

7 Redfish in Subareas V, VI, XII and XIV

This chapter deals with redfish of the genus *Sebastes* in general, therefore the Group provides information on the redfish fisheries in Sub-areas V, VI, XII and XIV (chapter 7.1), the abundance and distribution of juveniles (chapter 7.2), discards and by-catches (chapter 7.3). Chapters 7.4 and 7.5 deal with the stock identity of *S. mentella* and related special requests.

Species of the genus *Sebastes* are common and widely distributed in the North Atlantic. They are found off the coast of Great Britain, along Norway and Spitzbergen, in the Barents Sea, off the Faroe Islands, Iceland, East and West Greenland, and along the east coast of North America from Baffin Island to Cape Cod. All *Sebastes* species are viviparous. The extrusion of the larvae takes place in late winter–late spring/early summer, but copulation occurs in autumn–early winter.

There are three species of redfish commercially exploited in ICES Sub-areas V, VI, XII, and XIV, *S. marinus*, *S. mentella*, and *S. viviparus*. The last one has only been of a minor commercial value in Icelandic waters and is exploited in two small areas south of Iceland at depths of 150–250 m. The landings of *S. viviparus* decreased from 1,160 t in 1994 to 2 t in 2004.

7.1 Nominal landings and splitting of the landings into stocks

The official statistics reported to ICES do not divide catch by species/stocks (Tables 7.2.1–7.2.5). Only preliminary official landings data were provided by NEAFC. Detailed descriptions of the fisheries are given in the respective chapters: *S. marinus* in chapter 8.1, demersal *S. mentella* in chapter 9.1 and pelagic *S. mentella* in chapter 10.1.

Information from various sources, are used to split demersal landings into species (see WD30 of NNWG2004). In Division Va, if no direct information is available on the catches for a given vessel, the landings are allocated based on logbooks and samples from the fishery. According to the proportion of biological samples from each cell (one fourth of ICES statistical square), the unknown catches within that cell is split accordingly and raised to the landings of a given vessel. For other areas, samples from the landings are used as basis for dividing the demersal redfish catches between *S. marinus* and *S. mentella*. Furthermore, according to Icelandic legislation, fishing vessels are obligated to divide their *S. mentella* catches into pelagic *S. mentella* or demersal *S. mentella*, depending whether they are fishing west or east of the redfish line (see WD30 of NNWG2004 for further details).

The pelagic *S. mentella* fishery in Division Va has in recent years moved more northwards, and in some years, it merged with the demersal *S. mentella* fishery on the redfish line in June/July. When the pelagic *S. mentella* crossed the redfish line, it was recorded as demersal *S. mentella* and caught with bottom trawls resulting in increased landings in 2003 (see chapter 10.1.2.4). Furthermore, the fraction of demersal *S. mentella* catches taken by pelagic trawls has been varying since 1993, based on log-book data, ranging between 0% in 2004 and 23% in 1994 (average 12%). WD07 was presented where the proposal was made that all catches taken by pelagic trawl should be reported as pelagic *S. mentella*, and catches taken by bottom trawls as catches of demersal *S. mentella* to improve the catch statistics and to prevent overexploitation of *S. mentella* in the overlapping areas of pelagic and demersal fisheries for *S. mentella*. Since ACFM concluded to maintain the current advisory units, this proposal was not considered further by the Working Group.

7.2 Abundance and distribution of 0-group and juvenile redfish

Available data on the distribution of juvenile *S. marinus* indicate that the nursery grounds are located in Icelandic and Greenland waters. No nursery grounds have been found in Faroese waters. Studies indicate that considerable amounts of juvenile *S. marinus* off East Greenland are mixed with juvenile *S. mentella* (Magnússon *et al.* 1988; 1990, ICES CM 1998/G:3). The 1983 Redfish Study Group report (ICES CM 1983/G:3) and Magnússon and Jóhannesson (1997) describe the distribution of 0-group *S. marinus* off East Greenland. The nursery areas for *S. marinus* in Icelandic waters are found all around Iceland, but are mainly located west and north of the island at depths between 50 and 350 m (ICES CM 1983/G:3; Einarsson, 1960; Magnússon and Magnússon 1975; Pálsson *et al.* 1997). The migration of juveniles is along the north coast towards the most important fishing areas off the west coast.

Indices for 0-group redfish in the Irminger Sea and at East Greenland areas were available from the Icelandic 0-group surveys from 1970–1995. Thereafter, the survey was discontinued. Above or average year-class strengths were observed in 1972, 1973–74, 1985–91, and in 1995.

Abundance and biomass indices of juvenile (<17 cm) redfish (juveniles were only classified to the genus *Sebastes* spp. due to difficult identification) from the German annual groundfish survey, conducted on the continental shelf and slope of West and East Greenland down to 400 m, shows that juveniles were abundant in 1993 and 1995–1998 (Figure 7.3.1). The 1999–2003 survey results indicate low abundance and are similar to those observed in the late 1980s. In 2004, a minor increase in abundance was observed.

7.3 Discards and by-catch of small redfish

An offshore shrimp fishery with small meshed trawl (44 mm in the codend) began in the early 1970s off West Greenland. This fishery expanded to East Greenland in the beginning of the 1980s and was mainly conducted on the shallower part of the Dohrn Bank and on the continental shelf from 65°N to 60°N. Observer samples from the Greenland Fishery Licence Control showed that redfish is by-catch in the shrimp fishery off Greenland. No information was available in recent years to quantify the by-catch and about the length distribution of the fish caught. The amount of by-catches of juvenile redfish in the shrimp fishery, however, is expected to be considerably high. Since 1st October 2000, sorting grids with 22 mm bar spacing have been mandatory to reduce the bycatches. The documentation of the effect of sorting grids on the by-catches is needed in order to estimate the by-catch of young redfish in the shrimp fishery.

In late 1980's, Iceland introduced a sorting grid with a bar spacing of 22 mm in the shrimp fishery to reduce the by-catch of juveniles in the shrimp fishery north of Iceland. This was partly done to avoid redfish juveniles as a by-catch in the fishery, but also juveniles of other species. Since the large year-classes of *S. marinus* disappeared out of the shrimp fishing area, there in the early 1990's, observers report small redfish as being negligible in the Icelandic shrimp fishery.

7.4 Special Requests

Special request 1.a) from NEAFC (ToR c) of this Group), regarding the stock identity of *S. mentella*, is dealt with in chapter 7.1, whereas request 1.b) (contained in ToR d) of this Group) to “provide quantitative information to allow spatial and temporal limitations in catches and other measures to avoid disproportionate exploitation rate of any one component, especially to prevent local depletion” is dealt with in chapter 10.3.

Detailed descriptions of the fishery of different nations are given in chapters 8 for *S. marinus*, 9 for demersal *S. mentella*, and 10 for pelagic *S. mentella*, based on various working documents.

7.5 Stock identity and management units of *S. mentella*

After the “Study Group on Stock Identity and Management Units of Redfishes” (SGSIMUR, 31 Aug-3 Sep 2004, Bergen, Norway), dealing with the stock structure of demersal and pelagic *S. mentella*, the NWWG met from 6-10 Sep 2004 (Bergen, Norway) to a) assess the status of and provide catch options for 2005 for the stocks of redfish in Subareas V, XII and XIV, (...); e) update information on the stock composition, distribution and migration of the redfish stocks in Subareas V and XIV, and consider the report of SGSIMUR with regard to implications for assessment and advice on pelagic “deep-sea” *Sebastes mentella* and the *Sebastes mentella* fished in demersal fisheries on the continental shelf and slope; f) provide information on the horizontal and vertical distribution of pelagic redfish stock components in the Irminger Sea as well as seasonal and interannual changes in distribution”.

ACFM concluded to maintain the current advisory units until more information becomes available: a demersal unit on the continental shelf in ICES Divisions Va, Vb, and XIV and a pelagic unit in the Irminger Sea and adjacent areas (V, VI, XII, and XIV).” This latter unit also includes pelagic redfish in the NAFO Convention Area. A schematic illustration of the horizontal and vertical distribution of redfish in these areas is given in Figure 7.1.1.

Two working documents, dealing with the stock structure of *S. mentella* (ToR c) were submitted to the NWWG in 2005. The working group did not have sufficient expertise to thoroughly review the scientific content of these papers. What follows is a summary of the content of these papers: 1) WD08 presents Russian biological, ecological and parasitological studies that indicate no substantial exchange between the investigated components of *S. mentella* as they relatively stably dwell in different oceanic biotopes, mesopelagic and mesobenthic depths. According to this working document, just minor exchange is possible between these components in the direction from the pelagic Irminger Sea to the slope of Iceland. 2) WD32 describes genetic analyses that resulted in allelic richness that was statistically significant lower at shallow waters when compared to the depth. Values of individual admixture proportions originating in either the shallow or the depth habitats were calculated using a model based Bayesian method. Catch-depth was plotted against these values and a clear signal emerged. Two clusters segregated according to both the depth and admixture proportions indicating depth as barrier to gene-flow within the Irminger Sea. The authors conclude that the structure described is genuine and observed differences cannot be attributed to different life-cycle stages.

Recent underwater tagging experiments showed that *S. mentella* tagged in the pelagic fisheries areas southwest off Iceland were recaptured in shelf areas in Division Va (WD25), and vice versa. According to the few recaptures obtained so far, some degree of mixture of pelagic and demersal *S. mentella* in these areas is very likely.

For the abovementioned reasons, the Group continues to provide fishery and survey information for the pelagic *S. mentella* unit in the Irminger Sea and adjacent waters (chapter 10), separated from the demersal *S. mentella* (chapter 9). The *S. marinus* on the continental shelves of ICES Divisions Va, Vb and Sub-areas VI and XIV is dealt with in chapter 8.

Table 7.2.1 REDFISH. Nominal landings (tonnes) by countries, in Division Va 1998-2004, as officially reported to ICES.

COUNTRY	1998	1999	2000	2001	2002	2003	2004*
Faroe Islands	280	255					
Germany	284	428	513	844	467	1,105	620
Greenland	-*	-*	-*	-*	3,341*		
Iceland	108,380	81,430	95,118	48,970	63,247	67,997	70,167
Norway	-	18	36	26*	16*	19	9
UK (E/W/NI)	-	542	734	1,037	432	...	...
UK (Scotland)	-	149	70	114	272	...	...
United Kingdom					704	1,081	1,008
Total	108,944	82,822					71,803

*Preliminary.

Table 7.2.2 REDFISH. Nominal landings (tonnes) by countries, in Division Vb 1998-2004, as officially reported to ICES.

COUNTRY	1998	1999	2000	2001	2002	2003	2004*
Faroe Islands	6,484	6,191					
France	110*		250	189	221	262	
Germany	-	207	79	88	2	19	+
Greenland	-*	-*	-*	-*	13*		
Iceland	-	-	-	54	35	-	
Ireland	-	-	-	1	-		
Norway	39	37	41	24*	30*	31	19
Portugal							15
Russia	-	-	12	-	-	-	3
UK (E/W/NI)	4	15	111	92	120	...	...
UK (Scotland)	27	46	142	116	89	...	...
United Kingdom					409	89	152
Total	6,664						189

*Preliminary.

Table 7.2.3 REDFISH. Nominal landings (tonnes) by countries, in Sub-area VI 1998-2004, as officially reported to ICES.

COUNTRY	1998	1999	2000	2001	2002	2003	2004*
Estonia	-	-	-	+	-	-	1
Faroe Islands	-	44					
France	297*		269	188	97	113	
Germany	1	+	+	1	-	-	1
Ireland	10	34	54	47	26		
Norway	3	8	11	5*	9*	7	2
Portugal	1	-	-	-	-	-	
Russia	-	243	461	88	19	94 ¹	
Spain	-	38	16	4	784		
UK (E/W/NI)	12	4	20	44	7	...	...
UK (Scotland)	364	762	405	485	376	...	...
United Kingdom						950	517
Total	688						521

*Preliminary. ¹Reported as *S. mentella*.

Table 7.2.4 REDFISH. Nominal landings (tonnes) by countries, in Sub-area XII 1998-2004, as officially reported to ICES.

COUNTRY	1998	1999	2000	2001	2002	2003	2004*
Estonia	3,968	2,108	4,000	-	-	-	
Faroe Islands	1,793	528					
France	3*	-*	+	+	-	1	
Germany	9,746	8,204	1,128	3,833	3,032	565	313
Greenland	1,180*	1,188*	124*	740*	-*		
Iceland	1,311	5,072	3,121	11,679	5,745	-	14,266
Latvia	-	-	-	-	1,061	371	+
Lithuania	-	-	-	-	-	14,321	
Norway	602	2,040	2,200	878*	1,094*	3,111	1,858
Poland	-	-	-	-	1	-	
Portugal	-	-	-	387	878	504 ¹	1,727
Russia	89	7,698	9,243	4,509	6,090	2,430 ²	812 ²
Spain	2,231	1,723	576	1,332	854		
UK (E/W/NI)	+	187	-	-	+	...	...
UK (Scotland)	-	1	+	-	4	...	...
United Kingdom						1	+
Total	20,923	28,749					18,976

*Preliminary. ¹Reported as V/XII/XIVGRN. ²Reported as *S. mentella*.

Table 7.2.5 REDFISH. Nominal landings (tonnes) by countries, in Sub-area XIV 1998-2004, as officially reported to ICES.

COUNTRY	1998	1999	2000	2001	2002	2003	2004*
Estonia	-	-	3,811	599	-	-	
Faroe Islands	47	2					
Germany	9,709	8,935	7,840	6,758	9,576	7,050	2,336
Greenland	296*	3,152*	3,545*	2,587*	1,171*		
Iceland	6,441	23,770 ¹	17,999	31,786	41,805	43,063 ²	123
Norway	525	3,253	3,699	4,258*	4,215*	5,073	6,964
Poland	-	-	-	-	-	141 ⁴	2,011
Portugal	4,133	4,302	4,154	2,116	2,208	2,116 ³	2,693
Russia	25,748	16,652	14,851	23,851	25,309	28,687 ⁴	31,381 ⁴
Spain	4,660	4,175	2,657	4,982	-		
UK (E/W/NI)	43	68	45	179	16	...	...
UK (Scotland)	-	-	-	-	17	...	...
United Kingdom						378	338
Total	51,602	64,309					45,846

*Preliminary. ¹Note Excluding 58 t reported as area unknown. ²Oceanic redfish. ³Reported as V/XII/XIV. ⁴Reported as *S. mentella*.

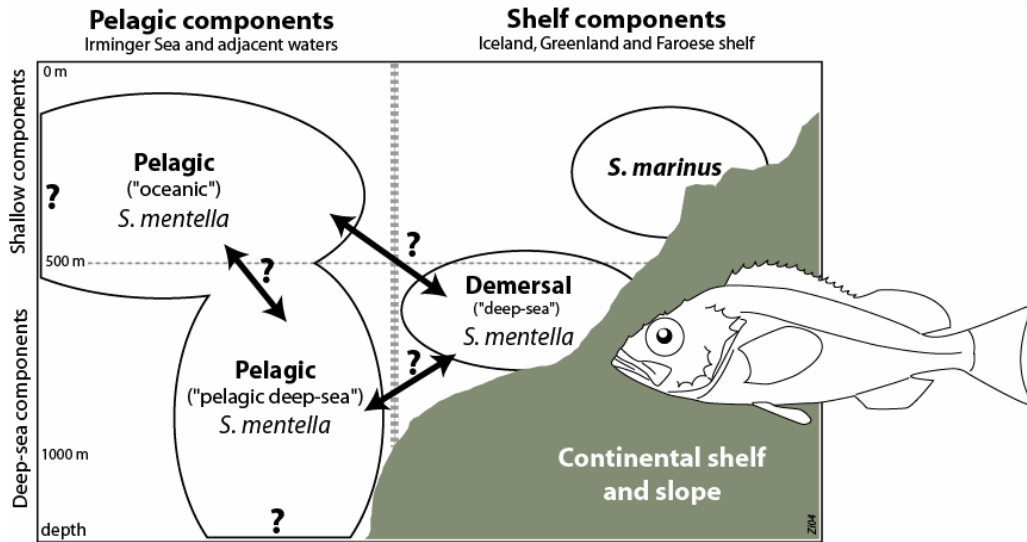


Figure 7.1.1 Possible relationship between redfish occurrences in the Irminger Sea and adjacent waters.

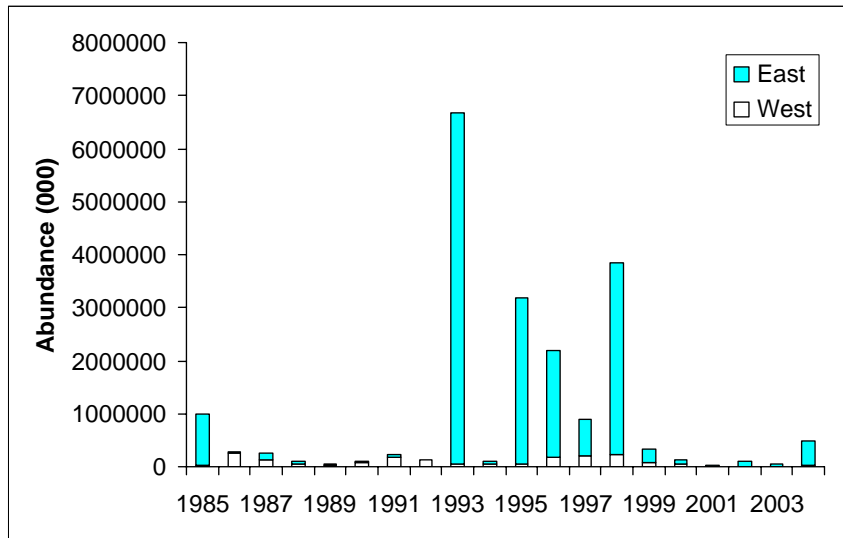


Figure 7.3.1 Survey abundance indices of juvenile *Sebastes* spp. (<17 cm) from the German groundfish survey conducted on the continental shelves off East and West Greenland 1985-2004.