

## 7 Orange roughy (*Hoplostethus atlanticus*) in the Northeast Atlantic

### 7.1 Stock description and management units

The stock structure of this species but the information available is insufficient to admit the existence of separate populations of orange roughy in the North Atlantic.

For assessment purposes, ICES considers three assessment units along ICES area:

- Subarea 6;
- Subarea 7;
- Orange roughy in all other areas.

Given the scarcity of spatial fisheries data, biological and genetics data, WGDEEP have not altered these assessment units.

Orange roughy is an aggregating species and the spatial scale of current management units would not prevent sequential depletion of local aggregations. Such local aggregations may not represent different biological populations, i.e. a biological population may comprise several local aggregations. However the sequential depletion of local aggregations could lead to depletion at stock level. Therefore, ICES has recommended that where the small-scale distribution is known, this be used to define smaller and more meaningful management units. ? In other words, where aggregation are known, their biomass should be estimated to derive small-scale catch levels that can be sustained at aggregation level. Nevertheless, the methodology to do that is hardly available.

## 7.2 Orange roughy (*Hoplostethus Atlanticus*) in Subarea 6

### 7.2.1 The fishery

There was a French target fishery, centred on spawning aggregations around the Hebrides Terrace Seamount in the early 1990s. Irish vessels exploited aggregations further south in divisions 7c and 7k in the early 2000s, but directed fisheries had ceased by 2006. No fishing and no catch was reported for years 2017–2020. From 2017, following the ban of trawling deeper than 800 m in EU waters and for EU vessels in International waters (EU regulation 2016/2336 of 14 December 2016), catch by EU vessels are expected negligible or null.

### 7.2.2 Landings trends

Table 7.2.1 and Figure 7.2.1 show the landings (ICES estimates) data for orange roughy for ICES Subarea 6 as reported to ICES or as reported to the WGDEEP ?. In recent years, only a small landing, 700 kg rounded to 1 tonne (Table 7.2.1) was landed by the Faroe Islands in 2016. The cumulative landings in Subarea 6 since 1988 were 7188 tonnes. There were no landings in 2017–2020.

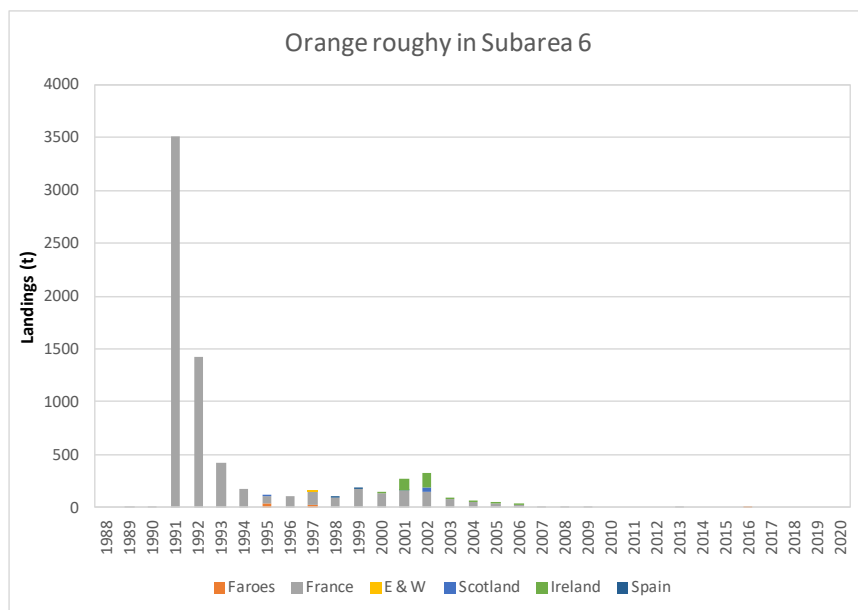


Figure 7.2.1. Time-series of orange roughy landings by country in ICES Subarea 6.

### 7.2.3 ICES Advice

The ICES advice was published in 2020 for 2021–2024. It applies to orange roughy in the North-east Atlantic and states that when the precautionary approach is applied, there should be zero catches in each of the years 2021–2024.

### 7.2.4 Management

In 2003 a TAC was introduced for orange roughy in Subarea 6, this TAC remained at 88 tonnes until 2006. In order to align the TAC with landings, the TAC for EU vessels in Area 6 was reduced annually between 2007 and 2009. Zero TACs have been set for orange roughy in all EU waters since 2010. In recent years, the species is prohibited in all EU waters.

Landings in relation to TAC are displayed in Table 7.2.2.

**Table 7.2.2. EU TACs and landings in EU and international waters of 6.**

| Year | TAC (t) | Landing (t) |       |
|------|---------|-------------|-------|
|      |         | EU vessels  | Total |
| 2003 | 88      | 81          | 81    |
| 2004 | 88      | 56          | 56    |
| 2005 | 88      | 45          | 45    |
| 2006 | 88      | 33          | 33    |
| 2007 | 51      | 12          | 12    |
| 2008 | 34      | 5           | 5     |
| 2009 | 17      | 2           | 2     |
| 2010 | 0       | 0           | 0     |
| 2011 | 0       | 0           | 0     |
| 2012 | 0       | 0           | 0     |
| 2013 | 0       | 0           | 0     |
| 2014 | 0       | 0           | 0     |
| 2015 | 0       | 0           | 0     |
| 2016 | 0       | 0           | 1     |
| 2017 | 0       | 0           | 0     |
| 2018 | 0       | 0           | 0     |
| 2019 | 0       | 0           | 0     |
| 2020 | 0       | 0           | 0     |

## 7.2.5 Data available

### 7.2.5.1 Landings and discards

Landings are in Table 7.2.1.

Raised discard weights were not available for 2014 and 2015. For 2016 and 2017, discards were estimated to 0 (zero). In 2018-2020 there was no reported landings nor discards to ICES.

### 7.2.5.2 Length compositions

Length distributions are available from historical observer programmes and current deep-water surveys. Available information can be found in the stock annex.

### 7.2.5.3 Age compositions

No new information. Available information can be found in the stock annex.

#### 7.2.5.4 Weight-at-age

No information.

#### 7.2.5.5 Maturity and natural mortality

No new information. Available information can be found in the stock annex.

#### 7.2.5.6 Catch, effort and research vessel data

No new information. Available information can be found in the stock annex.

### 7.2.6 Data analyses

No new analysis was performed in 2021.

### 7.2.7 Management considerations

A zero TAC without allowing a bycatch can potentially lead to discarding if existing fisheries overlap with the distribution of orange roughy. However since the ban of trawling deeper than 800 m the overlap between existing fisheries and the distribution of orange roughy might be minimal in EU waters of Subarea 6.

Due to the closure of the fishery in subareas 6 and 7 and trawling ban deeper than 800 m there are no fishery-dependent data to evaluate the status of the stocks.

PSA assessment of the susceptibility of orange roughy populations in Subareas 6 and 7 to **current** and deep-water trawl fisheries (see WGDEEP 2014, Section 7.3) has shown a strong reduction in risk over time when fisheries directed targeting practices stopped and continued with mixed deep-water trawl fisheries. Before the ban of trawling deeper than 800 m, some spatial overlap between the species and fisheries remained, such as on the "flat" fishing grounds in Subarea 6 on the continental slope to the northwest of Ireland extending to the west of Scotland. Following the application of the ban of bottom trawling deeper than 800 m (EU regulation 2016/2336) this bycatch might be minor in EU fisheries because the fraction of orange rough biomass occurring shallower than 800 m is minor or inexistent.

**Table 7.2.1. Orange roughy catch in Subarea 6.**

| Year | Faroese | France | E & W | Scotland | Ireland | Spain | Total |
|------|---------|--------|-------|----------|---------|-------|-------|
| 1988 | -       | -      | -     | -        | -       | -     | 0     |
| 1989 | -       | 5      | -     | -        | -       | -     | 5     |
| 1990 | -       | 15     | -     | -        | -       | -     | 15    |
| 1991 | -       | 3,502  | -     | -        | -       | -     | 3502  |
| 1992 | -       | 1,422  | -     | -        | -       | -     | 1422  |
| 1993 | -       | 429    | -     | -        | -       | -     | 429   |
| 1994 | -       | 179    | -     | -        | -       | -     | 179   |
| 1995 | 40      | 74     | -     | 2        | -       | -     | 116   |
| 1996 | 0       | 116    | -     | 0        | -       | -     | 116   |

| Year | Faroes | France           | E & W | Scotland | Ireland | Spain | Total |
|------|--------|------------------|-------|----------|---------|-------|-------|
| 1997 | 29     | 116              | 1     | -        | -       | -     | 146   |
| 1998 | -      | 100              | -     | -        | -       | 2     | 102   |
| 1999 | -      | 175              | -     | -        | 0       | 1     | 176   |
| 2000 | -      | 136              | -     | -        | 2       | -     | 138   |
| 2001 | -      | 159              | -     | 11       | 110     | -     | 280   |
| 2002 | n/a    | 152              | -     | 41       | 130     | -     | 323   |
| 2003 | -      | 79               | -     | -        | 2       | -     | 81    |
| 2004 | -      | 54               | -     | -        | 2       | -     | 56    |
| 2005 | -      | 41               | -     | -        | 6       | -     | 47    |
| 2006 |        | 32               |       |          | 1       |       | 33    |
| 2007 |        | 12               |       |          |         |       | 12    |
| 2008 |        | 5                |       |          |         |       | 5     |
| 2009 |        | 3                |       |          |         |       | 3     |
| 2010 |        | 0                |       |          |         |       | 0     |
| 2011 |        | 0                |       |          |         |       | 0     |
| 2012 |        | 0                |       |          |         |       | 0     |
| 2013 |        | 1 <sup>(1)</sup> |       |          |         |       | 3**   |
| 2014 |        | 0                |       |          |         |       | 0     |
| 2015 |        |                  |       |          |         |       | 0     |
| 2016 | 1      |                  |       |          |         |       | 1     |
| 2017 |        |                  |       |          |         |       | 0     |
| 2018 |        |                  |       |          |         |       | 0     |
| 2019 |        |                  |       |          |         |       | 0     |
| 2020 |        |                  |       |          |         |       | 0     |

### 7.3 Orange roughy (*Hoplostethus Atlanticus*) in Subarea 7

#### 7.3.1 The fishery

After the first few years (1991-93) of the fishery in Subarea 6, the main fishery for orange roughy in the northern hemisphere was in Subarea 7. This fishery peaked in 2002 and rapidly declined thereafter. Some targeted fishing from a few or even one single 20–24 m trawlers was carried out until 2008 while the remaining catches were a bycatch from the mixed deep-water trawl fishery operating on the slopes.

#### 7.3.2 Landings trends

Table 7.3.1 and Figure 7.3.1 show the landings data for orange roughy as reported to ICES or as reported to the Working Group.

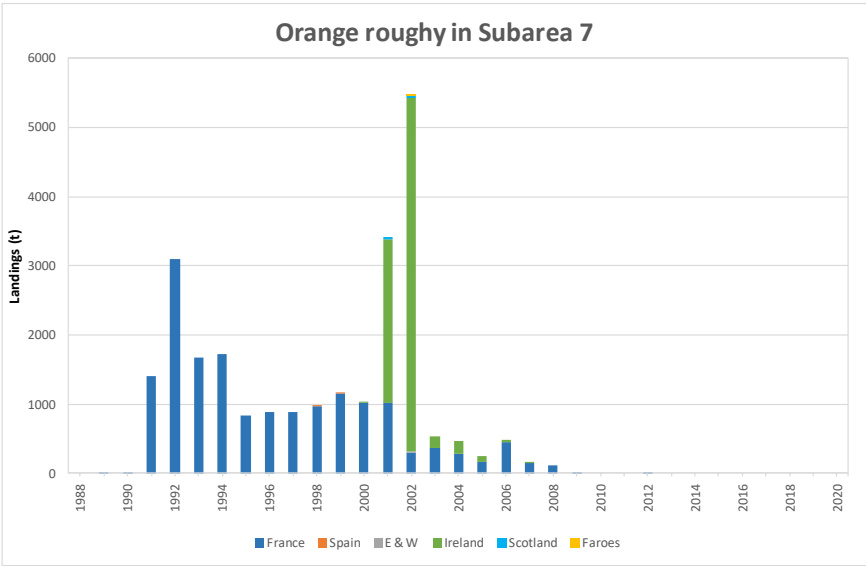


Figure 7.3.1. Time-series of orange roughy landings by country in ICES Subarea 7.

#### 7.3.3 ICES Advice

The ICES advice was published in 2020 for 2021–2024. It applies to orange roughy in the North-east Atlantic and states that when the precautionary approach is applied, there should be zero catch in each of the years 2021–2024.

#### 7.3.4 Management

A TAC for orange roughy in Subarea 7 was first introduced in 2003. Landings in relation to TAC are displayed in the table below:

**Table 7.3.2. EU TACs and landings in EU and international waters of Subarea 7.**

| Year | TAC (t) | Landing (t) |       |
|------|---------|-------------|-------|
|      |         | EU vessels  | Total |
| 2003 | 1349    | 541         | 541   |
| 2004 | 1349    | 467         | 467   |
| 2005 | 1149    | 255         | 255   |
| 2006 | 1149    | 489         | 489   |
| 2007 | 193     | 172         | 172   |
| 2008 | 130     | 118         | 118   |
| 2009 | 65      | 15          | 15    |
| 2010 | 0       | 0           | 0     |
| 2011 | 0       | 0           | 0     |
| 2012 | 0       | 0           | 0     |
| 2013 | 0       | 0           | 0     |
| 2014 | 0       | 0           | 0     |
| 2015 | 0       | 0           | 0     |
| 2016 | 0       | 0           | 0     |
| 2017 | 0       | 0           | 0     |
| 2018 | 0       | 0           | 0     |
| 2019 | 0       | 0           | 0     |
| 2020 | 0       | 0           | 0     |

The TAC for orange roughy in Subarea 7 was set to 0 t for 2016 and 2017. No catch was reported.

### 7.3.5 Data available

#### 7.3.5.1 Landings and discards

Landings are shown in Table 7.3.1.

There were no landings since 2010. Discards of orange roughy from the French mixed deep-water fishery in Subareas 6 and 7 were estimated from observer data. In recent years, discards estimated at fleet level have been calculated for total discards and by species. In 2012, the estimated discards of orange roughy was 400 kg.

### 7.3.5.2 Length compositions

No new information available. Historic information can be found in the stock annex.

### 7.3.5.3 Age compositions

No new information available. Historic information can be found in the stock annex.

### 7.3.5.4 Weight-at-age

No data.

### 7.3.5.5 Maturity and natural mortality

No new information available. Historic information can be found in the stock annex.

### 7.3.5.6 Catch, effort and research vessel data

No new information. Available information can be found in the stock annex.

## 7.3.6 Management considerations

See section 6.1.1. Management considerations.

**Table 7.3.1. Working Group estimates of landings of orange roughy, *Hoplostethus atlanticus*, by country in Subarea 7. Reported landings after 2012 have been 0 and the table was not expanded for these years.**

| Year | France | Spain | E & W | Ireland | Scotland | Faroes | Total |
|------|--------|-------|-------|---------|----------|--------|-------|
| 1988 | -      | -     | -     | -       | -        | -      | 0     |
| 1989 | 3      | -     | -     | -       | -        | -      | 3     |
| 1990 | 2      | -     | -     | -       | -        | -      | 2     |
| 1991 | 1406   | -     | -     | -       | -        | -      | 1406  |
| 1992 | 3101   | -     | -     | -       | -        | -      | 3101  |
| 1993 | 1668   | -     | -     | -       | -        | -      | 1668  |
| 1994 | 1722   | -     | -     | -       | -        | -      | 1722  |
| 1995 | 831    | -     | -     | -       | -        | -      | 831   |
| 1996 | 879    | -     | -     | -       | -        | -      | 879   |
| 1997 | 893    | -     | -     | -       | -        | -      | 893   |
| 1998 | 963    | 6     | -     | -       | -        | -      | 969   |
| 1999 | 1157   | 4     | -     | -       | -        | -      | 1161  |
| 2000 | 1019   | -     | -     | 1       | -        | -      | 1020  |
| 2001 | 1022   | -     | 1     | 2367    | 22       | -      | 3412  |
| 2002 | 300    |       | 14    | 5114    | 33       | 4      | 5465  |
| 2003 | 369    |       |       | 172     |          |        | 541   |
| 2004 | 279    |       |       | 188     |          |        | 467   |



| Year | France | Spain | E & W | Ireland | Scotland | Faroes | Total |
|------|--------|-------|-------|---------|----------|--------|-------|
| 2005 | 165    |       |       | 90      |          |        | 255   |
| 2006 | 451    |       |       | 37      |          |        | 489   |
| 2007 | 145    |       |       | 28      |          |        | 164   |
| 2008 | 118    |       |       |         |          |        | 118   |
| 2009 | 15     |       |       |         |          |        | 15    |
| 2010 |        |       |       |         |          |        | 0     |
| 2011 |        |       |       |         |          |        | 0     |
| 2012 | 2      |       |       |         |          |        | 2     |

## 7.4 Orange Roughy (*Hoplostethus atlanticus*) In subareas 1, 2, 4, 5, 8, 9, 10, 12 and 14 and Division 3.a

### 7.4.1 The fishery

Fisheries have been conducted in Divisions 5.a–b and Subareas 8, 10 and 12. Most started in the early 1990s, the exception being Subarea 10 which started in 1996. Since 2010, fisheries are mainly occurring in subareas 10 and 12, with sporadic catches in 5.a, 5.b and 9. In recent years, one Faroese trawler operated a small directed fishery in ICES Subareas 10 and 12. Information on this fishery is presented in WD01 Ofstad, 2020.

### 7.4.2 Landing trends

Table 7.4.0 and Figure 7.4.1 show ICES estimates of landings of orange roughy from ICES subareas 1, 2, 4, 5, 8, 9, 10, 12 and 14 and Division 3.a. Landings from the single trawler fishing in subareas 10 and 12 have been between 50 and 150 tonnes per year since 2014. They amounted to 150 tonnes in 2017. During the two last years, these landings were from subarea 10 only. In 2018, 20.65 tonnes was caught in Subarea 10 and 8.75 tonnes in Subarea 12. In 2019, 31.07 tonnes was caught in Subarea 10 and 28.96 tonnes in Subarea 12. There were no catch of orange roughy in 2020.

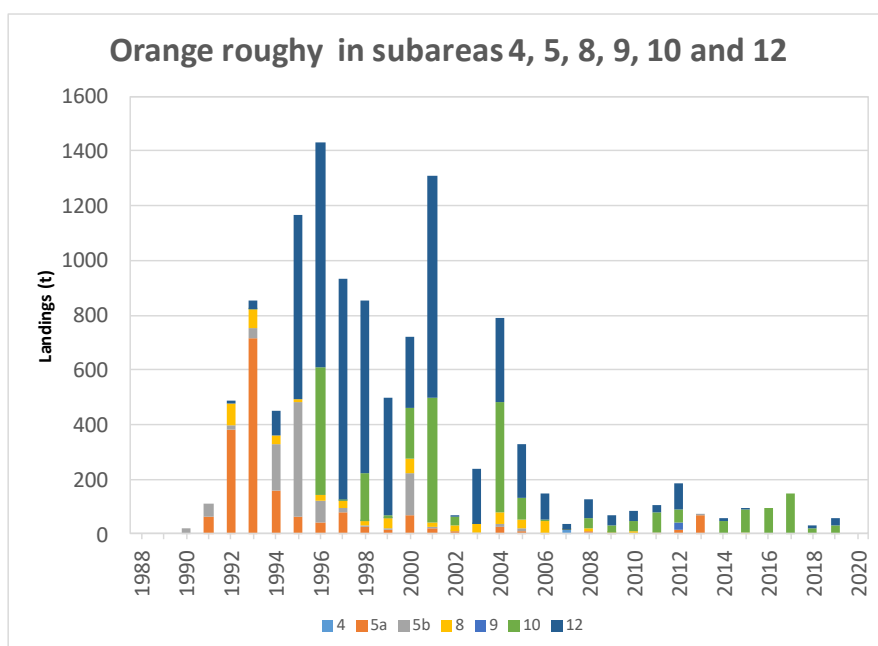


Figure 7.4.1. Time-series of orange roughy landings by subarea in all ICES areas (except subareas 6 and 7).

### 7.4.3 ICES Advice

The ICES advice was published in 2020 for 2021–2024. It applies to orange roughy in the North-east Atlantic and states that when the precautionary approach is applied, there should be zero catch in each of the years 2021–2024.

#### 7.4.4 Management measures

The EU TAC is set to for 0. The TAC applies to Community waters and EC vessels in international waters. Landings in relation to EU TAC are shown in Table 7.4.1.

In the NEAFC Regulatory Area, targeted fisheries for orange roughy are not permitted to vessels of the contracting parties, which must take measures to decrease bycatch (Recommendation 6: 2016).

In addition there are a number of management measures that are currently in place in the NEAFC regulatory area in relation to bottom trawling in known VMEs and outside existing fishing areas.

**Table 7.4.1. EU TACs and landings in Community waters and waters not under the sovereignty or jurisdiction of third countries of 1, 2, 3, 4, 5, 8, 9, 10, 11, 12 and 14.**

| Year | Landing (t) |            |       |
|------|-------------|------------|-------|
|      | EU TAC (t)  | EU vessels | Total |
| 2005 | 102         | 71         | 278   |
| 2006 | 102         | 58         | 149   |
| 2007 | 44          | 16         | 36    |
| 2008 | 30          | 8          | 112   |
| 2009 | 15          | 5          | 62    |
| 2010 | 0           | <1         | 83    |
| 2011 | 0           | 4          | 124   |
| 2012 | 0           | 28         | 167   |
| 2013 | 0           | 0          | 57    |
| 2014 | 0           | 0          | 58    |
| 2015 | 0           | 0          | 84    |
| 2016 | 0           | 0          | 0     |
| 2017 | 0           | 0          | 0     |
| 2018 | 0           | 0          | 0     |
| 2019 | 0           | 0          | 0     |
| 2020 | 0           | 0          | 0     |

## 7.4.5 Data available

### 7.4.5.1 Landings and discards

Landings are in Table 7.4.0. In recent years, Faroe Islands continued the fishery for orange roughy. The Faroese catches were 93 and 150 tonnes in Subarea 10, respectively in 2016 and 2017. In 2016 and 2017, small discards were reported by Spain in divisions 8.c and 9.a, 500 and 225 kg respectively in 2016 and 2017. In 2018 reported discards were 120 kg by Spain from Division 8.c. The Faroese catches were 21 tons in Subarea 10 and 9 tons in Subarea 12 in 2018 and 31 tons in area 10 and 29 tons in Subarea 12 in 2019. There were no catch of orange roughy in 2020.

### 7.4.5.2 Length composition

Sampling of lengths, weight and gender of orange roughy was carried out by trained crew members on board the single Faroese fishing vessel operating in this fishery. Samples were taken randomly from the catch. The length distribution of the catch is between 50–70 cm total length (Figure 7.4.1), which is the same as in the Faroese experimental fishery in the nineties (Thomsen, 1998). The average length and weight of orange roughy females and males were around the same in 2011–2018 compared with the results from the experimental fishery in 1992–1998 (Thomsen, 1998) (Table 7.4.2). In 2019, only length measurements were taken, no sex or weight measurements were available.

**Table 7.4.2. Mean length and weight by sex and combined (comb.). From sampling by trained crew members on board the single Faroese fishing vessel targeting orange roughy. <sup>a</sup> Thomsen, 1998.**

| Year                   | Area            | Month            | Average length (cm) |      |       | Average weight (kg) |      |
|------------------------|-----------------|------------------|---------------------|------|-------|---------------------|------|
|                        |                 |                  | Female              | Male | Comb. | Female              | Male |
| 1992-1998 <sup>a</sup> | Faroe Islands   |                  | 61.4                | 58.6 |       | 4.4                 | 3.7  |
| 1992-1998 <sup>a</sup> | Hatton Bank     |                  | 64.6                | 62.8 |       | 4.9                 | 4.3  |
| 1992-1998 <sup>a</sup> | Reykjanes ridge |                  | 58.9                | 56.4 |       | 3.6                 | 3.0  |
| 1992-1998 <sup>a</sup> | North of Azores |                  | 60.6                | 59.7 |       | 3.9                 | 3.7  |
| 2011                   | 27.10b          | Feb., Mar.       | 61.4                | 60.5 | 60.9  | 3.5                 | 3.2  |
| 2012                   | 27.10b          | Feb.             | 61.4                | 60.8 | 61.0  | 3.5                 | 3.2  |
| 2013                   | 27.10b          | Jan.             | 60.9                | 57.7 | 59.6  | 4.3                 | 3.8  |
| 2014                   | 27.10b          | Jun., Jul.       | 62.1                | 58.4 | 60.5  | 4.2                 | 3.7  |
| 2015                   | 27.10b          | Jul., Aug.       | 59.0                | 58.3 | 58.6  | 3.7                 | 3.5  |
| 2016                   | 27.10b          | Jun., Oct., Nov. | 61.4                | 58.7 | 60.1  | 4.3                 | 3.7  |
| 2017                   | 27.10b          | Nov.             | 60.6                | 57.5 | 58.7  | 3.9                 | 3.4  |
| 2018                   | 27.10b, 27.12c  | Feb.             | 63.4                | 60.1 | 61.5  | 4.2                 | 3.8  |
| 2019                   | 27.10b, 27.12cd | Feb., Mar.       |                     |      | 61.4  |                     |      |

**7.4.5.3 Age composition**

No data.

**7.4.5.4 Weight-at-age**

No data.

**7.4.5.5 Maturity and natural mortality**

No data.

**7.4.5.6 Catch, effort and research vessel data**

Catch and effort data were collected on a haul-by-haul basis in the Faroese fishery.

Orange roughy is caught occasionally in the stratified bottom trawl survey in East Greenland (Division 14.b) (Nielsen et. al., 2019). The species was only caught in 2008, 2013, 2014 and 2015 (Figure 7.4.2). In 2014 and 2015, estimated biomass was 1.7 t and 1.1 t, respectively, and all other years it was zero or very close to. No length distributions are calculated because of too few specimens ( $N < 20$ ) has been caught.

There was no information available of orange roughy in ICES division 14.b in the period 1999–2019 (Nilsen, 2020).

**7.4.6 Data analysis**

No data analysis was carried out in 2021.

**7.4.7 Management considerations**

Due to its very low productivity, orange roughy can only sustain very low rates of exploitation. Currently, it is not possible to manage a sustainable fishery for this species. ICES recommends no directed fisheries for this species. Bycatches in mixed fisheries should be as low as possible.

The zero EU TAC implies that no EU fishing for the species is allowed. The application of the EU regulation 2016/2336, establishing specific conditions for fishing for deep-sea stocks in the north-east Atlantic implies that bycatch in EU trawl fisheries might be minor as a consequence of the ban of fishing deeper than 800 m with trawls in this regulation. Possible bycatch should be minor because the fraction of orange rough biomass occurring shallower than 800 m is minor or inexistent. With the exception of the black scabbardfish fishery in Subarea 9.a, where bycatch of orange roughy are not known to occur, there are no EU longline fisheries at depth where orange roughy occurs.

Concerns were raised at the WGDEEP 2020 about potential sequential depletion of orange roughy at seamounts. It was recommended to perform an analysis of available VMS-data and investigate the fishing grounds exploited by this fishery.

In 2015–2019 all landings from the stock were caught in the NEAFC RA.

**7.4.8 References**

- ICES. 2014. Report of the Working Group on Biology and Assessment of Deep-sea Fisheries Resources (WGDEEP), 4–11 April 2014, Copenhagen, Denmark. ICES CM 2014/ACOM:17. 862 pp.
- Nilsen, J., Nogueira, A., and Christensen, H.T. 2019. Survey results of roughhead grenadier, roundnose grenadier, greater silver smelt, blue ling, tusk, black scabbardfish, ling, and orange roughy in ICES subdivision 14.b.2 in the period 1998–2016. WD05 WGDEEP 2019.

Nilsen, J. 2019. Commercial catches of roundnose grenadier, roughhead grenadier, greater silver smelt, blue ling, tusk, black scabbard fish, ling and orange roughy in ICES division 14b in the period 1999-2019. WD02 WGDEEP 2020.

Ofstad, L.H. 2020. Faroese fishery of orange roughy in ICES areas 10 and 12. WD01 WGDEEP 2020.

Thomsen, B. 1998. Faroese quest of orange roughy in the North Atlantic. Copenhagen (Denmark), ICES.

## 7.4.9 Tables and Figures

**Table 7.4.0a. Working Group estimates of landings in tonnes of orange roughy, *Hoplostethus atlanticus*, in Division 5.a.**

| Year | Iceland | Total |
|------|---------|-------|
| 1988 | -       | 0     |
| 1989 | -       | 0     |
| 1990 | -       | 0     |
| 1991 | 65      | 65    |
| 1992 | 382     | 382   |
| 1993 | 717     | 717   |
| 1994 | 158     | 158   |
| 1995 | 64      | 64    |
| 1996 | 40      | 40    |
| 1997 | 79      | 79    |
| 1998 | 28      | 28    |
| 1999 | 14      | 14    |
| 2000 | 68      | 68    |
| 2001 | 19      | 19    |
| 2002 | 10      | 10    |
| 2003 | 0       | 0     |
| 2004 | 28      | 28    |
| 2005 | 9       | 9     |
| 2006 | 2       | 2     |
| 2007 | 0       | 0     |
| 2008 | 4       | 4     |
| 2009 | <1      | <1    |
| 2010 | <1      | <1    |
| 2011 | 4       | 4     |

| Year | Iceland | Total |
|------|---------|-------|
| 2012 | 16      | 16    |
| 2013 | 54      | 54    |
| 2014 | 0       | 0     |
| 2015 | 0       | 0     |
| 2016 | 0       | 0     |
| 2017 | 0       | 0     |
| 2018 | 0       | 0     |
| 2019 | 0       | 0     |
| 2020 | 0       | 0     |

**Table 7.4.0b. Working Group estimates of landings in tonnes of orange roughy, *Hoplostethus atlanticus*, in Division 5.b.**

| Year | Faroes | France | Total |
|------|--------|--------|-------|
| 1988 | -      | -      | 0     |
| 1989 | -      | -      | 0     |
| 1990 | -      | 22     | 22    |
| 1991 | -      | 48     | 48    |
| 1992 | 1      | 12     | 13    |
| 1993 | 36     | 1      | 37    |
| 1994 | 170    | +      | 170   |
| 1995 | 419    | 1      | 420   |
| 1996 | 77     | 2      | 79    |
| 1997 | 17     | 1      | 18    |
| 1998 | -      | 3      | 3     |
| 1999 | 4      | 1      | 5     |
| 2000 | 155    | 0      | 155   |
| 2001 | 1      | 4      | 5     |
| 2002 | 1      | 0      | 1     |
| 2003 | 2      | 3      | 5     |
| 2004 |        | 7      | 7     |
| 2005 | 3      | 10     | 13    |

| Year | Faroes | France | Total |
|------|--------|--------|-------|
| 2006 | 0      | 0      | 0     |
| 2007 | 0      | 1      | 1     |
| 2008 | 0      | <1     | <1    |
| 2009 | <1     | 2      | 2     |
| 2010 | <1     | <1     | <1    |
| 2011 | 0      | 0      | 0     |
| 2012 | 0      | 0      | 0     |
| 2013 | 1      |        | 1     |
| 2014 | 0      |        | 0     |
| 2015 | 0      |        | 0     |
| 2016 | 0      | 0      | 0     |
| 2017 | 0      | 0      | 0     |
| 2018 | 0      | 0      | 0     |
| 2019 | 0      | 0      | 0     |
| 2020 | 0      | 0      | 0     |

**Table 7.4.0c. Working Group estimates of landings in tonnes of orange roughy, *Hoplostethus atlanticus*, in Subarea 8.**

| Year | France | Spain | E & W | Total |
|------|--------|-------|-------|-------|
| 1988 | -      | -     | -     | 0     |
| 1989 | 0      | -     | -     | 0     |
| 1990 | 0      | -     | -     | 0     |
| 1991 | 0      | -     | -     | 0     |
| 1992 | 83     | -     | -     | 83    |
| 1993 | 68     | -     | -     | 68    |
| 1994 | 31     | -     | -     | 31    |
| 1995 | 7      | -     | -     | 7     |
| 1996 | 22     | -     | -     | 22    |
| 1997 | 1      | 22    | -     | 23    |
| 1998 | 4      | 10    | -     | 14    |
| 1999 | 33     | 6     | -     | 39    |



| Year | France | Spain | E & W | Total |
|------|--------|-------|-------|-------|
| 2000 | 47     | -     | 5     | 52    |
| 2001 | 20     | -     | -     | 20    |
| 2002 | 20     | -     | -     | 20    |
| 2003 | 31     |       |       | 31    |
| 2004 | 43     |       |       | 43    |
| 2005 | 29     |       |       | 29    |
| 2006 | 43     |       |       | 43    |
| 2007 | 1      |       |       | 1     |
| 2008 | 8      |       |       | 8     |
| 2009 | 13     |       |       | 13    |
| 2010 | 8      |       |       | 8     |
| 2011 | 0      |       |       | 0     |
| 2012 | 0      |       |       | 0     |
| 2013 | 0      |       |       | 0     |
| 2014 |        |       |       | 0     |
| 2015 | 6      |       |       | 6     |
| 2016 | 0      |       |       | 0     |
| 2017 | 0      | 0     | 0     | 0     |
| 2018 | 0      | 0     | 0     | 0     |
| 2019 | 0      | 0     | 0     | 0     |
| 2020 | 0      | 0     | 0     | 0     |

Table 7.4.0d. Working Group estimates of landings in tonnes of orange roughy, *Hoplostethus atlanticus*, in Subarea 9.

| Year | Portugal | Spain(1) | Total |
|------|----------|----------|-------|
| 1990 | 0        | -        | 0     |
| 1991 | 0        | -        | 0     |
| 1992 | 0        | -        | 0     |
| 1993 | 0        | -        | 0     |
| 1994 | 0        | -        | 0     |
| 1995 | 0        | -        | 0     |

| Year | Portugal | Spain(1) | Total |
|------|----------|----------|-------|
| 1996 | 0        | -        | 0     |
| 1997 | 0        | 1        | 1     |
| 1998 | 0        | 1        | 1     |
| 1999 | 0        | 1        | 1     |
| 2000 | 0        | 0        | 0     |
| 2001 | 0        | 0        | 0     |
| 2002 | 0        | 0        | 0     |
| 2003 | 0        | 0        | 0     |
| 2004 | 0        | 0        | 0     |
| 2005 | 0        | 0        | 0     |
| 2006 | 0        | 0        | 0     |
| 2007 | 0        | 0        | 0     |
| 2008 | 0        | 0        | 0     |
| 2009 | 0        | 0        | 0     |
| 2010 | 0        | 0        | 0     |
| 2011 | 4        | 0        | 4     |
| 2012 | 28       |          | 28    |
| 2013 | 0        |          | 0     |
| 2014 |          |          | 0     |
| 2015 |          |          | 0     |
| 2016 |          |          | 0     |
| 2017 |          |          | 0     |
| 2018 |          |          | 0     |
| 2019 | 0        | 0        | 0     |
| 2020 |          |          | 0     |

Included in landings from Subarea 9 until 2002

Table 7.4.0e. Working Group estimates of landings in tonnes of orange roughy, *Hoplostethus atlanticus*, in Subarea 10.

| Year | Faroës | France | Norway | E & W | Portugal | Ireland | Total |
|------|--------|--------|--------|-------|----------|---------|-------|
| 1989 | -      | -      | -      | -     | -        |         | 0     |

| Year | Faroes  | France | Norway | E & W | Portugal | Ireland | Total |
|------|---------|--------|--------|-------|----------|---------|-------|
| 1990 | -       | -      | -      | -     | -        |         | 0     |
| 1991 | -       | -      | -      | -     | -        |         | 0     |
| 1992 | -       | -      | -      | -     | -        |         | 0     |
| 1993 | -       | -      | 1      | -     | -        |         | 1     |
| 1994 | -       | -      | -      | -     | -        |         | 0     |
| 1995 | -       | -      | -      | -     | -        |         | 0     |
| 1996 | 470     | 1      | -      | -     | -        |         | 471   |
| 1997 | 6       | -      | -      | -     | -        |         | 6     |
| 1998 | 177     | -      | -      | -     | -        |         | 177   |
| 1999 | -       | 10     | -      | -     | -        |         | 10    |
| 2000 | -       | 3      | -      | 28    | 157      |         | 188   |
| 2001 | 84      | -      | -      | 28    | 343      |         | 455   |
| 2002 | 30      | -      | -      | -     | -        |         | 30    |
| 2003 |         | 1      |        |       |          |         | 1     |
| 2004 | 384     |        |        |       |          | 19      | 403   |
| 2005 | 128     | 2      |        |       |          |         | 130   |
| 2006 | 8       |        |        |       |          |         | 8     |
| 2007 | 0       |        |        |       |          |         | 0     |
| 2008 | 37      |        |        |       |          |         | 37    |
| 2009 | 26      |        |        |       |          |         | 26    |
| 2010 | 39      |        |        |       |          |         | 39    |
| 2011 | 77      |        |        |       |          |         | 77    |
| 2012 | 45      |        |        |       |          |         | 45    |
| 2013 | 0       |        |        |       |          |         | 0     |
| 2014 | 47 (1)  |        |        |       |          |         | 47    |
| 2015 | 83 (1)  |        |        |       |          |         | 83    |
| 2016 | 93 (1)  |        |        |       |          |         | 93    |
| 2017 | 150 (1) |        |        |       |          |         | 150   |
| 2018 | 21 (1)  |        |        |       |          |         | 21    |

| Year | Faroës | France | Norway | E & W | Portugal | Ireland | Total |
|------|--------|--------|--------|-------|----------|---------|-------|
| 2019 | 31 (1) |        |        |       |          |         | 31    |
| 2020 | 0      |        |        |       |          |         | 0     |

(1) Landings 2014–2019 were from Division 10.b

**Table 7.4.0f. Working Group estimates of landings in tonnes of orange roughy, *Hoplostethus atlanticus*, in Subarea 12.**

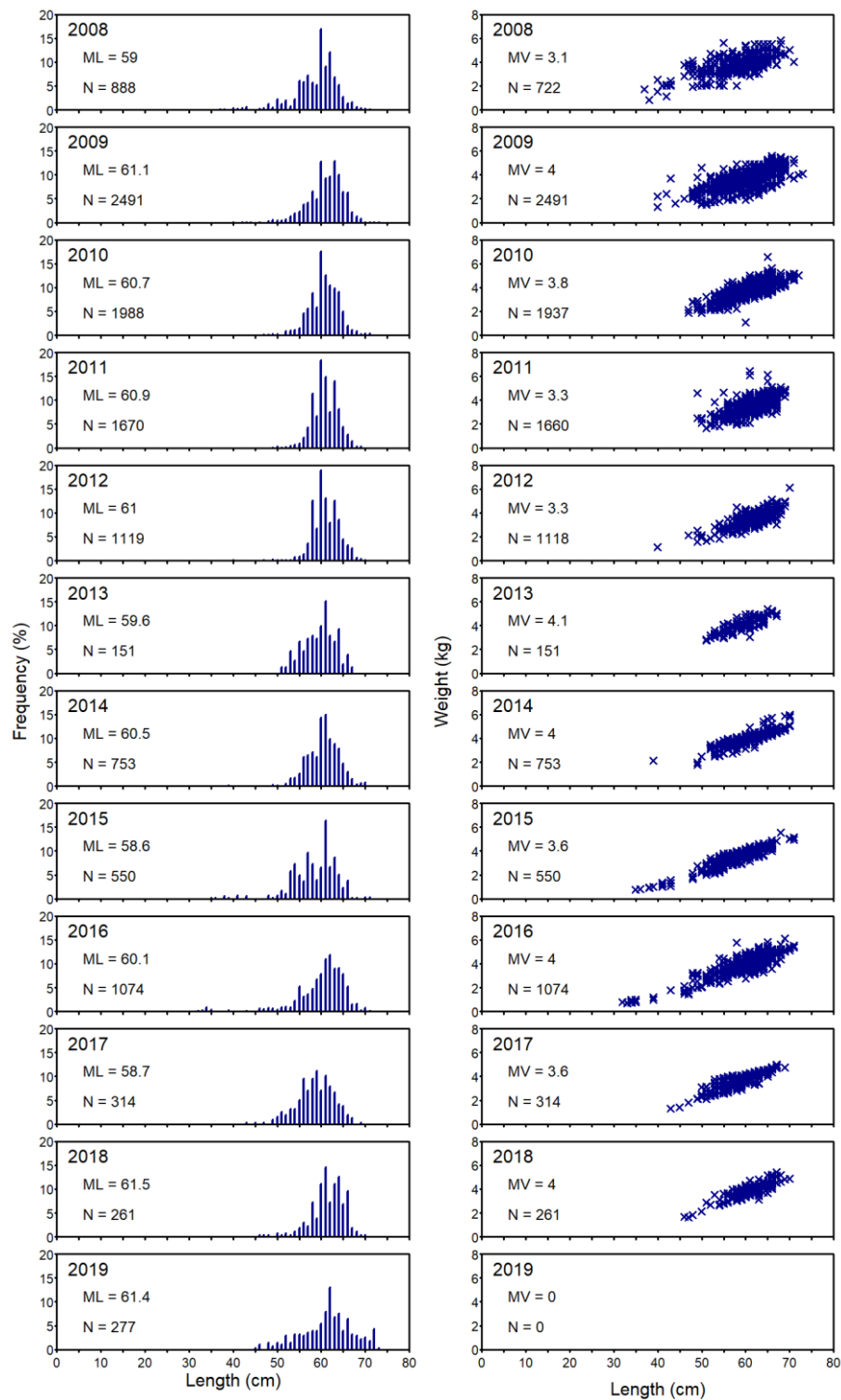
| Year | Faroës | France | Iceland | Spain | E & W | Ireland | New Zealand | Russia | Total |
|------|--------|--------|---------|-------|-------|---------|-------------|--------|-------|
| 1989 | -      | 0      | -       | -     | -     |         |             | -      | 0     |
| 1990 | -      | 0      | -       | -     | -     |         |             | -      | 0     |
| 1991 | -      | 0      | -       | -     | -     |         |             | -      | 0     |
| 1992 | -      | 8      | -       | -     | -     |         |             | -      | 8     |
| 1993 | 24     | 8      | -       | -     | -     |         |             | -      | 32    |
| 1994 | 89     | 4      | -       | -     | -     |         |             | -      | 93    |
| 1995 | 580    | 96     | -       | -     | -     |         |             | -      | 676   |
| 1996 | 779    | 36     | 3       | -     | -     |         |             | -      | 818   |
| 1997 | 802    | 6      | -       | -     | -     |         |             | -      | 808   |
| 1998 | 570    | 59     | -       | -     | -     |         |             | -      | 629   |
| 1999 | 345    | 43     | -       | 43    | -     |         |             | -      | 431   |
| 2000 | 224    | 21     | -       | -     | 2     |         |             | 12     | 259   |
| 2001 | 345    | 14     | -       | -     | 2     |         | 450         | -      | 811   |
| 2002 | +      | 6      | -       | -     | -     |         | 0           | -      | 6     |
| 2003 |        | 64     |         |       |       | 136     | 0           | -      | 200   |
| 2004 | 176    | 131    |         |       |       |         | 0           |        | 307   |
| 2005 | 158    | 36     |         |       |       |         | 0           |        | 193   |
| 2006 | 81     | 15     |         |       |       |         |             |        | 96    |
| 2007 | 20     |        |         |       |       |         |             |        | 20    |
| 2008 | 71     |        |         |       |       |         |             |        | 71    |
| 2009 | 34     |        |         |       |       |         |             |        | 34    |
| 2010 | 35     |        |         |       |       |         |             |        | 35    |
| 2011 | 27     |        |         |       |       |         |             |        | 27    |
| 2012 | 94     |        |         |       |       |         |             |        | 94    |

| Year | Faroes | France | Iceland | Spain | E & W | Ireland | New Zealand | Russia | Total |
|------|--------|--------|---------|-------|-------|---------|-------------|--------|-------|
| 2013 | 2      |        |         |       |       |         |             |        | 2     |
| 2014 | 11     |        |         |       |       |         |             |        | 11    |
| 2015 | 1      |        |         |       |       |         |             |        | 1     |
| 2016 | 0      |        |         |       |       |         |             |        | 0     |
| 2017 | 0      |        |         |       |       |         |             |        | 0     |
| 2018 | 9      |        |         |       |       |         |             |        | 9     |
| 2019 | 29     |        |         |       |       |         |             |        | 29    |
| 2020 | 0      |        |         |       |       |         |             |        | 0     |

**Table 7.4.0g. Orange roughy total international landings in tonnes in the ICES area, excluding Subareas 6 and 7.**

| Year | 4 | 5.a | 5.b | 8  | 9 | 10  | 12  | All areas |
|------|---|-----|-----|----|---|-----|-----|-----------|
| 1988 |   | 0   | 0   | 0  | 0 | 0   | 0   | 0         |
| 1989 |   | 0   | 0   | 0  | 0 | 0   | 0   | 0         |
| 1990 |   | 0   | 22  | 0  | 0 | 0   | 0   | 22        |
| 1991 |   | 65  | 48  | 0  | 0 | 0   | 0   | 113       |
| 1992 |   | 382 | 13  | 83 | 0 | 0   | 8   | 486       |
| 1993 |   | 717 | 37  | 68 | 0 | 1   | 32  | 855       |
| 1994 |   | 158 | 170 | 31 | 0 | 0   | 93  | 452       |
| 1995 |   | 64  | 420 | 7  | 0 | 0   | 676 | 1167      |
| 1996 |   | 40  | 79  | 22 | 0 | 471 | 818 | 1430      |
| 1997 |   | 79  | 18  | 23 | 1 | 6   | 808 | 935       |
| 1998 |   | 28  | 3   | 14 | 1 | 177 | 629 | 852       |
| 1999 |   | 14  | 5   | 39 | 1 | 10  | 431 | 500       |
| 2000 |   | 68  | 155 | 52 | 0 | 188 | 259 | 722       |
| 2001 |   | 19  | 5   | 20 | 0 | 455 | 811 | 1310      |
| 2002 |   | 10  | 1   | 20 | 0 | 30  | 6   | 67        |
| 2003 |   | +   | 5   | 31 | 0 | 1   | 200 | 237       |
| 2004 |   | 28  | 7   | 43 | 0 | 403 | 307 | 788       |
| 2005 |   | 9   | 13  | 29 | 0 | 83  | 193 | 327       |
| 2006 |   | 2   | 0   | 43 | 0 | 8   | 96  | 149       |

| Year | 4  | 5.a | 5.b | 8 | 9  | 10  | 12 | All areas |
|------|----|-----|-----|---|----|-----|----|-----------|
| 2007 | 14 |     | 1   | 1 | 0  | 0   | 20 | 36        |
| 2008 | 7  | 4   | <1  | 8 | 0  | 37  | 71 | 127       |
| 2009 | 0  | 1   | 2   | 3 | 0  | 26  | 34 | 66        |
| 2010 | 0  | <1  | <1  | 8 | 0  | 39  | 35 | 82        |
| 2011 | 0  | 4   | 0   | 0 | <1 | 77  | 27 | 108       |
| 2012 |    | 16  | 0   | 0 | 28 | 45  | 94 | 183       |
| 2013 |    | 54  | 1   | 0 | 0  | 0   | 2  | 57        |
| 2014 |    |     |     |   |    | 47  | 11 | 58        |
| 2015 |    |     |     | 6 |    | 83  | 1  | 90        |
| 2016 |    |     |     |   |    | 93  |    | 93        |
| 2017 |    |     |     |   |    | 150 |    | 150       |
| 2018 |    |     |     |   |    | 21  | 9  | 30        |
| 2019 |    |     |     |   |    | 31  | 29 | 60        |
| 2020 |    |     |     |   |    | 0   | 0  | 0         |



**Figure 7.4.1. Length composition and length–weight relation of orange roughy in Faroese catches 2008–2019. There were no weight measurements of orange roughy in 2019.**

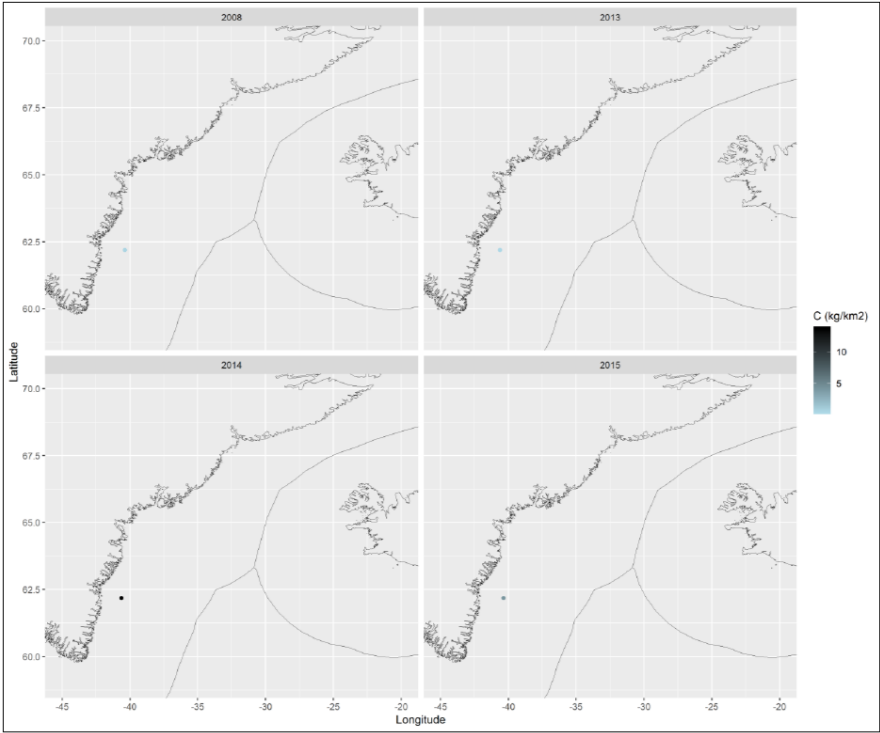


Figure 7.4.2. Distribution of survey catches of orange roughy at East Greenland in 1998–2016. No survey in 2001, 2017