

2.4 Stock Summaries

2.4.9 Pelagic *Sebastes mentella* in the Irminger Sea and adjacent areas (Subareas V, VI, XII, and XIV and the NAFO Subareas 1+2)

State of the stock

In the absence of reference points and an analytical assessment, the state of the stock cannot be fully evaluated. Stock status is based mainly on the perception of stock trends derived from survey indices. The acoustic-trawl survey in 2007 indicates that the stock size is low compared to the early 1990s, but stock size has not shown any clear trends since 1999. The exploitation rate for this stock is unknown.

Management objectives

There are no explicit management objectives for this stock.

Reference points

No precautionary reference points have been established.

Single-stock exploitation boundaries

ICES advises that a management plan be developed and implemented which takes into account the uncertainties in science and the properties of the fisheries. ICES suggests that catches of *S. mentella* are set at 20 000 t as a starting point for the adaptive part of the management plan.

Management considerations

1. Management strategy

There are a number of uncertainties in the assessment of *Sebastes mentella* in the Irminger Sea. The lack of reliable indices of abundance and accurate recruitment indices prevent precise determination of stock status. The stock definition is still under review and there are concerns that the current approach based on a single stock, without recognition of its possible components, does not capture the stock dynamics. ICES is also concerned about the lack of agreed TACs and allocation schemes, which result in catches greatly exceeding the advice. This increases the risk of overexploitation. The autonomous quotas that have been set are insufficient to constrain catches.

ICES advises that a management plan be developed and implemented which takes into account the uncertainties in science and the properties of the fisheries. It is suggested that NEAFC, in cooperation with ICES, takes the initiative to develop the recommended approach for management of redfish in the Irminger Sea prior to the beginning of the 2008 fishery.

A management plan should include:

- Objectives
- Knowledge base (life history considerations, catch statistics, effort, surveys, etc.)
- Rules to determine removal rate (adaptive approach: start low, change according to agreed criteria)
- Instruments (TACs, effort, access rights...)
- Implementation and enforcement
- International agreement

A dialogue between managers, scientists, and stakeholders should go much further than specifying a harvest control rule. It should look also at the type of scientific knowledge needed for management, at the type of management system needed in view of uncertainties, and at ways to improve the situation in general.

ICES suggests that catches of *S. mentella* are set at 20 000 t as a starting point for the adaptive part of the management plan. ICES has previously advised that most deepwater species like redfish can only sustain low rates of exploitation, since slow-growing, long-lived species that are depleted have a long recovery period. Fisheries should only be allowed to expand when indicators have been identified and a management strategy including appropriate monitoring requirements has been decided and is implemented.

The basis of the 20 000 t is that this is a significant reduction in catches compared with the recent past. This is expected to result in a lower exploitation rate, but the absolute magnitude cannot be estimated.

2. Other issues

In 2005 and in previous years, ICES advised that “management action should be taken to prevent a disproportional exploitation rate of any one component.” This advice has proven open to different interpretations and is difficult to support with estimates of sustainable catch by area. Management should prevent a disproportional exploitation rate of the fish in the two distinct fishing areas to prevent local depletion. This should be done for two reasons: 1) to reduce the risk to local ecosystems, and 2) to avoid depletion of local populations in the light of the unresolved stock structure. However, at this time there is no available scientific information to provide a quantitative estimate on the split of catches, which would warrant a sustainable exploitation of redfish in different geographical areas.

A comparison of the number of vessels fishing the resource and reporting to NEAFC by VMS with those visible on satellite images indicates that the unreported effort might be a significant amount. During the observation days in June 2002 to 2006 (in the main fishing season), the effort could be more than 15–33% higher than reported to NEAFC, and thus the unreported catch could be in that order of magnitude. Latest information available for 2006 showed that the unreported effort could be around 19–29%.

The stock structure of redfish *S. mentella* in Subareas V, VI, XII, and XIV, and in the NAFO Convention Area has been evaluated by an ICES study group in 2004. The outcome is not conclusive and supports different hypotheses (from a one-stock- to different multi-stock-hypotheses). Consequently, and solely for practical reasons, the perception of stock structure in this report is unchanged from the 2003 report. Additional information on stock structure has been available since 2004. Drawing conclusions from this information would require a comprehensive evaluation that integrates these results with those from other disciplines. It will be done by a panel of external experts on stock identity.

Commercial cpue series were previously used to determine stock size. However, the fishery targets pelagic aggregating fish and fishing technology is improving at an increasing rate. Therefore, stable or increasing cpues are not considered to reflect the stock status reliably, but decreasing cpue likely indicates a decreasing stock. Overall cpues declined between 1995 and 1997 and have since fluctuated without a clear trend.

Factors affecting the fisheries and the stock

Nursery areas for the stock are found at the continental slope off East Greenland. The juvenile redfish in these areas should therefore be protected, and measures already in place to reduce the bycatches in the shrimp fishery need to be continued.

Changes in fishing technology and fishing patterns

Since 1997, the main fishing season occurred during the second quarter. The pattern in the fishery has been reasonably consistent in the last 7 years and can be described as follows: In the first months of the fishing season (which usually starts in early April) the fishery is conducted in the area east of 32°W and north of 61°N, and in July (or August) the fleet moves to areas south of 60°N and west of about 32°W where the fishery continues until October. There is very little fishing activity in the period from November until late March or early April, when the next fishing season starts. The fleets participating in this fishery have continued to develop their fishing technology, and most trawlers now use large pelagic trawls (“Gloria”-type) with vertical openings of 80–150 m. The vessels have operated at a depth range of 200 to 950 m in 1998–2005; mainly deeper than 600 m in the first and second quarters, and at depths shallower than 500 m in the third and fourth quarters. Discarding is at present not considered to be significant for this fishery.

The pelagic fishery in the Irminger Sea only exploits the mature part (approximately 95% mature) of the stock. The fishery started in 1982 in the upper 500 m and expanded from 1991 onwards into deep waters where the majority of the catch is now taken. Catches in the southwestern area (almost exclusively shallower than 500 m) have remained relatively stable but low since 1997, with a slight decline in the last 2 years. In the northeastern area (deeper than 500 m) catches increased until 1997 and then fluctuated without a clear trend until 2004. In 2005, the catches from this area dropped to about half the previous level and only increased slightly in 2006. The main feature of the fishery in recent years is a clear distinction between two widely separated grounds fished at different seasons and different depths. Since 2000, the southwestern fishing ground extended also into the NAFO Convention Area. The parameters analysed so far do suggest, however, that the aggregations in the NAFO Convention Area do not form a separate stock. Some biological features distinguish the fisheries in the two areas. The length distributions of the catches differ between the described two main fishing ground/seasons. The fisheries in the northeastern area (2nd quarter) mainly targets larger and post-spawning fish.

Scientific basis

Data and methods

ICES again had difficulties in obtaining catch estimates from the various fleets and there are indications that unreported catches are substantial. Furthermore, landings data were missing from some ICES member countries. In spite of the best of efforts there is a need for a special action through NEAFC and NAFO to provide ICES with all information that might lead to more reliable catch statistics.

Cpue series, catch, and length information is available from the commercial fishery. Acoustic surveys conducted since 1991 in the Irminger Sea are available for estimation of the stock biomass above the deep-scattering layer. Trawl information from below this layer is available from 1999. Data on maturity-at-length and maturity-at-weight and some age-reading experiments were available from both fishery and survey. In recent years, data from most fishing nations have been compiled, and this enabled production of detailed charts showing the area and depth distribution of the fisheries (see Section 2.4.6).

Uncertainties in assessment and forecast

The acoustic estimates for pelagic redfish only provide stock estimates for redfish distributed shallower than the deep-scattering layer (DSL). However, since 1996 only about 20–30% of the total catches have been taken from the shallow layer.

The acoustic biomass estimates provide only approximate indexes of stock size due to varying coverage of the stock distribution area and methodological deficiencies.

The quality of the trawl biomass estimate cannot be verified, as the data series is very short. Therefore, the abundance estimates by the trawl-method must only be considered as a rough attempt to measure the abundance within and deeper than the DSL.

Comparison with previous assessment and advice

Key considerations in last year's advice of zero catch were the decline in reported landings and cpue in the two preceding years. A further decline in 2006 was not observed. The advice this year is provided in the context of an adaptive management strategy.

Sources of information

Report of the North-Western Working Group, 24 April–3 May 2007 (ICES CM 2007/ACFM:17).

Report of the Study Group on Stock Identity and Management Units of Redfishes (SGSIMUR), 31 August–3 September 2004, Bergen, Norway (ICES CM 2005/ACFM:10).

Catch data for pelagic *S. mentella*

| Year | ICES Advice | Predicted catch corresp. to advice | 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 | 180 |
| 1997 | No specific advice | - | 153–158 | 123 |
| 1998 | TAC not over recent (1993–1996) levels of 150 000 t | | 153 | 117 |
| 1999 | TAC to be reduced from recent (1993–1996) levels of 150 000 t | | 153 | 110 |
| 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 | 129 |
| 2002 | TAC less than 75% of catch 1997–1999 – Revised to be below current catch levels | <85 | Not agreed NEAFC proposal (95) | 146 |
| 2003 | TAC not exceed current catch levels | 119 | Not agreed NEAFC proposal (119) | 161 |
| 2004 | TAC not exceed current catch levels | 120 | Not agreed NEAFC proposal (120) | 126 |
| 2005 | Limit catch to 41 kt | 41 | Not agreed NEAFC proposal (75) / (116*) | 73 |
| 2006 | Catch less than 41 kt | 41 | Not agreed NEAFC proposal (62) / (99*) | 83 |
| 2007 | No fishery until clear indications of recovery of the stock | 0 | Not agreed NEAFC proposal (46) / (73*) | |
| 2008 | Starting point for adaptive management strategy | 20 | | |

Weights in '000 t.

* sum of all quotas in force.

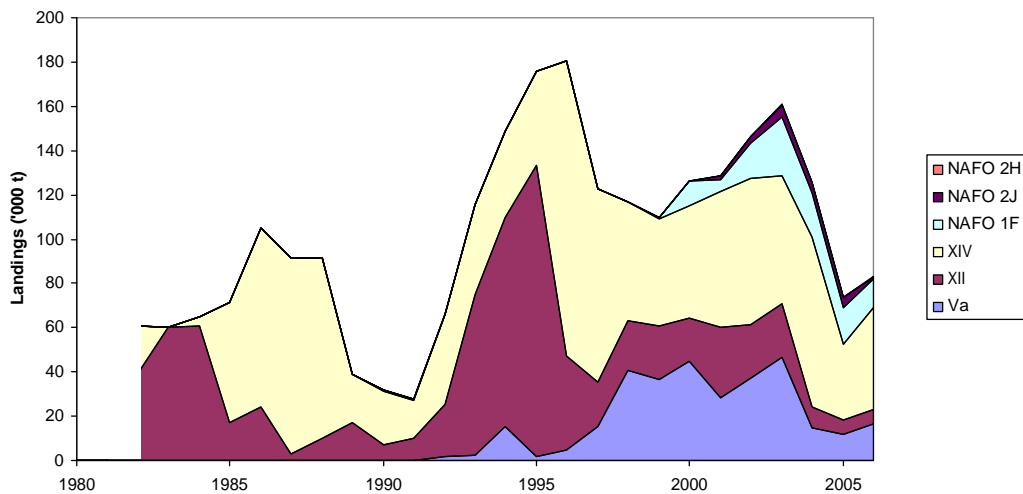


Figure 2.4.9.1 Pelagic *S. mentella*. Landings by area.

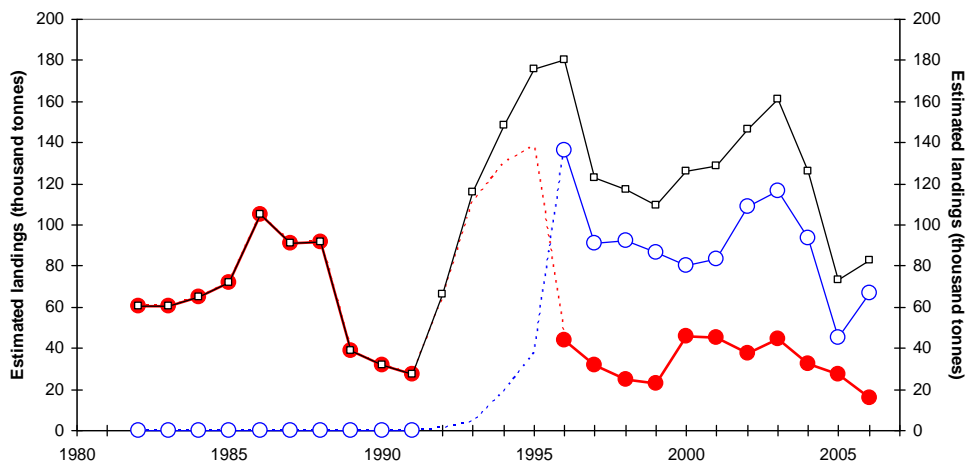


Figure 2.4.9.2 Pelagic *S. mentella*. Landings by depth strata. Estimates of catch by depth strata in the period 1992–1995 are not considered precise. Red filled circles: Estimates of catch from shallower water. Blue open circles: Estimates of catch from deeper waters.

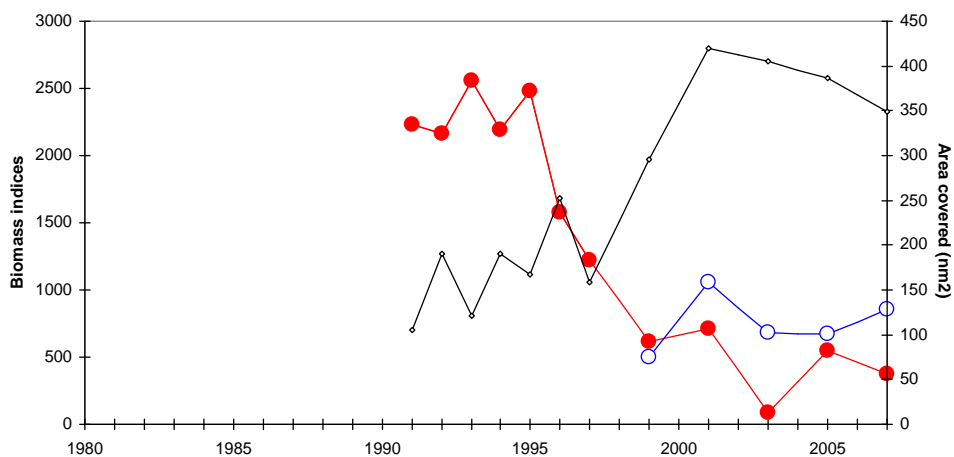


Figure 2.4.9.3 Pelagic *S. mentella*. Overview of survey indices, including aerial coverage in the Irminger Sea. Red filled circles: Acoustic estimates from above the scattering layer. Blue open circles: Trawl estimates from below 500 m (1997–2001) and below 350 m (2005 and 2007). Black diamonds: Area coverage of the survey.

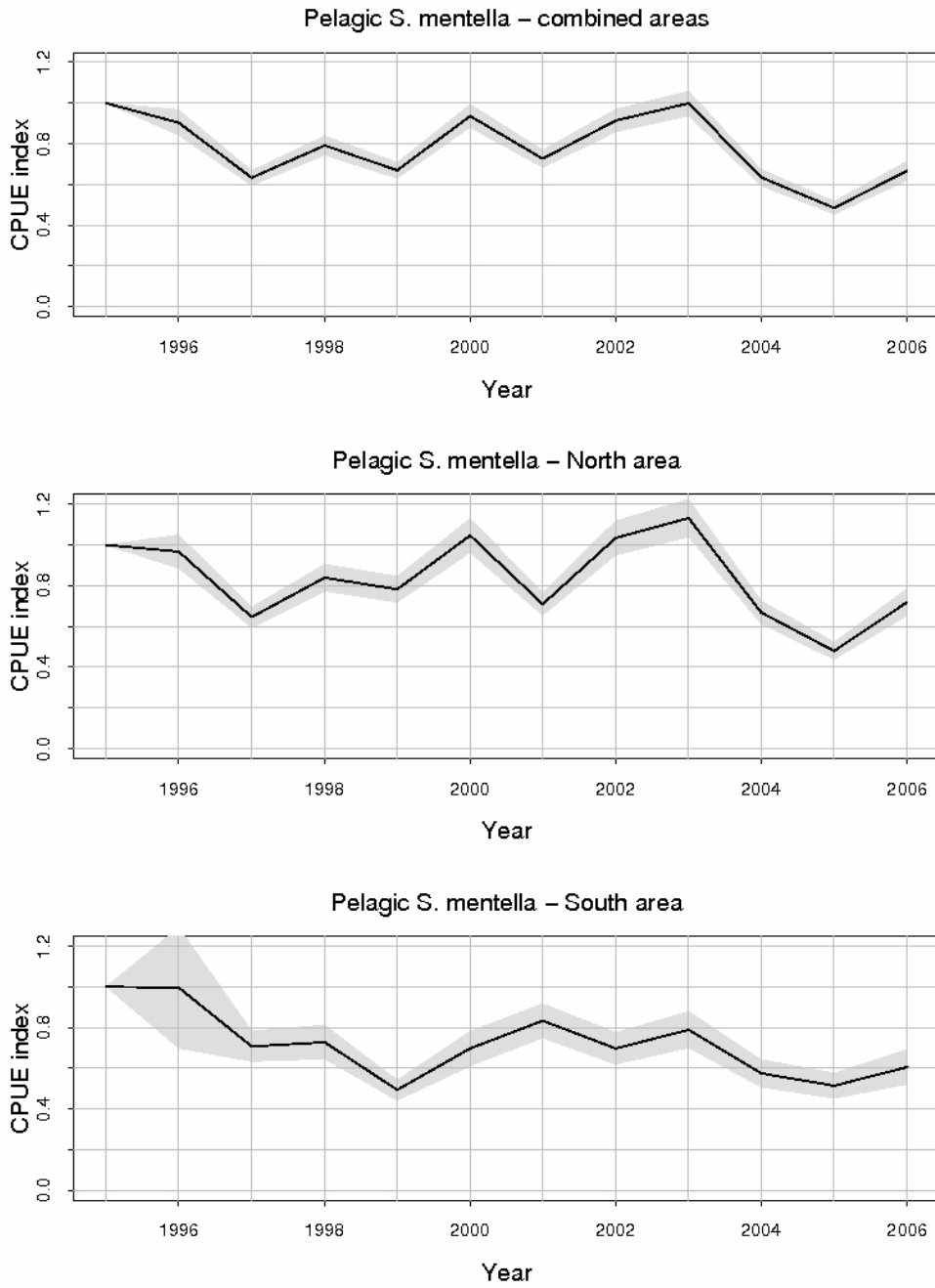


Figure 2.4.9.4 Pelagic *S. mentella*. International cpue by area.

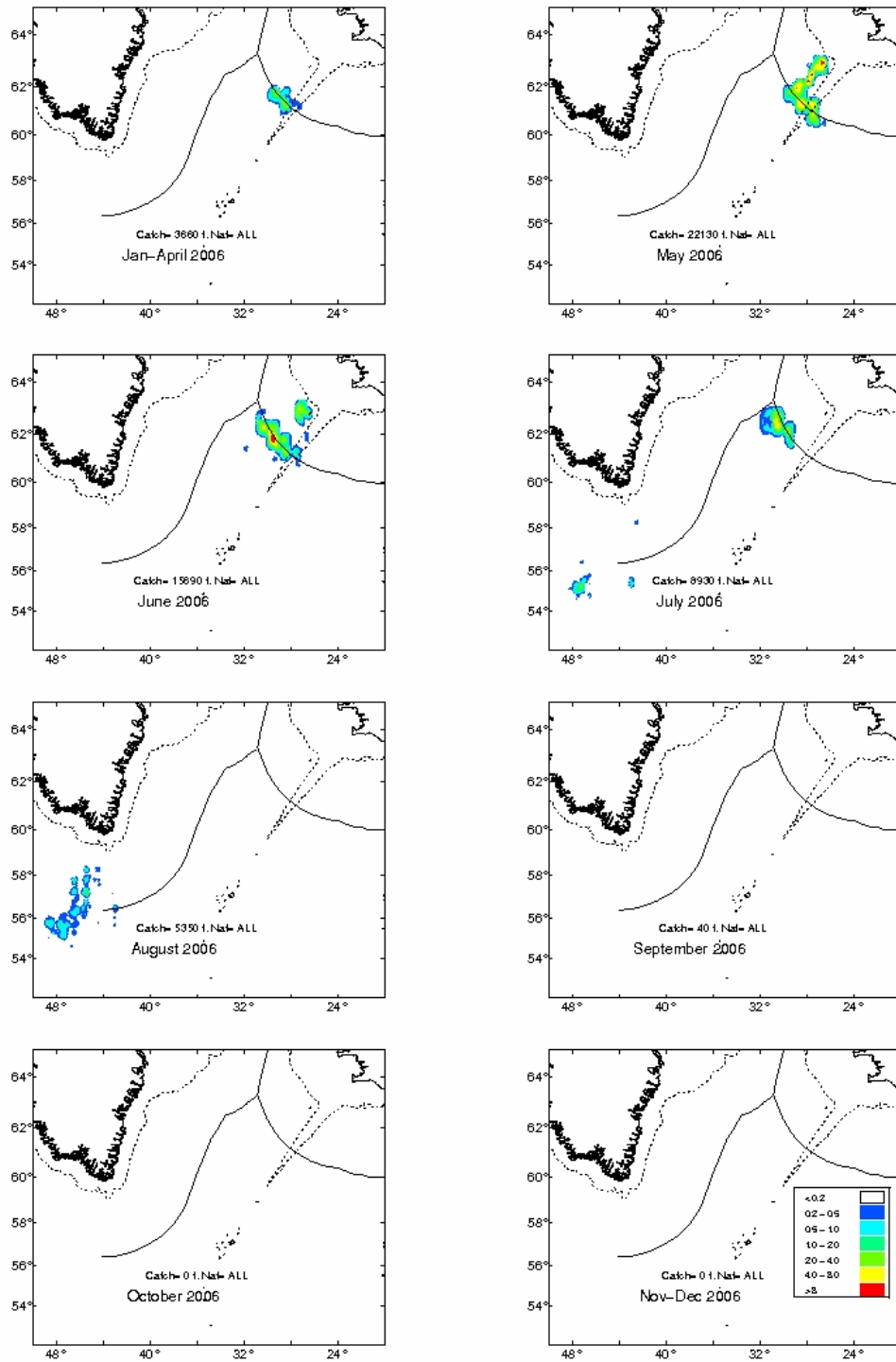


Figure 2.4.9.5. Fishing areas and total catch of the pelagic redfish (*S. mentella*) by month in 2006, derived from catch statistics provided by Germany, Norway, Iceland, and Greenland. The scale for the catch is in tonnes per square nautical mile. Total catch for each period is also given.

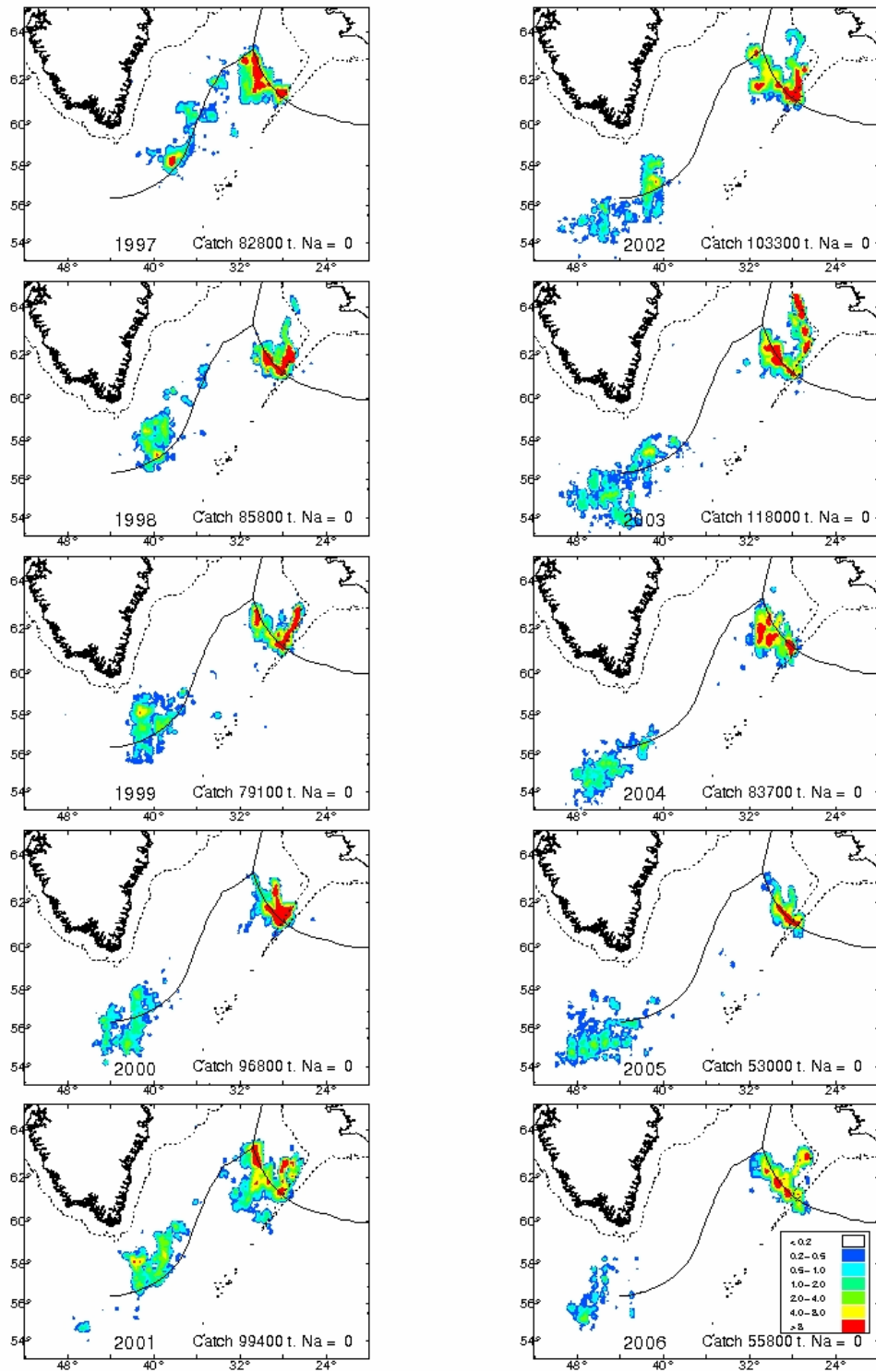


Figure 2.4.9.6 Fishing areas and total catch of the pelagic redfish (*S. mentella*) in the Irminger Sea and adjacent waters 1997–2006. Data are from the Faroe Islands (1995–2006), Germany (1995–2006), Greenland (1999–2003), Iceland (1995–2006), Norway (1995–2003), and Russia (1997–2006). The scale given is tonnes per square nautical mile.

Table 2.4.9.1

Pelagic *S. mentella*. Catches (in tonnes) by area as used by the Working Group. Due to the lack of area reporting for some countries, the share in Subareas XII and XIV is only approximate in the most recent years.

| YEAR | VA | XII | XIV | NAFO 1F | NAFO 2J | NAFO 2H | TOTAL |
|------|--------|---------|---------|------------|------------|------------|---------|
| 1982 | | 39 783 | 20 798 | | | | 60 581 |
| 1983 | | 60 079 | 155 | | | | 60 234 |
| 1984 | | 60 643 | 4 189 | | | | 64 832 |
| 1985 | | 17 300 | 54 371 | | | | 71 671 |
| 1986 | | 24 131 | 80 976 | | | | 105 107 |
| 1987 | | 2 948 | 88 221 | | | | 91 169 |
| 1988 | | 9 772 | 81 647 | | | | 91 419 |
| 1989 | | 17 233 | 21 551 | | | | 38 784 |
| 1990 | | 7 039 | 24 477 | 385 | | | 31 901 |
| 1991 | | 10 061 | 17 089 | 458 | | | 27 608 |
| 1992 | 1 968 | 23 249 | 40 745 | | | | 65 962 |
| 1993 | 2 603 | 72 529 | 40 703 | | | | 115 835 |
| 1994 | 15 472 | 94 189 | 39 028 | | | | 148 689 |
| 1995 | 1 543 | 132 039 | 42 260 | | | | 175 842 |
| 1996 | 4 744 | 42 603 | 132 975 | | | | 180,322 |
| 1997 | 15 301 | 19 826 | 87 698 | | | | 122 825 |
| 1998 | 40 612 | 22 446 | 53 910 | | | | 116 968 |
| 1999 | 36 524 | 24 085 | 48 521 | 534 | | | 109 665 |
| 2000 | 44 677 | 19 862 | 50 722 | 11 052 | | | 126 313 |
| 2001 | 28 148 | 32 164 | 61 457 | 5 290 | 1 751 | 8 | 128 818 |
| 2002 | 37 279 | 24 026 | 66 194 | 15 702 | 3 143 | | 146 344 |
| 2003 | 46 676 | 24 232 | 57 780 | 26 594 | 5 377 | 325 | 160 984 |
| 2004 | 14 456 | 9 679 | 76 656 | 20 336 | 4 778 | | 125 905 |
| 2005 | 11 726 | 6 784 | 34 041 | 16 260 | 4 899 | 5 | 73 715 |
| 2006 | 16 380 | 6 795 | 45 943 | 12 939 | 593 | 260 | 82 910 |