SECTION V

(pages 189 to 216)

Report of the Ad hoc Working Group on Management of Oceanic Redfish 24-25 June 2002 Dartmouth, N.S., Canada

Report of the Ad hoc Working Group on Management of Oceanic Redfish

(FC Doc. 02/13)

24-25 June 2002
Dartmouth, N.S., Canada

1. Opening of the Meeting

The ad hoc Working Group on Management of Oceanic Redfish was called to order by Mr. Dean Swanson (USA), Chair of the Fisheries Commission at 1015 hours, June 24, 2002 at the Ramada Plaza Hotel in Dartmouth, Nova Scotia. Representatives from Canada, the European Union, Denmark (on behalf of the Faroe Islands and Greenland), Iceland, Japan, Latvia, Lithuania, Norway, Poland, Russian Federation and the United States of America were present (Annex 1). The Chair welcomed participants to Dartmouth.

2. Election of a Chairman

Mr. Terje Lobach (Norway) was appointed as Chair for the meeting.

3. Appointment of Rapporteur

Mr. Robert Steinbock was appointed as Rapporteur for the meeting.

4. Adoption of Agenda

The Chair noted the Terms of Reference for this Working Group (FC W.P. 02/17 Revised) which formed the basis for the provisional agenda. The agenda (Annex 2**)** was adopted as modified.

5. Review of the scientific advice on Oceanic Redfish, including the distribution of it in the Northwest Atlantic

Mr. Thorsteinn Sigurdsson (Iceland) provided an update of the survey information and fishery related data and a review of the ICES scientific advice for oceanic redfish (Pelagic *Sebastes mentella)* (Redfish W.G. W.P. 02/4) and Information Paper #1 (Annex 3).

He summarized the survey data as follows:

- A total of about 715,000 tonnes redfish was measured acoustically above 500 m. Redfish is now observed more south-westerly than it was prior to 1999.
- Observed decrease in acoustic abundance since 1994 – exceeds the removed biomass by a factor of 2.
- Redfish is mixed with the scattering layer.
- Based on the trawl method, about 1 million tonnes were estimated below 500 m. The estimate is highly uncertain and only a very rough indicator of the abundance.
- About 1.1 million tonnes were estimated above 500 m with the trawl method highly uncertain, only a very rough indicator of the abundance.
- It is not possible to combine the results from the acoustics and the results from the trawl method.

Mr. Sigurdsson noted the joint efforts in collecting fishery related data and evaluating the commercial catch statistics from the NEAFC parties for oceanic redfish in the NEAFC Convention Area.

He summarized the ICES scientific advice for oceanic redfish for 2003 from the May 2002 ACFM meeting. ICES noted that the recent exploitation level seems not to have caused stock size reduction. For 2002 and 2003, ICES advises that TACs do not exceed current catch levels (including the NAFO Convention Area). The average catch in the last five years has been 119,000 tonnes. In addition, ICES advises that management action should be taken to prevent a disproportional exploitation rate of any one component.

With respect to the special requests on redfish, ICES considers the interpretations of the evidence on stock structure are still diverging and that individual indicators are inconclusive. Therefore the stock structure remains uncertain. Further studies are in progress. Concerning the request on distribution, ICES noted that observations indicate that since 1996:

a) the fisheries in the Northeastern area in the first half of the year are occurring at depths deeper than 500 m and catching larger fish (35-45 cm).
b) The fisheries in the Southwestern area in the second half of the year are mainly occurring at depths shallower than 500 m catching smaller fish (33-38 cm).
c) All information supports that the fishery in the NAFO Convention Area is from the same stock as fished in the western part of ICES Sub-area XII.

Delegates raised questions on the ICES scientific advice and highlighted the uncertainty of using catch rates as a reflection of stock status and that concerns had been expressed by some ICES scientists. It was noted that the distribution of fishing effort does not coincide with the distribution of the stock due, in part, to economic factors related to the quality of the fish. Although the fishery is concentrated on small geographical areas, the distribution of the stock/stocks during the fishing season is very large. There are no indicators from the surveys that the distribution area has been shrinking as a result of the fishery.

Mr. Ralph Mayo (USA), Chair of the Scientific Council, summarized the Scientific Council's review of the information on oceanic redfish (Annex 4). He advised that Scientific Council was not in a position to re-evaluate the ICES information but only commented on the applicability of the information with respect to decisions on the state of the pelagic *Sebastes mentella* resource in the North Atlantic. Scientific Council considered that CPUE (standardized or not) in hours fished for redfish can be misleading and may be optimistic. Scientific Council does not consider this as a reliable indicator of stock status since redfish exhibit schooling behavior and relatively good catch rates may still be possible while the area of distribution of the resource is declining or the number of schools is diminishing. Scientific Council concluded that a stronger statement should be made about the uncertainty in the stock status of pelagic *Sebastes mentella* in ICES Sub-areas V, XII and XIV and the NAFO Convention Area, particularly for the considerations that the standardized CPUE series do not indicate significant stock reductions since 1995.

6. Discussion of possible recommendations to the Fisheries Commission on the relationship and management process between NAFO and NEAFC

The Chair recalled the background to the management decisions for Division 1F redfish which were developed at the Special Fisheries Commission meeting in March 2001 and then "rolled over" for 2002 at the Special Fisheries Commission meeting in January 2002 (Annex 5). He noted that NEAFC adopted measures for pelagic redfish for 2002 and on April 8, 2002, adopted a

supplementary measure to concur with the NAFO decision regarding catches in the NAFO Convention Area in 2002 (Annex 6).

The Representative of the EU noted that NEAFC has traditionally managed the oceanic redfish stock and the NEAFC Parties expect historical rights in light of the scientific research undertaken and their fisheries in the NEAFC Convention Area. However, at the same time, he recognized a certain need to accommodate those parties, not members to NEAFC, which wished to fish this stock in the NAFO Convention Area. A balance needs to be struck between these interests. He saw the main objective was to avoid an unlimited fishery.

The Chair noted that one issue to be addressed is that the current NAFO measure covers only catches in Division 1F and does not cover the entire distribution of the stock in the NAFO Convention Area (SA 2 and Division 3K).

The Representative of Denmark (on behalf of the Faroes and Greenland) considered that NAFO members had resolved the challenge of an unlimited fishery through the current NAFO measure and that it would be wise to keep as much of this measure as possible. He agreed on the need to expand the area of application of the current measure from Division 1F to include SA 2 and Division 3K. He felt that survey results from a 2-month period are an insufficient basis for a new management system. He proposed maintaining the current measure and that any modifications thereto should be of an interim nature.

The Representative of Canada stated that conservation was a priority in light of the migratory trends of the resource and the uncertainty of the state of oceanic redfish. There is a need to ensure that NAFO parties participate and have a meaningful role with NEAFC in the consideration of scientific advice and the management of oceanic redfish as well as a possible role for the relevant coastal States. NAFO parties need to consider the situation and ecological factors in the NAFO Convention Area. Coordination between NAFO and NEAFC was required.

The Representative of Norway was encouraged that parties were prepared to build on the existing measures as a point of departure. He noted some procedural challenges in terms of developing the sequence of advice and decision making between NAFO and NEAFC.

The Representative of Canada tabled and explained a proposal that had been discussed at a Heads of delegation meeting. Other Contracting Parties expressed appreciation for the Canadian proposal and noted that they endorsed the approach. A number of Contracting Parties expressed the view that 5,000 tonnes proposed in point 3 of Redfish W.G. W.P. 02/5 (Revision 3) was too high but agreed to support it in the interests of attaining consensus. Some operational details and clarifications were incorporated during a detailed review of the paper.

The Working Group agreed to recommend that the Fisheries Commission accept Redfish W.G. W.P. 02/5 (Revision 4) (Annex 7). However, the Representative of Lithuania, with respect to NAFO's management of oceanic redfish (pelagic *Sebastes mentella*), expressed the view that a significant percentage of the overall resources are found in the NAFO Convention Area. Therefore, he was of the opinion that NAFO should manage that portion of the oceanic redfish resources in the NAFO Convention Area. Further, in their view, the proposed NAFO quota of 5000 tonnes as recommended in Point 3 of the W.G. W.P. 02/5 (Revision 4) was too small in comparison to the current distribution of the resources. Therefore, Lithuania recommended that a NAFO quota larger than 5000 tonnes should be established by the Fisheries Commission.

7. Other Matters

There were no other matters discussed.

8. Adjournment of the Meeting

The meeting adjourned at 1500 hours on June 25, 2002.

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Annex 2. Agenda

1. Opening of the Meeting
2. Election of a Chairman
3. Appointment of Rapporteur
4. Adoption of Agenda
5. Review of the scientific advice on Oceanic Redfish, including the distribution of it in the Northwest Atlantic
6. Discussion of possible recommendations to the Fisheries Commission on the relationship and management process between NAFO and NEAFC
7. Other matters
8. Adjournment of the Meeting

Annex 3. Summary of the Scientific Advice from ICES

(Information Paper #1)

Answer to Special Request on Redfish

NEAFC requested information on:

a) Review the stock situation and its advice for pelagic redfish in the Irminger Sea for 2002 at the May 2002 ACFM meeting.
b) submit new information on stock identity of the components of redfish such as "pelagic deep-sea" *Sebastes ment*ella, "oceanic" *Sebastes mentella* fished in the pelagic fisheries, and the "deep-sea" *Sebastes mentella* fished in demersal fisheries on the continental shelf and slope;
c) provide information on the horizontal and vertical distribution of pelagic redfish stock components and fisheries in the Irminger Sea and adjacent waters as well as seasonal and interannual changes in distribution. Information on the vertical distribution should allow NEAFC to further consider the appropriateness of separate management measures for different geographical areas/seasons.

The request a) is addressed in the ACFM report, Section 3.2.6.d.

Request b): On further information on stock identity of redfish

An extensive discussion of the problem was made at NEAFC's request last year (Section 3.2.9 in the 2001 ACFM report). The request is also addressed as part of the introduction section 3.2.6.a in this year's report.

Some recent studies on genetics, biological markers, and fish distribution were presented to the Working Group in 2002. ICES considers that interpretations of the evidence on stock structure are still diverging and that individual indicators are inconclusive. Therefore the stock structure remains uncertain. Further studies are in progress.

Request c): Update information on the development of the pelagic fishery for redfish with respect to seasonal and area distribution to allow NEAFC to further consider the appropriateness of separate management measures for different geographical areas/seasons.

Observations indicate that since 1996 a) the fisheries in the Northeastern area in the first half of the year are occurring at depths deeper than 500 m and catching larger fish, and b) the fisheries in the Southwestern area in the second half of the year are mainly occurring at depths shallower than 500 m catching smaller fish. In last year's report there was a detailed description of the fishery. Below is an update to this information.

The geographical distribution of the catches by periods and years since 1995 is given in Figure 3.2.6.a.2. The fishery of these four nations (Germany (1995–2001), Iceland (1989–2001), Norway (1995–2001), Russia (1999-2000), and Greenland (1999–2001)) indicate that there was a similar pattern in the fishery since 1996. Fishing usually started in early April and up to the end of June it was prosecuted in areas east of 32°W and north of 61°N. In July and August, the fleet moves about 400–500 nautical miles to areas south of 60°N and west of about 34°W, where the fishery continues until October. There is very little fishing activity from November until late March. Figure 3.2.6.a.3 gives the locations of part of the Spanish activity in the Irminger Sea, and it shows that they had a similar pattern in 2000 and 2001 as the above-mentioned fleets. The same applies for the Russian fleet in 2001 (Figure 3.2.6.a.4). In the third quarter of the year the fishing has, in general, moved towards the southern part of the area, fishing mostly at depths shallower than

500 m, within Subarea XII as well as in the NAFO convention area, both outside and inside the Greenlandic EEZ. However, it is important to note that the described fishing pattern of the fleet changed significantly around 1995, mainly in terms of area and depth expansion. The changes in the fishing pattern as described above does not necessarily reflect changes in stock distribution, maybe due to commercial reasons.

Although the information on fishing depth is incomplete, except for the Icelandic, Faroese, and the Greenlandic fisheries, the general pattern is that the fishing in the first and second quarter of the year is mostly conducted deeper than 500 m. Further, although there are no haul-by-haul data available for the German catches, the available information shows that the fishery in the first two quarters was characterised by a fishery deeper than 450 m, and at shallower depths during the third and fourth quarters in 1995–2001. There is a similar pattern in the Spanish fishery. They were fishing deeper than 500 m in the second quarter of the year, and in the third quarter fishery continued at depths shallower than 500 m. The Greenland vessel participating in this fishery also reported all its catches taken above 400 m after July, and showed the same pattern as the Icelandic fleet in the first 2 quarters of the year.

Over 95% of all the fish caught in the pelagic redfish fishery are mature. The redfish caught in the Southwestern area are generally smaller than the fish caught in the Northeastern area (Figure 3.2.6.a.5), the dominant length classes being 33-38 cm in the Southwestern area, and 35 – 45 cm in the Northeastern area.

As has been reported in earlier reports of the Working Group, Iceland has classified its pelagic catches between oceanic and pelagic deep-sea redfish according to a contentious method. The results of this classification have shown that the proportion of fish classified as oceanic-type redfish has been very low during recent years, and only about 5% of the Icelandic catches were classified as oceanic type. The Icelandic fishery prior to 2001 was mostly concentrated on the pelagic deepsea fishery in the first half of the year in the Northeastern area. In 2001, the percentage of the oceanic type increased to about 1/3 of its quota, this being largely a result of increased effort in the Southwestern fishing area at depths shallower than 400 m. The increase in 2001 is due to the effort regulations in the fishery. Based on the samples, the results also indicate that shallower than 500–600 m depth, the proportion "oceanic" is between 85–100%, as the proportion deeper than 600 m is usually between 0–20%.

The above observations indicate that in the last three years a) the fishery in the Northeastern area in the first half of the year is occurring at depths deeper than 500 m and catching larger fish, and b) the fishery in the Southwestern area in the second half of the year is mainly occurring at depths shallower than 500 m catching smaller fish.

ICES recommends that NEAFC requests all nations participating in the pelagic redfish fishery to provide ICES with information on the trawling depth (headline depth for each haul as a log-book data), so ICES can have more detailed description of the fishery by season and areas as a basis for giving its advice on the resource.

Pelagic fishery for *Sebastes mentella* in the Irminger Sea

The stock structure of pelagic redfish *S. mentella* in Subarea XII, Division Va, and Subarea XIV, and in the NAFO Convention Area remains generally uncertain. There is a difference in the depth and geographical distribution of the two pelagic redfish types, namely the 'oceanic *S. mentella*', mainly above 500 meters and southwesterly in the Irminger Sea, and the 'pelagic deep-sea *S. mentella*', mainly below 500 meters and northeasterly in the Irminger Sea. There are no

indications that the pelagic *S. mentella* in the NAFO Convention Area are distinct from the stock(s) or components in the adjacent Irminger Sea.

State of stock/exploitation: The state of the stock is not precisely known. There are indications from acoustic surveys that the stock may have been larger in the early 1990s. Although variable, CPUE series from the commercial fisheries on both redfish types indicate no trend in the stocks since 1995. Biomass estimates from a survey in 2001 suggest a biomass in the order of 2 million tonnes, but this estimate is highly uncertain. Therefore it is not known if the current exploitation rate is above or below the 5% exploitation rate considered sustainable.
Management objectives: There is no explicit management objective for this stock.

Advice on management: The recent exploitation level seems not to have caused stock size reduction. For 2002 and 2003, ICES advises that TACs do not exceed current catch levels (including the NAFO Convention Area). The average catch in the last 5 years has been 119 thousand tonnes. In addition, ICES advises that management action should be taken to prevent a disproportional exploitation rate of any one component.

Relevant factors to be considered in management: Possible changes in the depth distribution of the two redfish types above and below 500 m combined with the differences in geographic coverage of acoustic surveys in different years ,mean that the acoustic biomass series cannot be interpreted as a consistent series showing relative changes in stock size. The stock structure for pelagic *S. mentella* is unknown. Fishing patterns after 1995 resulted in 2 almost distinct fishing grounds in terms of geographic distribution and trawling depth. In 2000 and 2001, substantial catches were taken from the pelagic *S. mentella* aggregations discovered recently in the NAFO Convention Area. There may be a relationship between the demersal deep-sea *S. mentella* on the continental shelves of the Faroe Islands, Iceland, and Greenland and the pelagic *S. mentella* components in the Irminger Sea. This should be kept in mind in the management of these components.

Since this is a relatively new fishery on a long-lived, slow-growing species, ICES notes that monitoring of the stock is essential in order to keep track of biomass changes as they occur. Similarly, it is important to gather the information needed to evaluate the productivity of the stock. This includes information on recruitment, nursery areas, stock identification, and biomass estimation.

Nursery areas for both of the pelagic stock components are likely to be found at the continental slope off East Greenland. The juvenile redfish in these areas should, therefore, be protected and appropriate measures to reduce the by-catches in the shrimp fishery need to be taken.

Comparison with previous assessment and advice: The decline in the time-series of the acoustic survey has been the basis for the advice in past assessments. Less emphasis on the acoustic survey estimates has resulted in a change in the perception of stock trends. The decline in the acoustic estimators is no longer considered to represent stock decline only, but also changes in the availability of the *S. mentella* to the acoustical instruments. The assessment of the current state of the stock and the advice is based on standardized CPUE indices.

Elaboration and special comment: The pelagic fishery in the Irminger Sea is conducted only on the mature part (approximately 95% mature) of the stock. The fishery started in 1982. After decreasing from 1988–1991, mostly due to a reduction in Russian effort, landings increased. The increase in the catches from 1991–1996 is a direct consequence of increased fishing effort due to new fleets entering the fishery. However, the catches have been significantly lower during the last

5 years; at the same time the fishery has expanded into deeper water and the season has expanded from March to December.

The 2001 trawl-acoustic survey on pelagic redfish (*S. mentella*) in the Irminger Sea and adjacent waters was carried out in June/July. Approximately 420 000 square nautical miles were covered, which is the most extended coverage for acoustic assessment pelagic redfish in the Irminger Sea. The stock size measured with the acoustics was assessed to be about 715 000 t at depths down to the deep-scattering layer or about 350 m. The acoustic survey results (shallower than 500 m) indicate a stable stock situation size compared with the 1999 results. In 2001, as well as in 1999, the stock shallower than 500 m was observed more south-westerly and deeper than it has been during former acoustic surveys in the last decade.

By using information from trawl hauls biomass in the depth layers from 0-500 depth, including the layer where the redfish that was mixed with the deep-scattering layer, was estimated at about 1.1 mill. t. Such estimates are not directly comparable with the acoustic estimates shallower than 500 m depth and should be interpreted with care, due to their innovate nature. About 1.1 mill. t was estimated by using the information from the trawl hauls deeper than 500 m. At these depths, the densest concentrations were found in the NE part of the area (Figure 3.2.6.d.2). This method is still experimental and needs further development.

New survey information will be available after the June/July 2003 survey has been carried out.

Given the technical, seasonal, geographical, and depth changes of the fishing activities, the relevance of the estimated reduction in CPUE as indicator of stock abundance remains difficult to assess both above and below 500 m.

Data on maturity-at-length, and -at-weight and some age-reading experiments were available from both the survey and from the fishery. CPUE series are available for some fleets and as standardised series (Figures 3.2.6.d.1.a-c).

Source of information: Report of the Northwestern Working Group, 29 April – 8 May 2002 (ICES CM 2002/ACFM:20).

Catch data for oceanic and pelagic deep-sea *S. mentella* combined (Tables 3.2.6.d.1-3):

Year	ICES Advice	Predicted catch corresp. to advice	Agreed TAC	ACFM Catch
1987	No assessment	-		91
1988	No assessment	-		91
1989	TAC	90–100		39
1990	TAC	90–100		32
1991	TAC	66		27
1992	Preference for no major expansion of the fishery	-		66
1993	TAC	50		116
1994	TAC	100		149
1995	TAC	100		176
1996	No specific advice	-	153[1]	180
1997	No specific advice	-	153–158[1]	123[2]
1998	TAC not over recent (1993-1996) levels of 150 000 t		153[1]	117[2]
1999	TAC to be reduced from recent (1993-1996) levels of 150 000 t		153[1]	110[2]
2000	TAC set lower than recent (1997-1998) catches of 120 000 t	85	120	126
2001	TAC less than 75% of catch 1997-1999	85	95	117
2002	TAC less than 75% of catch 1997-1999 – Revised to be below current catch levels	85	Not agreed NEAFC proposal (120)	
2003	TAC not exceed current catch levels	119		

[1]Set by NEAFC. [2]Preliminary. (Weights in '000 t).

Pelagic fishery for *Sebastes mentella* in the Irminger Sea

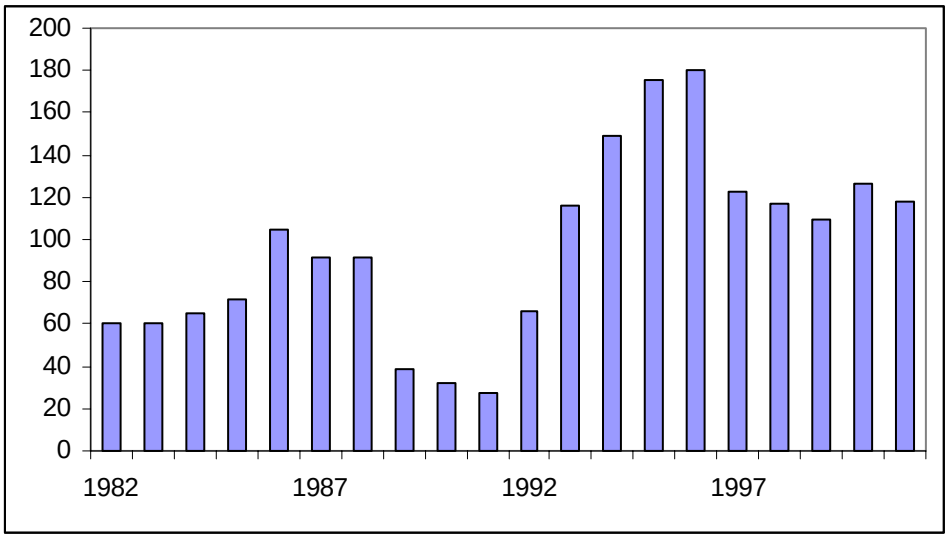

Table 3.2.6.d.1 Results of dividing the Icelandic pelagic redfish catch (t) according to the Icelandic samples from the fishery.

Year	Oceanic	Deep sea	Not classified	Catch Oceanic	Catch Deep sea	Total Catch
1995	72%	27%	0%	25186	9445	34631
1996	45%	52%	3%	29182	33721	62903
1997	36%	64%	0%	14859	26417	41276
1998	10%	85%	4%	5504	46780	52284
1999	15%	85%	0%	6765	37159	43924
2000	5%	95%	0%	2262	42970	45232
2001	34%	66%	0%	14440	28032	42472

Table 3.2.6.d.2 Pelagic *S. mentella*. Landings (in tonnes) by area as used by the Working Group. Due to the lack of area reportings for some countries, the exact share in Subareas XII and XIV is just approximate in the latest years.

Year	Va	Vb	VI	XII	XIV	NAFO 1F	NAFO 2H	NAFO 2J	Total
1982	0	0	0	39,783	20,798				60,581
1983	0	0	0	60,079	155				60,234
1984	0	0	0	60,643	4,189				64,832
1985	0	0	0	17,300	54,371				71,671
1986	0	0	0	24,131	80,976				105,107
1987	0	0	0	2,948	88,221				91,169
1988	0	0	0	9,772	81,647				91,419
1989	0	0	0	17,233	21,551				38,784
1990	0	0	0	7,039	24,477	385			31,901
1991	0	0	0	10,061	17,089	458			27,608
1992	1,968	0	0	23,249	40,745				65,962
1993	2,603	0	0	72,529	40,703				115,835
1994	15,472	0	0	94,189	39,028				148,689
1995	1,543	0	0	132,039	42,260				175,842
1996	4,744	0	0	42,603	132,975				180,322
1997	15,301	0	0	19,822	87,812				122,935
1998	40,612	0	0	22,446	53,910				116,968
1999	36,524	0	0	24,085	48,521	534			109,665
2000	44,677	0	0	19,862	50,722	10,815			126,076
2001[1]	28,139	0	0	28,957	53,753	5,299	208	1,284	117,649

Table 3.2.6.d.3 Pelagic redfish *S. mentella*. Time-series of survey results, areas covered, hydro-acoustic abundance, and biomass estimates shallower and deeper than 500 m (based on standardized trawl catches converted into hydro-acoustic estimates derived from linear regression models).

Year	Area covered (1000 NM^2)	Acoustic estimates < 500 m (10^6 ind.)	Acoustic estimates < 500 m (1000 t)	Trawl estimates < 500 m (10^6 ind.)	Trawl estimates < 500 m (1000 t)	Trawl estimates > 500 m (10^6 ind.)	Trawl estimates > 500 m (1000 t)
1991	105	3498	2235				
1992	190	3404	2165				
1993	121	4186	2556				
1994	190	3496	2190				
1995	168	4091	2481				
1996	253	2594	1576				
1997	158	2380	1225				
1999	296	1165	614			638	497
2001	420	1370	716	1955	1075	1446	1057

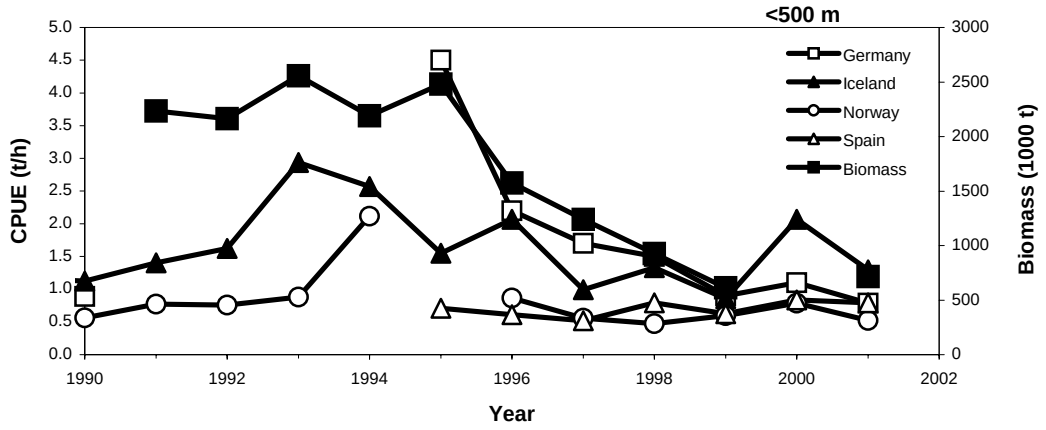

Figure 3.2.6.d.1.a Trends in CPUE of pelagic *S. mentella* fishery in the Irminger Sea, shallower than 500 m, and estimated acoustic biomass from surveys.

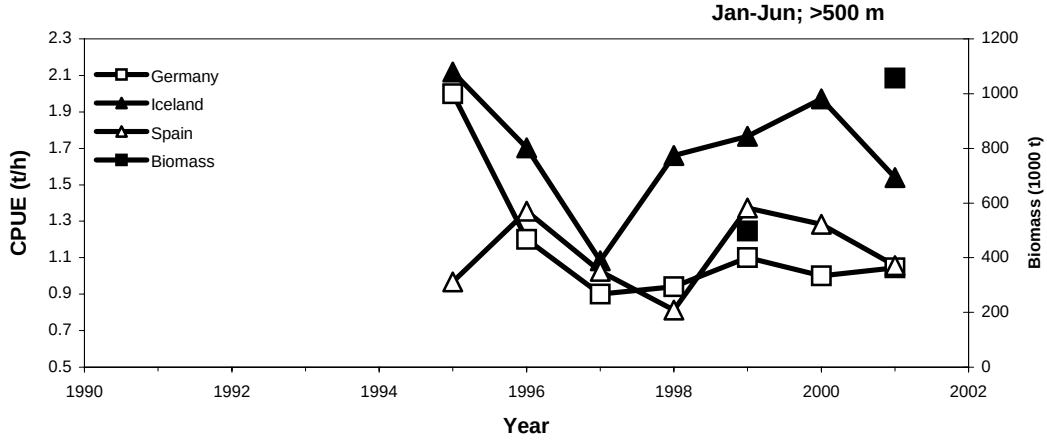

Figure 3.2.6.d.1.b Trends in CPUE of pelagic *S. mentella* fishery in the Irminger Sea, deeper than 500 m, and estimated trawl biomass from surveys.

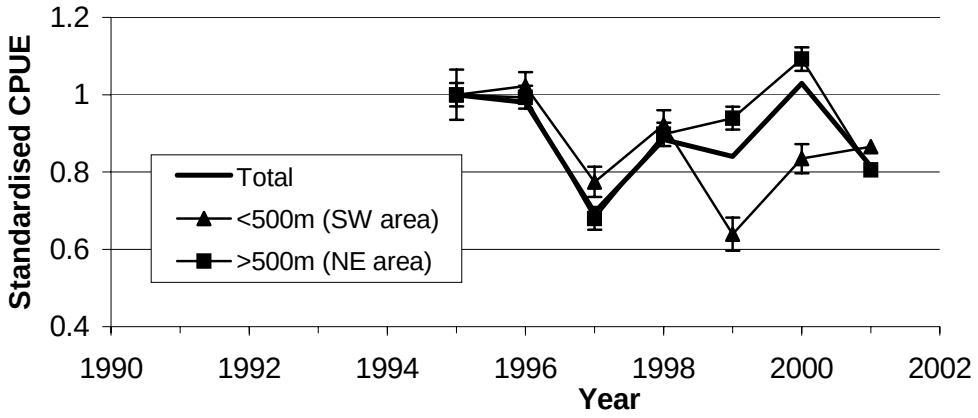

Figure 3.2.6.d.1.c Standardised CPUE, as calculated by using data from Germany (1995-2001), Iceland (1995-2001), Greenland (1999-2001), and Norway (1995-2001) in the GLM model (see chapter 10.2.2.), divided by depths shallower (southwestern area) and deeper than 500 m (northeastern area) and both depth layers (areas) combined (Total).

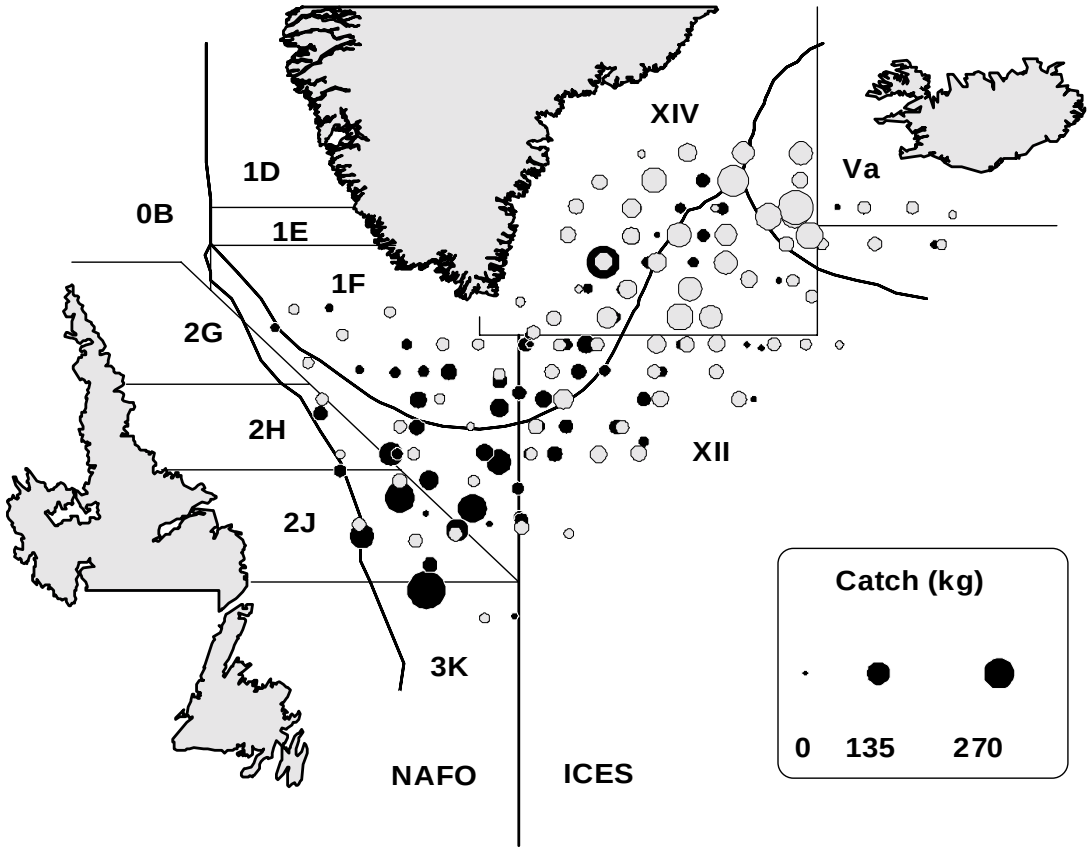

Figure 3.2.6.d.2 Pelagic redfish *S. mentella*. Standardised survey catches in June/July 2001 shallower than 500 m depth (black) and deeper than 500 m depth (grey).

Annex 4. Scientific Council information to the W.G. on Oceanic Redfish (W.G. W.P. 02/3)

Excerpt from SCS Doc. 02/19, Serial No. N4698
Report of the 6-20 June 2002 Scientific Council Meeting

The following text was the Scientific Council response to the Fisheries Commission request for information on Pelagic *Sebastes mentella* (Redfish) prepared during the Scientific Council Meeting, 6-20 June 2002.

Pelagic *Sebastes mentella* in NAFO Subareas 1-3 and Adjacent ICES Area (Annex 1, Item 8) (SCR Doc. 02/10, 19; SCS Doc. 02/18)

The Fisheries Commission requested:

"*Regarding pelagic S. mentella redfish in NAFO Subareas 1-3 Scientific Council is requested to review the most recent information on the distribution of this resource, as well as on the affinity of this stock to the pelagic redfish resource found in the ICES Sub-area XII, parts of SA Va and XIV and to the shelf stocks of redfish found in ICES Sub-areas V, VI and XIV, and NAFO Subareas 1-3."*

The Council responded as follows:

At its September 2001 Meeting, Scientific Council reviewed the most recent information available on the distribution of pelagic *S. mentella* based on the July 2001 international acoustic survey (SCR Doc. 01/161). The Scientific Council's conclusions on this subject can be found in *NAFO Sci. Coun. Rep.,* 2001, pages 211-212.

Scientific Council noted that the issue of possible relationships between pelagic *Sebastes mentella* and demersal *Sebastes mentella* in the NAFO area has not been considered by the ICES Working Group.

Scientific Council concludes that the recent report of the ICES North-Western Working Group presents the best available summary of knowledge about the distribution of pelagic *Sebastes mentella* and its affinity to the shelf stocks in the relevant ICES area. Possible relationships between pelagic *Sebastes mentella* and shelf *Sebastes mentella* (demersal) have not been studied in the NAFO area, and no data adequate to address this question exist. No national funds have been committed to this research area at present. Additional funding for specific research studies would be needed in order to address this topic.

Further to this subject, Scientific Council noted the following recommendations from Scientific Council from it's June 2001 Meeting:

"annually, in advance of the meeting of the North-Western Working Group (next meeting tentatively scheduled for April 2002), Scientific Council members who will be participating identify themselves to the NAFO Secretariat who will work with the Chair of Scientific Council and designate formal representation of NAFO to the Working Group. The designated person(s) shall then report back on the ICES North-Western Working Group deliberations to the subsequent meeting of Scientific Council.

and

"the Chair of Scientific Council will interact with the Chair of the ACFM of ICES as required so that information on approved analyses and recommendations pertaining to the North-Western Working Group is shared and conveyed to NAFO Scientific Council for consideration as necessary."

Scientific Council was provided a report on the deliberations of the ICES North-Western Working Group (NWWG) meeting that took place from April 28 to May 8, 2002 in Copenhagen as it pertains to stock structure, distribution and state of pelagic *Sebastes mentella* in ICES Sub-areas V, XII and XIV and the NAFO Convention area. New information was presented on the general issue of stock structure within this whole area. The genetic structure of the pelagic and demersal stocks of deep-sea redfish (*S. mentella*) in the North Atlantic remains poorly known, but further research is currently being carried out. However, Scientific Council agreed with the NWWG that, based on the data available, all information suggests that the fishery for pelagic *S. mentella* in the NAFO Convention Area (eastern part of Div. 1F, 2H and 2J) is based on the same stock as fished in western part of ICES Sub-area XII.

Scientific Council also noted the following as it pertains to the state of the pelagic *S. mentella* resource in ICES Sub-areas V, XII and XIV and the NAFO Convention area:

In the 2001 trawl-acoustic survey, as well as in that of 1999, the stock shallower than 500 m was observed more southwesterly and deeper than it has been during former acoustic surveys in the last decade. During the same period, a gradual increase in temperature in the observation area has been observed. This may have influenced the distribution pattern of the redfish in June-July as the highest concentrations were found in the colder, i.e. southwestern part of the survey area. In June/July 2001, about half of the total acoustically estimated stock biomass was found in the NAFO Convention Area shallower than 500 m omitting the Canadian EEZ. Scientific Council noted that the surveys in 1999 and 2001 extended further to the south and west into the NAFO Convention Area and this may in past account for the perception of greater distribution to the west.

Since 1994, acoustic estimates of stock biomass show a drastic decreasing trend. The estimate was only 0.7 million tons in 2001, compared with 2.2 and 1.6 and 0.6 million tons in 1994, 1996 and 1999, respectively. This represents a reduction of about 1.5 million tons in the period. During the same period, the total catch has been about 800 000 tons. Therefore, the catch alone cannot explain the changes in the stock estimate. During the same period, the fishery has also developed towards greater depth and towards bigger fish, and in recent years, the majority of the catch has been caught at depths deeper than 500 m. Based on these results, the NWWG concluded that acoustic estimates cannot be considered accurate measures of relative changes in stock size of the upper layer fish, as availability may have changed during the surveyed period. Information suggests that fish inhabiting the upper layer may have migrated out of the surveyed area, both horizontally and vertically (deeper). Scientific Council agreed with this evaluation.

In addition to the acoustic measurements, an attempt was made to estimate the redfish in and below the deep scattering layer. This was done by correlating catches and acoustic values at depths between 100 and 450 m. The obtained correlation was used to convert the trawl data at greater depths to acoustic values and subsequently to an abundance and biomass estimate. Standardized trawl hauls were carried out at different depth intervals, evenly distributed over the survey area. Data for the correlation calculations between trawl catches and the acoustic results were obtained during trawling only. In addition, scrutinized acoustic values were only taken from exactly the same position and depth range as covered by the trawl. Using this method, a total of approximately 1 075 000 tons were estimated to be at depths between 0 and 500 m. and about 1 056 000 tons below 500 m. In June/July 2001, one third of the biomass obtained with the trawl

method of about 2 million tons was found in the NAFO Convention Area outside the Canadian EEZ. The NWWG considered that the low correlation between catch and the acoustic values used for abundance estimation and the assumption that catchability of the trawl is the same, regardless of the trawling depth, make the method questionable. Estimates based on these calculations both above and below 500 m depth, must be considered as a very rough measure with high uncertainty as the applicability of the method can only be verified after replicate measurements. The NWWG considered that the estimated abundance derived from the trawl data should be treated with great caution and they cannot be combined with the acoustic results. Scientific Council agreed with this evaluation.

The trend in unstandardized CPUE from different fleets in depths shallower than 500 m indicates a steep downward trend since 1995, and the trend in acoustic estimates from the surveys (described above) track these changes. In recent years, there is no clear signal in CPUE, but it should be noted that CPUE decreased between 2000 to 2001 for most indices, both shallower and deeper than 500 m. The results of a standardized CPUE analysis, derived from a GLM CPUE model incorporating data from Germany (1995-2001), Iceland (1995-2001), Greenland (1999-2001) and Norway (1995-2001) were available. The model takes into account year, month, vessel and area (ICES statistical square). The model shows that the index did decrease until 1997 and increased thereafter until 2000 and decreased by about 15% in 2001. Given the technical, seasonal, geographical and depth changes of the fishing activities, the NWWG considered that the relevance of the unstandardized national CPUE series as indicator of stock abundance remains difficult to assess. However, from the standardized CPUE series, the NWWG stated that it can be concluded that the pelagic redfish CPUE remained stable since 1995 for all fishing areas as well as separated above and below 500 m depth. The models do not indicate significant stock reductions since 1995. Scientific Council considered that CPUE (standardized or not) in hours fished for redfish can be misleading and may be optimistic. Scientific Council does not consider this a reliable indicator of stock status since redfish exhibit schooling behavior and relatively good catch rates may still be possible while the area of the distribution of the resource is declining or number of schools is diminishing.

The decline in the acoustic survey time series estimates has been the basis for the advice in past assessments. The assessment of the current state of the stock and basis of the advice is based on trends in standardized CPUE indices and a trawl biomass estimator that is based on an approach that is highly uncertain. The NWWG concluded that taking into account the uncertainty in stock indicators, it is not known if the exploitation rate generated by recent catches is above or below the 5% exploitation rate.

In summary, Scientific Council concluded that a stronger statement should be made about the uncertainty in the stock status of pelagic *S. mentella* resource in ICES Sub-areas V, XII and XIV and the NAFO Convention Area, particularly for the considerations that the standardized CPUE series do not indicate significant stock reductions since 1995.

Excerpt from NAFO Scientific Council Reports, 2001 (p.211-212)

4. **Update on Pelagic *S. mentella* (Redfish) in Division 1F and Adjacent ICES Area**

Regarding redfish in Division 1F, the Fisheries Commission requested (see Agenda Annex 1, Item 12) the Scientific Council to: *review all available information on the distribution of this resource over time, as well as on the affinity of this stock to the pelagic redfish resource*

found in the ICES Sub-area XII, parts of SA Va and XIV or to the redfish found in NAFO Sub-areas 1-3.

The Council responded:

The Council noted STACFIS at this meeting reviewed new information on the stock size and distribution of pelagic *Sebastes mentella* in NAFO Convention Area (Div. 1F, 2GHJ, 3K) and ICES Divisions XIV, XII and Va. (NAFO SCR Doc. 01/161). EU-Germany, Iceland, Russia and Norway carried out an ICES co-ordinated trawl-acoustic survey in June/July 2001. Five vessels participated and over 420 000 sq. naut. miles were covered. The stock size measured with the acoustic instruments was assessed to be about 715 000 tons at depths down to the deep-scattering layer (to about 350 m), with redfish having a mean length of 34.6 cm. Highest concentrations of redfish were in the southwest part of the area covered. The redfish was also mixed with the deep scattering layer. In addition to the acoustic measurements, an attempt was made to estimate the redfish in and below the deep scattering layer. This was done by correlating catches and acoustic values at depths between 100 and 450 m. The obtained correlation was used to transfer the trawl data at greater depths to acoustic values and from there to abundance. A total of approximately 1 075 000 tons were estimated to be at depths between 0 and 500 m and about 1 056 000 tons below 500 m depth. Below 500 m, the densest concentrations were found in the northeastern part of the area. The average length of the fishes caught below 500 m was 38.3 cm. The estimated abundance derived from the trawl data should be treated with great caution and they cannot be combined with the acoustic results. The preliminary data evaluation did not indicate significant changes in the stock size or distribution as compared with 1999 survey results.

A decreasing trend in the proportion of females at shallower water than 500 m during the last decade, but whether it is related to overexploitation of the females is not known. During the survey in 2001, recruits (25-30 cm) were observed, particularly in the western most area of the investigation; the western part of NAFO Div. 1F but also in the eastern parts of Div. 2H and 2J.

Fisheries of various fleets were discussed and various nations reported that little effort was directed towards pelagic *Sebastes mentella* in the NAFO Regulatory Area in 2001 up to date.

Council noted that a review on information about the stock structure of pelagic *Sebastes mentella* was presented during the NAFO Symposium on Deep-sea Fisheries (12-14 September 2001, Varadero, Cuba) and that there was no consensus with regard to various hypotheses.

Annex 5. NAFO Management Measures re Oceanic Redfish

(Extracted from FC Doc. 01/7-Report of the Special Fisheries Commission Meeting, 28-30 March 2001, Copenhagen, Denmark)
- Also "rolled-over" for 2002

Proposal re Oceanic Redfish in Div. 1F

(FC Doc. 01/4)

The management of Oceanic Redfish in 1F entails issues involving the reconciliation of conservation and enforcement measures for the stock in two adjacent convention areas (NAFO and NEAFC). In order to permit Contracting Parties adequate time to consider these issues, to ensure conservation of the stock and to facilitate fishing opportunities in 2001 without prejudice to the right of Contracting Parties to advance allocation arguments at future meetings of the NAFO Fisheries Commission, the Fisheries Commission adopts the following proposal:

1. Add the following column to the 2001 NAFO Quota Table:

	Oceanic Redfish[9]
	Div. 1F
Denmark (in respect of Faroe Islands & Greenland)	24,169
European Union	13,883
Iceland[10]	27,008
Norway	3,596
Poland	1,000
Russia	24,169
Canada, Estonia, Japan, Latvia, Lithuania	1,175
	95,000[11]

Footnote 9: These quotas are set on the basis of the TAC of 95,000 tons established by NEAFC for 2001. Quantities taken in the NEAFC Convention Area shall be deducted from the quotas mentioned.

Footnote 10: Iceland has objected to the NEAFC management measures for oceanic redfish for 2001. Iceland will however limit its fisheries in the NAFO Regulatory Area to 27,008 tons in 2001.

Footnote 11: Each Contracting Party shall notify the Executive Secretary bi-weekly of catches taken by its vessels from this stock in Div. 1F. The Executive Secretary shall notify without delay all Contracting Parties of the date on which, for this stock, accumulated reported catch taken by vessels of the Contracting Parties is estimated to equal 15,000 tons and then 30,000 tons.

2. This measure will not enter into force before NEAFC has established measures to the effect that catches of oceanic redfish in the NAFO Convention Area will be deducted from the NEAFC quotas for 2001.

3. It is understood that when fishing in Division 1F, NAFO Conservation and Enforcement Measures will apply.

4. Catches in Division 1F not to exceed 30,000 tons in 2001.

5. This arrangement applies to 2001 only and is without prejudice to sharing arrangements for this stock in future years.

Annex 6. Measure adopted by NEAFC on Pelagic Fishery for Redfish for 2002

NEAFC AM 20-51

NEAFC 20th Annual Meeting
Agenda item 7a — For Decision

PROPOSAL BY DENMARK (IN RESPECT OF FAROE ISLANDS AND GREENLAND) FOR A NEAFC RECOMMENDATION ON MANAGEMENT MEASURES ON PELAGIC FISHERY FOR REDFISH FOR 2002

The Parties of NEAFC agreed to take as a basis a provisional TAC (Total Allowable Catch) for redfish[1] of 95.000 tonnes.

In accordance with Articles 5 and 6 in the Convention, NEAFC recommends the following measures for redfish, fished with pelagic trawls in the Convention area excluding the Icelandic EEZ:

1. Quotas

a) Denmark (in respect of Faroe Islands and Greenland)	24.169 tonnes
b) EU	13.883 tonnes
c) Norway	3.596 tonnes
d) Poland	1.000 tonnes
e) Russia	24.169 tonnes
f) Co-operation Quota	1.175 tonnes[2]

Quotas excluding discards.

2. Transfer
Contracting Parties are free to transfer quantities of their quota to other Contracting Parties. All transfers shall be reported promptly to the Secretariat.

3. Mesh size
It is prohibited to use trawls with a mesh size of less than 100 mm.

4.
This recommendation may be revised on the basis of any new scientific advice from ICES.

[1] Oceanic Sebastes mentella and pelagic deep sea Sebastes mentella.
[2] Of which not more than 587,5 tonnes may be fished in the months January-April inclusive, and not more than 1.175 tonnes may be fished in the months May-December inclusive.

NEAFC SUPPLEMENTARY MANAGEMENT MEASURES ON PELAGIC FIHSERY FOR REDFISH

(Adopted by postal vote and effective from 8 April 2002).

NEAFC's Contracting Parties agree to supplement the Recommendation on management measures on pelagic fishery for redfish in Annex G in the Report from the 20th Annual Meeting with the text below:

Commensurate to the decision in the Fisheries Commission of NAFO on oceanic redfish, NEAFC adopts the following measure:

1. Quotas
Catches of redfish, fished with pelagic tgrawls in the NAFO Convention Area, Div. 1F, shall be deducted from the quotas established in the NEAFC Convention Area.[1]

2. Period
The measure pertains to all of 2002.

[1]In addition to compliance with NAFO reporting rules, Contracting Parties are encouraged to report catches of Oceanic Redfish in NAFO Division 1F to the NEAFC Secretariat in the same format as catches from the NEAFC Convention Area.

Annex 7. Proposal re Oceanic Redfish (pelagic *Sebastes mentella*) in NAFO SA 2 and Divisions 1F and 3K

(Redfish W.G. W.P. 02/5-Revision 4)

The management of Oceanic Redfish in NAFO SA 2 and Divisions 1F and 3K entails issues involving the reconciliation of conservation and enforcement measures for the stock in two adjacent convention areas (NAFO and NEAFC).

The Working Group recommends that the Fisheries Commission of NAFO, as long as the Oceanic Redfish fishery in the NAFO Convention Area continues, establish quotas of Oceanic Redfish for the NAFO Convention Area. Recognizing that this will require consultations between NAFO and NEAFC on a potential sharing arrangement and without prejudice to the right of Contracting Parties to advance allocation positions at future meetings of the NAFO Fisheries Commission, the Working Group recommends that the Fisheries Commission adopt the following proposal for 2003:

1. Add the following column to the 2003 NAFO Quota Table:

	Oceanic Redfish (Pelagic Sebastes mentella)
	NAFO SA 2 and Divisions 1F and 3K
Denmark (in respect of Faroe Islands & Greenland) European Union Iceland Norway Poland Russia	To be determined as per point 2 below.
Contracting Parties who are not members of NEAFC	To be determined as per points 3 and 4 below.

2. NEAFC will establish the 2003 TAC for Oceanic Redfish and the associated quota table applicable to NEAFC Contracting Parties. Quantities taken in the NEAFC Convention Area shall be deducted from the quotas mentioned.

3. The Working Group recommends that the Fisheries Commission of NAFO, after consultations with NEAFC, establish a quota of 5,000 tons from the 2003 TAC that NEAFC will establish, for allocation by the Fisheries Commission to NAFO Contracting Parties who are not NEAFC Contracting Parties, to be fished in the NAFO Convention Area.

4. The Fisheries Commission should establish a quota key or other means of sharing the quota to be fished by Contracting Parties who are not NEAFC Contracting Parties. In addition, the Fisheries Commission should establish relevant reporting requirements.

5. Combined catches in the NAFO Convention Area for Contracting Parties who are also NEAFC Contracting Parties shall not exceed 25,000 tons in 2003. These Contracting Parties shall notify the Executive Secretary bi-weekly of catches taken by its vessels from this allocation. The Executive Secretary shall notify without delay all Contracting Parties the dates on which accumulated reported catch taken by vessels of Contracting Parties who are members of NEAFC is estimated to equal 12,500t and then 25,000t.

6. It is understood that when fishing in NAFO SA 2 and Divisions 1F and 3K, NAFO Conservation and Enforcement Measures shall apply.

7. This arrangement applies to 2003 and is without prejudice to sharing arrangements for this stock in future years.