

2.3.10 Beaked redfish (*Sebastes mentella*) in Division 14.b, demersal (Southeast Greenland)

ICES stock advice

ICES advises that when the precautionary approach is applied, catches in 2017 should be no more than 1120 tonnes.

Stock development over time

A directed fishery started in 2009 and catches have increased from an average level of about 700 tonnes in 1995–2009 to approximately 6000 tonnes in 2010–2015. The Greenland Shallow Water survey index indicates that the biomass has been declining since 2010.

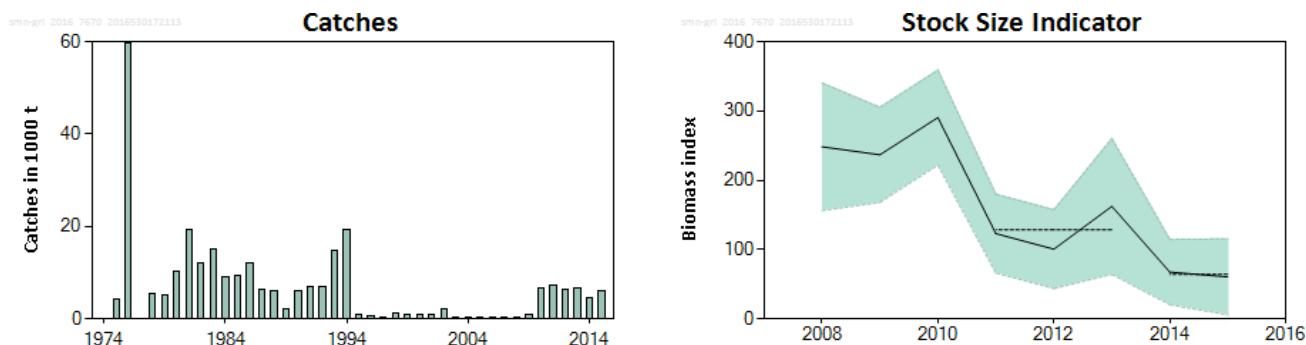


Figure 2.3.10.1 Beaked redfish in Division 14.b (demersal). Left: Catches in 1974–2015. Right: Biomass index of *S. mentella* > 17 cm from the Greenland Shallow Water survey (0–600 m); median (solid line) and 90% confidence intervals (shaded area) are plotted. The dashed horizontal lines indicate the average biomass for 2011–2013 and for 2014 and 2015.

Stock and exploitation status

Table 2.3.10.1 Beaked redfish in Division 14.b (demersal). State of the stock and fishery relative to reference points.

| | | Fishing pressure | | | | Stock size | | | |
|---------------------------|----------------------|------------------|------|------|----------------|----------------------|------|------|--------|
| | | 2013 | 2014 | 2015 | | 2013 | 2014 | 2015 | |
| Maximum sustainable yield | F_{MSY} | ? | ? | ? | Undefined | $B_{trigger}$ | ? | ? | ? |
| Precautionary approach | F_{pa} , F_{lim} | ? | ? | ? | Undefined | B_{pa} , B_{lim} | ? | ? | ? |
| Management plan | F_{MGT} | - | - | - | Not applicable | SSB_{MGT} | - | - | - |
| Qualitative evaluation | - | ? | ? | ? | Unknown | - | ↗ | ↘ | → |
| | | | | | | | | | Stable |

Catch options

The ICES framework for category 3 stocks was applied. The Greenland Shallow Water survey index was applied as index for the stock development. The advice is based on a comparison of the two latest index values (index A) with the three preceding values (index B), combined with the catch advice for 2016. The index is estimated to have decreased by 50%. Following the rapid decline observed in three of the four indices (Figures 2.3.10.1, 2.3.10.3, and 2.3.10.4), the application of an uncertainty cap is not considered sufficiently responsive and has therefore not been used. The precautionary buffer was applied in the advice for 2016, and therefore is not reapplied this year. Discarding is considered negligible.

Table 2.3.10.2 Beaked redfish in Division 14.b (demersal). For stocks in ICES data categories 3–6, one catch option is provided.

| | | |
|-------------------------|-------------|--------|
| Indicator A (2014–2015) | | 64.1 |
| Indicator B (2011–2013) | | 128.7 |
| Indicator ratio (A/B) | | 0.5 |
| Uncertainty cap | Not applied | - |
| Catch advice for 2016 | | 2240 t |
| Precautionary buffer | Not applied | - |
| Catch advice for 2017* | | 1120 t |

*[Catch advice for 2016] × [indicator ratio].

Basis of the advice

Table 2.3.10.3 Beaked redfish in Division 14.b (demersal). The basis of the advice.

| | |
|-----------------|---|
| Advice basis | Precautionary approach. |
| Management plan | There is no management plan for this stock. |

Quality of the assessment

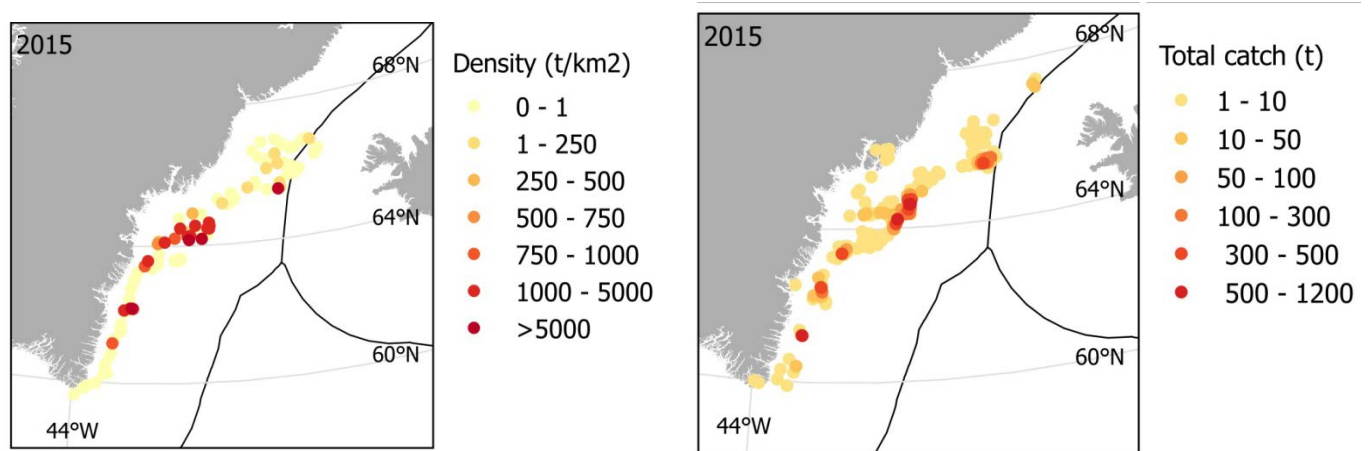
The present catch statistics do not separate *Sebastes mentella* from *Sebastes norvegicus*. Greenland surveys and samples from the commercial fishery are used to estimate a split of the catches based on morphological identification. A comparison of morphological and genetic species identification has shown approximately 5% mistakes in the morphological identification (ICES, 2016a).

The survey indices have large uncertainties, primarily due to the aggregating behaviour of the stock.

Connection to other stocks of *S. mentella* remains unresolved and their effect on survey estimates and catches is unknown.

Issues relevant for the advice

Sebastes mentella is a slow-growing, late-maturing species and is therefore considered vulnerable to overexploitation. Three of the four biomass and abundance indices for both adult and juvenile redfish have been declining since 2010 (Figures 2.3.10.1, 2.3.10.3, and 2.3.10.4). The deep Greenland survey (Figure 2.3.10.3, bottom), outside the area exploited by the fishery, does not show a decline. Furthermore, on the Greenlandic slope, *S. mentella* is primarily distributed in a relatively small area, which is also the hotspot area for the fishery (Figure 2.3.10.2). Given the biology of the species, the nature of the fishery, and the rapid decline in stock indicators, ICES has not applied the uncertainty cap in this year's advice.

**Figure 2.3.10.2** Distribution of beaked redfish in Division 14.b (demersal). Left: Greenland shallow water survey (0–600 m; density in t km⁻²). Right: Catches (t).

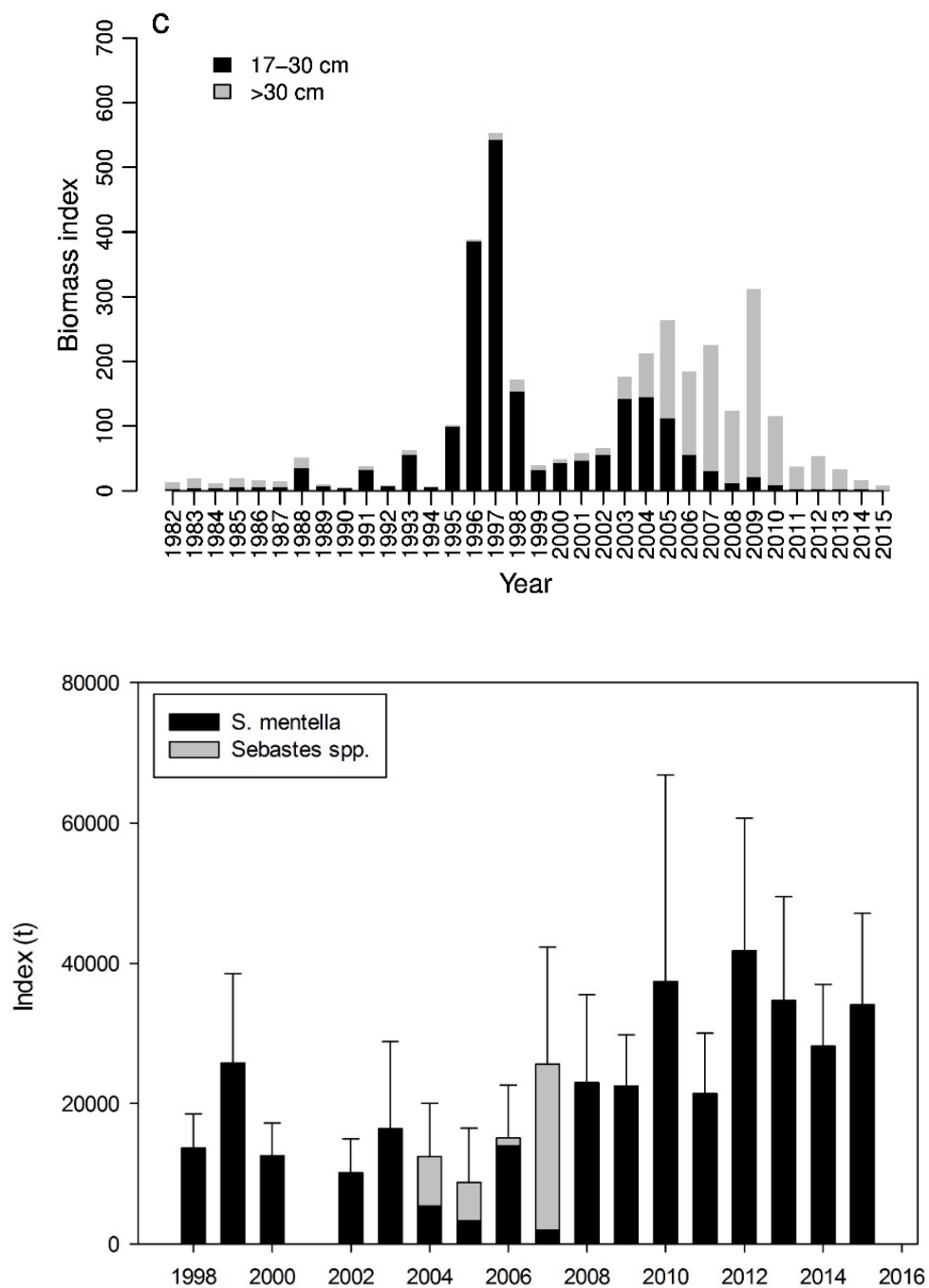


Figure 2.3.10.3 Top: *S. mentella* 17–30 cm (black) and >30 cm (grey). German survey (0–400 m). Bottom: Biomass of *S. mentella* and *Sebastes* spp. derived from the deep Greenland survey. Bars indicate 2 s.e. of the biomass. No survey in 2001. In 2004, 2005, and 2007 a large proportion of the redfish were not determined to species and only reported as “*Sebastes* spp.” It is most likely that the majority of these fish were *S. mentella*.

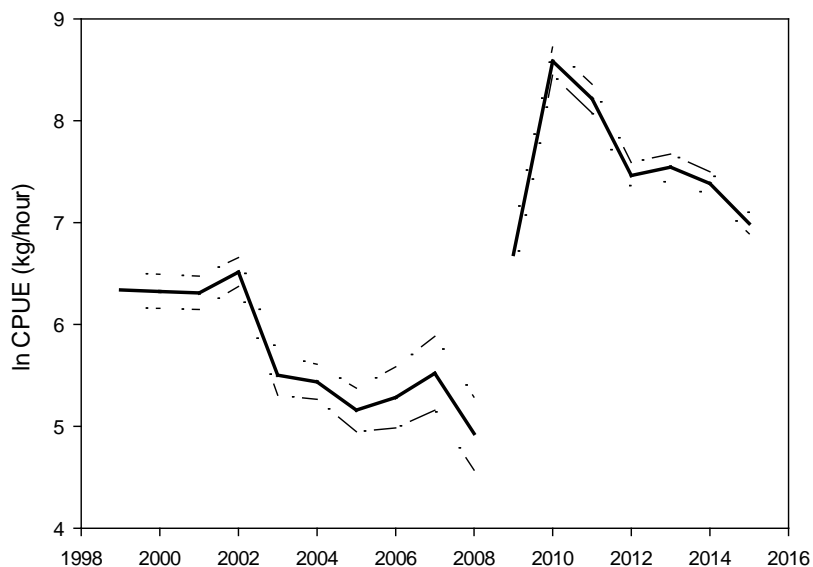


Figure 2.3.10.4 Cpue $\ln(\text{kg hour}^{-1})$ ($\pm 2 \times \text{s.e.}$) for the directed fishery on beaked redfish in Division 14.b (demersal). Prior to 2009 the cpue does not reflect a targeted fishery.

Reference points

No reference points have been defined for this stock.

Basis of the assessment

Table 2.3.10.4 Beaked redfish in Division 14.b (demersal). The basis of the assessment.

| | |
|--------------------------|--|
| ICES stock data category | 3 (ICES, 2016b) |
| Assessment type | Survey trend-based assessment (ICES, 2016a) |
| Input data | Survey index (GRL-GFS) |
| Discards and bycatch | Discarding is considered negligible. |
| Indicators | Survey indices GER(GRL)-GFS-Q4 and GRL-DEEP; demersal cpue. |
| Other information | The stock was benchmarked in 2012 (ICES, 2012) with no analytical assessment model accepted. |
| Working group | North-Western Working Group (NWWG) |

Information from stakeholders

There is no available information.

History of the advice, catch, and management

Table 2.3.10.5 Beaked redfish in Division 14.b (demersal). History of ICES advice, the agreed TAC, and ICES estimates of catch.

| Year | ICES advice | Predicted catch corresp. to advice | Agreed TAC for demersal redfish in Greenland EEZ | ICES catch |
|------|--------------------------------|------------------------------------|--|------------|
| 2011 | No expansion of fishery | - | 6 | 6.7 |
| 2012 | No expansion of fishery | < 1 | 6.8* | 6.6 |
| 2013 | Precautionary approach | < 3.5 | 6.8* | 6.6 |
| 2014 | No new advice same as for 2013 | < 3.5 | 6.8* | 4.6 |
| 2015 | No new advice same as for 2013 | < 3.5 | 6.8* | 6.0 |
| 2016 | Precautionary approach | < 2.24 | 3.4*, ** | |
| 2017 | Precautionary approach | < 1.12 | | |

Weights in thousand tonnes.

Advice prior to 2011 was given for beaked redfish (*S. mentella*) in Division 5.a and Subarea 14 (Icelandic slope stock).

*A total mixed TAC of 8.5 kt was set for *S. mentella* and *S. norvegicus*.

**In an agreement between Greenland and Iceland, 10% of the TAC of 51 kt set for *S. norvegicus* goes to Greenland. This share is then withdrawn from Greenland's mixed TAC mentioned in the footnote above (i.e. $8.5 - 5.1 = 3.4$ kt).

History of catch and landings

Table 2.3.10.6 Beaked redfish in Division 14.b (demersal). Catch distribution by fleet in 2015 as estimated by ICES.

| Table 2.13.10.6 Beaked rechin in Division 14.6 (demersal): catch distribution by fleet in 2015 as estimated by ICES. | | | |
|--|------------------|-------------|------------|
| Total catch (2015) | Landings | | Discards |
| 5 977 t | 99% bottom trawl | 1% longline | Negligible |
| | 5 977 t | | |

Table 2.3.10.7 Beaked redfish in Division 14.b (demersal). ICES catch in tonnes.

| Year | Catch |
|------|-------|
| 1974 | 0 |
| 1975 | 4400 |
| 1976 | 59700 |
| 1977 | 0 |
| 1978 | 5403 |
| 1979 | 5131 |
| 1980 | 10406 |
| 1981 | 19391 |
| 1982 | 12140 |
| 1983 | 15207 |
| 1984 | 9126 |
| 1985 | 9376 |
| 1986 | 12138 |
| 1987 | 6407 |
| 1988 | 6065 |
| 1989 | 2284 |
| 1990 | 6097 |
| 1991 | 7057 |
| 1992 | 7022 |
| 1993 | 14828 |
| 1994 | 19305 |
| 1995 | 819 |
| 1996 | 730 |
| 1997 | 199 |
| 1998 | 1376 |
| 1999 | 853 |
| 2000 | 982 |
| 2001 | 901 |
| 2002 | 2109 |
| 2003 | 446 |
| 2004 | 482 |
| 2005 | 267 |
| 2006 | 202 |
| 2007 | 226 |
| 2008 | 92 |
| 2009 | 895 |
| 2010 | 6613 |
| 2011 | 7376 |
| 2012 | 6243 |
| 2013 | 6761 |
| 2014 | 4608 |
| 2015 | 5977 |

Summary of the assessment

Table 2.3.10.8 Beaked redfish in Division 14.b (demersal). Assessment summary. Biomass index from the Greenland shallow water survey with 90% confidence intervals (CI).

| Year | Survey biomass | Upper CI | Lower CI |
|------|----------------|----------|----------|
| 2008 | 248.3 | 340.42 | 156.18 |
| 2009 | 236.7 | 305.3 | 168.1 |
| 2010 | 290.5 | 359.1 | 221.9 |
| 2011 | 123.1 | 179.94 | 66.26 |
| 2012 | 100.6 | 157.44 | 43.76 |
| 2013 | 162.3 | 260.3 | 64.3 |
| 2014 | 67.6 | 114.64 | 20.56 |
| 2015 | 60.6 | 115.48 | 5.72 |

Sources and references

ICES. 2012. Report of the Benchmark Workshop on Redfish Stocks (WKRED), 1–8 February 2012, Copenhagen, Denmark. ICES CM 2012/ACOM:48. 291 pp.

ICES. 2016a. Report of the North-Western Working Group (NWWG), 27 April–4 May, 2016, ICES Headquarters, Copenhagen. ICES CM 2016/ACOM:08.

ICES. 2016b. General context of ICES advice. *In* Report of the ICES Advisory Committee, 2016. ICES Advice 2016, Book 1, Section 1.2.