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-

PART 2 (STECF-12-08)

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REVIEW OF SCIENTIFIC ADVICE FOR 2013 - PART 2 (STECF-12-08)

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1. INTRODUCTION AND TERMS OF REFERENCE

1.1. Introduction

1.1.1. Background

This report represents the STECF review of advice for stocks in the North Sea Celtic and Irish Seas, West of Scotland, West of Ireland, south western waters, Icelandic and East Greenland, Barents Sea and the Norwegian Sea, Faeroe plateau ecosystem and widely distributed and migratory stocks, and deep sea stocks in the North East Atlantic.

In undertaking the review, STECF has consulted the most recent reports on stock assessments and advice from ICES and has attempted to summarise them in a common format. The review was drafted by the STECF Expert Working Group EWG-12-09 during its meeting held in Copenhagen, Denmark from 2-6 July 2012.

The STECF review of advice for 2013 Part 1 included the latest assessments and advice for stocks in the Baltic Sea and was published in June 2012. Part 3 will contain information of other stocks of interest to the European Community and will be published in November 2012. Parts 1, 2 and 3 will also be amalgamated and published as the Consolidated STECF Review of advice for 2013 in November 2012.

1.1.2. Format of the STECF Review of advice

For each stock, a summary of the following information is provided:

STOCK: [Species name, scientific name], [management area]

FISHERIES: fleets prosecuting the stock, management body in charge, economic importance in relation to other fisheries, historical development of the fishery, potential of the stock in relation to reference points or historical catches, current catch (EU fleets' total), any other pertinent information.

SOURCE OF MANAGEMENT ADVICE: reference to the management advisory body.






MANAGEMENT AGREEMENT: where these exist.

REFERENCE POINTS: where these have been proposed.

STOCK STATUS: Reference points, current stock status in relation to these. STECF has included precautionary reference point wherever these are available. The stock status is summarised in a "traffic light" table utilising four separate symbols to indicate status in relation to different reference points. The key to the symbols is as follows:

⊖ - indicates an undesirable situation e.g. F is above the relevant reference point or SSB is below the relevant reference point

⊕ - indicates a desirable situation e.g. F is below the relevant reference point or SSB is above the relevant reference point

-  - indicates that the status is unknown e.g the reference point is undefined or unknown, or F or SSB is unknown relative to a defined reference point
-  - indicates that status lies between the precautionary (pa) and limit (lim) reference points
-  - indicates that the absolute level is unknown but increasing
-  - indicates that the absolute level is unknown but unchanged
-  - indicates that the absolute level is unknown but decreasing

RECENT MANAGEMENT ADVICE: summary of most recent advice.

FISHING OPPORTUNITIES FOR 2012 according to COM(2011) 298-Final. The TACs or effort limits for 2012 that should be proposed according to the rules prescribed in COM (2011) 298-Final).

STECF COMMENTS: Any comments STECF thinks worthy of mention, including errors, omissions or disagreement with assessments or advice.

1.1.3. Commission Communication to the Council concerning a consultation on Fishing Opportunities for 2013 and general context of ICES advice

STECF is requested to take into account Harvest Control Rules adopted in any type of multi-annual management plan and rules and principles for the setting of TACs as specified in the Commission Communication to the Council concerning a consultation on Fishing Opportunities for 2013 (COM(2012) 278 final). STECF notes that in its 2012 advice, for most stocks, ICES provides catch options corresponding to the principles outlined in the working method for proposing TACs in Section 6 of COM(212) 278 final.

Furthermore, ICES has now provided quantitative advice on catch options for many stocks for which data are limited. The basis for such advice is given in the general context of ICES advice (ICES Advice 2012, Book 1). While agreeing with the general approach, there are a number of instances where STECF was able to draw attention to additional information which either supplemented or in some cases, resulted in STECF providing advice that differed to that from ICES. This is clearly indicated in the relevant sections of this report.

The ICES framework for data limited stocks provides a means of calculating a value for future catches. The framework has been applied in cases where stocks do not have population estimates from which catch options can be derived using the existing MSY framework. The principles underlying the framework for data limited stocks are that all available information should be used and that a precautionary approach should be followed with an increasing margin of precaution being adopted as information becomes increasingly more limited. ICES has classified data-limited stocks into 5 categories depending on availability of data and information and has devised different harvest control rules for each of the categories.

With the exception of stocks for which stock status relative to candidate reference points for stock size or exploitation is unknown, ICES has applied a change limit of + 20% to its catch advice. The change limit is relative to the reference on which it is based e.g. recent average catches or projection of a trend.

For stocks for which stock status relative to candidate reference points for stock size or exploitation is unknown, ICES has adopted a precautionary margin of -20%. In practice, for many stocks, this results in advice from ICES for a 20% reduction in catches relative to a recent value, usually the average of the most recent 3 years of available catch or landings data. In cases where ICES has advised that based

on the average landings over a specific period, catches should be reduced by x%, STECF considers that it is more appropriate to express the resulting figure in terms of landings rather than catches.

In the absence of clear management objectives, STECF has in most cases agreed with the ICES advice on data limited stocks.

While recognising that the ICES approach is an attempt to move in the direction of sustainable exploitation, the choice of 20% both as a change limit and a precautionary margin is somewhat arbitrary and the risks associated with applying such rules have not been evaluated with respect to management objectives or the precautionary approach. Hence, STECF considers it important to point out that the advised catches corresponding to the harvest rules proposed by ICES provides a means of calculating a value for future catches but there is no guarantee, that setting TACs in line with that value will achieve management objectives. Hence when setting TACs, managers may wish to consider whether the catches corresponding to the advice from ICES and STECF on data limited stocks is in line with their objectives.

1.2. Terms of Reference

The STECF is requested to review and comment on the scientific advice released in 2011 – 2012 in particular for the stocks specified below. The text of previous STECF reviews of stocks for which no updated advice is available shall be retained in the report in order to facilitate easy reference and consultation.

STECF is requested, in particular, to highlight any inconsistencies between the assessment results and the advice delivered by scientific advisory committees of ICES and RFMOs.

In addition, when reviewing the scientific advice from ICES, and any associated management recommendations, STECF is requested to take into account Harvest Control Rules adopted in any type of multi-annual management plan and rules and principles for the setting of TACs as specified in the Commission Communication to the Council concerning a consultation on Fishing Opportunities for 2013 (COM(2012) 278 final – see supporting documentation).

✓ **Eco-Region 1: North Sea**

- Stocks of
 - Anglerfish in ICES Divisions IIIa & Vb , Subareas IV, VI, XII & XIV
 - Brill in the North Sea
 - Cod in ICES Subarea IV, ICES Divisions VIID and IIIa (Skagerrak)
 - Cod in ICES Division IIIa (Kattegat)
 - Dab in the North Sea
 - Flounder in the North Sea
 - Grey Gunard in the North Sea
 - Haddock in ICES Subarea IV and ICES Division IIIa (Skagerrak & Kattegat)
 - Herring in ICES Division IIIa and Subdivisions 22-24 (Western Baltic Spring spawners)
 - Herring in ICES Division IIIa, Subarea IV and Division VIId (North Sea Autumn spawners)
 - Horse Mackerel (*Trachurus trachurus*) in ICES Division IIIa (eastern part), IVb, IVc & VIId
 - Lemon Sole in the North Sea
 - Mackerel in the North Sea
 - Megrin in the North Sea
 - *Nephrops norvegicus* in ICES Division IIIa (Functional Units 3 & 4)
 - *Nephrops norvegicus* in Norwegian Deep (Functional Unit 32)
 - *Nephrops norvegicus* in divisions IVa, Noup (Functional Unit 10) and Moray Frith (Functional Unit 9)
 - *Nephrops norvegicus* in ICES Division IVa, Fladen ground (Functional Unit 7)
 - *Nephrops norvegicus* in ICES Division IVb, Firth of Forth (Functional Unit 8) and Farn Deep (Functional Unit 6)
 - *Nephrops norvegicus* in ICES Divisions IVb & IVc, Botney Gut / Silver Pit (Functional Unit 5) and Off Horn Reef (Functional Unit 33)
 - Norway Pout in ICES Subarea IV & ICES Division IIIa (Skagerrak & Kattegat)
 - *Pandalus* stocks
 - Plaice in the ICES Subarea IV
 - Plaice in the ICES Division VIId
 - Plaice in ICES Division IIIa
 - Pollack in the North Sea
 - Rays and skates in the North Sea
 - Red Gunard in the North Sea
 - Red Mullet in the North Sea
 - Saithe in the ICES Subarea IV, ICES Division IIIa and ICES Subarea VI
 - Sandeel in ICES Division IIIa (Skagerrak & Kattegat)
 - Sandeel in ICES Subarea IV
 - Sandeel in the Shetland area
 - Seabass in the North Sea
 - Sole in ICES Division IIIa
 - Sole in ICES Subarea IV
 - Sole in ICES Division VIId
 - Sprat in the North Sea
 - Spurdog
 - Turbot in the North Sea
 - Whiting in the ICES Subarea IV and ICES Division VIId

- Whiting in ICES Division IIIa
- Witch in the North Sea

✓ **Eco-Region 2: Celtic Sea and West of Scotland**

- Stocks of
 - Anglerfish (*Lophius piscatorius* & *L. budegassa*) in Divisions VIIb-k, VIIIa & VIIIb
 - Cod in ICES Division VIa
 - Cod in ICES Division VIb
 - Cod in ICES Division VIIa
 - Cod in ICES Divisions VIIb,c,e-k VIII,IX,X,CECAF 34.1.1 (EU)
 - *Galeorhinus galeus* in ICES Subareas VI & VII
 - Greenland Halibut in the Western waters
 - Grey Gurnard in the Western waters
 - Haddock in ICES Division VIa
 - Haddock in ICES Division VIb
 - Haddock in ICES Division VIIa
 - Haddock in ICES Divisions VIIb-k, VIII, IX, X, CECAF 34.1.1 (EU)
 - Northern stock of Hake
 - Herring in ICES Divisions VIIa-South & VIIb-k
 - Herring in ICES Division VIa-North
 - Herring in Celtic Sea and ICES Division VIIj
 - Herring in ICES Division VIIa-North (Irish Sea)
 - Megrims (*Lepidorhombus whiffiagonis* & *L. boscii*) in ICES Divisions VIIb, VIIc, VIIe-k, VIIIa, VIIIb & VIIId
 - Megrims (*Lepidorhombus whiffiagonis* & *L. boscii*) in ICES Subarea VI
 - *Nephrops norvegicus* in ICES Divisions VIIb, VIIc VIIj & VIIk
 - *Nephrops norvegicus* in ICES Divisions VIIf, VIIg & VIIh (Functional Units 20-22)
 - *Nephrops norvegicus* in ICES Division VIa (Functional Units 11, 12, 13)
 - *Nephrops norvegicus* in Functional Units 14 & 15
 - Norway pout in ICES Division VIa
 - Plaice in ICES Division VIIa
 - Plaice in ICES Divisions VIIb & VIIc
 - Plaice in ICES Division VIIe
 - Plaice in ICES Divisions VIIf & VIIg
 - Plaice in ICES Divisions VIIh-k
 - Plaice in ICES Divisions Vb (EU waters), VI, XII, XIV PLE/56-14
 - Pollack in ICES Division VII
 - Pollack in in ICES divisions VI & VII
 - Red Mullet in the Western waters
 - Sandeel in ICES Division VIa
 - *Scyliorhinus canicula* and *Scyliorhinus stellaris* in Subareas VI and VII
 - Seabass in the Western waters
 - Sole in ICES Division VIIa
 - Sole in ICES Divisions VIIb & VIIc
 - Sole in ICES Divisions VIId & VIIe
 - Sole in ICES Divisions VIIf & VII

- Sole in ICES Divisions VIIh-k
- Sole in ICES divisions Vb(EC), VI, XII, XIV
- Sprat in ICES Divisions VIIId & VIIe
- Whiting in ICES Division VIIa
- Whiting in ICES Divisions VIIe-k
- Whiting in ICES Division VIIa
- Whiting in ICES Division VIIb
- Whiting in ICES Division VIII
- Rays and Skates in ICES Subareas VI & VII
- *Other demersal elasmobranches West of Scotland*

✓ **Eco-Region 3: Bay of Biscay and Iberian waters**

- Stocks of
 - Anchovy in ICES Subarea VIII
 - Anchovy in ICES Division IXa
 - Anglerfish (*Lophius piscatorius* & *L. budegassa*) in ICES Divisions VIIIc & IXa
 - *Galeorhinus galeus* in ICES Subareas VIII, IX and X
 - Grey Gurnard in the Bay of Biscay and Iberian waters
 - *Horse Mackerel in CECAF areas (Madeira Island)*
 - *Horse Mackerel in CECAF areas (Canary Islands)*
 - *Horse Mackerel in ICES subarea X (Azores Islands)*
 - Megrim (*Lepidorhombus boscii* & *L. whiffiagonis*) in ICES Divisions VIIIc & IXa
 - Norway lobster in ICES division VIIIc
 - Norway lobster in ICES divisions VIIId, b, d & e
 - Norway lobster in ICES divisions IX and X; CECAF 34.1.1 (EU)
 - Pollack in the Bay of Biscay and Iberian waters
 - Plaice in the Bay of Biscay and Iberian waters
 - Rays and Skates in ICES Subareas VIII & IX
 - Red Gurnard in the Bay of Biscay and Iberian waters
 - Red Mullet in the Bay of Biscay and Iberian waters
 - Sardine in ICES Divisions VIIIc & IXa
 - Saithe in ICES divisions VII, VIII, IX, X, CECAF 34.1.1 (EU)
 - *Scyliorhinus canicula* and *Scyliorhinus stellaris* in Subareas VIII, IX & X
 - Seabass in the Bay of Biscay and Iberian waters
 - Sole in ICES Divisions VIIId & VIIb
 - Sole in ICES divisions VIIIc, d & e, IX, X, CECAF 34.1.1 (EU),
 - Southern stock of Hake in ICES Divisions VIIIc & IXa
 - Southern Horse Mackerel (*Trachurus trachurus*) in ICES Division IXa
 - Southern Mackerel component of NEA Mackerel (*Scomber scombrus*)
 - Whiting in the Bay of Biscay and Iberian waters
 - *Other demersal elasmobranches in the Bay of Biscay and Iberian Waters*

✓ **Eco-Region 4: Icelandic and East Greenland**

- Stocks of
 - Greenland cod
 - Greenland halibut
 - Herring in ICES subareas I & II (Norwegian Spring spawners)
 - Icelandic cod
 - Icelandic haddock
 - Icelandic saithe
 - Icelandic Capelin
 - Icelandic summer spawning herring
 - *Sebastes mentella* in ICES Subareas V, VI, X, XII & XIV, NAFO Subareas I & II
 - *Sebastes mentella*

✓ **Eco-Region 5: The Barents Sea and the Norwegian Sea**

- Stocks of
 - Capelin
 - Greenland halibut
 - Northeast cod
 - Norwegian coastal cod
 - Northeast Arctic haddock
 - Northeast Arctic saithe
 - *Sebastes marinus* in ICES Subareas I & II
 - *Sebastes mentella* in ICES Subareas I & II
 - Shrimp

✓ **Eco-Region 6: Faeroe plateau ecosystem**

- Stocks of
 - Cod in ICES Subdivision Vb1
 - Cod in ICES Subdivision Vb2
 - Haddock in ICES Division Vb (including extra catch option requested by Commission – see below)
 - Saithe in ICES Subdivision Vb

✓ **Widely distributed and migratory stocks**

- Part 1
 - Stocks of
 - Alfonsinos / Golden eye perch (*Beryx* spp.)

- Black scabbard fish in ICES Divisions Vb, XIIb and Subareas VI and VII
- Black scabbard fish in ICES Subareas VIII and IX
- Black scabbard fish in other areas
- Blue Ling in ICES Division Va & ICES Subarea XIV
- Blue Ling in ICES Division Vb & ICES Subareas VI & VII
- Blue Ling in ICES Subareas I & II, ICES Division IIIa & IVa, ICES Subareas VIII, IX & XII
- *Blue shark (Prionace glauca) in the North-east Atlantic*
- Blue whiting in ICES Subareas I-IX, XII & XIV
- Blue whiting in ICES Subareas IIa
- Blue whiting in ICES Subareas Vb,VI,VII
- Blue whiting in ICES Subareas VIIIabd
- Blue whiting in ICES Subareas VIIIe
- Blue whiting in ICES Subareas VIIIc,IX,X
- Boarfish in ICES divisions VI, VII, VIII (EU)
- *Catsharks and nursehounds (Scyliorhinus canicula and Scyliorhinus stellaris) in the North-east Atlantic*
- Deep-water fish (several species) in IVA, IIIa, Vb, VI, VII, VIII, IX, X and XII.
- European eel
- Forkbeard spp.
- Great silver smelt in ICES Division Va
- Great silver smelt in ICES Subareas I & II, ICES Division IIIa, ICES Subarea IV, ICES Division Vb, ICES Subareas VI, VII, VIII, IX, X, XII & XIV
- *Horse mackerel in ICES Divisions IIa, IVa, Vb, VIa, VIIa-c,e-k and VIIIa-e*
- Kitefin shark in ICES Subareas I-XIV
- Leafscale gulper shark
- Ling in ICES Subareas I & II
- Ling in ICES Division Va
- Ling in ICES Division Vb
- Ling in ICES Divisions IIIa & IVa & ICES Subareas VI, VII, VIII, IX, XII & XIV
- Northeast Atlantic spurdog
- Northeast Atlantic portbeagle
- Northeast Atlantic basking shark
- Northeast Atlantic Mackerel - combined Southern, Western and North Sea spawning components
- Orange roughy
- Portuguese dogfish and leafscale gulper shark in ICES Subareas I-XIV
- *Rays and Skates in the North-east Atlantic*
- Red seabream in ICES Subarea IX
- Red seabream in ICES Subarea X (Azores)
- Red seabream in ICES Subareas VI, VI and VIII
- Roundnose grenadier in ICES Division Vb, Subareas VI & VII, ICES Division XIIb
- Roundnose grenadier in on the Mid-Atlantic ridge
- Roundnose grenadier in ICES Division IIIa
- Roundnose grenadier in all other areas

- *Thresher sharks (Alopias vulpinus & Alopias superciliosus) in the North-east Atlantic*
- *Tope (Galeorhinus galeus) in the North-east Atlantic*
- Tusk in ICES Subareas I & II
- Tusk in ICES Division Va and Subarea XIV
- Tusk in ICES Division IIIa, ICES Subarea IV, ICES Division Vb & VIa & XIIb, ICES Subareas VII, VIII, IX
- Tusk in ICES Division VIb

Tusk in ICES Subarea XII excluding XIIb

1.3. Participants

Acknowledgement

The STECF review of scientific advice for 2012 Part 2 was drafted by the STECF-EWG 11-09 held in Lyngby, Denmark from 2-6 July 2011. The Report was reviewed and adopted by the STECF at its 40th plenary session held in Copenhagen from 9-13 July 2012.

STECF acknowledges the extensive contribution made by the following participants:

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Contact details of Participants are presented in section 10 below.

2. ECO-REGION 1: RESOURCES OF THE NORTH SEA

2.1. Norway lobster (*Nephrops norvegicus*) - IIa (EU zone), IIIa and North Sea (EU zone)

Assessments of the *Nephrops* Functional Units (FUs) of Subarea IV utilized a number of approaches, including Underwater UWTV surveys (UWTV) surveys, length composition information, and basic fishery data such as

landings and effort. Owing to uncertainties in the accuracy of historic landings and to inaccurate effort figures in some fisheries, increasing attention is paid to survey information and size composition data as an indicator of stock status. Within SubArea IV, there are TV surveys providing sufficiently long time series of information to apply a quantitative assessment approach in four of the FUs as described in the paragraphs below. The remainder of the FUs are dealt with using a new approach developed by ICES for *Nephrops* stocks falling into the ‘Data Limited Stock’ category; this is also described below. Furthermore, ICES has recognised the *Nephrops* in the trenches across six ICES statistical rectangles 41-43F0 and 41-43F1 as a functional unit: FU34, ‘The Devil’s Hole’ and in 2012 has provided advice for this FU for the first time. Since 2011 the *Nephrops* stock in IIIa (FU3&4) has also been assessed on the basis of UWTV data.

In 2009 there were important developments in the methodology to assess the status of *Nephrops* stocks. The use of UWTV surveys has enabled the development of fishery-independent indicators of abundance. STECF (2005) had suggested that a combination of an absolute abundance estimate from an UWTV survey and a harvest rate based on $F_{0.1}$ from a combined sex-length cohort analysis (LCA) and the mean weight and selection pattern from the commercial fishery could be used to calculate appropriate landings. The approach has been further developed and evaluated by ICES workshops in 2007, 2009 and 2010 (ICES 2007, ICES 2009, 2010). The 2009 workshop addressed concerns raised regarding factors which could potentially bias the UWTV survey results. Major sources of bias were quantified for each survey and an overall bias correction factor derived which, when applied to the estimates of abundance from the UWTV survey allows them to be treated as absolute abundance levels.

In particular the workshop concluded that the UWTV surveys detect the burrows of *Nephrops* considerably smaller than the sizes of those taken by the fishery. Therefore the abundance estimates used to calculate the Harvest Ratios presented in the advice since 2009 include a component of the stock that is too small to be exploited by the fishery. This has resulted in calculated Harvest Ratios appearing to have decreased in the current advice compared to previous estimates of Harvest Ratios. In essence, this is a scaling issue, not a change in exploitation rate. The previous proportion corresponding to fishing at $F_{0.1}$ were in the range of 15–20% whereas the revised values from the benchmark in 2009 are in the range of 8–10%.

The advice in 2012 applying to 2013 for the major *Nephrops* stocks (FUs) in the North Sea and IIIa is now based on the harvest rate approach initially advocated by STECF. STECF also encourages establishing and developing UWTV surveys for other *Nephrops* functional units.

Because there is a proportion of the stock that is observed by TV surveys that is not available to the gears that catch *Nephrops*, HRs are based on the catch/fishable stock size ratio. STECF agrees with ICES that it is appropriate to estimate HRs on the catch/fishable size ratio. However, using such an approach implies historical HR estimates for each FU that are greater than were previously estimated (when compared to $F_{0.1}$, for example), since previous estimates were based on the catch/total stock size ratio.

MSY approach

There are no precautionary reference points defined for *Nephrops*. Under the new ICES MSY framework, exploitation rates which are likely to generate high long-term yield (and low probability of stock overfishing) have been explored and proposed for each functional unit. Owing to the way *Nephrops* are assessed, it is not possible to estimate F_{msy} directly and hence proxies for F_{msy} are determined. Three candidates for F_{msy} are $F_{0.1}$, $F_{35\%SpR}$ and F_{max} . There may be strong differences in relative exploitation rates between the sexes in many stocks. To account for this, values for each of the candidates have been determined for males, females and the two sexes combined. The appropriate F_{msy} candidate has been selected for each Functional Unit independently according to the perception of stock resilience, factors affecting recruitment, population density, knowledge of biological parameters and the nature of the fishery (relative exploitation of the sexes and historical Harvest Rate vs. stock status).

A decision making framework based on the table below was used in the selection of preliminary stock specific F_{msy} proxies. These may be modified following further data exploration and analysis. The combined sex F_{msy} proxy should be considered appropriate provided that the resulting percentage of virgin spawner per-recruit for males or females does not fall below 20%. In such a case a more conservative sex specific F_{MSY} proxy should be picked over the combined proxy.

		Burrow Density (average numbers/m2)		
		Low	Medium	High
		<0.3	0.3-0.8	>0.8
Observed harvest rate or landings compared to stock status	> F _{max}	F _{35%SpR}	F _{max}	F _{max}
	F _{max} - F _{0.1}	F _{0.1}	F _{35%SpR}	F _{max}
	< F _{0.1}	F _{0.1}	F _{0.1}	F _{35%SpR}
	Unknown	F _{0.1}	F _{35%SpR}	F _{35%SpR}
Stock Size Estimates	Variable	F _{0.1}	F _{0.1}	F _{35%}
	Stable	F _{0.1}	F _{35%SpR}	F _{max}
Knowledge of biological parameters	Poor	F _{0.1}	F _{0.1}	F _{35%SpR}
	Good	F _{35%SpR}	F _{35%SpR}	F _{max}
History Fishery	Stable spatially and temporally	F _{35%SpR}	F _{35%SpR}	F _{max}
	Sporadic	F _{0.1}	F _{0.1}	F _{35%SpR}
	Developing	F _{0.1}	F _{35%SpR}	F _{35%SpR}

Preliminary MSY B triggers were proposed at the lowest observed UWTV abundance.

STECF notes that the estimated HRs for *Nephrops* FUs imply that in some cases, the most recent harvest rate is significantly higher than F_{msy} (or even F_{max}) and that to set catch limits for 2011 in line with F_{msy} would imply reductions in harvest rate and similar large reductions in fishing opportunities and revenue to the fleets that exploit *Nephrops*. STECF does not have the appropriate data and information to quantify the potential economic effects of such reductions. In addition, given that for most *Nephrops* FUs for which UWTV survey estimates are available, there does not seem to be any immediate biological risk to the stocks even at recently observed harvest rates, incremental reductions in fishing mortality towards the F_{msy} target would seem appropriate. STECF therefore suggests that fishing opportunities for each FU be set in line with successive annual adjustments in fishing mortality (HR) until F_{msy} is realised.

For most of the Sub Area IV FUs without UWTV surveys, assessment is made on the basis of a new approach developed in 2012, drawing on aspects of the TV survey methodology in order to provide a quantitative estimate of fishing opportunity likely to be compliant with MSY considerations. This approach is based on habitat extent and population characteristics. The physical area of each FU has been determined either through knowledge of the sediment type, or from the fishery itself (e.g. VMS positions). Estimates of total abundance are calculated by taking the physical area and multiplying by potential values of *Nephrops* density which are drawn either from neighbouring FUs with existing TV surveys or from preliminary TV surveys of the specific FU. The numbers removed corresponding to the average (10 years) and maximum observed landings were estimated using mean weights and appropriate discard rates. Finally, the harvest rates for these removal numbers were calculated for each of the possible density values and these are laid down in a table and example of which is provided:

Basis: Surface area FU 5: 1850 km², Mean weight: 25.6 grams, Discards: 25% in number

		Range of potential density (<i>Nephrops</i> per m ²)								
Basis	landings	0.05	0.1	0.2	0.3	0.4	0.5	0.6	0.7*	0.8
0.5 * Average landings	500	26.4%	13.2%	6.6%	4.4%	3.3%	2.6%	2.2%	1.9%	1.6%

Average landings (last 10 yrs)	1000	52.8%	26.4%	13.2%	8.8%	6.6%	5.3%	4.4%	3.8%	3.3%
Maximum historic landings	1400	73.9%	37.0%	18.5%	12.3%	9.2%	7.4%	6.2%	5.3%	4.6%

Shaded areas indicate Harvest Rates > range of North Sea F_{MSY} proxies of 8 % - 16%

* Most recent density estimate (preliminary TV survey results)

In order to give advice, average landings of the last 10 years are considered together with the relevant densities in the area (gathered through preliminary surveys or assumed based on neighbouring FUs). The resulting harvest rate is compared to Harvest rates commensurate with F_{MSY} for North Sea Nephrops stocks, which are in the region 8% (FU6) to 16.3% (FU 8), at average 12.3%. Based on this table and these reference points, if in any FU average landings result in a harvest rate below the minimum F_{MSY} harvest rate calculated for the North Sea, this is considered a precautionary state and advice is given on the basis of landings at the average of the last 10 years. Where the harvest rate resulting from the average landings are higher or concerns over state state exist for other reasons, additional precautionary reductions are considered.

ICES points out that this is approach is likely to develop further in future years as new information becomes available.

This approach applies to FU 5, FU10, FU 32, FU 33 and FU34. Advice sheets have been provided by ICES for these FUs and are updated with the new methodology providing individual FU catch advice for the first time.

***Nephrops* Functional Units in III a and the North Sea**

Norway lobster (*Nephrops*) in the North sea (IV) and Skagerrak-Kattegat (IIIa) is assessed in a number of different stock functional units (FU) treated as separate stocks, see below. However, for management purposes the North Sea is partitioned into 2 units only: The EU EEZ and Norwegian EEZ, each of which is treated as a single unit.

FU 3&4 Skagerrak and Kattegat EU EEZ & Norwegian EEZ

FU 5 Botney Gut EU EEZ

FU 6 Farn Deep “

FU 7 Fladen ground “

FU 8 Firth of Forth “

FU 9: Moray Firth EU EEZ

FU 10: Noup “

FU 32 Norwegian Deep Norwegian EEZ

FU 33 Horn’s Reef EU EEZ

FU 34 Devil’s Hole EU EEZ

The *Nephrops* in FU 3 & 4 as well as *Nephrops* in FU 32 (Norwegian EEZ) are managed as separate units, but otherwise the situation is complicated in the EU EEZ in the North Sea, where the specific biological advice for the different FUs is not applied because management operates for the (single) EU EEZ of the North Sea. A consequence of this approach is that in the EU EEZ catches can be taken anywhere, and this could imply inappropriate harvest rates (HRs) from some parts. More important, vessels are free to move between grounds, which allow effort to develop on some grounds in a largely uncontrolled way. Management at the FU level could provide the controls to ensure that catch opportunities and effort are compatible and in line with the scale of the resources in each of the stocks defined by the Functional Units. Note that advice for 2013 based on 2012 assessments is provided for all FUs (including those covered by TV surveys and those by the new data limited approach

It is important to note that overall landings from Subarea IV (around 20000 in 2011 – a decrease of around 6000 tonnes since 2010) include small amounts from ICES rectangles which are not included in the main FUs for which individual advice sheets are provided. Average landings for rectangles outside Functional Units since 2010 when the Devil’s Hole was split off have been around 820 tonnes, STECF agrees with ICES that this could form the basis of a 2013 landing for these areas.

STECF notes that in the North Sea (which comprises nine *Nephrops* Functional Units (FUs), eight of which are in the EU EEZ) the present aggregated management approach (overall TAC for all FUs) runs the risk of unbalanced effort distribution. Adoption of management initiatives to ensure that effort can be appropriately controlled in smaller areas within the overall TAC area is recommended. If management continues to operate an overall TAC for the area, this can be obtained from the sum of the advice for the individual FUs in the EU EEZ, 16500 tonnes, plus an allowance for the other rectangles (820 tonnes). The advice for the Norwegian EEZ amounts to 800 tonnes.

It should be noted, however, that despite the provision of a North Sea total, STECF still **recommends** that *Nephrops* FUs should be managed separately.

2.1.1. Norway lobster (*Nephrops norvegicus*) in Skagerrak & Kattegat (IIIa).

FISHERIES: Historically, two Functional Units in this Management Area: a) Skagerrak (FU 3) and b) Kattegat (FU 4) have been distinguished. However, the distribution of *Nephrops* is continuous from southern Kattegat into Skagerrak, and the exchange of recruits between the southern and northern areas is very likely. ICES therefore recommends that these two FUs are treated as one single FU. The majority of landings are made by Denmark and Sweden, with Norway contributing only small landings from the Skagerrak. In more recent years minor landings have been taken by Germany. During the last 15 years, landings from IIIa varied between 3,000 t and 5,000 t. Peak landings of 5123 were recorded in 2010. In 2011 landings declined by more than 1000 t to 3986 t.

SOURCE OF MANAGEMENT ADVICE: The main management advisory body is ICES. The assessment in 2011 is based on combined Danish and Swedish UWTV survey data for 2011.

REFERENCE POINTS:

	<i>Type</i>	<i>Value</i>	<i>Technical basis</i>
MSY	MSY B_{trigger}	Undefined.	
Approach	$F_{\text{MSY}} = F_{\text{max}}$	Harvest ratio 7.9%.	Equivalent to F_{max} Combined sex.
Precautionary Approach	Not defined.		

Harvest ratios as proxy for F_{MSY} for Division IIIa from length cohort analysis 2011 (2008–2010):

	Male	Female	Combined
F_{max}	6.8 %	10.0 %	7.9 %
$F_{0.1}$	4.9 %	7.6 %	5.6 %
$F_{35\%SPR}$	8.1 %	12.9 %	10.5 %

STOCK STATUS:

F (Fishing Mortality)		
2009	2010	2011

MSY (F_{MSY})	?	✓	✓	Appropriate
Precautionary approach (F_{pa}, F_{lim})	?	?	?	Undefined

SSB (Spawning-Stock Biomass)				
	2010	2011	2012	
MSY ($B_{trigger}$)	?	?	?	Undefined
Precautionary approach (B_{pa}, B_{lim})	?	?	?	Undefined

Absolute estimates of abundance were available in 2010 and 2011 from an underwater TV (UWTV) survey. The estimated harvest ratios of 6.4% (2010) and 5.0% (2011) from these UWTV surveys together with the fishery indices (effort and l_{pue}) suggest that the stock is exploited sustainably.

RECENT MANAGEMENT ADVICE:

ICES advises on the basis of the MSY approach that landings in 2013 should be no more than 5200 t.

STECF COMMENTS: STECF agrees with the ICES assessment of the state of the stock and the advice for 2013.

STECF notes that the landings corresponding to ICES advice for 2013 imply a 58% increase on the status quo harvest ratio (and 58% more in landings) from this subdivision.

With regards to the introduction of a discard ban in the Skagerrak STECF notes that a discard ban on *Nephrops* will first enter into force in 2015.

2.1.2. Norway lobster (*Nephrops norvegicus*) in Botney Gut (FU 5).

FISHERIES: Landings from Botney Gut were 1053 t in 2011, a 10% increase from 2010 landings. Up to 1995, the Belgian fleet used to take over 75% of the international landings from this stock, but since then, its share has dropped to less than 6%. Long-term effort of the Belgian *Nephrops* fleet has shown an almost continuous decrease since the all-time high in the early 1990s. In 2011 around 80% of the total international landings were taken by Dutch and UK trawlers. STECF notices that there has been a considerable increase in UK landings from this FU in the same period as the landings from Farn Deep (FU6) has decreased.

SOURCE OF MANAGEMENT ADVICE: The main management advisory body is ICES. Biennial advice (for 2013 and 2014) for this FU was provided in 2012. Information on this FU is considered inadequate to provide advice based on precautionary limits. The perception of the stock is based on development in LPUEs. In the absence of a full analytical assessment, ICES bases its advice for *Nephrops* on average landings, unless this is considered to be not precautionary.

REFERENCE POINTS:

	Type	Value	Technical basis
MSY	MSY $B_{trigger}$		No reference points are defined

Approach	F_{msy}		No reference points are defined
Precautionary Approach	Not defined		

STOCK STATUS:

F (Fishing Mortality)		
2009–2011		
Qualitative evaluation	?	Unknown

SSB (Spawning-Stock Biomass)		
2009–2011		
Qualitative evaluation	?	Unknown

The state of this stock is unknown. LPUE indicators show no trends for different fleets in recent years.

RECENT MANAGEMENT ADVICE: Based on the ICES approach for data-limited stocks, ICES advises that landings should be no more than 1000 tonnes. The 2012 advice for this *Nephrops* stock is biennial and valid for 2013 and 2014.

To protect the stock in this functional unit, management should be implemented at the functional unit level.

Other considerations

ICES approach to data-limited stocks

For this stock, average landings of 1000 t in the last ten years correspond to a potential harvest rate of 3.8%, based on the most recent density estimate (preliminary TV survey results) of 0.7 *Nephrops* per m². This is considered below the range of MSY harvest rates in the North Sea (between 8%–16%) and is therefore considered precautionary.

STECF COMMENTS: STECF agrees with the ICES assessment of the state of the stock and the advice for 2013 and 2014.

STECF considers that management of fishing mortality on *Nephrops* stocks would best be achieved if measures, including catch restrictions, were implemented at the level of the functional unit.

2.1.3. Norway lobster (*Nephrops norvegicus*) in the Farn Deep (FU 6)

FISHERIES: Total landings from the Farn deep decreased from 2703 t in 2009 to 1443 t in 2010, but increased again in 2011 to 2070 t. The UK fleet has accounted for virtually all landings from the Farn Deeps. Estimated discarding during this period has fluctuated around 25% by weight of the catch in the Farn Deeps.

SOURCE OF MANAGEMENT ADVICE: The main management advisory body is ICES. The assessment is based UWTV surveys of absolute abundance. The method used to raise the abundances in previous years has been found to be statistically flawed and a new raising procedure has been developed to avoid these errors. Revisions to the UWTV survey calculations for 2007–2010 (in 2012) have resulted in changes to the bias-corrected abundance indices, particularly in 2010.

REFERENCE POINTS:

Type	Value	Technical basis
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MSY	MSY B _{trigger}	890 million	Bias-corrected UWTV survey index at start of current decline (2007) as measured by a geostatistical method.
Approach	F _{MSY}	Harvest rate 8%.	Equivalent to F _{35%SPR} males in 2011.
Precautionary	F _{0.1}	Not agreed.	
Approach	F _{max}	Not agreed.	

Harvest rate reference points, 2011

	Male	Female	Combined
F _{max}	9.5 %	20.0 %	12.1 %
F _{0.1}	6.4 %	12.7 %	7.2 %
F _{35%SPR}	8 %	18.7 %	11.5 %

STOCK STATUS:

F (Fishing Mortality)			
	2008	2009	2010
MSY (F _{MSY})	✘	✘	✘ Above
Precautionary approach (F _{pa} , F _{lim})	?	?	? Undefined

SSB (Spawning-Stock Biomass)			
	2008	2009	2010
MSY (B _{trigger})	✘	✘	✘ Below trigger
Precautionary approach (B _{pa} , B _{lim})	?	?	? Undefined

The UWTV survey indicates that the stock status has declined since 2005 and has been rebuilding to just below MSY_{Btrigger} since 2009. Changes in survey methodology in 2007 make exact comparisons with the preceding series difficult, but the general trend is considered reliable.

RECENT MANAGEMENT ADVICE: ICES advises on the basis of the MSY transition that landings in 2013 should be no more than 1400 t.

To protect the stock in this functional unit (FU), management should be implemented at the functional unit level.

Other considerations

MSY approach

Following the ICES MSY framework implies a harvest rate of 8%, resulting in landings of 1300 t in 2013.

Following the transition scheme towards the ICES MSY framework implies fishing mortality to be reduced to $(0.4 \cdot F_{2010} + 0.6 \cdot F_{MSY}) = 8.8\%$ (biomass is just below MSY Btrigger, so no additional reductions are considered relevant), corresponding to landings of no more than 1400 t in 2013.

STECF COMMENTS: STECF agrees with the ICES assessment of the state of the stock and the advice for 2013.

STECF considers that management of fishing mortality on Nephrops stocks would best be achieved if measures, including catch restrictions, were implemented at the level of the functional unit.

STECF notes that the landings corresponding to ICES advice for 2013 imply a 35% decrease on the status quo harvest ratio (39% less in landings) from this functional unit.

2.1.4. Norway lobster (*Nephrops norvegicus*) in Fladen Ground (FU 7) (Division IVa)

FISHERIES: There is only one Functional Unit in this area: FU 7 (Fladen Ground). Small quantities of landings are taken outside the main Fladen Ground Functional Unit. The fleet fishing the Fladen Ground for *Nephrops* comprises approximately 100 trawlers, which are predominantly Scottish (> 97%), based along the Scottish NE coast. Nearly three quarters of the landings are made by single-rig vessels and one-quarter by twin-rig vessels. 80mm mesh is the commonest mesh size. Nearly 40% of the *Nephrops* landings at Fladen are reported as by-catch, in fisheries which may be described as mixed. In 2011 total landings decreased to 7558 t, a more than 40% decrease from 2010 landings of 12825 t. U.K (Scotland) accounted for 99 %, the remaining part being Danish. Discarding rates seem to have decreased in recent years to around 5% by number. In 2011 there are no *Nephrops* discarded in this FU.

SOURCE OF MANAGEMENT ADVICE: The main management advisory body is ICES. The assessment is based UWTV surveys of absolute abundance. The FMSY proxy harvest rate values were updated by the 2011 WG from the per-recruit analysis based on input parameters from a combined-sex length cohort analysis of 2008–2010 catch-at-length data. Previous analysis used 2005, 2006, and preliminary 2007 data which showed substantially greater discard rates than have recently been observed.

REFERENCE POINTS:

	<i>Type</i>	<i>Value</i>	<i>Technical basis</i>
MSY	MSY B _{trigger}	2767 million individuals	Bias-adjusted lowest observed UWTV survey estimate of abundance
Approach	F _{msy}	Harvest ratio 10.3%	Equivalent to F _{0.1} combined sex in 2011. F _{msy} proxy based on length-based Y/R
Precautionary Approach	Not defined		

Harvest rate reference points, 2011

	Male	Female	Combined
F _{max}	16.2 %	24.1 %	18.5 %
F _{0.1}	9.5 %	12.1 %	10.3 %
F _{35%}	11.4 %	14.4 %	12.4 %

STOCK STATUS:

F (Fishing Mortality)			
	2009	2010	2011
MSY (F_{MSY})	✓	✓	✓ Below target
Precautionary approach (F_{pa}, F_{lim})	?	?	? Undefined

SSB (Spawning-Stock Biomass)			
	2009	2010	2011
MSY ($B_{trigger}$)	✓	✓	✓ Above trigger
Precautionary approach (B_{pa}, B_{lim})	?	?	? Undefined

The stock has declined in the last three years but remains just above MSY $B_{trigger}$. The harvest rate has fluctuated around 8% in recent years, which is below FMSY.

RECENT MANAGEMENT ADVICE:

ICES advises on the basis of the MSY approach that landings in 2013 should be no more than 10 000 t.

To protect the stock in this functional unit (FU), management should be implemented at the functional unit level.

Other considerations

MSY approach

Following the ICES MSY framework implies a harvest rate lower than 10.3%, corresponding to landings of less than 10 000 t in 2013.

STECF COMMENTS: STECF agrees with the ICES assessment of the state of the stock and the advice for 2013.

STECF notes that the landings corresponding to ICES advice for 2013 imply a 21% increase on the status quo harvest ratio (and 20% more in landings) from this functional unit.

2.1.5. Norway lobster (*Nephrops norvegicus*) in Firth of Forth (FU 8)

FISHERIES: Landings from the Firth of Forth fishery are predominantly reported from Scotland, with very small contributions from England. The area is periodically visited by vessels from other parts of the UK. Estimated discarding rates are 43% by number (24% by weight) in the Firth of Forth. Similar to levels recorded since the beginning of the data series in 1985. During the years 2007-09 annual landings were around 2500 t, but declined to 1871 t in 2010 and 1888 t in 2011.

SOURCE OF MANAGEMENT ADVICE: The main management advisory body is ICES. The assessment is based UWTV surveys of absolute abundance. The FMSY proxy harvest rate values were updated in 2011 on the basis of per-recruit analysis, based on input parameters from a combined-sex length cohort analysis of 2008–2010 catch-at-length data. Previous analysis used 2005, 2006, and preliminary 2007 data, which showed greater discard rates than those observed recently.

REFERENCE POINTS:

Type	Value	Technical basis

MSY Approach	MSY $B_{trigger}$	292 million individuals.	Bias-adjusted lowest observed UWTV survey estimate of abundance.
	F_{MSY}	Harvest rate 16.3%.	Equivalent to F_{max} combined sex in 2011. F_{msy} proxy based on length-based Y/R
Precautionary Approach	Not defined.		

Harvest rate reference points, 2011

	Male	Female	Combined
F_{max}	12.7 %	26.7 %	16.3 %
$F_{0.1}$	7.7 %	15.2 %	9.4 %
$F_{35\%}$	9.4 %	18.3 %	12.7 %

STOCK STATUS:

F (Fishing Mortality)			
	2009	2010	2011
MSY (F_{MSY})	✘	✘	✘ Above target
Precautionary approach (F_{pa}, F_{lim})	?	?	? Undefined

SSB (Spawning-Stock Biomass)			
	2009	2010	2011
MSY ($B_{trigger}$)	✔	✔	✔ Above trigger
Precautionary approach (B_{pa}, B_{lim})	?	?	? Undefined

The stock remains above MSY $B_{trigger}$ but has declined over the last three years. The harvest rate remains above F_{MSY} .

RECENT MANAGEMENT ADVICE:

ICES advises on the basis of the transition to the MSY approach that landings in 2013 should be no more than 1400 t.

To protect the stock in this functional unit (FU), management should be implemented at the functional unit level.

Other considerations

MSY approach

To follow the ICES MSY framework the harvest rate should be reduced to 16.3%, corresponding to maximum landings of 1300 t in 2013.

To follow the transition scheme towards the ICES MSY framework the harvest rate should be reduced to 17.1% ($0.4 * F_{2010} + 0.6 * F_{MSY}$), corresponding to landings of no more than 1400 t in 2013 (where F2010 is the observed harvest rate in 2010 (18.4%)).

STECF COMMENTS: STECF agrees with the ICES assessment of the state of the stock and the advice for 2013.

STECF considers that management of fishing mortality on Nephrops stocks would best be achieved if measures, including catch restrictions, were implemented at the level of the functional unit.

STECF notes that the landings corresponding to ICES advice for 2013 imply a 23% decrease on the status quo harvest ratio (and 26% less in landings) from this functional unit.

2.1.6. Norway lobster (*Nephrops norvegicus*) in Moray Firth (FU 9)

FISHERIES: Landings from this fishery are predominantly reported from Scotland, with very small contributions from England in the mid-1990s, but not recently. About three quarters of the landings are made by single-rig trawlers, a high proportion of which use a 70-mm mesh. In 1999, twin-rig vessels predominantly used a 100 mm mesh, with 90% of the twin-rig landings made using this mesh size. Legislative changes in 2000 permitted the use of an 80 mm mesh. Total estimated landings in 2011 were 1391 t, an increase of 35% compared to 2010 landings.

Although discarding rates in numbers have decreased in 2011 by 30% compared to 2010 but is still about averaged over the whole available period (2003 to 2011).

SOURCE OF MANAGEMENT ADVICE: The main management advisory body is ICES. The assessment is based UWTV surveys of absolute abundance.. The FMSY proxy harvest rate values were updated in 2011 on the basis of per-recruit analysis, based on input parameters from a combined-sex length cohort analysis of 2008–2010 catch-at-length data. Previous analysis used 2005, 2006, and preliminary 2007 data.

REFERENCE POINTS:

	<i>Type</i>	<i>Value</i>	<i>Technical basis</i>
MSY	MSY B _{trigger}	262 million individuals.	Bias-adjusted lowest observed UWTV survey estimate of abundance (1997).
Approach	F _{MSY}	Harvest rate 11.8%.	Proxy, equivalent to F _{35%SPR} combined sex in 2011.
Precautionary Approach	Not defined.		

Harvest rate reference points, 2011

	Male	Female	Combined
F _{max}	12.3 %	23.8 %	14.9 %
F _{0.1}	7.2 %	11.6 %	7.8 %
F _{35%}	9.1 %	17.1 %	11.8 %

STOCK STATUS:

F (Fishing Mortality)		
2009	2010	2011

MSY (F_{MSY})	✓	✓	✗	Above target
Precautionary approach (F_{pa}, F_{lim})	?	?	?	Undefined

SSB (Spawning-Stock Biomass)				
	2009	2010	2011	
MSY ($B_{trigger}$)	✓	✓	✓	Above trigger
Precautionary approach (B_{pa}, B_{lim})	?	?	?	Undefined

The stock is declining but remains above MSY $B_{trigger}$. The harvest rate was just below F_{MSY} in 2010, but increased in 2011

RECENT MANAGEMENT ADVICE:

ICES advises on the basis of the MSY approach that landings in 2013 should be no more than 950 t.

To protect the stock in this functional unit (FU), management should be implemented at the functional unit level.

Other considerations

MSY approach

Following the ICES MSY framework implies the harvest rate should be less than 11.8%, resulting in landings of less than 950 t in 2013.

STECF COMMENTS: STECF agrees with the ICES assessment of the state of the stock and the advice for 2013.

STECF considers that management of fishing mortality on Nephrops stocks would best be achieved if measures, including catch restrictions, were implemented at the level of the functional unit.

STECF notes that the landings corresponding to ICES advice for 2013 imply a 15% decrease on the status quo harvest ratio (and 21% less in landings) from this functional unit.

2.1.7. Norway lobster (*Nephrops norvegicus*) in the Noup (FU 10)

FISHERIES: Landings from this fishery are predominantly reported from Scotland. Total landings declined from 173 t in 2008 to a low of 38 t in 2010, but increased to 70 t in 2011.

SOURCE OF MANAGEMENT ADVICE: The main management advisory body is ICES. The advice is based on a calculation of potential landing options and harvest rates, given the known surface area of Nephrops habitat and assumed densities of the functional unit. The methods applied to derive quantitative advice for data-limited stocks are expected to evolve as they are further developed and validated.

REFERENCE POINTS:

	Type	Value	Technical basis
MSY	MSY $B_{trigger}$		No reference points are defined
Approach	F_{msy}		No reference points are defined

Precautionary Approach	Not defined		
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STOCK STATUS:

F (Fishing Mortality)		
2008 - 2010		
Qualitative evaluation	?	Insufficient information

SSB (Spawning-Stock Biomass)		
2008 - 2010		
Qualitative evaluation	?	Insufficient information

The state of the stock is unknown.

RECENT MANAGEMENT ADVICE:

Based on the ICES approach for data-limited stocks, ICES advises that catches should be no more than 50 tonnes. This is the first year that ICES is providing quantitative advice for data-limited stocks

To protect the stock in this functional unit (FU), management should be implemented at the functional unit level.

Other considerations

ICES approach to data-limited stocks

For this stock, average landings of 150 t for the last ten years correspond to a potential harvest rate of 9.2%, based on the 2007 density estimate of 0.2 Nephrops per m². This is considered within the range of MSY harvest rates in the North Sea (between 8% and 16%). Furthermore, as the density estimate is five years old and landings per unit effort have declined significantly since 2007, there is concern that the burrow density has declined since 2007 and the harvest rate may consequently be higher. For this reason it is not recommended to use the average landings of the last ten years as the basis for advice.

For this stock, ICES advises that catches should decrease by 20% in relation to average catches of the last three years, corresponding to catches of no more than 50 t.

STECF COMMENTS: STECF agrees with ICES, that the state of the stock is unknown and the advice for 2013 and 2014.

STECF considers that management of fishing mortality on Nephrops stocks would best be achieved if measures, including catch restrictions, were implemented at the level of the functional unit.

STECF also notes the value of 50 t advised by ICES is based on the average reported landings over the years 2009-2011. STECF therefore advises that it seems more appropriate to express the advice for 2013 in terms of landings instead of catches. STECF therefore advises that based on the ICES approach for data limited stocks, landings of Nephrops in the Noup (FU 10) should be no more than 50 t in 2013 and 2014.

**2.1.8. Norway lobster (*Nephrops norvegicus*) in the Norwegian Deep, FU 32
(Division IVa, East of 2° E + rectangles 43 F5-F7).**




FISHERIES: Landings from this area have declined steadily since 2005. In 2005 landings were 1089 t, in 2011 landings were only 395 t. The majority of the landings from this FU are taken by Denmark (> 80%) and Norway. Peak landings of around 1200 t were recorded in 2002. The decline in landings is due to substantial decreases in Danish effort for *Nephrops* in the Norwegian Deep.




SOURCE OF MANAGEMENT ADVICE: The main management advisory body is ICES. The perception of the stock status is based on Danish LPUE data.

REFERENCE POINTS:

	<i>Type</i>	<i>Value</i>	<i>Technical basis</i>
MSY	MSY B_{trigger}	-	No reference points are defined
Approach	F_{msy}	-	No reference points are defined
Precautionary Approach	Not defined		

STOCK STATUS:

F (Fishing Mortality)		
	2009–2011	
MSY (F_{MSY})		Unknown
Precautionary approach ($F_{\text{pa}}, F_{\text{lim}}$)		Unknown
Qualitative evaluation		below poss refpoints

SSB (Spawning-Stock Biomass)		
	2009–2011	
MSY (B_{trigger})		Unknown
Precautionary approach ($B_{\text{pa}}, B_{\text{lim}}$)		Unknown
Qualitative evaluation		stable

Landings per unit effort (lpue) have been relatively stable over the last 18 years and suggest that current and past levels of exploitation are sustainable. Harvest rates are considered low for this stock.

RECENT MANAGEMENT ADVICE:

Based on the ICES approach for data-limited stocks, ICES advises that landings should be no more than 800 t for both 2013 and 2014. . This is the first year ICES is providing quantitative advice for data-limited stocks.

For the stock in this functional unit (FU), management is implemented at the functional unit level.

Other considerations

ICES approach to data-limited stocks

For this stock, the last ten years' average landings of 800 t correspond to a potential harvest rate of 0.1%, based on the minimum density estimate (from Fladen grounds) of 0.2 Nephrops per m². This is considered below the range of MSY harvest rates in the North Sea (between 8% and 16%) and is therefore considered precautionary.

STECF COMMENTS: STECF agrees with the ICES advice for 2013 and 2014.

STECF considers that management of fishing mortality on Nephrops stocks would best be achieved if measures, including catch restrictions, were implemented at the level of the functional unit.

2.1.9. Norway lobster (*Nephrops norvegicus*) in Horns Reef (FU 33)

FISHERIES: For several years Denmark was the only country exploiting *Nephrops* in this FU, and accounted for more than 90% of total landings up to 2005. However in recent years Germany and Netherlands have expanded their share of this stock. In 2007 total landings amounted to 1,467 t, and were the highest recorded. In 2010 landings declined to a total of 806 t but increased again in 2011 to 1191 t.

SOURCE OF MANAGEMENT ADVICE: The main management advisory body is ICES. The perception of the stock is based on LPUE and length distribution in the catches.

REFERENCE POINTS:

	<i>Type</i>	<i>Value</i>	<i>Technical basis</i>
MSY	MSY B _{trigger}	-	No reference points are defined
Approach	F _{msy}	-	No reference points are defined
Precautionary Approach	Not defined		

STOCK STATUS:

F (Fishing Mortality)		
	2009–2011	
MSY (F _{MSY})	?	Unknown
Precautionary approach (F _{pa} , F _{lim})	?	Unknown

SSB (Spawning-Stock Biomass)		
	2009–2011	
MSY (B _{trigger})	?	Unknown
Precautionary approach (B _{pa} , B _{lim})	?	Unknown
Qualitative evaluation	↗	Increasing

The state of this stock is unknown. There is an increase in abundance over the whole period, although part of the increase may be due to an increase in gear efficiency (technological creep) in the last years.

RECENT MANAGEMENT ADVICE:

Based on the ICES approach for data-limited stocks, ICES advises that landings should be no more than 1100 tonnes. This is the first year ICES is providing quantitative advice for data-limited stocks (see Quality considerations).

For the stock in this functional unit (FU), management is implemented at the functional unit level.

Other considerations

ICES approach to data-limited stocks

For this stock, the last ten years’ average landings of 1100 t correspond to a potential harvest rate of 3.0%. In the absence of information from the ICES area itself, this is based on an assumed low density of 0.2 Nephrops per m², corresponding to the lowest observed density in the North Sea (Fladen ground). This is considered below the range of MSY harvest rates in the North Sea (between 8% and 16%) and is therefore considered precautionary.

STECF COMMENTS: STECF agrees with the ICES assessment of the state of the stock and the advice for 2013 and 2014.

STECF considers that management of fishing mortality on Nephrops stocks would best be achieved if measures, including catch restrictions, were implemented at the level of the functional unit.

2.1.10. Norway lobster (*Nephrops norvegicus*) Devil’s Hole (FU 34)

FISHERIES: Peak landings of 1305 t from this functional unit were recorded in 2009. Since then they have declined substantially. In 2011 total landings amounted to 433 t. UK (Scotland accounts for nearly all landings).

SOURCE OF MANAGEMENT ADVICE: The main management advisory body is ICES. The perception of the stock is based on LPUE and length distribution in the catches.

REFERENCE POINTS:

	<i>Type</i>	<i>Value</i>	<i>Technical basis</i>
MSY	MSY B _{trigger}	-	No reference points are defined
Approach	F _{msy}	-	No reference points are defined
Precautionary Approach	Not defined		

STOCK STATUS:

F (Fishing Mortality)		
	2009–2011	
MSY (F_{MSY})	?	Unknown
Precautionary approach (F_{pa}, F_{lim})	?	Unknown
SSB (Spawning-Stock Biomass)		
	2009–2011	

MSY ($B_{trigger}$)	?	Unknown
Precautionary approach (B_{pa}, B_{lim})	?	Unknown
Qualitative evaluation	↗	Increasing

The state of the stock is unknown. Decreasing effort in combination with the recent decrease in landings per unit effort indicate the stock may be declining. The TV assessment series is too short and the ancillary data too limited to provide a full UWTV assessment for this area at the present time.

RECENT MANAGEMENT ADVICE:

This is the first year ICES gives advice for this functional unit separately. Based on the ICES approach for data-limited stocks, ICES advises that landings should be no more than 600 tonnes in 2013 and 2014. This is the first year ICES is providing quantitative advice for data-limited stocks

To protect the stock in this functional unit (FU), management should be implemented at the functional unit level.

Other considerations

ICES approach to data-limited stocks

For this stock, the last ten years' average landings of 600 t correspond to a potential harvest rate of 6.8%, based on the most recent density estimate (preliminary 2012 survey results) of 0.3 Nephrops per m². This is considered below the range of MSY harvest rates in the North Sea (between 8% and 16%) and is therefore considered precautionary.

STECF COMMENTS: STECF agrees with the ICES assessment of the state of the stock and the advice for 2013 and 2014.

STECF considers that management of fishing mortality on Nephrops stocks would best be achieved if measures, including catch restrictions, were implemented at the level of the functional unit.

2.2. Northern shrimp (*Pandalus borealis*) on Fladen Ground (Division IVa)

The most recent advice for this stock was provided by ICES in 2011. Hence, the following text remains unchanged from the Consolidated STECF Review of Advice for 2012. Advice for 2013 will be provided in Part 3 of the STECF review of Advice for 2013 which will be available in November 2012.

FISHERIES: In the EU zone of the North Sea, *Pandalus* on the Fladen Ground (Div. IVa) is the main shrimp stock exploited, which has been exploited. This stock has been exploited mainly by Danish and UK trawlers with the majority of landings taken by the Danish fleet. Historically, large fluctuations in this fishery have been frequent, for instance between 1990 and 2000 annual landings ranged between 500 t and 6000 t. However since 2000 a continuous declining trend is evident, and in 2004 and 2005 recorded landings dropped to below 25 t. No catches were recorded in 2006-2010. Information from the fishing industry in 2004 gives the explanation that this decline is caused by low shrimp abundance, low prices on small shrimp characteristic for the Fladen Ground and high fuel prices.

SOURCE OF MANAGEMENT ADVICE: The main management advisory body is ICES. No assessment of this stock has been made since 1992, due to insufficient assessment data.

REFERENCE POINTS: There is no basis for defining precautionary reference points for this stock.

STOCK STATUS:

F (Fishing Mortality)	
2008–2010	

Qualitative evaluation	?	Insufficient information
SSB (Spawning-Stock Biomass)		
2008–2010		
Qualitative evaluation	?	Insufficient information

The available information is inadequate to evaluate stock trends. The state of the stock is therefore unknown. The stock has not been exploited since 2005.

RECENT MANAGEMENT ADVICE: There is insufficient information to evaluate the status of the stock. Therefore, based on precautionary considerations, ICES advises that no increase of the catch should take place unless there is evidence that this will be sustainable.

Additional considerations

The available information is inadequate to evaluate stock trends. The state of the stock is therefore unknown and fishing possibilities cannot be projected.

PA considerations

There is insufficient information to evaluate the status of the stock. Therefore, based on precautionary considerations, ICES advises that no increase of the catch should take place unless there is evidence that this will be sustainable.

Other considerations

No fishery has existed from 2006 onwards. No new data are available on the stock.

If the landings of this fishery return to substantial levels, a data collection programme should be implemented.

FISHING OPPORTUNITIES FOR 2012 according to COM(2011) 298-Final.

STECF notes that with reference to COM(2011) 298-final this stock is classified under category 3.

STECF COMMENTS: STECF agrees with the ICES advice.

STECF also advises that, if fisheries on this stock is resumed, that effort should not be allowed to expand to levels above the average for the years prior to the present absence of fishing activities (1999-2003), corresponding to average landings of 1400.

2.3. Northern shrimp (*Pandalus borealis*) in Division IIIa and Division IVa East (Skagerrak and Norwegian Deeps)

The most recent advice for this stock was provided by ICES in 2011. Hence, the following text remains unchanged from the Consolidated STECF Review of Advice for 2012. Advice for 2013 will be provided in Part 3 of the STECF review of Advice for 2013 which will be available in November 2012.

FISHERIES: *Pandalus borealis* is fished by bottom trawls at 150–400 m depth throughout the year by Danish, Norwegian and Swedish fleets. Northern shrimps are mainly caught by 35–45 mm single- and twin-trawl nets (minimum legal mesh size is 35 mm). A larger number of vessels use sorting grids on a voluntary basis. The number of Danish trawlers has declined over the last 20 years, whereas the Norwegian fleet of <11 m vessels has expanded. No significant changes took place in the Swedish fishery during the last decade except for an increase in the use of twin trawls in the last two years. Because of this development (and the accompanying increase in the size of the trawls), the efficiency of the fisheries has increased.



Total landings have varied between 10,000 and 15,000 t in the period 1985- 2009. Discarding of small shrimp takes place, mainly due to high grading. In 2010 total landings were around 7,700 t, a 30% decrease compared to 2009 landings, while estimated catches (including discards) were around 8,300 t.

SOURCE OF MANAGEMENT ADVICE: The main management advisory body is ICES.

In recent years several assessment models, including both cohort based and stock production models, have been applied for this stock. A major problem has been (and still is) to obtain realistic data for the predation mortality on this stock, which is believed to have stronger influence on the stock fluctuations than the fishery. This year's advice is based on the Danish and Norwegian lpue data, and Norwegian survey biomass and recruitment indices (1 group abundance index) from 2006 onwards.

REFERENCE POINTS: No reference points have not been defined for this stock.

STOCK STATUS:

F (Fishing Mortality)		
	2008–2010	
Qualitative evaluation		Insufficient information
SSB (Spawning-Stock Biomass)		
	2008–2010	
Qualitative evaluation		Decrease

The state of the stock is unknown. Landing per unit effort (lpue) indices, which fluctuated without trend from the mid-1990s through the mid-2000s, have declined from 2008 onward. Survey biomass indices have also declined since 2007. Recruitment indices in 2008–2010 are lower than those in 2006 and 2007. The 2011 recruitment index, although higher than that in 2010, is low.

RECENT MANAGEMENT ADVICE: ICES advises based on precautionary considerations, that catches in 2012 should be reduced. Additionally, measures should be taken to address discarding.

Additional considerations

No analytical assessment can be presented for this stock. Therefore, fishing possibilities cannot be projected.

PA considerations

Given the recent declines in survey biomass indices and the very low recruitment indices, a reduction in landing is warranted.

The management of this stock should address the discarding of small shrimps, which occurs mainly in the Swedish fleet due to highgrading as a consequence of restrictive TACs. In 2010, estimated discards amounted to 8% of the total catch (weight). All vessels, including the increasing number of small Norwegian vessels (<11 m), should be required to complete and provide logbooks. Additionally, sorting grids should be mandatory in all areas to minimize bycatch.

Other considerations

Survey biomass indices declined 15% from 2010 to 2011. A reduction of at least 15% of the recent landings (2010) could therefore be appropriate. This corresponds to landings in 2012 of less than 6 500 t.

Highgrading, due to TAC constraints, occurs in several fleets.

FISHING OPPORTUNITIES FOR 2012 according to COM(2011) 298-Final.

STECF notes that with reference to COM(2011) 298-final this stock is classified under category 3.

STECF COMMENTS: STECF agrees with ICES that the state of the stock is uncertain and that survey indices indicate decline in both recruitment and stock biomass in recent years. STECF notes that there have been large

fluctuations since 1990s, both in recruitment and stock size. However, the continuous decline of both indices from 2007 to 2010 and a further decline in the biomass index in 2011, give reason for caution. In relation to precautionary considerations STECF therefore agrees with ICES that catches from this stock should be reduced. STECF notes that the survey biomass index shows a 15% decline between 2010 and 2011 and a similar reduction may be an appropriate basis for limiting catches in 2012. Such a reduction would imply that catches in 2012 should be no greater than 6 500 t.

STECF also agrees with ICES that the management of this stock should address the discarding of small shrimps, due to high-grading as a consequence of restrictive TACs. Furthermore, STECF endorses that sorting grids facilitating the escape of fish should be mandatory in this fishery as they are in all other *Pandalus borealis* fisheries in the North Atlantic.

2.4. Cod (*Gadus morhua*) in the Kattegat

FISHERIES: Cod in the Kattegat is exploited by Denmark, Sweden, and Germany. The fishery is conducted by both trawl and gillnets. Landings fluctuated between 4,000 and 22,000 t (1971-2001). Landings have decreased continuously since then. Reported landings were 145 t in 2011. Fishery-independent information indicates that removals from the stock are substantially higher than reported landings and that the mismatch between TAC/official landings and the total removals has increased in the most recent years.

SOURCE OF MANAGEMENT ADVICE: The main management advisory body is ICES. The assessment is considered indicative of trends only. The assessment is based on the recently developed stochastic state-space model (SAM) that provides statistically sound estimates of uncertainty in the model results. The model allows estimating potential additional removals from the stock, not represented by reported landings. The stock estimates for these years consequently rely more on survey information.

MANAGEMENT AGREEMENT: The EU has adopted a long-term plan for cod stocks and the fisheries exploiting those stocks (Council Regulation (EC) 1342/2008). This regulation repeals the recovery plans in Regulation (EC) No 423/2004, and has the objective of ensuring the sustainable exploitation of the cod stocks on the basis of maximum sustainable yield while maintaining a target fishing mortality of 0.4 on specified age groups.

REFERENCE POINTS:

	<i>Type</i>	<i>Value</i>	<i>Technical basis</i>
Management	SSB _{MP}	6400	B _{lim}
Plan	F _{MP}	0.4	Same as for other cod stocks
MSY	MSY B _{trigger}	Not defined	
Approach	F _{MSY}	Not defined	
Precautionary Approach	B _{lim}	6400 t	lowest observed SSB before the late 1990s.
	B _{pa}	10 500 t	B _{lim} *exp(1.645*0.3).
	F _{lim}	Not defined	
	F _{pa}	Not defined	

(unchanged since: 2011)

STOCK STATUS:

	F (Fishing Mortality)			
	2009	2010	2011	
MSY (F _{MSY})	?	?	?	Unknown
Precautionary approach (F _{pa} ,F _{lim})	?	?	?	Unknown
SSB (Spawning Stock Biomass)				

	2010	2011	2012
MSY ($B_{trigger}$)	?	?	? Undefined
Precautionary approach (B_{pa}, B_{lim})	✗	✗	✗ Reduced reproductive capacity
Management plan (SSB_{MP})	✗	✗	✗ Below limit

Spawning stock biomass has been at a historically lowest level since 2000. Recruitment in recent years has been among the lowest in the time series. Current level of fishing mortality is unknown due to a pronounced difference between the catch data (landings plus discards estimated from observer data) and the total removals from the stock estimated within the model based on survey data. The harvest rate based on available catch data shows a decline from 2000 to 2009, and a stable level in 2009-2011.

RECENT MANAGEMENT ADVICE:

ICES advises on the basis of precautionary considerations that there should be no directed fisheries and bycatch and discards should be minimised.

Other considerations

Due to uncertainty in the recent estimates, especially concerning fishing mortality, reliable predictions cannot be presented.

Management plan

According to the long-term management plan, the fishing mortality in 2013 shall be reduced by 25 % compared with the fishing mortality rate in 2011, unless the target 0.4 is reached. The current level of fishing mortality on cod in the Kattegat cannot be reliably estimated. According to Article 9 in the management plan, TAC and effort should be reduced by 25 % in cases when it is advised that the catches of cod should be reduced to the lowest possible level.

At present situation, where the cod landings are very low compared to the available estimates of discards and estimated unallocated removals from the stock, TAC is not effectively regulating total removals from the stock. The Articles 11 and 13 in the management, which allow Member States to avoid reductions in effort by introducing measures to avoid catching cod (closed areas, selective gears) have resulted in changes in fisheries. Evaluation of effectiveness of these measures for cod recovery and possible improvements is currently ongoing within EU STECF and bilaterally by Sweden and Denmark.

ICES evaluated this plan in 2009 and concluded it was in accordance with the precautionary approach if implemented and enforced adequately; however, this evaluation is not expected to be realistic in a situation of high unaccounted removals as estimated by the present assessment model.

Precautionary considerations

The stock size is considered to be far below B_{lim} , while the exploitation status is uncertain. Therefore, there should be no directed fisheries and bycatch and discards should be minimised.

STECF COMMENTS: STECF agrees with the ICES assessment of the state of the stock and the advice that there should be no directed fisheries and that bycatch and discards should be minimized. STECF advises that this advice should be interpreted to mean that in 2013, catches of cod from the Kattegat should be reduced to the lowest possible level.

STECF notes that, under article 12 of the management plan fishing effort should be adjusted by the same percentage as the TAC (25% reduction).

2.5. Cod (*Gadus morhua*), in the North Sea (IIa, IIIa Skagerrak, IV and VIId)

FISHERIES: North Sea cod are exploited by fleets from Belgium, Denmark, The Netherlands, Germany, France, Sweden, Norway, and UK. Small catches are also taken by fleets from Poland and the Faroe Islands. Cod are taken mainly by mixed fisheries using otter trawls, seine nets, gill nets, long-lines and beam trawl. The stock is managed by TAC through joint negotiation between the EU and Norway, technical and supporting

effort regulations in units of days at sea per vessel since 2003. Historically, landings peaked at about 350,000 t in the early 1970s, subsequently declining to around 200,000 t by 1988. From 1989 until 1998, landings remained between about 100 000 t and 140,000 t. Reported landings decreased sharply in 1999 to 96,000 t, and then declined steadily to 24,400 t in 2007. Reported landings for 2009, 2010 and 2011 were about 30 800t, 37 000t and 32 900t respectively. The assessment area for this stock includes ICES Divisions IIIa (Skagerrak), VIId and Sub-area IV, which are different management areas and for which separate TACs are set.

SOURCE OF MANAGEMENT ADVICE: The main management advisory body is ICES. The assessment used the age-based model (SAM) incorporating landings and discards, and calibrated with one survey index (from IBTS quarter 1). For ICES Subarea IV and Divisions VIId, discards were estimated from the Scottish discards sampling program up until 2005, raised to the total international fleet. The coverage of national discard data has subsequently improved.

REFERENCE POINTS:

	<i>Type</i>	<i>Value</i>	<i>Technical basis</i>
Management	SSB _{MP}	150 000 t	= B _{pa}
Plan	F _{MP}	0.4	Mortality rate when SSB > SSB _{MP} .
MSY	MSY B _{trigger}	150 000 t	The default option of B _{pa} .
Approach	F _{MSY}	0.19	F _{max} 2010, within the range of fishing mortalities consistent with F _{MSY} (0.16–0.42).
Precautionary approach	B _{lim}	70 000 t	Bloss (~1995).
	B _{pa}	150 000 t	B _{pa} = Previous MBAL and signs of impaired recruitment below 150 000 t.
	F _{lim}	0.86	F _{lim} = F _{loss} (~1995).
	F _{pa}	0.65	F _{pa} = Approx. 5th percentile of F _{loss} , implying an equilibrium biomass > B _{pa} .

MANAGEMENT AGREEMENT: In 2005 the EU and Norway revised their initial agreement from 1999 and agreed to implement a long-term management plan for the cod stock. This plan was again updated in December 2008 and entered into force on 1 January 2009. The plan aims to be consistent with the precautionary approach and is intended to provide for sustainable fisheries and high yield leading to a target fishing mortality to 0.4. The main changes between the 2008 and 2004 plans is a phasing (transitional and long-term phase) and the inclusion of an F reduction fraction. That is:

Transitional arrangement:

F will be reduced as follows: 75 % of F₂₀₀₈ for the TACs in 2009, 65 % of F₂₀₀₈ for the TACs in 2010, and applying successive decrements of 10 % for the following years.

The transitional phase ends as from the first year in which the long-term management arrangement leads to a higher TAC than the transitional arrangement.

F reduction fraction

If the size of the stock on 1 January of the year prior to the year of application of the TACs is:

- Above the precautionary spawning biomass level, the TACs shall correspond to a fishing mortality rate of 0.4 on appropriate age groups;
- Between the minimum spawning biomass level and the precautionary spawning biomass level, the TACs shall not exceed a level corresponding to a fishing mortality rate on appropriate age groups equal to the following formula:
- $0.4 - (0.2 * (\text{Precautionary spawning biomass level} - \text{spawning biomass}) / (\text{Precautionary spawning biomass level} - \text{minimum spawning biomass level}))$
- At or below the limit spawning biomass level, the TAC shall not exceed a level corresponding to a fishing mortality rate of 0.2 on appropriate age groups.

The plan shall be subject to triennial review, the first of which will take place before 31 December 2011.

The EU has adopted a long-term plan for this stock with the same aims as the EU-Norway plan (Council Regulation (EC) 1342/2008).

ICES has evaluated the EC management plan (EC 1342/2008) and the EU-Norway agreed long-term plan in March 2009 (Annex 6.4.2) and concluded that these management plans are in accordance with the precautionary approach only if implemented and enforced. A joint ICES-STEFCF group met during 2011 to conduct a historical evaluation of the effectiveness of these plans. The group concluded that although there has been a gradual reduction in F and discards in recent years, the plans for North Sea cod have not controlled F as envisaged, and following the current regime is unlikely to deliver FMSY by 2015.

STOCK STATUS:

F (Fishing Mortality)					
		2009	2010	2011	
MSY (F_{MSY})		✗	✗	✗	Above target
Precautionary approach (F_{pa}, F_{lim})		✓	✓	✓	Harvested sustainably
Management plan (F_{MP})					
		✗	✗	✗	Above target

SSB (Spawning-Stock Biomass)					
		2010	2011	2012	
MSY ($B_{trigger}$)		✗	✗	✗	Below trigger
Precautionary approach (B_{pa}, B_{lim})		✗	✗	✗	Reduced reproductive capacity
Management plan (SSB_{MP})					
		✗	✗	✗	Below trigger

There has been a gradual improvement in the status of the stock over the last few years. SSB has increased from the historical low in 2006, but remains just below B_{lim} . Fishing mortality declined from 2000 and is now below F_{pa} , but is estimated to be well above FMSY. Recruitment since 2000 has been poor. The proportion of discards is still high relative to the historical period.

RECENT MANAGEMENT ADVICE:

ICES advises on the basis of the EU-Norway management plan that landings in 2013 should be no more than 25 441 t.

Other considerations

Management plan

The EU-Norway agreement management plan as updated in December 2008 aims to be consistent with the precautionary approach and is intended to provide for sustainable fisheries and high yield, leading to a target fishing mortality of 0.4 (for details see Annex 6.4.2). This management plan will be re-considered during 2012.

The EU has adopted a long-term plan for this stock with the same aims (Council Regulation (EC) 1342/2008). In addition to the EU-Norway agreement the EU plan also includes effort restrictions, reducing kW-days available to community vessels in the main métiers catching cod in direct proportion to reductions in fishing mortality until the long-term phase of the plan is reached, for which the target F is 0.4 if SSB is above B_{pa} . Following the management plan implies a reduction in effort ceilings of 18.2% in 2012 and 22.2% in 2013 compared to the preceding year.

In both plans fishing mortality should be reduced to levels corresponding to 75% of F2008 in 2009 and 65% of F2008 in 2010. Until the long-term phase of the management plans has been reached, further annual reductions of 10% must be applied to achieve an F in 2013 equal to 35% of F2008. This would lead to a TAC reduction of more than 20%. The management plans limit annual TAC variations to 20%. According to these rules, landings should be no more than 25 441 t in total for Subarea IV and Divisions IIIa West and VIId in 2013.

MSY approach

While ICES considers that a reduction in F took place, the intermediate year F assumption from the management plan is considered to be over-optimistic. An alternative assumption for the F in 2012 is made based on the continuation of the F trend from 2006 to 2010.

Following the ICES MSY framework requires fishing mortality to be reduced to 0.10 (lower than FMSY because SSB 2013 < MSY Btrigger), resulting in landings of less than 10 000 t in 2012. This is expected to lead to an SSB of 123 000 t in 2014.

To follow the transition scheme towards the ICES MSY framework the fishing mortality must be reduced to $(0.4 \cdot 0.58) + (0.6 \cdot 0.10) = 0.29$, which is lower than Fpa. This results in landings of less than 27 600 t in 2013, which is expected to lead to an SSB of 101 000 t in 2014.

PA approach

Even a zero catch in 2013 is not expected to result in SSB reaching Bpa in 2014.

Mixed fisheries

In 2012, ICES offers mixed-fisheries advice for the first time. In contrast to single-species advice there is no single recommendation for mixed fisheries, but rather a range of plausible scenarios, assuming fishing patterns and catchability in 2012 and 2013 are unchanged from those in 2011. Major differences between the outcomes of the various scenarios indicate potential undershoot or overshoot of the TACs corresponding to the single-species advice. As a result, fleet dynamics may change, but cannot be determined.

Cod is the limiting species for the North Sea demersal fisheries in 2013. The ‘minimum’ and ‘cod’ scenarios of the mixed-fisheries analyses presented below are both consistent with the single-species advice for cod.

Rationale	Landings¹⁾ (2013)	Basis	F_{total} (2013)	F_{land} (2013)	F_{disc} (2013)	F_{unal}²⁾ (2013)	Disc (2013)	Unal²⁾ (2013)	SSB (2014)	%SSB³⁾ Change	%TAC⁴⁾ Change
Management Plan	25.441	TAC constraint	0.27	0.16	0.06	0.06	6.6	8.6	103	+36%	-20%
<i>Mixed fisheries options – minor differences with calculation above can occur due to different methodology used</i>											
<i>Maximum</i>	49	A	0.77	NA	NA	NA	NA	NA	50	-34 %	+55 %
<i>Minimum</i>	25	B	0.25	NA	NA	NA	NA	NA	114	51 %	-20 %
<i>Cod MP</i>	25	C	0.29	NA	NA	NA	NA	NA	95	+25 %	-20 %
<i>SQ effort</i>	42	D	0.55	NA	NA	NA	NA	NA	68	-10%	+33 %
<i>Effort Mgt</i>	30	E	0.32	NA	NA	NA	NA	NA	96	+26 %	-6 %

Weights in thousand tonnes.

¹⁾ Landings do not include unallocated mortality.

²⁾ Unallocated removals (calculated by dividing total by average catch multiplier in last three years).

³⁾ SSB 2014 relative to SSB 2013.

⁴⁾ Landings 2013 (not including unallocated removals) relative to TAC 2012.

Mixed fisheries assumptions:

- A. Maximum scenario: Fleets stop fishing when last quota exhausted.
- B. Minimum scenario: Fleets stop fishing when first quota exhausted.
- C. Cod management plan scenario: Fleets stop fishing when cod quota exhausted.
- D. *Status quo* (SQ) effort scenario: Effort in 2012 and 2013 as in 2011.
- E. Effort management scenario: Effort reductions according to cod and flatfish management plans.

The starting assumptions (interim year choices) differ between scenarios so that catches and F's in 2013 are not necessarily comparable between different options and the original management option table.

STECF COMMENTS: STECF agrees with the ICES assessment of the state of the stock and the advice for 2013.

STECF notes that the predicted change in SSB is less optimistic for the cod management plan mixed fisheries scenario (cod MP) than for the single species advice (management plan). This is only due to differences in the software used for single-species cod advice, that embeds a large range of additional uncertainties in stock dynamics, and for integrated mixed-fisheries advice, that perform deterministic forecast for all stocks. Therefore, minor differences in projections can occur.

With regards to the introduction of a discards ban in Skagerrak, STECF has estimated the following:

TAC in Skagerrak represents a fixed share of 12% of the total TAC, implying that TAC in Skagerrak for 2013 following ICES advice would be at 3040 tonnes. Meanwhile, according to data provided to ICES and used in the assessment, discards in Skagerrak represented 22% of total discards in 2011. This higher proportion of discards compared to landings is explained by the lower mesh size (90 mm) used in Skagerrak for the main demersal fisheries. 22% of the 6.6 kt discards estimated by ICES for 2013 represents 1430 tonnes. Consequently, total catch of cod in Skagerrak would be estimated at 4 470 tonnes in 2013.

2.6. Haddock (*Melanogrammus aeglefinus*) in IIa (EU zone), in Sub-area IV (North Sea) and Division IIIa (Skagerrak- Kattegat)

FISHERIES: North Sea haddock is exploited predominantly by fleets from the UK (Scotland), Norway and Denmark. Most landings are for human consumption and are taken by towed gears, although there is a small by-catch in the small-mesh industrial fisheries. Substantial quantities are discarded in some years when new year-classes recruit to the fishery. Over 1963-2006, catches have ranged from 55,000 t to 930,000 t. In recent years catches have decreased and the estimates for 2005 to 2011(48,100 t) represent the lowest on record. A contributory factor to the lower catches in recent years has been the maintenance of low fishing mortality rate.

SOURCE OF MANAGEMENT ADVICE: The management advisory body is ICES. The age-based assessment model (XSA) is calibrated with three survey indices. Discards and industrial by-catch data were included in the assessment. Discards were estimated from the discards sampling programme from several countries, with most observations coming from Scotland.

MANAGEMENT AGREEMENT: In 1999 the EU and Norway agreed to implement a long-term management plan for the haddock stock, which is consistent with the precautionary approach and which is intended to constrain harvesting within safe biological limits ($SSB > B_{lim}$) and is designed to provide for sustainable fisheries and high potential yield ($F_{HCR} = 0.3$). A revised management plan was implemented in January 2009.

REFERENCE POINTS:

	<i>Type</i>	<i>Value</i>	<i>Technical basis</i>
Management	F_{MP}	0.3	
Plan	SSB_{MP}	100 000 t	Trigger value B_{lim} .
MSY	$MSY B_{trigger}$	140 000 t	Default to value of B_{pa} .
Approach	F_{MSY}	0.3	Provisional proxy is the management target F_{mgt} , within the range of fishing mortalities consistent with F_{MSY} (0.25–0.48).

	B_{lim}	100 000 t	Smoothed B_{loss} .
Precautionary	B_{pa}	140 000 t	$B_{pa} = 1.4 * B_{lim}$.
Approach	F_{lim}	1.0	$F_{lim} = 1.4 * F_{pa}$.
	F_{pa}	0.7	10% probability that $SSBMT < B_{pa}$.

(unchanged since: 2011)

STOCK STATUS:

F (Fishing Mortality)			
	2009	2010	2011
MSY (F_{MSY})	✓	✓	✓ Appropriate
Precautionary approach (F_{pa}, F_{lim})	✓	✓	✓ Harvested sustainably
Management plan (F_{MP})	✓	✓	✓ Below target

SSB (Spawning-Stock Biomass)			
	2010	2011	2012
MSY ($B_{trigger}$)	✓	✓	✓ Above trigger
Precautionary approach (B_{pa}, B_{lim})	✓	✓	✓ Full reproductive capacity
Management plan (SSB_{MP})	✓	✓	✓ Above trigger

Fishing mortality has been below F_{pa} and around F_{MSY} and SSB has been above MSY $B_{trigger}$ since 2001. Recruitment is characterized by occasional large year classes, the last of which was the strong 1999 year class. Apart from the 2005 and 2009 year classes which are about average, recent recruitment has been poor.

RECENT MANAGEMENT ADVICE:

ICES advises on the basis of the EU–Norway management plan that landings in 2013 should be no more than 47,811 t.

Other considerations

Management plan

In 2008 the EU and Norway agreed a revised management plan for this stock, which states that every effort will be made to maintain a minimum level of SSB greater than 100 000 t (B_{lim}). Furthermore, fishing was restricted on the basis of a TAC consistent with a fishing mortality rate of no more than 0.30 for appropriate age groups, along with a limitation on interannual TAC variability of $\pm 15\%$. Following a minor revision in 2008, interannual quota flexibility (“banking and borrowing”) of up to $\pm 10\%$ is permitted (although this facility has not yet been used). The stipulations of the management plan have been adhered to by the EU and Norway since its implementation in January 2007.

Following the management plan implies a TAC of 47 811 t in 2013, which is a TAC increase of 15% and is expected to lead to an F decrease of 3%.

MSY approach

Following the ICES MSY framework implies fishing mortality to be increased to 0.3, resulting in human consumption landings of less than 49 000 t in 2012. This would be expected to lead to an SSB of 202 000 t in 2014.

PA approach

The fishing mortality in 2013 should be no more than F_{pa} , corresponding to human consumption landings of less than 96 000 t in 2011. This is expected to keep SSB just above B_{pa} in 2014.

Mixed fisheries

In 2012, ICES puts forward mixed-fisheries advice for the first time. In contrast to single-species advice there is no single recommendation but a range of plausible scenarios, assuming fishing patterns and catchability in 2012 and 2013 unchanged from those in 2011. Major differences between the outcomes of the various scenarios indicate potential undershoot or overshoot of the TACs corresponding to the single-species advice. As a result, fleet dynamics may change, but cannot be determined.

The TAC for haddock in 2012 (15% reduction of the 2011 TAC) implies a reduction of fishing mortality in 2012 to 66% of the F in 2011 (which was at the level of the target of the management plan). This reduction means that the haddock TAC may act as a limiting factor in many fisheries in 2012.

In 2013, cod is the limiting species for all the North Sea demersal fisheries. Following the 'cod' scenario (full implementation of the cod management plan), the haddock management plan catch options could not be fully utilized.

Rationale	Human consumption (2013)	Basis	F 2013	F HC 2013	F Disc 2013	F ind. Bycatch 2013	Disc 2013	Ind. Bycatch 2013	Catch 2013	SSB 2014	%SSB ¹⁾ Change	%TAC Chang
Management Plan	47.811	15% TAC increase	0.29	0.20	0.09	0.001	6	0	54	203	-20%	+15%
<i>Mixed fisheries options – minor differences with calculation above can occur due to different methodology used</i>												
Maximum	56	A	0.46	NA	NA	NA	NA	NA	NA	145	-43 %	+34 %
Minimum	25	B	0.14	NA	NA	NA	NA	NA	NA	231	-10 %	-39 %
Cod MP	26	C	0.17	NA	NA	NA	NA	NA	NA	207	-19 %	-36 %
SQ effort	46	D	0.33	NA	NA	NA	NA	NA	NA	175	-31%	+12 %
Effort Mgt	27	E	0.17	NA	NA	NA	NA	NA	NA	217	-15 %	-35 %

Weights in thousand tonnes.

Under the assumption that effort is linearly related to fishing mortality.

¹⁾ SSB 2014 relative to SSB 2013.

²⁾ Human Consumption 2013 relative to TAC 2012.

Mixed-fisheries assumptions:

- A. Maximum scenario: Fleets stop fishing when last quota exhausted.
- B. Minimum scenario: Fleets stop fishing when first quota exhausted.
- C. Cod management plan scenario: Fleets stop fishing when cod quota exhausted.
- D. *Status quo* (SQ) effort scenario: Effort in 2012 and 2013 as in 2011.
- E. Effort management scenario: Effort reductions according to cod and flatfish management plans.

The landings in Division IIIa are calculated as 6% of the combined area total. The figure 6% has been used as the basis of the TAC split.

STECF COMMENTS:

STECF agrees with the ICES assessment of the state of the stock and the advice for 2013.

STECF notes that the measures prescribed by the management plan, if fully implemented and enforced will maintain fishing mortality at or around F_{msy} .

STECF notes that the predicted change in SSB is almost identical for the cod management plan mixed fisheries scenario (cod MP) than for the single species advice (management plan).

With regards to the introduction of a discards ban in Skagerrak, STECF has estimated the following:

TAC in Skagerrak represents a fixed share of 6% of the total TAC, implying that TAC in Skagerrak for 2013 following ICES advice would be at 2 770 tonnes. Meanwhile, according to data provided to ICES and used in

the assessment, discards in Skagerrak represented 15% of total discards in 2011. This higher proportion of discards compared to landings is explained by the lower mesh size (90 mm) used in Skagerrak for the main demersal fisheries. 15% of the 6 kt discards estimated by ICES for 2013 represents 880 tonnes. Consequently, total catch of haddock in Skagerrak would be estimated at 3 650 tonnes in 2013.

2.7. Saithe (*Pollachius virens*) in Divisions IIa (EU zone), IIIa, Subareas IV (North Sea) and VI (West of Scotland).

FISHERIES: In the various areas over which this stock is distributed, saithe are primarily taken in a direct trawl fishery in deep water along the Northern Shelf edge and the Norwegian Trench. In the first quarter of the year the fisheries are directed towards spawning aggregations, while smaller fish are targeted during the rest of the year. Gill-nets are also used, and there is still a small purse seine fishery in Norwegian coastal waters. Norway has introduced 120 mm mesh size in trawls, but in EU waters 110 mm may still be used by the EU fleets. Saithe is also taken as part of the mixed roundfish fishery. The stock is exploited by nations including Norway, France, Germany, the UK, Ireland, Spain and Denmark. Between 1967-2006, ICES Working Group reported landings have varied between 88,326t and 343,967t and have been relatively stable over the last 21 years (mostly just over 100,000 t). In 2010 and 2011 the landings were 101,940t and 97,104t respectively. The stock is managed by TAC. Separate TACs are set for Saithe in IIa (EU zone), IIIa, North Sea combined (Sub-area IV) and Sub-area VI.

SOURCE OF MANAGEMENT ADVICE: The main management advisory body is ICES. The advice is based on an age-based assessment (XSA) calibrated using data from three commercial cpue series and indices from three surveys. There are no discard estimates for the majority of this fishery. Discarding of saithe occurs in the non-targeted fisheries, but the level of discard is considered to be small compared to the total catch of saithe.

MANAGEMENT AGREEMENT:

In 2008 EU and Norway renewed the existing agreement on “a long-term plan for the saithe stock in the Skagerrak, the North Sea and west of Scotland, which is consistent with a precautionary approach and designed to provide for sustainable fisheries and high yields. The plan shall consist of the following elements.

1. *Every effort shall be made to maintain a minimum level of Spawning Stock Biomass (SSB) greater than 106,000 tonnes (B_{lim}).*
2. *Where the SSB is estimated to be above 200,000 tonnes the Parties agreed to restrict their fishing on the basis of a TAC consistent with a fishing mortality rate of no more than 0.30 for appropriate age groups.*
3. *Where the SSB is estimated to be below 200,000 tonnes but above 106,000 tonnes, the TAC shall not exceed a level which, on the basis of a scientific evaluation by ICES, will result in a fishing mortality rate equal to $0.30 - 0.20 * (200,000 - SSB) / 94,000$.*
4. *Where the SSB is estimated by the ICES to be below the minimum level of SSB of 106,000 tonnes the TAC shall be set at a level corresponding to a fishing mortality rate of no more than 0.1.*
5. *Where the rules in paragraphs 2 and 3 would lead to a TAC which deviates by more than 15 % from the TAC of the preceding year the Parties shall fix a TAC that is no more than 15 % greater or 15 % less than the TAC of the preceding year.*
6. *Notwithstanding paragraph 5 the Parties may where considered appropriate reduce the TAC by more than 15 % compared to the TAC of the preceding year.*
7. *A review of this arrangement shall take place no later than 31 December 2012.*
8. *This arrangement enters into force on 1 January 2009.”*

REFERENCE POINTS:

	Type	Value	Technical basis
Management	SSB _{MP}	200 000 t	B _{pa}
Plan	F _{MP}	0.3	Or lower depending on SSB in relation to SSB target.
MSY	MSY B _{trigger}	200 000 t	Default value B _{pa}
Approach	F _{MSY}	0.3	Stochastic simulation using hockey-stick stock–recruitment.
Precautionary approach	B _{lim}	106 000 t	B _{lim} = 106 000 t (estimated in 1998)
	B _{pa}	200 000 t	Affords a high probability of maintaining SSB above B _{lim} .

	F_{lim}	0.6	F_{loss} the fishing mortality estimated to lead to stock falling below B_{lim} in the long term.
	F_{pa}	0.4	Implies that $B_{eq} > B_{pa}$ and $P(SSB_{MT} < B_{pa}) < 10\%$.

STOCK STATUS:

F (Fishing Mortality)				
	2009	2010	2011	
MSY (F_{MSY})	✗	✓	✓	Appropriate
Precautionary approach (F_{pa}, F_{lim})	✓	✓	✓	Harvested sustainably
Management plan (F_{MP})	✗	✓	✓	Below limit

SSB (Spawning-Stock Biomass)				
	2010	2011	2012	
MSY ($B_{trigger}$)	✓	✓	✓	Above trigger
Precautionary approach (B_{pa}, B_{lim})	✓	✓	✓	Full reproductive capacity
Management plan (SSB_{MP})	✓	✓	✓	Above trigger

SSB has been above B_{pa} since 1997 but has declined since 2005 towards B_{pa} . Fishing mortality has fluctuated around F_{MSY} since 1997. Recruitment has been below average since 2006.

RECENT MANAGEMENT ADVICE:

ICES advises on the basis of the EU–Norway management plan that landings in 2013 should be no more than 100 684 tonnes for the whole assessment area.

Other considerations

Management plan

The EU–Norway agreement management plan does not clearly state whether the SSB in the intermediate year or the SSB at the beginning or end of the TAC year should be used to determine the status of the stock. ICES interprets this as being the SSB at the beginning of the intermediate year (2012). Since SSB at the beginning of 2012 is above B_{pa} , and a $F = 0.3$ will give a larger change than 15%, paragraph 5 of the harvest control rule applies, resulting in a TAC of 100 684 t and an SSB in 2014 of 252 000 t.

The EU–Norway agreed management plan as updated in December 2008 (Annex 6.4.12) was evaluated by ICES (ICES, 2008), and considered to be consistent with the precautionary approach in the short term (< 5 years).

MSY approach

Following the ICES MSY framework implies a fishing mortality of $F_{MSY} = 0.3$. This would result in landings of no more than 113 100 t in 2013 and an SSB in 2014 of 241 000 t.

PA approach

Fishing at $F_{pa} = 0.4$ results in landings of less than 143 000 t in 2013 and a SSB of 214 000 in 2014.

Mixed fisheries

In 2012, ICES puts forward mixed-fisheries advice for the first time. In contrast to single-species advice there is no single recommendation but a range of plausible options, assuming fishing patterns and catchability in 2012 and 2013 similar to those in 2011. Major differences between the outcomes of the various scenarios indicate

potential unbalance between single-species fishing opportunities. The consequences of this unbalance in terms of changes in fleet dynamics cannot be ascertained.

Cod is the limiting species for the North Sea demersal fisheries in 2013. Following the ‘cod’ scenario (full implementation of the cod management plan), the saithe management plan catch options could not be fully utilized.

Rationale	landings 2013	landings IIIa & IV 2013¹⁾	landings VI 2013¹⁾	Basis	F 2013	SSB 2014	% SSB change 2)	% TAC change 3)
Management plan	100.684	91.219	9.464	15% TAC constraint	0.26	252	+7%	+15%
<i>Mixed fisheries options – minor differences with calculation above can occur due to different methodology used</i>								
<i>Maximum</i>	131	118	12	A	0.39	200	-15%	+49%
<i>Minimum</i>	55	50	5.2	B	0.12	316	+35%	-37%
<i>Cod MP</i>	59	53	5.5	C	0.14	286	+22%	-33%
<i>SQ Effort</i>	104	94	9.8	D	0.28	236	0%	+19%
<i>Effort Mgt</i>	86	78	8.1	E	0.22	261	+11%	-1%

Weights in thousand tonnes.

¹⁾ Landings split according to the average in 1993–1998, i.e. 90.6% in Subarea IV and Division IIIa West and 9.4% in Subarea VI.

²⁾ SSB 2014 relative to SSB 2013.

³⁾ Landings 2013 relative to TAC 2012.

Mixed Fisheries assumptions:

- A. Maximum scenario: Fleets stop fishing when last quota exhausted.
- B. Minimum scenario: Fleets stop fishing when first quota exhausted.
- C. Cod management plan scenario: Fleets stop fishing when cod quota exhausted.
- D. *Status quo* (SQ) effort scenario: Effort in 2012 and 2013 as in 2011.
- E. Effort management scenario: Effort reductions according to cod and flatfish management plans.

The starting assumptions (interim year choices) differ between scenarios so that catches and F's in 2013 are not necessarily comparable between different options and the original management option table.

STECF COMMENTS:

STECF agrees with the ICES assessment of the state of the stock and the advice for 2013.

STECF notes that the predicted change in SSB is more optimistic for the cod management plan mixed fisheries scenario (cod MP) than for the single species advice (management plan).

STECF notes that although saithe is assessed together in area IV and VI, TACs are set separately for areas IV and VI.

The fishery in Subarea VI consists largely of a directed deep-water fishery operating on the shelf edge but includes a mixed fishery operating on the shelf. Therefore STECF considers the management advice for saithe in area VI must take into account the management adopted for area VI cod (catches in 2013 should be reduced to the lowest possible level).

With regards to the introduction of a discards ban in Skagerrak, STECF notes that discards are not included in the assessment of saithe. STECF furthermore notes that the management area for saithe includes the North Sea, the Skagerrak, the Kattegat and EU waters of the Baltic Sea and the Norwegian Sea and there is no separate TAC for the Skagerrak. According to data provided to ICES and used in the assessment, landings in Skagerrak represented 4% of combined landings in 2011. The available information show an average discardrate in the Skagerrak in 2009 to 2011 of 9% of the total catch. Assuming the same distribution of landings in 2013, a

discardrate of 9% and applying ICES advice for 2013 the predicted catch in 2013 in the Skagerrak is 4360 tonnes

2.8. Whiting (*Merlangius merlangus*), Skagerrak & Kattegat (IIIa)

FISHERIES: The majority of whiting landed from the Skagerrak and Kattegat are taken as by-catch in the small-mesh industrial fisheries. Some are also taken as part of a mixed demersal fishery. As in the North Sea stock, landings decreased in the Skagerrak and Kattegat drastically and were below 2,000 t since 1997. Nominal landings for 2011 were 113 t. ICES estimates of discards are 794 tonnes in 2011 which is three times higher than last year's estimate.

SOURCE OF MANAGEMENT ADVICE: The management advisory body is ICES.

MANAGEMENT AGREEMENT: There are no specific management agreements for whiting in IIIa.

REFERENCE POINTS:

No reference points have been defined for this stock.

STOCK STATUS:

F (Fishing Mortality)	
1980 - 2011	
Qualitative evaluation	<div style="display: flex; align-items: center;"> ? Insufficient information </div>

SSB (Spawning Stock Biomass)	
1980 - 2011	
Qualitative evaluation	<div style="display: flex; align-items: center;"> ? Insufficient information </div>

The available landing data provide tentative information on the stock status. However, due to the uncertain population structure and possible changes in fishing patterns over the studied period, as well as the low quality of existing surveys, the present lack of knowledge prevent further interpretation.

RECENT MANAGEMENT ADVICE:

Based on the ICES approach for data limited stocks, ICES advises that catches should be no more than 570 tonnes.

This is the first year that ICES is providing quantitative advice for data limited stocks.

Other considerations

ICES approach to data limited stocks

For data limited stocks without information on abundance or exploitation ICES considers that a precautionary reduction of catches should be implemented, unless there is ancillary information clearly indicating that the current level of exploitation is appropriate for the stock.

For this stock, ICES advises that catches should decrease by 20% in relation to the last three years average catch, corresponding to catches (including discards) of no more than 500 t in 2013.

STECF COMMENTS: STECF agrees with the ICES assessment that the state of the stock is unknown and with the advice for 2013 and 2014.

2.9. Whiting (*Merlangius merlangus*) in Subarea IV (North Sea) and Division VIII (Eastern Channel)

FISHERIES: Whiting are taken as part of a mixed fishery, as well as a by-catch in fisheries for *Nephrops* and industrial species. Substantial quantities are discarded. Historically total catches have varied considerably ranging between 25 000 and 153 000 t. In 2011, the Working Group estimated that about 30 087 t were caught. The human consumption landings in the North Sea were 13 305 t with a TAC for 2012 of 17 056 t. The landings in the Eastern Channel amounted to 5 064 t.

Whiting are caught in mixed demersal roundfish fisheries, fisheries targeting flatfish, the *Nephrops* fisheries, and the Norway pout fishery. The current minimum mesh-size in the targeted demersal roundfish fishery in the northern North Sea has resulted in reduced discards from that sector compared with the historical discard rates. Mortality has increased on younger ages due to increased discarding in the recent year as a result of recent changes in fleet dynamics of *Nephrops* fleets and small mesh fisheries in the southern North Sea. The by-catch of whiting in the Norway pout and sandeel fisheries is dependent on activity in that fishery, which has recently declined after strong reductions in the fisheries. These are low values based on the assumption of a similar by-catch rate to that observed in previous years, when the industrial fisheries were at a low level. A larger catch allocation for by-catch may be required if industrial effort increases.

Catches of whiting in the North Sea are also likely to be affected by the effort reduction seen in the targeted demersal roundfish and flatfish fisheries, although this will in part be offset by increases in the number of vessels switching to small mesh fisheries.

The minimum mesh size was increased to 120 mm in the northern area in 2002 and this may have contributed to the substantial decrease in landings. Landing compositions from the northern area, in 2006 to 2009, indicate improved survival of older ages. In addition, the total number of fish discarded appears to have been reduced since 2003, from around 60% in 2003 to around 47% in 2009. However, because of the restrictive TACs discard rates increased in 2010 and are expected to have been high again in 2011.

SOURCE OF MANAGEMENT ADVICE: The management advisory body is ICES. The stock assessment is based on an XSA assessment, calibrated with two survey indices. Commercial catch-at-age data were disaggregated into human consumption, discards, and industrial by-catch components.

MANAGEMENT AGREEMENT: The EU and Norway agreed to implement a long-term management plan for the whiting stock, which is consistent with long-term stability even when recruitment is poor for several consecutive years.

REFERENCE POINTS:

	<i>Type</i>	<i>Value</i>	<i>Technical basis</i>
Management	SSB _{MP}	Undefined.	
Plan	F _{MP}	0.3*	Management plan.
MSY	MSY B _{trigger}	Undefined.	
Approach	F _{MSY}	Undefined.	
Precautionary approach	B _{lim}	Undefined.	
	B _{pa}	Undefined.	
	F _{lim}	Undefined.	
	F _{pa}	Undefined.	

* In light of the revision of the perception of the stock history, the target *F* is no longer considered applicable and the management target needs re-evaluation.

STOCK STATUS:

F (Fishing Mortality)

	2009	2010	2011	
MSY (F_{MSY})	?	?	?	Undefined
Precautionary approach (F_{pa}, F_{lim})	?	?	?	Undefined

SSB (Spawning-Stock Biomass)				
	2010	2011	2012	
MSY ($B_{trigger}$)	?	?	?	Undefined
Precautionary approach (B_{pa}, B_{lim})	?	?	?	Undefined
Qualitative evaluation	→	→	→	At recent average

The perception of the stock abundance has been revised upwards, due to changes in predation estimates. However, the trends in stock dynamics are unchanged. SSB is around the average of the time-series. Fishing mortality has been stable with minor fluctuations since 2003. Recruitment was low between 2003 and 2007, then increased slightly, but has remained below average since 2008.

RECENT MANAGEMENT ADVICE: ICES advises on the basis of precautionary considerations that landings should be no more than 26 000 t (human consumption for the combined area) in 2013. Management for Division VIIId should be separated from the rest of Subarea VII.

Other considerations

Management plan

The response to the Joint EU–Norway request on the management of whiting in Subarea IV (North Sea) and Division VIIId (Eastern Channel) from ICES in September 2010 stated that “maintaining fishing mortality at its current level of 0.3 would be consistent with long-term stability if recruitment is not poor”. Consequently the EU and Norway have agreed to interim management of whiting at this level of total fishing mortality for 2011, conditional on a $\pm 15\%$ TAC constraint. ICES assumes that this approach is still in place.

Following this management plan in 2013 implies a fishing mortality of 0.3, which would increase the TAC by more than 15%. Applying the TAC constraint would lead to human consumption landings of no more than 19 614 t for the North Sea. Although not covered by the management plan, this option would lead to landings in Division VIIId of no more than 7628 t.

After the considerable revisions in this year’s assessment, caused by new estimates of natural mortality, the target F is no longer considered applicable and the management target needs re-evaluation.

MSY approach

There are no reference points to enable MSY advice.

PA considerations

As an interim measure, it would be appropriate to scale the target F in the plan (0.3) according to the proportional change in F between the old and new assessment. The level of F of the whole time-series was revised downwards by around 25% between the 2011 and 2012 assessments, which would generate a target F of 0.225 ($0.75 * 0.3$).

Following this approach in 2013 with a target fishing mortality of 0.225 would lead to human consumption landings of no more than 19 000 t in the North Sea and 7000 t in Division VIIId.

Mixed fisheries

In 2012, ICES offers mixed-fisheries advice for the first time. In contrast to single-species advice there is no single recommendation for mixed fisheries but rather a range of plausible scenarios, assuming fishing patterns and catchability in 2012 and 2013 unchanged from those in 2011. Major differences between the outcomes of the various scenarios indicate potential undershoot or overshoot of the TACs corresponding to the single-species advice. As a result, fleet dynamics may change, but cannot be determined.

Cod is the limiting species for the North Sea demersal fisheries in 2013. Following the 'cod' scenario (full implementation of the cod management plan), the catch options resulting from the whiting single-species advice could not be fully utilized.

Rationale	Landings IV+VIId 2013	Landings IV 2013	Landings VIId 2013	Basis	F 2013	F (landings) 2013	F (disc) 2013	F ind. (IBC) 2013	Disc 2013	IBC 2013	Total catch 2013	SSB 2014	%SSB ¹⁾ Change	%TAC ²⁾ Change
MP target	26	19	7	2011 MP F rescaled (0.75*0.3)	0.225	0.15	0.07	0.006	11	1	38	346	11%	11%
<i>Mixed fisheries options – minor differences with calculation above can occur due to different methodology used</i>														
Maximum	25	18.0	7.0	A	0.22	NA	NA	NA	NA	NA	NA	346	11 %	6 %
Minimum	8.8	6.4	2.4	B	0.07	NA	NA	NA	NA	NA	NA	376	20 %	-62 %
Cod MP	9.9	7.2	2.7	C	0.08	NA	NA	NA	NA	NA	NA	370	18 %	-58 %
SQ effort	19	13.7	5.3	D	0.16	NA	NA	NA	NA	NA	NA	357	14 %	-22 %
Effort Mgt	9.0	6.5	2.5	E	0.07	NA	NA	NA	NA	NA	NA	374	19 %	-62 %

Weights in thousand tonnes.

Under the assumption that effort is linearly related to fishing mortality.

¹⁾ SSB 2014 relative to SSB 2013.

²⁾ Human consumption for Subarea IV in 2013 relative to TAC for Subarea IV and Division IIa in 2012 (17 056 t).

Mixed-fisheries assumptions:

- A. Maximum scenario: Fleets stop fishing when last quota exhausted.
- B. Minimum scenario: Fleets stop fishing when first quota exhausted.
- C. Cod management plan scenario: Fleets stop fishing when cod quota exhausted.
- D. *Status quo* (SQ) effort scenario: Effort in 2012 and 2013 as in 2011.
- E. Effort management scenario: Effort reductions according to cod and flatfish management plans.

The starting assumptions (interim year choices) differ between scenarios so that catches and F's in 2013 are not necessarily comparable between different options and the original management option table.

The catch split between Subarea IV and Division VIId in 2012 is assumed to be the same as the proportion as estimated in 2011: 72% landings from Subarea IV and 28% landings from Division VIId. There should be separate management for Division VIId.

STECF COMMENTS:

STECF agrees with the ICES assessment of the state of the stock and the advice for 2013.

STECF notes that the management plan prescribes that the TAC in 2013 should be set in accordance with a fishing mortality in 2013 of $F = 0.3$, which would increase the 2012 TAC by more than 15%. Applying the 15% TAC constraint would lead to human consumption landings of no more than 19 614 t for the North Sea. Although not covered by the management plan, this option would lead to landings in Division VIId of no more than 7628 t.

STECF notes that the predicted change in SSB is more optimistic for the cod management plan mixed fisheries scenario (cod MP) than for the single species advice.

2.10. Anglerfish (*Lophius piscatorius*) in IIa (EU zone), North Sea IV, IIIa

Anglerfish (*Lophius piscatorius*) in IIa, IV and IIIa are assessed together with anglerfish (*Lophius piscatorius* & *Lophius budegassa*) in Subareas VI, XII and XIV. The stock summary and advice is given in Section 3.10.

2.11. Brill (*Scopthalmus rhombus*) in the North Sea

FISHERIES: Brill is mainly caught as a valuable bycatch species in the beam-trawl fisheries targeting flatfish, and to a lesser extent in the otter trawl and fixed-net fisheries. Locally, a minimum landing size of 30 cm is used. Landings have fluctuated between 1000 t and 1500 t for most of the available time series (1973-2008). In the period 1991-1994 landings between 1500 t and 2400 t have been recorded.

A precautionary TAC (including turbot) in areas IIa and IV for 2011 and 2012 was set to 4 642 t.

SOURCE OF MANAGEMENT ADVICE: The management advisory body is ICES.

MANAGEMENT AGREEMENT: There are no specific management agreements for brill in the North Sea.

REFERENCE POINTS:

No reference points have been defined.

STOCK STATUS:

F (Fishing Mortality)			
2007–2009			
Qualitative evaluation	<table border="1"> <tr> <td>?</td> <td>Insufficient information</td> </tr> </table>	?	Insufficient information
?	Insufficient information		
SSB (Spawning-Stock Biomass)			
2007–2009			
Qualitative evaluation	<table border="1"> <tr> <td>?</td> <td>Insufficient information</td> </tr> </table>	?	Insufficient information
?	Insufficient information		

The available information is inadequate to evaluate stock trends. There is no information on the stock identity of this species.

RECENT MANAGEMENT ADVICE:

The 2011 advice for this stock is biennial and valid for 2012 and 2013. ICES advises on the basis of precautionary considerations that catches should not increase.

This is the same advice as last year and the ICES data-limited approach will be implemented in 2013.

Other considerations

No reliable assessment can be presented. The main cause of this is lack of data. Therefore, fishing possibilities cannot be projected.

Precautionary considerations

The available information is insufficient to evaluate stock trends and exploitation status. Landings have been relatively stable since 1998. Effort for the main fleet with brill bycatches (beam trawls) in the North Sea and Skagerrak has declined 40% between 2003 and 2009. Based on these considerations ICES advises that catches should not increase.

STECF COMMENTS: STECF agrees with the ICES assessment that the state of the stock is unknown and with the advice for 2012 and 2013.

STECF notes that the advice is given for brill in Subarea IV and Divisions IIIa and VIId,e. However, as around 60% of the brill is caught in the North Sea, STECF consider the advice is also appropriate for the North Sea.

STECF notes that brill is mainly a bycatch species in fisheries for plaice and sole. TACs may not be appropriate as a management tool to control fishing mortality for bycatch species.

2.12. Dab (*Limanda limanda*) IIa (EU zone), North Sea

FISHERIES: Dab is a bycatch in the fishery for flatfish, shrimp and demersal species, mainly in the beam trawl fisheries. Dab catches are generally discarded based on the availability of target species and market price. Landings have fluctuated around 7 000t from 1973 until 1983. Between 1984 and 1997 they amounted up to around 4 000t. Since the record high values in the period 1998-2000 of about 13 000t, landings have steadily decreased to 8 029 t in 2008.

A precautionary TAC (including flounder) in areas IIa and IV for 2011 and 2012 was set to 18 434 t.



SOURCE OF MANAGEMENT ADVICE: The management advisory body is ICES.

MANAGEMENT AGREEMENT: There are no specific management agreements for dab in the North Sea.

REFERENCE POINTS:

No reference points have been defined.

STOCK STATUS:

F (Fishing Mortality)	
2007 – 2009	
Qualitative evaluation	 Insufficient information
TSB (Total Stock Biomass)	
2007 – 2009	
Qualitative evaluation	 Increase in the main area

There is no information on the stock identity of this species. Landing data are not complete and are probably not indicative for catches since discard rates are variable. The mixed TAC with flounder reduces the accuracy of catch statistics per species. Different surveys show a stable to increasing total biomass for the main area (IV) in which the fisheries are conducted.

RECENT MANAGEMENT ADVICE:

The 2011 advice for this stock is biennial and valid for 2012 and 2013. ICES advises on the basis of precautionary considerations that catches should not increase.

This is the same advice as last year and the ICES data-limited approach will be implemented in 2013.

Other considerations

No reliable assessment can be presented. The main cause of this is lack of data (exact catches and biological survey results). Therefore, fishing possibilities cannot be projected.

Precautionary considerations

The available information shows an increase in total biomass for the main area (IV) in which the fisheries are conducted. Exploitation status is unknown. Effort for the main fleet with dab bycatches (beam trawls) in the North Sea and Skagerrak has declined 40% between 2003 and 2009. Based on these considerations ICES advises that catches should not increase.

STECF COMMENTS: STECF agrees with the ICES assessment that the state of the stock is unknown and with the advice for 2012 and 2013.

STECF notes that the advice is given for dab in IIIa and North Sea. However, as around 90% of the dab is caught in the North Sea, STECF consider the advice is also appropriate for the North Sea.

STECF notes that dab is mainly a bycatch species in fisheries for plaice and sole. TACs may not be appropriate as a management tool to control fishing mortality for bycatch species.

2.13. Flounder (*Platichthys flesus*) - IIa (EU zone), North Sea

FISHERIES: Flounder is a bycatch in the fishery for flatfish and demersal species, mainly in the beam trawl fisheries. Discard rates can vary considerably, depending on availability of the main target species and market price. Landings have fluctuated around 2 500t from 1973 until 1983 and around 1500t between 1984 and 1997. Since the record high values in 1998 of 5 560t, landings have fluctuated around 3 500t with a 2008 landings of 2 895t.

A precautionary TAC (including dab) in areas IIa and IV for 2011 and 2012 was set to 18 434 t.



SOURCE OF MANAGEMENT ADVICE: The management advisory body is ICES.

MANAGEMENT AGREEMENT: There are no specific management agreements for flounder in the North Sea.

REFERENCE POINTS:

No reference points have been defined.

STOCK STATUS:

F (Fishing Mortality)	
2007 – 2009	
Qualitative evaluation	 Insufficient information
TSB (Total Stock Biomass)	
2007 – 2009	
Qualitative evaluation	 Increase in the main area

The available survey information indicates stable (IIIa) or increasing (IV) stock abundance. Subarea IV is the main fishing area where around 87% of the landings are taken. There is no information on the stock identity of this species. Landing data are not indicative for catches since discard rates are variable.

RECENT MANAGEMENT ADVICE:

The 2011 advice for this stock is biennial and valid for 2012 and 2013. ICES advises on the basis of precautionary considerations that catches should not increase.

This is the same advice as last year and the ICES data-limited approach will be implemented in 2013.

Other considerations

No reliable assessment can be presented. The main cause of this is lack of data (exact catches and biological survey results). Therefore, fishing possibilities cannot be projected.

Precautionary considerations

The available information shows an increase in total biomass for the main area (IV) in which the fisheries are conducted. Exploitation status is unknown. Effort for the main fleet with flounder bycatches (beam trawls) in the North Sea and Skagerrak has declined 40% between 2003 and 2009. Based on these considerations ICES advises that catches should not increase.

STECF COMMENTS: STECF agrees with the ICES assessment that the state of the stock is unknown and with the advice for 2012 and 2013.

STECF notes that the advice is given for dab in IIIa and North Sea. However, as around 90% of the flounder is caught in the North Sea, STECF consider the advice is also appropriate for the North Sea alone.

STECF notes that flounder is mainly a bycatch species in fisheries for plaice and sole. TACs may not be appropriate as a management tool to control fishing mortality for bycatch species.

2.14. Lemon sole (*Microstomus kitt*) in the North Sea

FISHERIES: Lemon sole are generally caught in mixed fisheries by beam trawlers and otter trawlers. There is no minimum landing size for lemon sole. Landings have fluctuated between 5 000 t and 8 000t in the period 1973-2001. Since then, landings have been stable just below 4 000t. The 2008 landings are 3 466t.

A precautionary TAC (including witch) in areas IIa and IV for 2011 and 2012 was set to 6 391 t.

SOURCE OF MANAGEMENT ADVICE: The management advisory body is ICES.

MANAGEMENT AGREEMENT: There are no specific management agreements for lemon sole in the North Sea.

REFERENCE POINTS:

No reference points have been defined.

STOCK STATUS:

F (Fishing Mortality)	
2007–2009	
Qualitative evaluation	<div style="display: flex; align-items: center;"> <div style="border: 1px solid black; border-radius: 50%; width: 20px; height: 20px; display: flex; align-items: center; justify-content: center; margin-right: 5px;">?</div> <div>Insufficient information</div> </div>
TSB (Total Stock Biomass)	
2007–2009	
Qualitative evaluation	<div style="display: flex; align-items: center;"> <div style="border: 1px solid black; border-radius: 50%; width: 20px; height: 20px; display: flex; align-items: center; justify-content: center; margin-right: 5px;">→</div> <div>Stable</div> </div>

The available survey information indicates stable abundance in recent years at a high level. There is no information on the stock identity of this species. Landings data show a declining long-term trend.

RECENT MANAGEMENT ADVICE:

The 2011 advice for this stock is biennial and valid for 2012 and 2013. ICES advises on the basis of precautionary considerations that catches should not increase.

This is the same advice as last year and the ICES data-limited approach will be implemented in 2013.

Other considerations

No reliable assessment can be presented. The main cause of this is lack of data (e.g. age, effort, and cpue data for countries that take the majority of landings). Therefore, fishing possibilities cannot be projected.

Precautionary considerations

The available survey information indicates stable abundance in recent years at a high level. There is no information on the stock identity of this species. Landings data show a declining long-term trend. Effort for the main fleet with lemon sole bycatches (otter trawls) in the North Sea and Skagerrak has declined 23% between 2003 and 2009. Based on these considerations ICES advises that catches should not increase.

STECF COMMENTS: STECF agrees with the ICES assessment that the state of the stock is unknown and with the advice for 2012 and 2013.

STECF considers that since advice for both witch and lemon sole is now available from ICES it may be appropriate to adopt separate management measures to regulate exploitation of these stocks.

STECF notes that the advice is given for lemon sole in IIIa, IV and VIId. There is no TAC set for lemon sole in IIIa and VIId. As around 90% of the lemon sole is caught in the North Sea, STECF consider the advice is appropriate for the North Sea alone.

2.15. Megrin (*Lepidorhombus whiffiagonis*.) in IIa (EU zone), North Sea

Megrin in IIa and IV are assessed together with megrim in Subarea Vb (EU Zone), VI, XII and XIV. The stock summary and advice is given in Section 3.12.

2.16. Plaice (*Pleuronectes platessa*) in Kattegat and Skagerrak (Division IIIa)

ICES has revised the stock definition for plaice in the Kattegat and the Skagerrak. Plaice in the Skagerrak is now assessed as a separate stock while plaice in the Kattegat is assessed together with plaice in subdivisions 24 to 32 and one in the Kattegat and subdivisions 22 and 23.

STECFs review of ICES advice for Kattegat and subdivisions 22 and 23 is given in section 4.7.1 of the STECF review of advice for 2013 Part 1 on stocks in the Baltic Sea.

2.16.1. Plaice in the Skagerrak

FISHERIES: Plaice is caught all year round with predominance from spring to autumn. The plaice catches in this area are taken in fisheries using seine, trawl and gill nets targeting mixed species for human consumption. Plaice is an important by-catch in a mixed cod-plaice fishery. Denmark and Sweden and Norway account for the majority of the landings while only minor landings are taken the German and, occasionally, vessels from Belgium and the Netherlands. Since the late seventies landings fluctuated between 6000 and 14 000 t. Landings in 2009, 2010 and 2011 are estimated to be 6 000 t, 9 200 t and 8 300 respectively.

SOURCE OF MANAGEMENT ADVICE: The main management advisory body is ICES. The assessment is an age-based analytical assessment of the Skagerrak and North Sea combined and is based on an updated version of indices of local adult aggregation during spawning as a monitoring of local abundance.



MANAGEMENT AGREEMENT: There are no specific management agreements for plaice in the Skagerrak.

REFERENCE POINTS:

No reference points have been defined.

STOCK STATUS:

F (Fishing Mortality)		
2009–2011		
MSY (F_{MSY})	?	Unknown
Precautionary approach (F_{pa}, F_{lim})	?	Unknown

SSB (Spawning-Stock Biomass)		
2007–2011		
MSY ($B_{trigger}$)	?	Unknown
Precautionary approach (B_{pa}, B_{lim})	?	Unknown
Qualitative evaluation	West  East 	West: increasing East: decreasing at historical low

Plaice in Skagerrak is considered to have two components: Eastern and Western, the latter of which is closely related to the North Sea stock. Catches in the Western component normally constitute at least 90–95% of the total catches. A combined assessment of the Skagerrak with the North Sea stock show an upward scaling of the total biomass by about 15%. The two local components in the Skagerrak show different trends in spawning-stock biomass. The average of the SSB index in the last two years (2010–2011) compared to the average of the three previous years (2007–2009) indicates a 17% increase in the Western and a 70% decrease in the Eastern component. The Eastern component index is around the lowest in the time-series. Fishing mortality is unknown, but effort has reduced.

RECENT MANAGEMENT ADVICE:

This is the first time ICES advises on plaice in Skagerrak separately. Plaice in Skagerrak is considered to be closely associated with plaice in the North Sea, although local components are present in the area. Based on the ICES approach for data-limited stocks, ICES advises that catches should be no more than 9000 tonnes. In the depleted Eastern Skagerrak, no directed fisheries should occur and bycatch and discards should be minimized.

This is the first year ICES is providing quantitative advice for data-limited stocks.

Other considerations

No analytical assessment is available for the Skagerrak alone. Therefore, detailed management options cannot be presented.

ICES approach to data-limited stocks

For data-limited stocks for which an abundance index is available, ICES uses as harvest control rule an index-adjusted *status quo* catch. The advice is based on a comparison of the two most recent index values with the three preceding values, combined with recent catch or landings data. Knowledge about the exploitation status also influences the advised catch.

A spatially-disaggregated abundance index from IBTS Quarter 1 is used as the basis of advice. This index measures the density of adult aggregation during spawning and is used as an indicator of abundance of local components outside of migration periods.

For this stock the abundance is estimated to have locally increased in the Western component by 17% in 2007–2009 (average of the three years) and 2010–2011 (average of the two years). Considering that effort has decreased recently, no additional reductions to reduce exploitation rate are deemed necessary in this area. Because this component is closely related to the plaice stock in the North Sea, catches could follow the advice for the North Sea stock.

However, in the Eastern component abundance is deemed to have decreased by 70% in 2007–2009 (average of the three years) and 2010–2011 (average of the two years) and the component is considered depleted. Catches in the area are low, but exploitation rate may be high due to the reduced stock status.

On these considerations, ICES advises that catches in Skagerrak could increase by 15% compared to the recent average catch of the last 3 years, corresponding to catches of no more than 9000 t. In the depleted Eastern Skagerrak, no directed fisheries should occur and bycatch and discards should be minimized.

STECF COMMENTS: STECF agrees with the ICES assessment of the state of the stock and the advice for the Eastern Skagerrak that no directed fisheries should occur and bycatch and discards should be minimized. STECF advises that this advice should be interpreted to mean that in 2013, catches of plaice from the Eastern Skagerrak should be reduced to the lowest possible level.

The value of 9000 t advised by ICES for Skagerrak represents a increase of 15% on the average reported landings over the period 2009-2011. STECF therefore considers it more appropriate to express the advice for 2013 in terms of landings instead of catches. Adopting such an approach implies landings of plaice from the Skagerrak of no more than 9000 t in 2013.

STECF notes that fisheries for plaice in Division IIIa are linked to those exploiting sole and that this linkage should be taken into account when implementing management rules for either stock.

With regards to the introduction of a discard ban in the Skagerrak STECF notes that a discard ban on plaice will first enter into force in 2015.

2.16.2. Plaice in the Kattegat

The advised landings of plaice in 2013 for Kattegat and subdivisions 22 and 23 is as outlined in sections 4.7.1 1,800 tonnes.

The predicted landings in the Kattegat under the above advised scenarios depends on the distribution of the landings between the Kattegat and subdivisions 22 and 23. The relative proportion of landings from subdivisions 22 and 23 has shown an increasing trend over the latest teen years as shown in the table below. Assuming 25% of the landings in 2013 to be taken in the Kattegat will give a predicted landing of plaice in 2013 in the Kattegat of 450 tonnes.

Year	Landings in tonnes		Relative distribution of landings by area	
	Kattegat	sd 22 and 23	Kattegat	sd 22 and 23
2002	2030	1847	52%	48%
2003	2296	1085	68%	32%
2004	1609	1006	62%	38%
2005	1251	1139	52%	48%
2006	1550	851	65%	35%
2007	1380	1219	53%	47%
2008	1008	1003	50%	50%
2009	659	1008	40%	60%
2010	497	1043	32%	68%
2011	368	1218	23%	77%

2.17. Plaice (*Pleuronectes platessa*) in Subarea IV (North Sea)

FISHERIES: North Sea plaice is taken mainly in a mixed flatfish fishery by beam trawlers in the southern and south eastern North Sea with a minimum mesh size of 80 mm. This mesh size catches plaice under the minimum landing size of 27 cm, which induces high discard rates (in the range of 50% by weight). Directed fisheries are also carried out with seine and gill net, and by beam trawlers in the central North Sea with a minimum mesh size of 100 - 120 mm depending on area. Fleets involved in this fishery are the Netherlands, UK, Belgium, Denmark, France, Germany and Norway. Landings fluctuated between 70 000 and 170 000 t (1987-2002) and are predominantly taken by EU fleets. The 2003, 2004, 2005, 2006 and 2007 landings of 66 500 t, 61 400t 55 700 t, 57 900 t and 49 700 t respectively were the lowest recorded since 1957. Landings in 2008 reached a record low of 48 900 t. The 2011 landings are 67 400 t.

The combination of days-at-sea regulations, high oil prices, and the decreasing TAC for plaice and the relatively stable TAC for sole, appear to have induced a more southern fishing pattern in the North Sea. This concentration of fishing effort results in increased discarding of juvenile plaice that are mainly distributed in those areas. This process could be aggravated by movement of juvenile plaice to deeper waters in recent years where they become more susceptible to the fishery. Also the lpue data show a slower recovery of stock size in the southern regions that may be caused by higher fishing effort in the more coastal regions.

SOURCE OF MANAGEMENT ADVICE: The main management advisory body is ICES. The advice is based on an age-based assessment using landings and discards, calibrated with three survey indices.

MANAGEMENT AGREEMENTS: The management agreement (1999), previously agreed between the EU and Norway was not renewed for 2005 and since that year has not been in force. A multiannual plan for

fisheries exploiting stocks of plaice and sole in the North Sea was established on 11 June 2007 (Council Regulation (EC) No 676/2007). This plan has two stages. The first stage aims at an annual reduction of fishing mortality by 10% in relation to the fishing mortality estimated for the preceding year, with a maximum change in TAC of +or- 15% until the precautionary reference points are reached for both plaice and sole in two successive years. ICES has interpreted the F for the preceding year as the estimate of F for the year in which the assessment is carried out. The basis for this F estimate in the preceding year will be a constant application of the procedure used by ICES in 2007. In the second stage, the management plan aims for exploitation at $F = 0.3$.

ICES has evaluated this management plan and considers it precautionary.

REFERENCE POINTS:

	<i>Type</i>	<i>Value</i>	<i>Technical basis</i>
Management Plan	SSB_{MP}	230 000 t	Stage one: Article 2.
	F_{MP}	0.6 0.3	Stage one: Article 2; Stage two: Article 4.
MSY Approach	MSY $B_{trigger}$	230 000 t	Default to value of B_{pa} .
	F_{MSY}	0.25	Simulation studies and equilibrium analyses taking into account a number of possible stock–recruitment relationships (range of 0.2–0.3).
Precautionary approach	B_{lim}	160 000 t	$B_{loss} = 160\ 000$ t, the lowest observed biomass in 1997 as assessed in 2004.
	B_{pa}	230 000 t	Approximately 1.4 B_{lim} .
	F_{lim}	0.74	F_{loss} for ages 2–6.
	F_{pa}	0.60	5th percentile of F_{loss} (0.6) and implies that $B_{eq} > B_{pa}^{1)}$ and a 50% probability that $SSB_{MT} \sim B_{pa}$.

STOCK STATUS:

F (Fishing Mortality)				
	2009	2010	2011	
MSY (F_{MSY})	✓	✓	✓	Appropriate
Precautionary approach (F_{pa}, F_{lim})	✓	✓	✓	Harvested sustainably
Management plan (F_{MP})	✓	✓	✓	Below target

SSB (Spawning-Stock Biomass)				
	2010	2011	2012	
MSY ($B_{trigger}$)	✓	✓	✓	Above trigger
Precautionary approach (B_{pa}, B_{lim})	✓	✓	✓	Full reproductive capacity

Management plan (SSB_{MP})	✓	✓	✓	Above target
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The stock is well within precautionary boundaries, and has reached its highest levels in recorded history. Recruitment has been at the long-term average from 2007 onwards. Fishing mortality is estimated to be at the historic low.

RECENT MANAGEMENT ADVICE:

ICES advises on the basis of the EU management plan (Council Regulation No. 676/2007) that landings of plaice in Subarea IV in 2013 should be no more than 97 070 t. The implementation of stage two of the plan (as stipulated in article 5 of the EC regulation) is not yet defined.

Other considerations

Following the EU multiannual plan would imply a TAC of 97 070 t ($F=0.27$) for Subarea IV in 2013, which is a 15% increase in comparison to 2012, complying to the constraint of 15% TAC change of the plan. This is expected to lead to an SSB of 665 000 t in 2014. ICES has evaluated this management plan and considers it to be precautionary. Both the North Sea plaice and sole stocks have been within safe biological limits in the last two years. According to the management plan (Article 3.2), this signals the end of stage one. Application of the plan is on the basis of transitional arrangements until an evaluation of the plan has been conducted (as stipulated in article 5 of the EC regulation)

MSY approach

Following the ICES MSY framework implies an increase in fishing mortality to 0.25, resulting in landings of 90 000 t of plaice in Subarea IV in 2013. This is expected to lead to an SSB of 677 000 t in 2014.

Given that the current (2011) estimate of fishing mortality is only slightly below F_{MSY} there is no need to follow a transition scheme towards this reference value.

Precautionary approach

The fishing mortality in 2012 should be no more than F_{pa} (0.6) corresponding to landings of less than 189 000 t of plaice in Subarea IV in 2013. This is expected to keep SSB above B_{pa} in 2014.

Mixed fisheries

In 2012, ICES puts forward mixed fisheries advice for the first time. In contrast to single species advice there is no single recommendation but a range of plausible options, assuming fishing patterns and catchability in 2012 and 2013 similar to those in 2011. Major differences between the outcomes of the various scenarios indicate potential unbalance between single-species fishing opportunities. The consequences of this unbalance in terms of changes in fleet dynamics cannot be ascertained.

Cod is the limiting species for the North Sea demersal fisheries in 2013. Following the 'cod' scenario (full implementation of the cod management plan), the plaice management plan catch options could not be fully utilised.

Rationale	Landings (2013) ³⁾	Basis	F(2-6) total (2013)	F(2-6) HC (2013)	F(2-3) Disc (2013)	Disc (2013)	Catch (2013)	SSB (2014)	% SSB change ¹⁾	%TAC change ²⁾
Management plan	97.070	TAC + 15%	0.27	0.14	0.26	53	151	665	6	15
<i>Mixed fisheries options – minor differences with calculation above can occur due to different methodology used</i>										
Maximum	121	A	0.38	NA	NA	NA	NA	575	-9	44
Minimum	49	B	0.12	NA	NA	NA	NA	785	25	-42
Cod_MP	52	C	0.14	NA	NA	NA	NA	724	15	-38
SQ effort	94	D	0.28	NA	NA	NA	NA	639	2	12

<i>Effort_Mgt</i>	68	E	0.18	NA	NA	NA	NA	716	15	-19
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Weights in '000 t.

¹⁾ SSB 2014 relative to SSB 2013.

²⁾ Landings 2013 relative to TAC 2012.

³⁾ Landings of plaice in Subarea IV, calculated as the projected total stock landings less the stock landings that occur in Division VIIId. The subtracted value (620 t) is estimated based on the plaice catch advice for Division VIIId for 2013, using the recent 3-year average (2009-2011) proportion of the Subarea IV plaice stock in the annual plaice landings in Division VIIId.

Mixed Fisheries assumptions:

- A. Maximum scenario: Fleets stop fishing when last quota exhausted
- B. Minimum scenario: Fleets stop fishing when first quota exhausted
- C. Cod management plan scenario: Fleets stop fishing when cod quota exhausted
- D. SQ effort scenario: Effort in 2012 and 2013 as in 2011
- E. Effort management scenario: Effort reductions according to cod and flatfish management plans

The starting assumptions (interim year choices) differ between scenarios so that catches and F's in 2013 are not necessarily comparable between different options and the original management option table.

STECF COMMENTS:

STECF agrees with the ICES assessment of the state of the stock and the advice for 2013.

STECF notes that the predicted change in SSB is more optimistic for the cod management plan mixed fisheries scenario (cod MP) than for the single species advice.

STECF notes that in this year's assessment of plaice in the North Sea, ICES has included information on the VIIId plaice stock, but the connection between North Sea and Skagerrak is only explored in the Skagerrak advice.

STECF notes that there are more northerly areas of the North Sea where concentrations of plaice are much higher than sole. North of 56°N (Council Reg. 2056/2001) the mandatory 120mm mesh nets will catch plaice with negligible sole catches. A fishery to take plaice independently of sole is therefore possible in these more northerly areas of the North Sea.

2.18. Plaice (*Pleuronectes platessa*) in Division VIIId (Eastern English Channel)

FISHERIES: Countries involved in this fishery are Belgium, France and the UK. Plaice is mainly caught in 80 mm beam-trawl (Belgian and English) fisheries for sole or in mixed demersal fisheries using otter trawls (mainly French). There is also a directed fishery during parts of the year by inshore trawlers and netters. Fisheries operating on the spawning aggregation in the beginning of the year catch plaice that originate from the North Sea, Divisions VIIId and VIIe components. Since the 80 mm mesh size does not match the minimum landing size for plaice (27 cm), a large number of undersized plaice are discarded, but no discard time-series is available yet. Landings fluctuated between 2,000 and 10,000 t (1976-2007). Landings fluctuated hardly in the last decennia but declined slightly from 5,800 t in 2002 to 3,500 t in 2011.

SOURCE OF MANAGEMENT ADVICE: The main management advisory body is ICES. The advice is based on an age-based assessment using commercial and survey data.

MANAGEMENT AGREEMENT: There are no specific management agreements for plaice in the Eastern Channel.

REFERENCE POINTS:

	<i>Type</i>	<i>Value</i>	<i>Technical basis</i>
MSY	MSY B _{trigger}	Undefined.	
Approach	F _{MSY}	0.23	Simulation studies and equilibrium analyses taking into account a number of possible stock–recruitment relationships


			and in line with the other plaice stocks
Precautionary approach	Not defined		

(unchanged since: 2012)

STOCK STATUS:

F (Fishing Mortality)		
2009-2011		
MSY (F_{MSY})	?	Unknown
Precautionary approach (F_{pa}, F_{lim})	?	Unknown

Qualitative evaluation		Lowest in time series
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SSB (Spawning-Stock Biomass)		
2008-2012		
MSY ($B_{trigger}$)	?	Unknown
Precautionary approach (B_{pa}, B_{lim})	?	Unknown
Qualitative evaluation		increasing

Fishing mortality has declined since the mid-1990s and is presently among the lowest in the time-series. Spawning-stock biomass declined from the 1990s to a record low (2003–2008) and has subsequently increased since. The two most recent estimates of recruitment are set to the geometric mean (1999–2009) because of poor reliability of the model fit.

RECENT MANAGEMENT ADVICE:

Based on the ICES approach for data limited stocks, ICES advises that catches of plaice in Division VIId should be no more than 4300 t, and discarding should be reduced.

This is the first year that ICES is providing quantitative advice for data limited stocks.

Other considerations

Due to uncertainty in the stock assessment, which is only considered indicative of stock trends, reliable predictions cannot be presented.

ICES approach to data limited stocks

For data limited stocks with abundance and fishing mortality information, ICES uses as harvest control rule an index-adjusted status-quo catch, further modified so as to reach the FMSY proxy in 2015. The advice is based on a comparison of the two most recent index values with the three preceding values, combined with recent catch or landings data, and subsequently multiplied by the appropriate ratio of values of F.

For this stock, the abundance is estimated to have increased by 74% between 2008-2010 (average of the three years) and 2011-2012 (average of the two years), whereas the current fishing mortality should be reduced by 29% in 2013 as a first step to reach the FMSY proxy by 2015. Since the product of 1.74 and 0.71 is larger than

1.2, this implies an increase of catches of at most 20% in relation to last three years average landings, corresponding to catches of no more than 4300 t.

STECF COMMENTS:

STECF agrees with the ICES assessment of the state of the stock and the advice for 2013.

STECF notes that ICES has set an F_{MSY} value based on simulation studies and equilibrium analyses taking into account a number of possible stock-recruitment relationships and in line with other plaice stocks.

STECF notes that the stock is advised for ICES Division VIId but is managed for ICES Divisions VIId and VIIe combined.

STECF reiterates its previous comment that due to the minimum mesh size (80 mm) in the mixed beam trawl fishery, a large number of undersized plaice are discarded. Discard estimates are not included in the assessment. The 80-mm mesh size is not matched to the minimum landing size of plaice (27 cm). Measures taken specifically directed at sole fisheries will also impact the plaice fisheries.

2.19. Sole (*Solea solea*) in Division IIIa

FISHERIES: The fishery is mainly conducted by Denmark, with smaller landings taken by Germany and Sweden. Significant amounts of sole are taken as by-catch in the fishery for *Nephrops*. Landings fluctuated between 200 t and 1,400 t (1971-2007). In 2009, 2010 and 2011 landings were 640 t, 538 t and 551 t respectively.

SOURCE OF MANAGEMENT ADVICE: The management advisory body is ICES. The advice is based on an age-based assessment using cpue data from three commercial tuning series (reference fleets) and one scientific survey series. During the period 2002–2004 there was considerable misreporting due to limiting TACs and weekly quota, which were included in the assessment. Since mid-2005, the increase in TAC and improved control are believed to have resulted in insignificant misreporting.

REFERENCE POINTS:

	<i>Type</i>	<i>Value</i>	<i>Technical basis</i>
MSY	$MSY B_{trigger}$	2000 t	lowest observed SSB excluding 1984–1985 low SSB's (ICES, 2010).
Approach	F_{MSY}	0.38	Provisional value based on Stochastic simulations. F associated with highest yield and low prob. of $SSB < B_{trigger}$ (ICES, 2010).
Precautionary	B_{lim}	Undefined.	
	B_{pa}	Undefined.	
Approach	F_{lim}	0.47	$F_{med 98}$ excluding the abnormal years around 1990.
	F_{pa}	0.30	Consistent with F_{lim} .

STOCK STATUS:

	F (Fishing Mortality)			
	2009	2010	2011	
MSY (F_{MSY})				At target
Precautionary approach (F_{pa}, F_{lim})				Increased risk

SSB (Spawning-Stock Biomass)			
	2010	2011	2012
MSY ($B_{trigger}$)	✘	✘	✘ Below trigger
Precautionary approach (B_{pa}, B_{lim})	?	?	Undefined

SSB has decreased from 2005, and has fluctuated around MSY $B_{trigger}$ since 2007 and is now below MSY $B_{trigger}$. Fishing mortality has been around F_{MSY} since 2005. The last strong year-class was in 2000 and since then recruitment has been slightly above the long-term average.

RECENT MANAGEMENT ADVICE:

ICES advises on the basis of the MSY approach that landings in 2013 should be no more than 560 tonnes.

STECF COMMENTS:

STECF agrees with the ICES assessment of the state of the stock and the advice for 2013.

STECF notes that based on recent simulations (WKFLAT 2010), F_{msy} is higher than F_{pa} . STECF therefore concludes that the F_{pa} value of 0.3 established in 1999 is inappropriate and needs to be revised to reflect more recent information on the stock.

With regards to the introduction of a discard ban in the Skagerrak STECF notes that a discard ban on plaice will first enter into force in 2015.

2.20. Sole (*Solea solea*) in Sub-area IV (North Sea)

FISHERIES: Sole is mainly taken by beam trawl fleets in a mixed fishery for sole and plaice in the southern part of the North Sea. A relatively small part of the catch is taken in a directed fishery by gill-netters in coastal areas, mostly in the 2nd quarter of the year. The stock is exploited predominantly by The Netherlands with smaller landings taken by Belgium, Denmark, France, Germany and the UK. Landings have fluctuated between 11,000 and 35 000 t (1957-2007). The landings in 2009, 2010 and 2011 are around 14 000 t, 12 600 t and 11 500 t.

SOURCE OF MANAGEMENT ADVICE: The main management advisory body is ICES. The advice is based on an age-based assessment using one commercial index and two survey indices.

REFERENCE POINTS:

	<i>Type</i>	<i>Value</i>	<i>Technical basis</i>
Management	SSB_{MP}	35 000 t	Stage one: Article 2.
Plan	F_{MP}	0.4	Stage one: Article 2;
		0.2	Stage two: Article 4.
MSY Approach	MSY $B_{trigger}$	35 000 t	Default to value of B_{pa} .
	F_{MSY}	0.22	Median of stochastic MSY analysis assuming Ricker Stock-Recruit relationship (range of 0.2-0.25).
Precautionary	B_{lim}	25 000 t	B_{loss}
	B_{pa}	35 000 t	$B_{pa}1.4*B_{lim}$

Approach	F_{lim}	Not defined.	
	F_{pa}	0.4	$F_{pa} = 0.4$ implies $B_{eq} > B_{pa}$ and $P(SSB < B_{pa}) < 10\%$

MANAGEMENT AGREEMENTS: A multiannual plan for fisheries exploiting stocks of plaice and sole in the North Sea was established on 11 June 2007 (Council Regulation (EC) No 676/2007). This plan has two stages. The first stage aims at an annual reduction of fishing mortality by 10% in relation to the fishing mortality estimated for the preceding year, with a maximum change in TAC of +or- 15% until the precautionary reference points are reached for both plaice and sole in two successive years. ICES has interpreted the F for the preceding year as the estimate of F for the year in which the assessment is carried out. The basis for this F estimate in the preceding year will be a constant application of the procedure used by ICES in 2007. In the second stage, the management plan aims for exploitation at $F = 0.2$.

ICES has evaluated the agreed long-term management plan (Council Regulation (EC) No. 676/2007) and concluded that it leads on average to a low risk of $B < B_{lim}$ within the next 10 years. ICES conclude that for sole the management plan can be provisionally accepted as precautionary.

STOCK STATUS:

F (Fishing Mortality)				
	2009	2010	2011	
MSY (F_{MSY})	✗	✗	✗	Above target
Precautionary approach (F_{pa}, F_{lim})	✓	✓	✓	Harvested sustainably
Management plan (F_{MP})	✓	✓	✓	Below target

SSB (Spawning-Stock Biomass)				
	2010	2011	2012	
MSY ($B_{trigger}$)	✗	✓	✓	Above trigger
Precautionary approach (B_{pa}, B_{lim})	⦿	✓	✓	Full reproductive capacity
Management plan (SSB_{MP})	✗	✓	✓	Above target

RECENT MANAGEMENT ADVICE:

ICES advises on the basis of the EU management plan (Council Regulation No. 676/2007) that landings in 2013 should be no more than 14 000 tonnes. ICES notes that the advice is based on stage one of the plan. The implementation of stage two of the plan (as stipulated in article 5 of the EC regulation) is not yet defined.

Other considerations

Management plan

Following the EU multiannual plan would imply a 10% reduction of F to 0.27, resulting in a TAC of 14 000 t in 2013 (an exact 15% reduction in comparison to 2012, without applying the 15% TAC change bounds of the plan) and implying a 10% reduction in fishing effort. This is expected to lead to an SSB of 49 000 t in 2014. ICES has evaluated this management plan and considers it to be precautionary. Both the North Sea plaice and

sole stocks have been within safe biological limits in the last two years. According to the management plan (Article 3.2), this signals the end of stage one. Application of the plan is on the basis of transitional arrangements until an evaluation of the plan has been conducted (as stipulated in article 5 of the EC regulation)

MSY approach

Following the ICES MSY framework implies fishing mortality to be reduced to 0.22 (F_{MSY} , as $SSB_{2012} > MSY B_{trigger}$), resulting in landings of less than 12 000 t in 2013. This is expected to lead to an SSB of 51 000 t in 2014.

Following the transition scheme towards the ICES MSY framework implies fishing mortality to be reduced to 0.27 ($((0.36 * 0.4) + (0.22 * 0.6))$), which will result in landings of less than 14 000 t in 2013. This is expected to lead to an SSB of 48 000 t in 2014.

Precautionary approach

The precautionary F_{pa} for North Sea sole is 0.4. This would lead to landings of 19 000 t in 2013 and an SSB of 41 000 t in 2014.

Mixed fisheries

In 2012, ICES puts forward mixed fisheries advice for the first time. In contrast to single species advice there is no single recommendation but a range of plausible options, assuming fishing patterns and catchability in 2012 and 2013 similar to those in 2011. Major differences between the outcomes of the various scenarios indicate potential unbalance between single-species fishing opportunities. The consequences of this unbalance in terms of changes in fleet dynamics cannot be ascertained.

Cod is the limiting species for the North Sea demersal fisheries in 2013. Following the ‘cod’ scenario (full implementation of the cod management plan), the plaice management plan catch options could not be fully utilised.

Rationale	Human Consumption landings (2013)	Basis	F Total (2013)	SSB (2014)	%SSB change¹	%TAC change²
Single Species Management plan	14	F = 0.27 (10% reduction)	0.27	49	4 %	-15 %
<i>Maximum</i>	19	A	0.42	42	-11%	+20%
<i>Minimum</i>	7.9	B	0.13	60	+27%	-51%
<i>Cod_MP</i>	8.6	C	0.15	56	+18%	-47%
<i>SQ effort</i>	15	D	0.30	47	+1%	-6%
<i>Effort_Mgt</i>	13	E	0.24	52	+10%	-21%

Weights in ‘000 t.

¹⁾ SSB 2014 relative to SSB 2013.

²⁾ Landings 2013 relative to TAC 2012.

Mixed Fisheries assumptions:

- A. Maximum scenario: Fleets stop fishing when last quota exhausted
- B. Minimum scenario: Fleets stop fishing when first quota exhausted
- C. Cod management plan scenario: Fleets stop fishing when cod quota exhausted
- D. SQ effort scenario: Effort in 2012 and 2013 as in 2011

E. Effort management scenario: Effort reductions according to cod and flatfish management plans

The starting assumptions (interim year choices) differ between scenarios so that catches and F 's in 2013 are not necessarily comparable between different options and the original management option table.

STECF COMMENTS: STECF agrees with the ICES assessment of the state of the stock and the advice for 2013.

STECF notes that the predicted change in SSB is more optimistic for the cod management plan mixed fisheries scenario (cod MP) than for the single species advice.

2.21. Sole (*Solea solea*) in Division VIId (Eastern English Channel)







FISHERIES: The main fleets, fishing for sole in Division VIId, are Belgian and English offshore beam trawlers (> 300 HP), which also take plaice as a by-catch. These fleets also operate in other management areas. French offshore trawlers targeting roundfish also take sole as a by-catch. Also numerous inshore < 10 m boats on the English and French coasts target sole in the spring and autumn mainly using fixed nets. Between 1986–1997, the total landings have been fluctuating around 4,500t. In 1998 the lowest landings were observed (3,400t), since 2000 the landings have increased to 5,000t in 2003 and fluctuated around that high value for the next 10 years. Landings in 2012 were 4,331 t.

SOURCE OF MANAGEMENT ADVICE: The main management advisory body is ICES. Although corrected for, the analytical assessments, using catch-at-age and CPUE data from commercial fleets and surveys are considered uncertain due to under-reporting from the inshore fleet and mis-reporting by beam trawlers.

REFERENCE POINTS:

	<i>Type</i>	<i>Value</i>	<i>Technical basis</i>
MSY	MSY B_{trigger}	8000 t	B_{pa}
Approach	F_{MSY}	0.29	Stochastic simulations assuming a smooth hockey-stick relationship.
Precautionary approach	B_{lim}	Not defined.	Poor biological basis for definition.
	B_{pa}	8000 t	This is the lowest observed biomass at which there is no indication of impaired recruitment. Smoothed B_{loss} .
	F_{lim}	0.55	F_{loss} , but poorly defined; analogy to North Sea and setting of 1.4 $F_{\text{pa}} = 0.55$. This is a fishing mortality at or above which the stock has shown continued decline.
	F_{pa}	0.4	Between F_{med} and 5th percentile of F_{loss} ; $SSB > B_{\text{pa}}$ and probability ($SSB_{\text{mt}} < B_{\text{pa}}$), 10%: 0.4.

STOCK STATUS:

	F (Fishing Mortality)			
	2009	2010	2011	
MSY (F_{MSY})				Above target
Precautionary approach ($F_{\text{pa}}, F_{\text{lim}}$)				Increased risk

SSB (Spawning-Stock Biomass)			
	2010	2011	2012
MSY ($B_{trigger}$)	✓	✓	✓ Above trigger
Precautionary approach (B_{pa}, B_{lim})	✓	✓	✓ Full reproductive capacity

The spawning-stock biomass has increased since 2002 and is above MSY $B_{trigger}$. Since 2005, fishing mortality has been above F_{pa} . Recent recruitment has been above average.

RECENT MANAGEMENT ADVICE:

ICES advises on the basis of the transition to the MSY approach that landings in 2013 should be no more than 5900 tonnes.

Other considerations

MSY approach

Following the ICES MSY framework implies fishing mortality to be reduced to 0.29 resulting in landings of less than 4800 t in 2013. This is expected to lead to a record high SSB of 17 200 t in 2014.

Following the transition scheme towards the ICES MSY framework implies that $(F_{2010} * 0.4) + (0.6 * F_{MSY})$ is 0.37, resulting in landings of less than 5900 t in 2013. This is expected to lead to an SSB of 16 000 t in 2014.

PA approach

The fishing mortality in 2013 should be no more than F_{pa} , corresponding to landings of less than 6300 t in 2013. This is expected to keep SSB well above B_{pa} in 2014.

STECF COMMENTS: STECF agrees with the ICES assessment of the state of the stock and the advice for 2013.

2.22. Turbot (*Psetta maxima*) in the North Sea

FISHERIES: Turbot is a valuable bycatch in the fishery for flatfish and demersal species and takes place with beam trawls, otter trawl and static gear. There is a targeted gill net fishery that takes less than 10% of the total catch. Discarding in the trawl fisheries for turbot is low. No official minimum landing size has been set, but part of the fisheries adopted a voluntary minimum landing size of 30 cm. A reduction in fishing effort on target flatfish species such as plaice and sole may have influenced the level of bycatch.

Landings have fluctuated between 4000 t and 6 000 t until 1995. Since then they have stabilised at a level of 3 000t – 4000 t before dropping slightly below that level in 2010/11

REFERENCE POINTS:

No reference points have been defined.

STOCK STATUS:

F (Fishing Mortality)			
	2007 - 2009		
Qualitative evaluation	<table border="1"> <tr> <td>?</td> <td>Insufficient information</td> </tr> </table>	?	Insufficient information
?	Insufficient information		
TSB (Total Stock Biomass)			
	2007 – 2009		

Qualitative evaluation	→	Stable
------------------------	---	--------

A trends based assessment for turbot in the North Sea is presented, which is taken to represent the stock throughout the area. Landings have been stable since 1995, and fishing mortality has declined since 2002. Recruitment has shown an increase since 2000 and total stock biomass has been stable in that period.

RECENT MANAGEMENT ADVICE:

The 2011 advice for this stock is biennial and valid for 2012 and 2013 (see [ICES, 2011](#)). ICES advises on the basis of precautionary considerations that catches should not increase.

This is the same advice as last year and the ICES data-limited approach will be implemented in 2013.

Other considerations

No reliable assessment can be presented. The main cause of this is a lack of data. Therefore, fishing possibilities cannot be projected.

Precautionary considerations

The available information suggests that total stock biomass varies without trend, and fishing mortality has decreased recently. Effort for the main fleet with turbot bycatches (beam trawls) in the North Sea and Skagerrak has declined 40% between 2003 and 2009. Based on these considerations ICES advises that catches should not increase.

STECF COMMENTS: STECF agrees with the ICES assessment of the state of the stock and the advice for 2013.

STECF notes that the advice is given for turbot in Subarea IV and Division IIIa. However, as around 90% of the turbot is caught in the North Sea, STECF consider the advice is also appropriate for the North Sea.

STECF notes that turbot is mainly a bycatch species in fisheries for plaice and sole. TACs may not be appropriate as a management tool to control fishing mortality for bycatch species.

2.23. Witch (*Glyptocephalus cynoglossus*) in the North Sea

FISHERIES: Witch is caught both as a target species and by-catch in IIIa. In the North Sea it is mainly taken as by-catch. A few Danish seine fisheries have been targeting this species in IIa In 2011 recorded landings were around 1500 t.

A precautionary TAC (including lemon sole) in areas IIa and IV for 2011 was set to 6 391 t.



SOURCE OF MANAGEMENT ADVICE: The main management advisory body is ICES. Assessment data are available for this species, especially from the IIIa fisheries (Denmark and Sweden). However, these data are considered insufficient at present for assessment of this stock and ICES has not assessed this stock.

REFERENCE POINTS:

No reference points have been defined.

STOCK STATUS:

F (Fishing Mortality)

	2007–2009	
Qualitative evaluation		Insufficient information
TSB (Total Stock Biomass)		
	2007–2009	
Qualitative evaluation		Stable

The available survey information indicates a declining trend of abundance since 2000 and recent indices are low. There is no information on the stock identity of this species. Landing data show a decline over the same period.

RECENT MANAGEMENT ADVICE:

The 2011 advice for this stock is biennial and valid for 2012 and 2013 (see [ICES, 2011](#)). ICES advises on the basis of precautionary considerations that catches should be reduced.

Other considerations

No reliable assessment can be presented.

Precautionary considerations

The available survey information indicates a declining trend of abundance since 2000 and recent indices are low. There is no information on the stock identity of this species. Landing data show a decline over the same period. Based on these considerations ICES advises that catches should be reduced.

STECF COMMENTS: STECF agrees with the ICES assessment of the state of the stock and the advice for 2013.

STECF notes that a substantial proportion of the total catch of witch is taken as a bycatch in mixed fisheries. TACs may not be appropriate as a management tool to control fishing mortality for bycatch species.

2.24. Norway pout (*Trisopterus esmarki*) in IIa, IIIa and the North Sea

The most recent advice for this stock was provided by ICES in 2011. Hence, the following text remains unchanged from the Consolidated STECF Review of Advice for 2012. Advice for 2013 will be provided in Part 3 of the STECF review of Advice for 2013 which will be available in November 2012.

FISHERIES: The fishery is mainly by Danish and Norwegian vessels using small mesh trawls in the northern North Sea.

The stock is managed by TACs. Landings fluctuated between 110,000 and 735,000 t. in the period 1971-1997, and apart from 2000 (184,000 t) decreased substantially in the following years. The fishery was closed in 2005, reopened in 2006 and closed again in 2007. Landings in 2008 and 2009 were 36,100 t and 54,500 t respectively. Due to the very high 2009 recruitment landings in 2010 amounted to 125,955 t. The fishery was again closed in the first half of 2011. Historically, the fisheries have resulted in bycatches of other species, particularly whiting, haddock, saithe, and herring. Bycatches of these species have been low in the recent decade

SOURCE OF MANAGEMENT ADVICE: The main management advisory body is ICES. The analytical seasonal XSA assessment model fitted for this stock is based on time-series of catch-at-age, four quarterly commercial cpue series, and four research survey series.

The stock is assessed twice a year. The spring assessment provides stock status up to 1st of April of the current year. The autumn assessment provides stock status for the current year and a forecast of fishing possibilities in the next year.

MANAGEMENT OBJECTIVES: No specific management objectives are known to ICES for this stock. Due to the short-lived nature of this species a preliminary TAC is set every year, which is updated on the basis of advice in the first half of the year (using the escapement management strategy approach)..

REFERENCE POINTS:

	Type	Value	Technical basis
MSY Approach	MSY $B_{\text{escapement}}$	150 000 t	= B_{pa}
	F_{msy}	Undefined	None advised
Precautionary approach	B_{lim}	90 000 t	$B_{\text{lim}} = B_{\text{loss}}$, the lowest observed biomass in the 1980s
	B_{pa}	150 000 t	= $B_{\text{lim}} e^{0.3*1.65}$
	F_{lim}	Undefined	None advised
	F_{pa}	Undefined	None advised

STOCK STATUS:

F (Fishing Mortality)			
	2008	2009	2010
MSY (F_{MSY})	?	?	? Undefined
Precautionary approach ($F_{\text{pa}}, F_{\text{lim}}$)	?	?	? Undefined
Qualitative evaluation			Below average

SSB (Spawning-Stock Biomass)			
	2009	2010	2011
MSY (B_{trigger})			Above trigger
Precautionary approach ($B_{\text{pa}}, B_{\text{lim}}$)			Full reproductive capacity

The stock size has increased since 2004 and is above $MSY_{\text{Bescapement}}$. Recruitment was well above average in 2009, but very low in 2010 and 2011 and this is expected to bring SSB below the $MSY_{\text{Bescapement}}$ in 2012. Fishing mortality has been lower than the natural mortality for this stock and has decreased in recent years to well below the long-term average F ($F=0.6$). The status of the stock is mainly determined by natural processes and recruitment.

RECENT MANAGEMENT ADVICE:

ICES advises on the basis of the MSY approach that there should be no catches of Norway pout in 2012 according to the escapement strategy.

Additional considerations

Management plans

ICES has evaluated and commented on three management strategies, although these have not yet been decided on. When combining a fixed F-management-strategy (F around 0.35 in 2012) with a fixed TAC strategy (a TAC of 50 000 t in 2012) the SSB is expected to decline below B_{pa} and $MSY_{\text{Bescapement}}$ by 1 January 2013.

MSY approach

To maintain the spawning-stock biomass above a reference level of $MSY_{\text{Bescapement}}$ by 1 January 2013, no catch of Norway pout can be taken according to the MSY approach in 2012. This is because the SSB is expected to

fall below $MSY B_{escapement}$ due to the very low 2010 and 2011 recruitment and the high natural mortality of the stock.

PA approach

The PA approach (to maintain $SSB(2012)$ above $B_{pa} = MSY B_{escapement}$) is similar to the MSY approach for this species.

FISHING OPPORTUNITIES FOR 2012 according to COM(2011) 298-Final.

STECF notes that with reference to COM(2011) 298-final this stock is classified under category 2. The rules for category 2 prescribe that for 2012, no catch of Norway pout can be taken in IIa, IIIa and the North Sea in 2012.

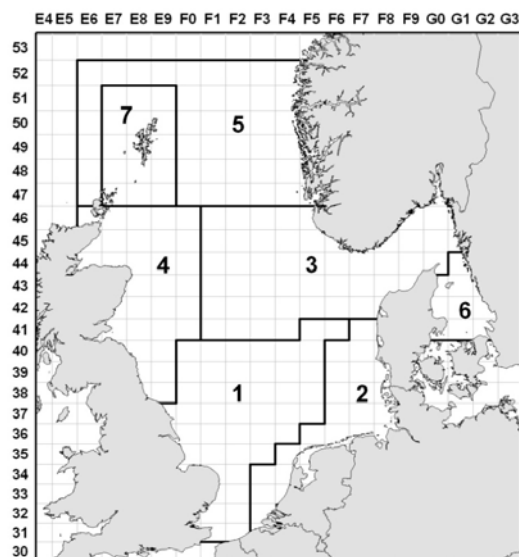
STECF COMMENTS:

STECF agrees with the ICES assessment of the state of the stock and the advice for 2012.

2.25. Sandeel (*Ammodytidae*) in the North Sea (IV), Skagerrak and Kattegat (IIIa)

Prior to 2010, ICES presented advice for this region in three units: North Sea (excluding the Shetland area), the Shetland area, and the Skagerrak–Kattegat. From 2010 onward, ICES advice has been provided for seven areas to better reflect the stock structure and to enable management to take action to avoid local depletions, as has been repeatedly advised in recent years. The amount of scientific and fisheries information differs by area and so does the level of detail for each area’s advice.

Section	Sandeel Area (SA)	Rectangles
2.25.1	1 Dogger Bank area	31-34 E9-F2; 35 E9- F3; 36 E9-F4; 37 E9-F5; 38-40 F0-F5; 41 F5-F6
2.25.2	2 South Eastern North Sea	31-34 F3-F4; 35 F4-F6; 36 F5-F8; 37-40 F6-F8; 41 F7-F8
2.25.3	3 Central Eastern North Sea	41 F1-F4; 42-43 F1-F9; 44 F1-G0; 45-46 F1-G1; 47 G0
2.25.4	4 Central Western North Sea	38-40 E7-E9; 41-46 E6-F0
2.25.5	5 Viking and Bergen Bank area	47-51 E6 + F0-F5; 52 E6-F5
2.25.6	6 Division IIIa East (Kattegat)	41-43 G0-G3; 44 G1
2.25.7	7 Shetland area	47-51 E7-E9



FISHERIES: Sandeel is taken by trawls with codend mesh sizes of less than 16 mm. The fishery is seasonal, taking place from April to July. Most of the catch consists of *Ammodytes marinus*, but other sandeel species are caught as well. By-catch of other species is low. Sandeels are largely stationary after settlement and the sandeel must be considered as a complex of local populations.

The stocks are exploited predominantly by Denmark and Norway, with minor landings taken by the UK, Sweden, Germany and the Faroes. Landings fluctuated between 550,000 t and 1,200,000 t in the period 1980 to 2002 with the highest catches observed in 1997. Catches dropped in 2003 and have since then been well below average reaching a minimum of 177,000 t in Dredge survey information for December has been available since 2010 and was used to estimate annual recruitment and conduct forecasts for SAs (Sandeel Area) 1, 2, and 3. A dredge survey is also available for SA 4, but at present there is not enough overlap with fishery data to provide a forecast. Trend-based advice is provided for the remaining three areas.

Catches in 2011 amount to 437,761 t. Catch possibilities are largely dependent on the size of the recruiting year-class.

SOURCE OF MANAGEMENT ADVICE: The main management advisory body is ICES. Analytical assessments are available for sandeel in Area 1-3. Catches in the remaining SAs have been less than 1% of the total since 2005, but were, on occasion, considerably higher in SA4 and SA5 before 2005.

The assessment of sandeel in SAs 1-3 is based on a seasonal age-based assessment using total commercial effort (SA 1 & 2) or catch and effort (SA 3) and fisheries independent data from dredge surveys.

In SA 4 a trends-based assessment is provided based on total international catch and effort data and a single survey index.

No assessment is available for SAs 5 – 7, however, catch statistics and acoustic data (SA 5 only) or trawl survey data (SA7 only) are used as indicators.

MANAGEMENT OBJECTIVES: No management objectives have been set for this stock nor are the Sandeel Areas managed jointly by the coastal states. Norway has implemented an experimental area-based sandeel management plan in the Norwegian waters since 2010, and regulations in Norwegian waters have differed from those in the EU waters.

RECENT MANAGEMENT ADVICE:

MSY reference points:

For sandeel, the ICES interpretation of the MSY concept uses B_{pa} estimates as the default value for MSY $B_{escapement}$. Advice is based upon the stock being at least MSY $B_{escapement}$ in the year after the advised fishery has taken place. The escapement strategy should allow for sufficient stock to remain for successful recruitment whilst providing adequate resource for predators of sandeel. ICES provides advice separately for the 7 areas.

In the light of studies linking low sandeel availability to poor breeding success of kittiwake, all commercial fishing in the Firth of Forth (SA 4) has been prohibited since 2000, except for a limited opening to fishing in May and June of each year to monitor the stock.

STECF COMMENTS:

STECF notes that the quality of the current assessment is considered much improved, because a) the stock assessment areas, used since 2010, better reflect the actual spatial stock structure and dynamics of sandeel, and b) the use of fishery-independent data from dredge surveys.

Application of the “SMS-effort” assessment model (in combination with the Sandeel Area-based assessment approach) has removed retrospective bias in F and SSB for the most recent years.

For all SAs covered by dredge surveys, the 2011 surveys confirmed the estimates of the 2010 year classes and indicated a similar situation concerning the 2011 year classes.

2.25.1. Sandeel (*Ammodytidae*) in Area-1 (The Dogger bank area).

Note: Following the provision of advice in March 2012, ICES reviewed the approach for real-time monitoring proposed by the Danish Ministry of Food, Agriculture and Fisheries and issued a further advice in May 2012. Following that review ICES considers that the approach is suitable for monitoring sandeel abundance in Sandeel Area 1, provided that the amount of fishery data collected is sufficient to deliver a reliable index of stock abundance.

REFERENCE POINTS:

	Type	Value	Technical basis
MSY Approach	MSY $B_{\text{escapement}}$	215 000 t	= B_{pa}
	F_{MSY}	Not defined	
Precautionary Approach	B_{lim}	160 000 t	Median SSB in the years (2000-2006) of lowest SSB and no impaired recruitment (WKSAN, 2010)
	B_{pa}	215 000 t	$B_{\text{pa}} = B_{\text{lim}} * \exp^{(\sigma * 1.645)}$ with $\sigma = 0.18$ estimated from assessment uncertainty in the terminal year (WKSAN, 2010)
	F_{lim}	Not defined	
	F_{pa}	Not defined	

MANAGEMENT AGREEMENTS: No specific management objectives are known to STECF.

STOCK STATUS:

F (Fishing Mortality)				
	2009	2010	2011	
MSY (F_{MSY})	?	?	?	Undefined
Precautionary approach (F_{pa} , F_{lim})	?	?	?	Undefined

SSB (Spawning-Stock Biomass)				
	2010	2011	2012	
MSY ($B_{\text{escapement}}$)	✓	✓	✓	Above escapement level
Precautionary approach (B_{pa} , B_{lim})	✓	✓	✓	Full reproductive capacity

(From March 2012 ICES advice) The stock, at the start of 2012, is expected to be at full reproductive capacity owing to the large recruitment in 2009. Fishing mortality decreased in 2005 from a high level and has since fluctuated without trend. Recruitment was very low in both 2010 and 2011, and the combined recruitment of these two years is the lowest combined value of any two consecutive years in the time-series.

RECENT MANAGEMENT ADVICE: `

Based on the updated assessment of SA 1, May 2012, ICES advises that no catches of sandeel should be taken in the North Sea Sandeel Area 1 in 2012.

Other considerations

Uncertainties in assessment and forecast

The dredge survey results are sufficiently robust to provide a reliable estimate of the incoming 1-group. Hence, fishing opportunities for 2012 can be established based on this information. The bad weather conditions during the 2011 survey and the very low recruitment value observed may indicate the relevancy of an analysis of real-time monitoring for 2012.

Management plans

A management plan needs to be developed. The ICES approach for MSY based management of a short-lived species as sandeel is an escapement strategy, i.e. to maintain SSB above MSY $B_{\text{escapement}}$ after the fishery has taken place. This does not include an upper limit on F. However, taking the historical F and stock development into account, an F value above 0.6 can probably not be recommended in any year. As effort is assumed proportional to F, a management plan could include an upper limit on effort estimated on the basis of the effort applied in recent years.

STECF COMMENTS: STECF agrees with the ICES assessment of the state of the stock and the advice for 2012.

2.25.2. Sandeel (*Ammodytidae*) in Area-2 (South Eastern North Sea)

REFERENCE POINTS:

	Type	Value	Technical basis
MSY	MSY $B_{\text{escapement}}$	100 000 t	= B_{pa}
Approach	F_{MSY}	Not defined	
Precautionary	B_{lim}	70 000 t	Median SSB in the years (2000-2006) of lowest SSB and no impaired recruitment (WKSAN, 2010)
	B_{pa}	100 000 t	$B_{\text{pa}} = B_{\text{lim}} * \exp^{(\sigma * 1.645)}$ with $\sigma = 0.23$ estimated from assessment uncertainty in the terminal year (WKSAN, 2010)
Approach	F_{lim}	Not defined	
	F_{pa}	Not defined	

MANAGEMENT AGREEMENTS: No specific management objectives are known to STECF.

STOCK STATUS:

F (Fishing Mortality)				
	2009	2010	2011	
MSY (F_{MSY})	?	?	?	Undefined
Precautionary approach (F_{pa} , F_{lim})	?	?	?	Undefined

SSB (Spawning-Stock Biomass)				
	2010	2011	2012	
MSY ($B_{\text{escapement}}$)	✘	✔	✘	Below escapement level
Precautionary approach (B_{pa} , B_{lim})	○	✔	○	Increased risk

Due to low values of F (~ 0.1) during 2007–2010 and the strong 2009 year class, SSB in 2011 is estimated around twice as high as B_{pa} . SSB in 2012 has dropped below B_{pa} again. Recruitment is very low in both 2010 and 2011.

RECENT MANAGEMENT ADVICE: ICES advises, on the basis of the MSY approach, that a fishery should only be allowed in 2012 if an analysis of real-time monitoring is available and indicates that the stock can be rebuilt to B_{pa} by 2013. Catches for monitoring purposes should not exceed 5,000 t.

Other considerations

MSY approach

Following the ICES MSY framework for a short-lived species, the fishery in 2012 should allow for sufficient stock (MSY Bescapement) to remain for successful recruitment. This implies a catch of 0 t in 2012 unless analysis of real-time monitoring is available and indicates that the stock can be rebuilt to B_{pa} by 2013. Catches for monitoring purposes should not exceed 5000 t.

In order to present an assessment, information on catch composition and catch per unit effort is required. The advice of a maximum of 5000 t in monitoring fisheries should provide sufficient samples and, thus, reliable estimates. This catch would result in a SSB of 94% of B_{lim} in 2013 (as opposed to 99% of B_{lim} with 0 catch).

Uncertainties in assessment and forecast

There appears to be a sufficiently robust relationship between recruitment in SA 1 and 2 to be able to apply the data sources and procedures from SA 1 to estimate the incoming year-class strength in SA 2.

The value assumed for recruitment in 2012 has very little impact on the catch advice for 2012, since its contribution to catch in 2012 and SSB in 2013 is minimal.

Management plans

A management plan needs to be developed. The ICES approach for MSY based management of a short-lived species as sandeel is the escapement strategy, i.e. to maintain SSB above MSY $B_{escapement}$ after the fishery has taken place. Such an approach does not include an upper limit on F . However, taking the historical F and stock development into account an F value above 0.4-0.5 is probably not recommendable. Such an F ceiling can be expressed as an effort limit for management usage as fishing mortality is assumed proportional to effort.

STECF COMMENTS: STECF agrees with the ICES assessment of the state of the stock and the advice for 2012.

2.25.3. Sandeel (*Ammodytidae*) in Area-3 (Central Eastern North Sea)

REFERENCE POINTS:

	<i>Type</i>	<i>Value</i>	<i>Technical basis</i>
MSY Approach	MSY $B_{escapement}$	195 000 t	= B_{pa}
	F_{MSY}	Not defined	
Precautionary	B_{lim}	100 000 t	The highest SSB (in 2001) in the period (2001-2007) with the lowest SSB and low recruitment (WKSAN, 2010)
	B_{pa}	195 000 t	$B_{pa} = B_{lim} * \exp(\sigma * 1.645)$ with $\sigma = 0.40$ estimated from assessment uncertainty in the terminal year (WKSAN, 2010)

Approach	F_{lim}	Not defined	
	F_{pa}	Not defined	

MANAGEMENT AGREEMENTS: No specific management objectives are known to ICES.

An experimental sandeel management plan has been applied in Norwegian waters since 2010. This management plan has not been evaluated by ICES.

STOCK STATUS:

F (Fishing Mortality)				
	2009	2010	2011	
MSY (F_{MSY})	?	?	?	Undefined
Precautionary approach (F_{pa}, F_{lim})	?	?	?	Undefined

SSB (Spawning Stock Biomass)				
	2010	2011	2012	
MSY ($B_{escapement}$)	✓	✓	✗	Below escapement level
Precautionary approach (B_{pa}, B_{lim})	✓	✓	⚠	Increased risk

Since 2005, F has been variable between years but below the long-term mean. The stock has increased from a record low SSB in 2004 (at half of B_{lim}) to above B_{pa} in 2010, but SSB has since declined and is below B_{pa} in 2012. Recruitment in 2010 and 2011 corresponds to the two lowest historical values. The combined recruitment of these two years is less than a quarter of the next lowest combined value of any two consecutive years in the time-series.

RECENT MANAGEMENT ADVICE:

ICES advises on the basis of the MSY approach that a fishery should only be allowed in 2012 if analysis of real-time monitoring is available and indicates that the stock can be rebuilt to B_{pa} by 2013. Catches for monitoring purposes should not exceed 5,000 t.

Other considerations

MSY approach

Following the ICES MSY framework for a short-lived species, the fishery in 2012 should retain a stock ($B_{escapement}$) that is sufficient for successful recruitment. This implies a zero catch in 2012 unless analysis of real-time monitoring is available and indicates that the stock can be rebuilt to B_{pa} by 2013. Catches for monitoring purposes should not exceed 5,000 t. In order to present an assessment, information on catch composition and catch per unit effort is required. The advice of a maximum of 5000 t in monitoring fisheries should provide sufficient samples and, thus, reliable estimates. This catch would result in a SSB at 86% of B_{lim} in 2013 (as opposed to 90% with zero catch).

Management plan

Based on the Norwegian national management plan a TAC for the Norwegian EEZ of SA 3 was set at 42,000 t in 2012. This is expected to lead to a SSB at 62% of B_{lim} in 2013. This experimental management plan has been applied in the Norwegian zone since 2010 and is based on geographical areas that are opened and closed on alternate years, with an area opened only if the spawning stock is estimated by the national institute to be large and widely distributed within it. The main objective of the plan is to rebuild the spawning stock and to increase the total recruitment and catch potential.

Additional considerations

No Norwegian effort data are available to ICES with the appropriate resolution. Norwegian fishing effort has therefore been estimated on the basis of Norwegian landings and the assumption that Danish and Norwegian CPUE are similar.

The dredge survey covers mainly the southern part of SA 3. A northerly extension of the survey area and coverage of the Skagerrak area would probably increase the quality of the survey results for assessment purpose.

The recruitment value assumed for 2012 has very little impact on the catch advice for 2012, since its contribution to catches in 2012 and SSB in 2013 is minimal.

Pre-season estimates of the incoming year class appear less robust for this area and it is therefore appropriate that in-season monitoring (e.g. acoustic monitoring and age-based commercial cpue) should continue in SA 3.

STECF COMMENTS:

STECF agrees with the ICES assessment of the state of the stock and the advice for 2012 that a fishery should only be allowed in 2012 if analysis of real-time monitoring is available and indicates that the stock can be rebuilt to Bpa by 2013. Catches for monitoring purposes should not exceed 5,000 t.

STECF notes that the management measures implemented in Norwegian waters in 2012 are inconsistent with ICES advice.

2.25.4. Sandeel (*Ammodytidae*) in Area-4 (Central Western North Sea)

REFERENCE POINTS: No reference points are defined for this stock.

MANAGEMENT AGREEMENTS: No specific management objectives are known to ICES.

STOCK STATUS:

F (Fishing Mortality)				
	2009	2010	2011	
MSY (F_{MSY})	?	?	?	Undefined
Precautionary approach (F_{pa}, F_{lim})	?	?	?	Undefined

SSB (Spawning Stock Biomass)				
	2010	2011	2012	
MSY ($B_{escapement}$)	✓	✓	✗	Below escapement level
Precautionary approach (B_{pa}, B_{lim})	✓	✓	⚠	Increased risk

Catch and survey data are not sufficient for a traditional age-based assessment, however the very limited effort applied in the area indicates a very low fishing mortality. The results from the dredge survey show a high recruitment in 2009 as observed in Areas 1 and 2. This is expected to lead to a considerable increase in SSB for 2011.

Survey data indicate that the strong 2009 year class has been followed by low recruitment in both 2010 and 2011. The very limited effort applied in the area suggests a very low fishing mortality.

RECENT MANAGEMENT ADVICE:

ICES advises on the basis of precautionary considerations that catches for monitoring purposes should not exceed 5000 t.

Other considerations

PA considerations

The stock trend is considered to be stable with recent low recruitment after a high recruitment in 2009, while the low recruitment is likely due to natural variation. The exploitation status is considered stable and very low. Therefore, catches in 2012 should remain low, and catches for monitoring purposes should not exceed 5000 t.

In order to present an assessment, information on catch composition and catch per unit effort is required. The advice of a maximum of 5000 t in monitoring fisheries should provide sufficient samples and, thus, reliable estimates.

Additional considerations

It is important to continue the Scottish dredge survey in this area, even though the overlap between this survey and the commercial CPUE time series is currently too short to provide reliable estimates of incoming 1-group strength. Little or no information is available for this area from the in-year monitoring system in recent years because of low fishing effort. Until there is sufficient overlap in the time series of dredge survey and commercial data there will be no scientific basis to present a catch forecast.

STECF COMMENTS: STECF agrees with the ICES assessment of the state of the stock and the advice for 2012.

2.25.5. Sandeel (*Ammodytidae*) in Area-5 (Viking and Bergen Bank area)

REFERENCE POINTS: No reference points are defined for this stock.

MANAGEMENT AGREEMENTS: No specific management objectives are known to STECF.

STOCK STATUS:

F (Fishing Mortality)	
	2009–2011
Qualitative evaluation	➡ Very low
SSB (Spawning-Stock Biomass)	
	2009–2011
Qualitative evaluation	? Insufficient information

Catch statistics and acoustic data are available for this stock. No landings have occurred since 2004 (except for 4t landed in 2007). The available information is inadequate to evaluate stock status or trends. The state of the stock is therefore unknown.

RECENT MANAGEMENT ADVICE: ICES advises on the basis of precautionary considerations that no increase in the fisheries should take place unless there is evidence that this will be sustainable.

STECF COMMENTS: STECF agrees with the ICES assessment that the state of the stock is unknown and that no increase in the fisheries should take place unless there is evidence that this will be sustainable.

2.25.6. Sandeel (*Ammodytidae*) in Area-6 (Division IIIa East (Kattegat))

REFERENCE POINTS: No reference points are defined for this stock.

MANAGEMENT AGREEMENTS: No specific management objectives are known to STECF.

STOCK STATUS:

F (Fishing Mortality)	
	2009–2011
Qualitative evaluation	? Insufficient information
SSB (Spawning-Stock Biomass)	
	2009–2011

Qualitative evaluation	 Insufficient information
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Only catch statistics are available for this stock. The available information is inadequate to evaluate stock status or trends. The state of the stock is therefore unknown.

RECENT MANAGEMENT ADVICE: ICES advises on the basis of precautionary considerations that no increase of the fisheries should take place unless there is evidence that this will be sustainable.

Other considerations

PA considerations

The stock trend and exploitation status are unknown. Catches are low and have not shown any particular trend in over a decade. Therefore, catches should not be allowed to increase unless there is evidence that this will be sustainable.



STECF COMMENTS: STECF agrees with the ICES assessment that the state of the stock is unknown and that no increase in the fisheries should take place unless there is evidence that this will be sustainable.

2.25.7. Sandeel (*Ammodytidae*) in Area-7 (Shetland area)

REFERENCE POINTS: No reference points are defined for this stock.

MANAGEMENT AGREEMENTS: No specific management objectives are known to ICES.

STOCK STATUS:

F (Fishing Mortality)	
	2009–2011
Qualitative evaluation	 Very low
SSB (Spawning-Stock Biomass)	
	2009–2011
Qualitative evaluation	 Insufficient information

Only catch statistics are available for this stock. The available information is inadequate to evaluate stock status or trends. The state of the stock is therefore unknown.

RECENT MANAGEMENT ADVICE:

ICES advises on the basis of precautionary considerations that no increase in the fisheries should take place unless there is evidence that this will be sustainable.

STECF COMMENTS: STECF agrees with the ICES assessment that the state of the stock is unknown that no increase in the fisheries should take place unless there is evidence that this will be sustainable.

2.26. Rays and skates in the North sea

The most recent advice for this stock was provided by ICES in 2011. Hence, the following text remains unchanged from the Consolidated STECF Review of Advice for 2012. Advice for 2013 will be provided in Part 3 of the STECF review of Advice for 2013 which will be available in November 2012.

FISHERIES: Rays and skates are taken as target and by-catches in most demersal fisheries in the ICES area, including the North Sea and with the exception of the Baltic. Most ray and skate landings are by-catches in trawl and seine fisheries. There are, however, a number of small-scale fisheries using large meshed tangle nets directed at thornback ray, and there have been directed longline fisheries for common skate.

Prior to the introduction of a generic TAC for all skate and rays species in North Sea in 1999 there has been no obligation for fishermen to record catches in the logbooks. As a consequence, there is a lack of information on the fisheries for rays. Statistical information by species is also limited because few European countries differentiate between species in landings statistics and they are collectively recorded as skates and rays.

Ray fisheries occur in coastal waters and tend to be seasonal, and size selection in towed gears is minimal owing to the shape of rays, though selection on board has occurred to comply with the market's preference for larger fish.

Overall landing figures for Rays and Skates in the North Sea have decreased in the last 15 years from more than 6,000 t in the mid 90ties to 2,500 t in 2008.

SOURCE OF MANAGEMENT ADVICE: The main advisory body is ICES.

REFERENCE POINTS: There are no agreed reference points for rays and skates in the North Sea.

STOCK STATUS: No reliable assessments can be presented for these stocks. The main cause of this is the lack of species specific landings data. In the absence of formal stock assessments and defined reference points for the species and stocks of skates (members of the family Rajidae) a qualitative evaluation of the status of individual species/stocks is provided in the table above, based on surveys and landings.

RECENT MANAGEMENT ADVICE: The most recent advice for this stock was provided by ICES in 2010 and covers 2011 and 2012. ICES advice for 2011 and 2012 is provided in the table below.

Species	Area	State of stock	Advice
Common skate <i>Dipturus batis</i> complex	IVa (likely merging with VI & IIa)	Depleted	Zero catch. Retain on prohibited species list
Thornback ray <i>Raja clavata</i>	IVc, VIId	Stable/increasing	Status quo catch
	IVa,b	Uncertain	Reduce catch from recent level
Spotted ray <i>Raja montagui</i>	IVb,c	Stable/increasing	Status quo catch
Starry ray <i>Amblyraja radiata</i>	IVa,b, IIa	Stable	Status quo catch
Cuckoo ray <i>Leucoraja naevus</i>	IVa,b (may extend into VI)	Stable	Status quo catch
Blonde ray <i>Raja brachyuran</i>	IVc, VIId (patchy occurrence)	Uncertain	No advice
Undulate ray <i>Raja undulate</i>	VIId, merges with VIIe	Uncertain. common in areas	Locally discrete No target fishery

Since 1999 there is a TAC for rays and skates in the North Sea. For 2009 and 2010 there were separate TACs for IIa and IV, for IIIa and for VIId. Since 1999 the TAC has gradually been reduced and since 2006 the TAC is believed to have become restrictive. If fishers do not change their practices this must either lead to an increase of discarding and/or to misreporting.

MSY approach

An estimate of fishing mortality is not available. Demersal elasmobranchs are long-lived stocks, and no population estimates are available. Further information is required on each of these stocks before MSY reference points can be identified. Until that time, fisheries should not expand beyond recent average landings (2006-2008) of 2 700 t for the main species.

PA approach

No targeted fishing should be permitted for *Raja undulata* and the *Dipturus batis* complex.

FISHING OPPORTUNITIES FOR 2012 according to COM(2011) 298-Final: STECF notes that with reference to COM(2011) 298-final these stocks are classified under category 3.

STECF COMMENTS: STECF agrees with the ICES assessment of the state of the stocks and the advice for 2011 and 2012.

2.27. Spurdog (*Squalus acanthias*) in the North Sea

The most recent advice for this stock was provided by ICES in 2011. Hence, the following text remains unchanged from the Consolidated STECF Review of Advice for 2012. Advice for 2013 will be provided in Part 3 of the STECF review of Advice for 2013 which will be available in November 2012.

Spurdog in the North Sea is assessed as part of the spurdog stock in the North East Atlantic and the stock summary and advice for 2012 is given in section 8.4.

2.28. Other Demersal elasmobranchs in the North Sea, Skagerrak and Eastern channel

The most recent advice for this stock was provided by ICES in 2011. Hence, the following text remains unchanged from the Consolidated STECF Review of Advice for 2012. Advice for 2013 will be provided in Part 3 of the STECF review of Advice for 2013 which will be available in November 2012.

FISHERIES: Historically the increase of commercial fisheries directed at elasmobranch species, and their economic value, rank them low among marine commercial fisheries (Bonfil 1994). In the Northeast Atlantic, although some elasmobranchs are taken in directed fisheries, the majority are landed as bycatch from fisheries targeting commercial teleost species. Recreational fisheries, including charter angling, may be an important component of the tourist industry in some areas.

SOURCE OF MANAGEMENT ADVICE: The main advisory body is ICES. The assessment is based on survey and landing trends.

REFERENCE POINTS: There are no agreed reference points for other demersal elasmobranchs in the North Sea, Skagerrak and Eastern channel.

STOCK STATUS:

In the absence of formal stock assessments and defined reference points for *Mustelus* and *Squatina* in this ecoregion, the following provides a qualitative evaluation of the general status of the major species, based on surveys and landings.

Species	Area	State of stock
<i>Mustelus</i> spp. (smooth hounds)	IVa,b,c, VIId	Increasing
<i>Squatina squatina</i> (angel shark)	IVa,b,c, VIId	Presumed extirpated in this ecoregion

RECENT MANAGEMENT ADVICE:

Advice for 2011 and 2012 by individual stocks

Species	Area	Advice
<i>Mustelus</i> spp. (smooth hounds)	IVa,b,c, VIId	Status quo catch

<i>Squatina squatina</i> (angel shark)	IVa,b,c, VIId	Zero catch. Retain on prohibited species list
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Outlook for 2011-2012

No reliable assessments can be presented for these stocks. The main cause of this is the lack of species specific landings data. If fishers do not change their practices this must either lead to an increase of discarding and/or to misreporting.

MSY transition scheme

An estimate of fishing mortality is not available. Demersal elasmobranchs are long-lived stocks, and no population estimates are available. Further information is required on each of these stocks before MSY reference points can be identified.

Policy paper

In the light of the EU policy paper on fisheries management (17 May 2010, [COM\(2010\) 241](#)) the stocks of these species are classified under a range of categories.

Species	Area	Policy Category
<i>Mustelus</i> spp. (smooth hounds)	IVa,b,c, VIId	No TAC is in place, but Annex III, Rule 8. Annex IV Rule 4 would apply.
<i>Squatina squatina</i> (angel shark)	IVa,b,c, VIId	Annex III, Rule 10

2.29. Herring (*Clupea harengus*) in the North Sea (Sub-area IV) including components of this stock in Divs. IIa, IIIa and VIId

Based on the distributions of the spawning grounds, larvae drift, nursery areas and migration of the adults, three main stock units of herring have been defined in the North Sea:

- Buchan herring. Spawn July to September in the Orkney Shetland area and off the Scottish east coast. Nursery areas are along the east coast of Scotland and the Skagerrak and Kattegat.
- Banks herring. Spawn August to September, off English east coast. Historically spawning also took place on the western edge of the Dogger Bank. Nursery areas are off the English east coast and Danish west coast.
- Downs herring. Spawn December to February in the southern North Sea and Eastern Channel. Nursery areas are off the English east coast, Dutch coast, Danish west coast and in the German Bight.

In addition to the three main stock units a number of small spring spawning units exist, spawning in coastal area in the eastern North Sea.

The stock complexity of herring in the North Sea is further complicated by the appearance in the north-eastern North Sea of herring belonging to herring populations spawning in the spring in the western Baltic, Skagerrak and Kattegat. Herring from these populations migrate into the North Sea in summer and autumn.

Although the three main North Sea herring stocks include summer, autumn and winter spawners they are often named autumn spawners to distinguish them from the spring spawning stocks.

FISHERIES: The North Sea autumn spawning herring is exploited by Belgium, Denmark, France, Faroe Islands, Germany, Netherlands, Norway, Sweden, and UK. Four main fisheries exploit the stock:

- Fleet A: Directed herring fisheries with purse-seiners and trawlers (32 mm minimum mesh size) in the North Sea and eastern Channel.
- Fleet B: Herring taken as by-catch in the small-mesh fisheries in the North Sea under EU regulations (mesh size less than 32 mm).
- Fleet C: Directed herring fisheries in Skagerrak and Kattegat with purse-seiners and trawlers (32 mm minimum mesh size).
- Fleet D: By-catches of herring caught in the small-mesh fisheries (mesh size less than 32 mm) in Skagerrak and Kattegat.

At present, the fishery on the stock is managed by five separate TACs in three different management areas (Skagerrak and Kattegat, Northern and Central North Sea, and Southern North Sea and Eastern Channel) through joint arrangements by EU and Norway. For both the North Sea and the Skagerrak and Kattegat two separate TAC's are set, one for each of the four fleets.

Most catch data reported by ICES were official landings, but for some nations catch estimates have been corrected by ICES for unallocated and misreported catch. Discard data are either incomplete or entirely missing. ICES catch includes unallocated and misreported landings, discards and slipping. Denmark and Norway provided information on by-catches of herring in the industrial fishery. The catch estimate for the North Sea and eastern Channel in 2011 by ICES amounts to 218,000 t.

SOURCE OF MANAGEMENT ADVICE: The main advisory body is ICES. The age-based assessment is based on landings from Subarea IV and Division IIIa and VIIId and on four survey time series (Acoustic 1–9+ ring index, IBTS age 1–5+, 0-group and larvae SSB indices).

REFERENCE POINTS:

	Type	Value	Technical basis
Management plan	F _{MP}	F ₀₋₁ = 0.05 F ₂₋₆ = 0.25	SSB is greater than the SSB _{MP} upper trigger of 1.5 million t (based on simulations).
		F ₀₋₁ = 0.05 F ₂₋₆ = 0.25 – (0.15*(1500000-SSB)/700000)	SSB is between the SSB _{MP} triggers of 0.8 and 1.5 million t (based on simulations).
		F ₀₋₁ = 0.04 F ₂₋₆ = 0.10	SSB is less than the SSB _{MP} lower trigger of 0.8 million t (based on simulations).
MSY Approach	MSY B _{trigger}	not defined	
	F _{MSY}	0.25	Simulations under different productivity regimes, research between 1996 and 2010.
Precautionary approach	B _{lim}	800 000 t	< 0.8 million t; poor recruitment has been experienced. Defined in 1997/2008.
	B _{pa}	1.3 million t	B _{trigger} in the previous harvest control rule.
	F _{lim}	not defined	
	F _{pa}	F ₂₋₆ = 0.25	Target Fs in the harvest control rule.

STOCK STATUS:

F (Fishing Mortality)

	2009	2010	2011	
MSY (F_{MSY})	✓	✓	✓	Below target
Precautionary approach (F_{pa})	✓	✓	✓	Harvested sustainably
Management plan (F_{MP})	✓	✓	✓	Below target

SSB (Spawning-Stock Biomass)*				
* at spawning time in autumn.	2010	2011	2012	
MSY ($B_{trigger}$)	?	?	?	Undefined
Precautionary approach (B_{pa}, B_{lim})	✓	✓	✓	Full reproductive capacity
Management plan (SSB_{MP})	✓	✓	✓	Above trigger

The assessment was benchmarked in 2012 and a new assessment methodology was accepted which changed the perception of the stock. ICES classifies the stock as being at full reproductive capacity and as being harvested sustainably, below the current management plan and F_{MSY} targets. The year classes from 2002 to 2007 are estimated to be among the weakest since the late 1970s. The year classes 2008 and 2009 are estimated to be above the long-term geometric mean; however, ICES considers that the stock is still in a low productivity phase.

MANAGEMENT AGREEMENTS: A management plan was agreed by EU and Norway in 2008. ICES has evaluated this management plan and concluded that the plan is consistent with the precautionary approach and the MSY approach. A full revision of the existing management plan is needed; until then, the current management plan is considered precautionary. The elements of the plan are as follows:

1. Every effort shall be made to maintain a minimum level of Spawning Stock Biomass (SSB) greater than 800,000 tonnes (B_{lim}).
2. Where the SSB is estimated to be above 1.5 million tonnes the Parties agree to set quotas for the directed fishery and for by-catches in other fisheries, reflecting a fishing mortality rate of no more than 0.25 for 2 ringers and older and no more than 0.05 for 0 - 1 ringers.
3. Where the SSB is estimated to be below 1.5 million tonnes but above 800,000 tonnes, the Parties agree to set quotas for the direct fishery and for by-catches in other fisheries, reflecting a fishing mortality rate on 2 ringers and older equal to:

$$0.25 - (0.15 * (1,500,000 - SSB) / 700,000) \text{ for 2 ringers and older,} \\ \text{and no more than 0.05 for 0 - 1 ringers}$$

4. Where the SSB is estimated to be below 800,000 tonnes the Parties agree to set quotas for the directed fishery and for by-catches in other fisheries, reflecting a fishing mortality rate of less than 0.1 for 2 ringers and older and of less than 0.04 for 0-1 ringers.
5. Where the rules in paragraphs 2 and 3 would lead to a TAC which deviates by more than 15 % from the TAC of the preceding year the parties shall fix a TAC that is no more than 15 % greater or 15 % less than the TAC of the preceding year.
6. Notwithstanding paragraph 5 the Parties may, where considered appropriate, reduce the TAC by more than 15 % compared to the TAC of the preceding year.
7. By-catches of herring may only be landed in ports where adequate sampling schemes to effectively monitor the landings have been set up. All catches landed shall be deducted from the respective quotas set, and the fisheries shall be stopped immediately in the event that the quotas are exhausted.

8. *The allocation of the TAC for the directed fishery for herring shall be 29 % to Norway and 71 % to the Community. The by-catch quota for herring shall be allocated to the Community.*
9. *A review of this arrangement shall take place no later than 31 December 2011.*
10. *This arrangement enters into force on 1 January 2009.*

In 2011 ICES examined the management plan and concluded that the management plan appears to operate well in relation to the objectives of consistency with the precautionary approach and a rational exploitation pattern.

The EU–Norway agreement calls for a review of the current plan no later than December 2011. An interim evaluation of the EU-Norway management plan took place in 2011 to evaluate alternative TAC setting procedures, each of which were shown to be precautionary. With the current rate of increase in the stock size, the main unsatisfactory issue relative to achieving simultaneous stable and high yields appears to be the 15% inter annual variability limit on TAC change. The analysis carried out by the benchmark workshop has revised the perception of the stock, and reference points and the existing management plan need to be re-evaluated.

RECENT MANAGEMENT ADVICE: ICES advises a revision of the EU/Norway management plan. Until then, ICES advises on the basis of the agreed EU/Norway management plan that catches in 2013 should be no more than 480,200t, including 465,750t for the A-fleet.

ICES advises that no bottom disturbing activities, e.g. aggregate extraction, should occur in areas with spawning grounds during the spawning season and within one month before and after this period.

Management plan

Following the agreed management plan between EU and Norway implies imposing the maximum 15% increase in TAC as the stock is estimated to be above the trigger biomass which results in a TAC of 465 750 t for the A-fleet in 2013 (Scenario ii), which would lead to an SSB of around 2.0 million tonnes at spawning time in 2013.

The agreed management plan between EU and Norway has been evaluated and ICES concluded that the plan is consistent with the precautionary approach and the MSY approach. The management plan has primacy over the ICES MSY framework when providing advice. The analysis carried out by the benchmark workshop has revised the perception of the stock, and thus a full revision of the existing management plan for North Sea autumn spawners is needed. The use of the current management plan is considered precautionary.

MSY approach

As no MSY Btrigger has been identified for this stock, the ICES MSY framework has been applied with F_{MSY} without consideration of SSB in relation to MSY Btrigger.

Following the ICES MSY framework implies raising the fishing mortality to 0.25, resulting in catches of less than 514,700 t in 2013 (Scenario iv). This is expected to lead to an SSB of around 2.0 million tonnes in 2013.

The analysis carried out by the benchmark workshop has revised the perception of the stock, and F_{MSY} needs to be re-evaluated.

Precautionary approach

The fishing mortality in 2013 should be no more than F_{pa} , corresponding to catches of less than 514,700 t in 2013 (Scenario iv). The SSB is expected to remain above B_{pa} in 2013.

The analysis carried out by the benchmark workshop has revised the perception of the stock, and precautionary reference points need to be re-evaluated.

STECF COMMENTS: STECF agrees with the ICES assessment of the state of the stock and the advice for 2013 that according to the existing EU Management plan, catches should be no more than 480 200 t, including 465 750 t for the A-fleet.

STECF agrees with the ICES recommendation that a full revision of the existing management plan is needed.

With regards to the discard ban to be introduced in the Skagerrak STECF notes that discards estimates is not available for the fisheries in the Skagerrak and STECF is not in the position to advice if the discard ban is likely to affect the herring fisheries

2.30. Herring (*Clupea harengus*) in Divisions IVc and VIIId (Downs spring-spawning herring)

FISHERIES: The Downs herring constitutes one of the three main stock units forming the North Sea herring stock and is included in the section on Herring (*Clupea harengus*) in the North Sea (Sub-area IV) including components of this stock in Divs. IIa, IIIa and VIIId

SOURCE OF MANAGEMENT ADVICE: The main management advisory body is ICES. Assessment has only been made on the combined North Sea stock based on analysis of catch at age data calibrated with survey data. No separate assessment has recently been made for the Downs component of the stock.

REFERENCE POINTS: No reference points have been defined for Downs herring. The reference points for North Sea autumn spawning herring are given above.

STOCK STATUS: The stock has returned to its pre-collapsed state and is now again a major component of the stock.

RECENT MANAGEMENT ADVICE: See Section on herring in the North Sea and adjacent areas. The sub-TAC for Divisions IVc and VIIId was established for the conservation of the spawning aggregation of Downs herring. The Downs herring is now again a major component of the stock. It is probable that exploitation of Downs herring has been relatively high. In the absence of data to the contrary ICES proposes that a share of 11% of the total North Sea TAC (average share 1989–2002) would still be appropriate for Downs herring. The protection of the various components should be considered in the evaluation of the long-term management plan.

STECF COMMENTS: STECF agrees with the ICES assessment of the state of the stock and the advice for 2013.

2.31. Horse mackerel (*Trachurus trachurus*) in the North Sea (Divisions IIIa eastern part, IVbc, VIIId).

The most recent advice for this stock was provided by ICES in 2011. Hence, the following text remains unchanged from the Consolidated STECF Review of Advice for 2012. Advice for 2013 will be provided in Part 3 of the STECF review of Advice for 2013 which will be available in November 2012.

FISHERY: Catches taken in Divisions IVb,c and VIIId are regarded as belonging to the North Sea horse mackerel and in some years also catches from Division IIIa - except the western part of Skagerrak. The total catch taken from this stock in 2010 was 22,255 tonnes, which represents a 50% decrease compared to 2009. In previous years most of the catches from the North Sea stock were taken as a by-catch in the small mesh industrial fisheries in the fourth quarter carried out mainly in Divisions IVb and VIIId, but in recent years a large part of the catch was taken in a directed horse mackerel fishery for human consumption.

SOURCE OF MANAGEMENT ADVICE: The main management advisory body is ICES.

REFERENCE POINTS: No reference points are set for this stock, as there is insufficient information to estimate reference points.

STOCK STATUS:

F (Fishing Mortality)	
	2008–2010
Qualitative evaluation	<div style="display: flex; align-items: center; justify-content: center;"> ? Insufficient information </div>
SSB (Spawning-stock Biomass)	
	2008–2010

Qualitative evaluation	?	Insufficient information
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The available information is insufficient to evaluate stock trends and exploitation status. Therefore, the state of the horse mackerel in the North Sea is unknown.

MANAGEMENT AGREEMENTS: Since 2010, the EU TAC for the North Sea area has included Divisions IVb,c and VIId. In the past, Division VIId was not considered in the North Sea TAC regulation area. The assessment area of North Sea horse mackerel also includes catches from Division IVa during the first two quarters of the year. The TAC for Division IVa is included in a different management area together with Divisions IIa, VIIa–c, VIIe–k, VIIIa, VIIIb, VIId, VIIIe, Subarea VI, EU and international waters of Division Vb, and international waters of Subareas XII and XIV. There is no TAC for Division IIIa.

In June 2009, an agreement was concluded between contracting parties to the Coastal States on mackerel banning high grading, discarding, and slipping from pelagic fisheries targeting mackerel, horse mackerel, and herring beginning in January 2010.

RECENT MANAGEMENT ADVICE: ICES advises on the basis of the precautionary considerations to reduce catch.

Other considerations

Precautionary considerations

Since 1998 catches have been substantially higher than in the years prior to 1998, but the sustainability of these recent catches cannot currently be assessed. Given that the exploitation status is unknown and there is no reliable information on stock trends, the advice for 2012 is to reduce catch.

FISHING OPPORTUNITIES FOR 2012 according to COM(2011) 298-Final.

STECF notes that with reference to COM(2011) 298-final this stock is classified under category 3.

STECF COMMENTS: STECF agrees with the ICES advice for 2012.

2.32. Sprat (*Sprattus sprattus*) in ICES Division IIIa

FISHERIES: The fisheries in IIIa are carried out by Denmark and Sweden using trawlers and along the Swedish coast by small purse seiners. Catches of sprat in Division IIIa averaged about 70,000 t in the 1970s, but since 1982 have typically been below 20,000 t. Landings in 2011 were nearly 11,000 t.

The directed human consumption sprat fishery serves a very small market while most sprat catches are taken in an industrial fishery, where catches are limited by herring by-catch restrictions. This combination of factors has prevented full utilisation of the occasional strong year-classes (which, in general, emerge and disappear very quickly).

SOURCE OF MANAGEMENT ADVICE: The main management advisory body is ICES.

REFERENCE POINTS: No reference points are defined for this stock.

STOCK STATUS:

F (Fishing Mortality)	
2009 – 2011	
Qualitative evaluation	? Insufficient information
TSB (Total Stock Biomass)	
2010 – 2012	
Qualitative evaluation	? Insufficient information

The available information is inadequate to evaluate stock status. The available survey results are not reliable indicators of sprat abundance in Division IIIa

MANAGEMENT OBJECTIVES: No specific management objectives are known to ICES. As sprat in Division IIIa is mainly fished together with juvenile herring, the exploitation of sprat is limited by the restrictions imposed on fisheries for juvenile herring.

RECENT MANAGEMENT ADVICE: Based on the ICES approach for data limited stocks, ICES advises that catches should be no more than 8200 tonnes.

This is the first year that ICES is providing quantitative advice for data limited stocks.

STECF COMMENTS: STECF agrees with the ICES assessment of the state of the stock.

The value of 8,200 t advised by ICES represents a precautionary reduction of 20% on the average reported landings over the period 2009-2011. STECF therefore advises that it seems more appropriate to express the advice for 2013 in terms of landings instead of catches. STECF therefore advises that based on the ICES approach for data limited stocks, landings of sprat should be no more than 8,200 t in 2012.

STECF notes that sprat in Division IIIa is mainly fished together with juvenile herring and the exploitation of sprat is limited by the restrictions imposed on fisheries for juvenile herring. With the current management regime, the sprat fishery is managed by bycatch ceilings of herring as well as bycatch percentage limits and quota restriction on sprat.

With regards to the discard ban to be introduced in the Skagerrak STECF notes that discards estimates is not available for the sprat fisheries in the Skagerrak and STECF is not in the position to advice if the discard ban is likely to affect the fisheries.

2.33. Sprat (*Sprattus sprattus*) in the North Sea (Subarea IV)


FISHERIES: Denmark, Norway, Sweden and UK exploit the sprat in this area. The fishery is carried out using trawlers and purse seiners. There are considerable fluctuations in total landings, from a peak in 1975 of 641,000 t to a low in 1986 of around 20,000 t. In the last 10 years landings have been at or below 200,000 t. Estimated total landings in 2010 and 2011 were around 143,000 t and 134,000 t respectively.


SOURCE OF MANAGEMENT ADVICE: The main management advisory body is ICES.

MANAGEMENT OBJECTIVES: No specific management objectives are known to ICES.

REFERENCE POINTS: No reference points are defined for this stock.

STOCK STATUS:

F (Fishing Mortality)	
2007 – 2009	
Qualitative evaluation	 Insufficient information

TSB (Total Stock Biomass)	
2007 – 2009	
Qualitative evaluation	 Increase in the main area

The stock appears to have increased judged from surveys as well as an exploratory assessment. The stock seems to sustain the recent catches.

RECENT MANAGEMENT ADVICE: Based on the ICES approach for data limited stocks, ICES advises that catches should not be more than 134,000 tonnes (catches of 2011).

This is the first year that ICES is providing quantitative advice for data limited stocks.

Other considerations

ICES approach to data limited stocks

For data limited stocks without information on abundance or exploitation ICES considers that a precautionary reduction of catches should be implemented, unless there is ancillary information clearly indicating that the current exploitation is appropriate for the stock.

For this stock, there is currently an increasing trend in abundance while catches have remained fairly constant. Recent catches appear to be sustainable. Therefore, ICES advises that catches in 2012 (in year advice) should not increase in relation to the the 2011 value of 134 000 t.

STECF COMMENTS: STECF notes the ICES assessment of the state of the stock and the advice for 2012 that catches should not be more than 134,000 tonnes.

STECF also notes the value of 134,000 t advised by ICES is based on 2011 landings. STECF therefore advises that it seems more appropriate to express the advice for 2013 in terms of landings instead of catches. STECF therefore advises that based on the ICES approach for data limited stocks, landings of sprat in the North Sea (Subarea IV) should be no more than 134,000 t in 2012.

2.34. Pollack (*Pollachius pollachius*) in the North Sea (ICES Sub-area IV and Division IIIa)

FISHERIES: Pollack is mainly caught as a bycatch in different fisheries. Trawl catches in the open North Sea are mainly taken in the directed saithe fisheries. Gillnets are dominating in Norwegian fisheries where about 75% of the catches are in coastal areas. Total landings in 2011 were 2066 t. Other removals are unknown.

SOURCE OF MANAGEMENT ADVICE: The management advisory body is ICES.

MANAGEMENT AGREEMENT: There are no specific management agreements for pollack in the North Sea.

REFERENCE POINTS: No biological reference points have been proposed for pollack in the North Sea.

STOCK STATUS:

F (Fishing Mortality)	
2009-2011	
Qualitative evaluation	<div style="display: flex; align-items: center;"> <div style="border: 1px solid black; border-radius: 50%; width: 20px; height: 20px; display: flex; align-items: center; justify-content: center; margin-right: 5px;">?</div> Insufficient information </div>

SSB (Spawning-Stock Biomass)	
2009-2011	
Qualitative evaluation	<div style="display: flex; flex-direction: column; align-items: flex-start;"> <div style="margin-bottom: 10px;"> <div style="display: flex; align-items: center;"> <div style="border: 1px solid black; border-radius: 50%; width: 20px; height: 20px; display: flex; align-items: center; justify-content: center; margin-right: 5px;">?</div> IV - Insufficient information </div> </div> <div> <div style="display: flex; align-items: center;"> <div style="border: 1px solid black; border-radius: 50%; width: 20px; height: 20px; display: flex; align-items: center; justify-content: center; margin-right: 5px;">✗</div> IIIa - Below possible reference points </div> </div> </div>

The landings data are insufficient to evaluate stock trends and therefore the state of the stock is unknown, although information available for IIIa suggests that the stock has strongly declined and is currently at a low level in this area.

RECENT MANAGEMENT ADVICE: Based on the ICES approach for data limited stocks, ICES advises that in Subarea IV catches should be no more than 1300 tonnes. In Division IIIa, there should be no directed fisheries and bycatch and discards should be minimised.

This is the first year that ICES is providing quantitative advice for data limited stocks.

Other considerations

No reliable assessment can be presented in this Ecoregion.

ICES approach to data limited stocks

For data limited stocks without information on abundance or exploitation ICES considers that a precautionary reduction of catches should be implemented, unless there is ancillary information clearly indicating that the current exploitation is appropriate for the stock.

For Pollack in this area two situations occur: for Subarea IV, insufficient information is available on abundance or exploitation. This implies that catches should decrease by 20% in relation to the last three years average catch, corresponding to catches of no more than 1300 t.

For Division IIIa, the abundance is estimated to be at the lowest in the time series. This implies that there should be no directed fisheries and bycatch and discards should be minimised in this Division.

STECF COMMENTS:

STECF agrees with the ICES assessment that the state of the stock is unknown and with the advice for 2013 and 2014. For Division IIIa the advice that there should be no directed fisheries and bycatch and discards should be minimised should be interpreted to mean that in 2013 and 2014, catches of Pollock from Division IIIa should be reduced to the lowest possible level.

Noting that ICES uses the trends in the survey index and average reported landings in 2009 – 2011 as basis for providing advice it seems more appropriate to express the advice for 2013 in terms of landings instead of catches. STECF therefore advises that landings of pollack in subarea IV should be no more than 1300 tonnes in 2013. STECF notes that the landings corresponding to ICES advice for the North Sea for 2013 imply a 20% decrease on the average reported catches over the years 2009-2011

STECF notes that since 2000, the officially-reported landings of pollack from the North Sea have averaged 2,310 t annually, but the average annual catch is unknown.

With regards to the introduction of a discards ban in Skagerrak, STECF notes that the proportion of the landings that have been taken in the Skagerrak has been in the order of 23 % in recent years. The discard information is very uncertain, but indicates that discards of pollack in the Skagerrak is low.

2.35. Red mullet (*Mullus barbatus* and *Mullus surmelutus*) in the North Sea

There is no advice relating specifically to striped red mullet in the North Sea. Advice from ICES on striped red mullet is only available at the NE Atlantic regional level and will be provided in Part 3 of the STECF review of Advice for 2013 which will be available in November 2012.

2.36. Red Gurnard (*Aspitrigla cuculus*) in the North Sea

There is no advice relating specifically to red gurnard in the North Sea. Advice from ICES on red gurnard is only available at the NE Atlantic regional level and will be provided in in Part 3 of the STECF review of Advice for 2013 which will be available in November 2012.

2.37. Grey gurnard (*Eutrigla gurnardus*) in the North Sea

FISHERIES: In the past, grey gurnard was predominantly exploited by fleets from Belgium, Denmark, France and Sweden. Historically, landings peaked at about 46,800 t in the late 1980s with Denmark taking 99% of the landings, and then declined substantially to around 180 t by 1998. Since the beginning of the 2000's the main fishery is conducted by The Netherlands and UK and landings remained around 500 t. Reported landings for 2010 and 2011 were 401 t and 449 t respectively. Currently, grey gurnard is a bycatch in the fishery for demersal species mainly by beam trawlers and otter trawlers. Catches are largely discarded.


SOURCE OF MANAGEMENT ADVICE: The management advisory body is ICES.


MANAGEMENT AGREEMENT: There are no specific management agreements for grey gurnard in the North Sea.

REFERENCE POINTS:

No reference points have been defined.

STOCK STATUS:

F (Fishing Mortality)	
2009–2011	
Qualitative evaluation	 Insufficient information

SSB (Spawning-stock Biomass)	
2009–2011	
Qualitative evaluation	 Above the long-term average

Abundance indices from Subarea IV show an increase in abundance and has been stable in the last decade. In Division VIIId, the abundance has fluctuated without trend since 1988, although the biomass in Division VIIId is much lower than in the North Sea. Landings data are not presented for this species because the landings were reported as one generic category of “gurnards” until 2010. Furthermore, landings data are considered only marginally informative because catches are mainly discarded.

RECENT MANAGEMENT ADVICE:

This is the first time ICES has provided advice for grey gurnard in Subarea IV (North Sea) and Divisions VIIId (Eastern Channel) and IIIa (Skagerrak–Kattegat). Based on the ICES approach for data-limited stocks, ICES advises that catches of grey gurnard should not increase from the average catch of the last three years. Because the data for catches of grey gurnard are considered highly unreliable, ICES is not in a position to quantify the result.

This is the first year ICES is providing quantitative advice for data-limited stocks.

Other considerations

No assessment can be presented for grey gurnard in Subarea IV (North Sea) and Divisions VIIId (Eastern Channel) and IIIa (Skagerrak–Kattegat). Therefore, no catch projections are available.

ICES approach to data-limited stocks

For data-limited stocks without information on abundance or exploitation ICES considers that a precautionary reduction of catches should be implemented, unless there is ancillary information clearly indicating that the current level of exploitation is appropriate for the stock.

For this stock the abundance is estimated to have been stable after an increase, which implies catches could remain at the average catch of the last three years. Because the data for catches of grey gurnard are considered highly unreliable, ICES is not in a position to quantify the result.

STECF COMMENTS: STECF agrees with the ICES assessment of the state of the stock and the advice for 2013 and 2014.

STECF notes that in the past, gurnards were often landed in one generic category of “gurnards”. Catch statistics are incomplete for several years: some countries reporting no landings at all, other countries reporting exceptionally high landings. Currently there is no TAC for this species in this area and it is not clear whether there should be one or several management units.

STECF notes that in 2011, advice for grey gurnard was given for the Northeast Atlantic as a whole. This year, biennial advice is given for three separate ecoregions: Bay of Biscay and Atlantic Iberian waters, North Sea, and Celtic seas.

2.38. Sea bass (*Dicentrarchus labrax*) in the North Sea

There is no advice relating specifically to sea bass in the North Sea. Advice from ICES on sea bass only available at the NE Atlantic regional level and will be provided in Part 3 of the STECF review of Advice for 2013 which will be available in November 2012.

3. ECO-REGION 2: RESOURCES OF THE CELTIC SEA AND WEST OF SCOTLAND

3.1. Norway lobster (*Nephrops norvegicus*) in ICES Div. Vb and Sub-area VI, (West of Scotland) and waters west of Ireland

There are no exploited *Nephrops* stocks in Div. Vb. In Sub-area VI and Divs. VIIb & VIIc (waters west of Ireland) the following functional units are considered by ICES:

FU no.	Name	ICES Divisions	Statistical rectangles
11	North Minch	VIa	44–46 E3-E4
12	South Minch	VIa	41–43 E2-E4
13	Clyde	VIa	39–40 E4-E5
16	Porcupine Bank	VIIc	31–36 D5–D6; 32–35 D7–D8
17	Aran Grounds	VIIb	34–35 D9–E0

Nephrops also occur in other areas not contained within the Functional Units. TV surveys in deep water suggest widespread distribution at low density, and surveys at Stanton Bank indicate a population there. Three *Nephrops* stocks (FUs) in Sub-area VI and one in Div. VIIb (FU 17) are currently assessed using UWTV surveys. On the basis of these, current stock abundance and harvest ratios are estimated.

MSY approach for stocks with UWTV surveys

There are no precautionary reference points defined for *Nephrops*. Under the ICES MSY framework, exploitation rates which are likely to generate high long-term yield (and low probability of stock overfishing) have been explored and proposed for each functional unit. Owing to the way *Nephrops* are assessed, it is not possible to estimate F_{msy} directly and hence proxies for F_{msy} are determined. Three stock-specific candidates for F_{msy} ($F_{0.1}$, $F_{35\%SPR}$ and F_{max}) were derived using a length-based per recruit analysis. There can be substantial differences in relative exploitation rates between the sexes in many stocks. To account for this, values for each of the candidates have been determined for males, females and the two sexes combined. The appropriate F_{msy} candidate has been selected for each Functional Unit independently according to the perception of stock resilience, factors affecting recruitment, population density, knowledge of biological parameters and the nature of the fishery (relative exploitation of the sexes and historical Harvest Rate vs. stock status).

The table below illustrates the framework against which stocks were evaluated and appropriate F_{MSY} proxies chosen. In general, $F_{35\%SPR}$ was used unless there were stock-specific justifications for either higher or lower harvest ratios.

The combined sex F_{msy} proxy should be considered appropriate provided that the resulting percentage of virgin spawner per-recruit for males or females does not fall below 20%. In such a case a more conservative sex specific F_{msy} proxy should be picked instead of the combined proxy.

		Burrow Density (average numbers/m2)		
		Low	Med	High
		<0.3	0.3-0.8	>0.8
Observed harvest rate or landings compared to stock status	>Fmax	F35%	Fmax	Fmax
	Fmax-F0.1	F0.1	F35%	Fmax
	<F0.1	F0.1	F0.1	F35%
	Unknown	F0.1	F35	F35%
Stock Size Estimates	Variable	F0.1	F0.1	F35%
	Stable	F0.1	F35%	Fmax
Knowledge of biological parameters	Poor	F0.1	F0.1	F35%
	Good	F35%	F35%	Fmax
History Fishery	Stable spatially and temporally	F35%	F35%	Fmax
	Sporadic	F0.1	F0.1	F35%
	Developing	F0.1	F35%	F35%

Where possible, a preliminary MSY $B_{trigger}$ was proposed based on the lowest observed UWTV abundance.

DCAC approach for stocks without UWTV surveys

The *Nephrops* specific data limited method was not considered appropriate for use with FU 16 (Porcupine Bank) *Nephrops* which does not have an UWTV survey. This is a deep-water *Nephrops* stock and the productivity of such stocks is generally lower than those in shelf waters. As a result, density estimates are likely to be lower and sustainable harvest rates also may be lower than for other shelf stocks for which this and the standard UWTV survey approach has been applied. Whereas the Porcupine trawl survey is an important indicator for this stock, it is prone to year effects and has a low cpue relative to the commercial fishery due to the timing of the survey in September. Its potential use for the provision of catch advice in the context of the ICES approach to data limited stocks was not explored this year. Instead, the Depletion-Corrected Average Catch (DCAC) model was applied.

Management considerations

The overriding management consideration for these stocks is that management should be at the functional unit rather than the ICES subarea/division level. Management at the functional unit level should provide the controls to ensure that catch opportunities and effort are compatible and in line with the scale of the resources in each of the stocks defined by the functional units. Current management of *Nephrops* in Subarea VI (both in terms of TACs and effort) does not provide adequate safeguards to ensure that local effort is sufficiently limited to avoid depletion of resources in functional units. In the current situation vessels are free to move between grounds, allowing effort to develop on some grounds in a largely uncontrolled way and this has historically resulted in inappropriate harvest rates from some parts.

STECF COMMENTS: STECF notes that to the West of Scotland (which comprises three *Nephrops* Functional Units (FUs)) the present aggregated management approach (overall TAC for all FUs) runs the risk of unbalanced effort distribution. Adoption of management initiatives to ensure that effort can be appropriately controlled in smaller areas within the overall TAC area (Vb & VI) is recommended. Furthermore, STECF notes

that the current aggregated management of all *Nephrops* FUs in this area as a single unit is a major obstacle for a management complying with the Commissions Communication on Fishing opportunities for 2012 (COM(2012)278 final) as the rules require a TAC for each stock (in this case FU).

STECF notes that there also are *Nephrops* catches in “other rectangles” in Division VIa, e.g. from offshore areas adjacent to Stanton Bank where Irish fishers frequently operate from the shelf edge. To provide some guidance on appropriate future landings for these areas, the use of an average landings figure of around 290 tonnes could be considered (On the basis of ICES advice that catches from ‘other areas’ should not increase).

3.1.1. Norway lobster (*Nephrops norvegicus*) in North Minch (FU 11)

FISHERY: The *Nephrops* fishery in this area is prosecuted entirely by UK (Scottish) vessels. Total effort by Scottish *Nephrops* trawlers has shown a gradual decreasing trend since 2002. Total *Nephrops* landings increased from about 3,000 t in 2005 to around 3800 t in 2008 but then fell in 2009 to 3497 t and to 2263 t in 2010. In 2011 landings were 2696. Recent years’ decline is apparently largely due to market conditions. Available information indicates that landings from the late 1990s up to 2005 are most likely to be an underestimate of actual landings, but the reliability of landings figures has improved since 2006 with the introduction of buyers and sellers legislation. The *Nephrops* trawl fishery in this area takes by-catches of other species and has been observed to have extremely high discard rates of haddock and whiting in recent years. Creel fishing takes place mainly in the sea-loch areas of this FU (but has recently extended also to further offshore) accounting for 500-600 tonnes. Overall effort in creel numbers is not known.

SOURCE OF MANAGEMENT ADVICE: The main management advisory body is ICES. The assessment in 2012 is based on trends in population indicators and catch options derived from UWTV surveys. For this FU, the absolute density observed in the UWTV survey is medium (~ 0.59 burrows m^{-2}). Historical harvest ratios in this FU have been above those equivalent to fishing at F_{max} and landings have been relatively stable in the last thirty years. $F_{35\%SpR}$ (combined between sexes) is expected to deliver high long-term yield with a low probability of recruitment overfishing and is therefore chosen as a proxy for F_{MSY} .

REFERENCE POINTS:

	<i>Type</i>	<i>Value</i>	<i>Technical basis</i>
MSY	MSY $B_{trigger}$	465 million individuals	Bias-adjusted lowest observed UWTV survey estimate of abundance
Approach	F_{msy}	12.5% harvest rate	Equivalent to $F_{35\%SpR}$ combined sex. F_{MSY} proxy based on length-based yield-per-recruit analysis.
Precautionary Approach	Not agreed		

Harvest ratio reference points (2011):

	Male	Female	Combined
F_{max}	12.2	37.2	16.6
$F_{0.1}$	7.4	19.8	8.7
$F_{35\%SpR}$	8.7	21.7	12.5

STOCK STATUS:

F (Fishing Mortality)

	2009	2010	2011
MSY (F_{MSY})	✘	✔	✔ Below target
Precautionary approach (F_{pa}, F_{lim})	?	?	? Not defined

SSB (Spawning-Stock Biomass)			
	2009	2010	2011
MSY ($B_{trigger}$)	✔	✔	✔ Above trigger
Precautionary approach (B_{pa}, B_{lim})	?	?	? Not defined

The stock has been above MSY $B_{trigger}$ for more than 10 years. The harvest ratios (removals/UWTV abundance) have fluctuated around the F_{MSY} proxy.

RECENT MANAGEMENT ADVICE:

ICES advises on the basis of the MSY approach that landings in 2013 should be no more than 4200 t.

To protect the stock in this functional unit, management should be implemented at the functional unit level.

Other considerations

MSY approach:

Following the ICES MSY framework implies the harvest ratio for the North Minch functional unit to be less than 12.5%, resulting in landings no more than 4200 t in 2013.

STECF COMMENTS: STECF agrees with the ICES assessment of the state of the stock and the advice for 2013.

STECF considers that management of fishing mortality on *Nephrops* stocks would best be achieved if measures, including catch restrictions, were implemented at the level of the functional unit.

STECF notes that the landings corresponding to ICES advice for 2013 imply a 71% increase on the status quo harvest ratio (and 75% more in landings) from this functional unit.

STECF notes that the TR2 fleet in this area has been observed to have extremely high discard rates of haddock and whiting in recent years and agrees that selectivity should be improved.

3.1.2. Norway lobster (*Nephrops norvegicus*) in South Minch (FU 12)

FISHERY: The *Nephrops* fishery in this area is prosecuted largely by UK vessels with a small proportion of the landings by Irish vessels. Reported effort by all Scottish *Nephrops* trawlers has shown a gradual decreasing trend since 2001. Total *Nephrops* landings from this FU were above 5000 t in 2007 and 2008 but decreased to around 4300 t in 2009 and further declined to around 3700 t in 2010 and 2011. The recent decline is apparently largely due to market conditions. Available information indicates that landings from the late 1990s up to 2005 are most likely to be underestimates of actual landings. The reliability of landings figures improved from 2006 with the introduction of buyers and sellers legislation. The *Nephrops* trawl fishery in this area takes by-catches of other species and has been observed to have extremely high discard rates of haddock and whiting in recent years. Larger vessels operating on the western limits of the ground generally take higher by-catches of fish. Creel fishing takes place mainly in inshore areas (including the sea-lochs), but has extended further offshore in recent years and accounts for around 900 tonnes. Overall effort in creel numbers is not known.

SOURCE OF MANAGEMENT ADVICE: The main management advisory body is ICES. The assessment in 2011 is based on trends in population indicators and catch options derived from UWTV surveys. For this FU,

the absolute density observed in the UWTV survey is medium (~ 0.44 burrows m⁻²). The fishery in this area has been in existence since the 1960s. Historical harvest ratios in this FU have been variable, but generally around the F_{35%SPR}. F_{35%SPR} (combined between sexes) is expected to deliver high long-term yield with a low probability of recruitment overfishing and is therefore chosen as a proxy for F_{MSY}.

REFERENCE POINTS:

	<i>Type</i>	<i>Value</i>	<i>Technical basis</i>
MSY	MSY B _{trigger}	1016 million individuals	Bias-adjusted lowest observed UWTV survey estimate of abundance
Approach	F _{msy}	12.3% harvest rate	Equivalent to F _{35%SPR} combined sex. F _{MSY} proxy based on length-based yield-per-recruit analysis.
Precautionary Approach	Not agreed		

Harvest ratio reference points (2011):

	Male	Female	Combined
F _{max}	13.3	26.8	16.1
F _{0.1}	7.8	13.8	8.7
F _{35%}	9.6	18.3	12.3

STOCK STATUS:

F (Fishing Mortality)				
	2009	2010	2011	
MSY (F _{MSY})				Below target
Precautionary approach (F _{pa} , F _{lim})				Not defined

SSB (Spawning-Stock Biomass)				
	2009	2010	2011	
MSY (B _{trigger})				Above trigger
Precautionary approach (B _{pa} , B _{lim})				Not defined

The stock has been above MSY B_{trigger} the full time-series. The harvest ratio (removals/UWTV abundance) has decreased since 2007 and is now below F_{MSY} proxy.

RECENT MANAGEMENT ADVICE:

ICES advises on the basis of the MSY approach that landings in 2013 should be no more than 5800 t.

To protect the stock in this functional unit, management should be implemented at the functional unit level.

Other considerations

MSY approach:

Following the ICES MSY approach implies the harvest ratio for the South Minch functional unit should be no more than 12.3%, resulting in landings of no more than 5800 t in 2013.

STECF COMMENTS: STECF agrees with the ICES assessment of the state of the stock and the advice for 2013.

STECF considers that management of fishing mortality on Nephrops stocks would best be achieved if measures, including catch restrictions, were implemented at the level of the functional unit.

STECF notes that the landings corresponding to ICES advice for 2013 imply a 89% increase on the status quo harvest ratio (and 87% more in landings) from this functional unit.

STECF notes that the TR2 fleet in this area has been observed to have extremely high discard rates of haddock and whiting in recent years and agrees that selectivity should be improved.

3.1.3. Norway lobster (*Nephrops norvegicus*) in Firth of Clyde (FU 13), including Sound of Jura.

FISHERY: *Nephrops* landings from FU 13 are taken entirely by UK vessels. Total *Nephrops* landings increased in the recent years, from around 3,400 t in 2005 to around 6500 t in 2007, but decreased in the following years. However, in 2011 landings increased again to 6431 t. Available information indicates that landings from the late 1990s up to 2005 most likely are underestimates of actual landings, but the reliability of landings figures has improved from 2006 with the introduction of buyers and sellers legislation. The *Nephrops* trawl fishery in this area takes by-catches of other species, mainly haddock, whiting and some cod. An increasing number of creel boats operate in the Clyde due to temporal and area bans on trawling. Creel landings were about 200 t in 2011. Overall effort in creel numbers is not known.

SOURCE OF MANAGEMENT ADVICE: The main management advisory body is ICES. The assessment in 2011 is based on trends in population indicators and catch options derived from UWTV surveys. Underwater TV surveys have been conducted for the Firth of Clyde subarea every year since 1995. Confidence intervals around the abundance estimates are stable throughout the series and relatively low compared with other FUs in Division VIa. Underwater TV surveys for the Sound of Jura subarea have been more fragmented and sampling is at a relatively low level; confidence intervals are larger.

REFERENCE POINTS:

Reference points – Firth of Clyde

	<i>Type</i>	<i>Value</i>	<i>Technical basis</i>
MSY	MSY B _{trigger}	579 millions	Lowest observed abundance estimate
Approach	F _{msy}	16.4% harvest rate	Equivalent to F _{max} combined sex. F _{MSY} proxy based on length-based yield-per-recruit analysis.
Precautionary Approach	Not agreed	Not defined	

Reference points – Sound of Jura

	<i>Type</i>	<i>Value</i>	<i>Technical basis</i>
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MSY	MSY B_{trigger}	Not defined	
Approach	F_{msy}	14.5% harvest rate	Equivalent to $F_{35\%SpR}$ combined sex
Precautionary Approach	Not agreed	Not defined	

Harvest ratio reference points (2011):

	Male	Female	Combined
F_{max}	13.6	34.0	16.4
$F_{0.1}$	8.7	21.1	9.7
$F_{35\%}$	10.7	25.7	14.5

STOCK STATUS:

Firth of Clyde

F (Fishing Mortality)			
	2009	2010	2011
MSY (F_{MSY})	✘	✘	✘ Above target
Precautionary approach ($F_{\text{pa}}, F_{\text{lim}}$)	?	?	?

SSB (Spawning-Stock Biomass)			
	2009	2010	2011
MSY (B_{trigger})	✔	✔	✔ Above trigger
Precautionary approach ($B_{\text{pa}}, B_{\text{lim}}$)	?	?	?

Sound of Jura

F (Fishing Mortality)			
	2009	2010	2011
MSY (F_{MSY})	✔	✔	✔ Below target
Precautionary approach ($F_{\text{pa}}, F_{\text{lim}}$)	?	?	?

SSB (Spawning-Stock Biomass)			
	2009	2010	2011
MSY (B_{trigger})	?	?	?

Precautionary approach (B_{pa}, B_{lim})	?	?	?	Not defined
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Harvest rates for Nephrops in the Firth of Clyde have declined since 2007 but remain above the proposed FMSY proxy. UWTV abundance remains well above the MSY $B_{trigger}$.

Harvest rates for *Nephrops* in the Sound of Jura have been well below the proposed F_{MSY} proxy in recent years. UWTV abundance remains higher than observed at the start of the series, but the series is too short and patchy to propose a MSY $B_{trigger}$.

RECENT MANAGEMENT ADVICE:

ICES advises on the basis of the MSY approach that landings in 2013 should be no more than 6400 t (5600 t for Firth of Clyde and 800 t for Sound of Jura).

Management of Nephrops should be implemented at the functional unit level. In this FU the two subareas imply that additional controls maybe required to ensure that the landings taken in each subarea are in line with the landings advice.

Other considerations

MSY approach:

Following the ICES MSY framework implies the harvest ratio for the Firth of Clyde subarea to be reduced to less than 16.4%, resulting in landings of no more than 5600 t in 2013. As the current harvest ratio for 2011 (17.6%) is very close to the FMSY proxy (16.4%), no transition stage was calculated.

Following the ICES MSY framework implies the harvest ratio for the Sound of Jura subarea to be less than 14.5%, resulting in landings of less than 800 t in 2013. For the Sound of Jura no transition is needed as the harvest rate is already below the FMSY proxy.

STECF COMMENTS: STECF agrees with the ICES assessment of the state of the stock and the advice for 2013.

STECF considers that management of fishing mortality on Nephrops stocks would best be achieved if measures, including catch restrictions, were implemented at the level of the functional unit.

STECF notes that the landings corresponding to ICES advice for 2013 imply a 7% decrease on the status quo harvest ratio (and 7% less in landings) from this functional unit (Firth of Clyde).

STECF notes that the landings corresponding to ICES advice for 2013 imply a 1200% increase on the status quo harvest ratio (and 800% more in landings) from this functional unit (Sound of Jura).

3.1.4. Norway lobster (*Nephrops norvegicus*) in FU 16, Porcupine Bank, Divisions VIIb,c,j,k


FISHERIES: Reported total landings for this FU have decreased significantly in recent years from 2186 t in 2007 to only 917 t in 2010. In 2011 landings increased to 1187 t (including estimated unallocated landings). The majority of landings are taken by Irish, Spanish and to a lesser extent, UK vessels. There are concerns about the accuracy of the landings statistics for some fleets. The fishery takes place throughout the year with a peak between April and July. A seasonal closure between May-July that covers much of the stock distribution area has been in effect since 2010. Most vessels are relatively large (between 20 and 35 m in total length) multi-purpose otter trawlers using single or twin rigs. Freezing of catches at sea has become increasingly prevalent since 2006. Fishing effort directed at *Nephrops* will also have bycatches of hake, megrim, and anglerfish in mixed fisheries.


SOURCE OF MANAGEMENT ADVICE: The main management advisory body is ICES. The advice is based on estimates of the Depletion-Corrected Average Catch (DCAC) method, which uses historical catch data and estimates of stock depletion over the catch time series to estimate sustainable yields.

REFERENCE POINTS:

No reference points are defined for this stock.

STOCK STATUS:

F (Fishing Mortality)		
2011		
MSY (F_{MSY})	?	Undefined
Precautionary approach (F_{pa}, F_{lim})	?	Undefined
Qualitative evaluation		Absolute level unknown, but decreasing

SSB (Spawning Stock Biomass)		
2011		
MSY ($B_{trigger}$)	?	Undefined
Precautionary approach (B_{pa}, B_{lim})	?	Undefined
Qualitative evaluation		Increasing, from critically low abundance

The size distribution of commercial landings and survey biomass to landings indicate that the exploitation rate has declined relative to the late 2000s. Survey information indicates that recruitment to the fishery has been very weak between 2004 and 2008 and the stock declined to a low level. The average recruitment observed in the 2009 survey has resulted in increased abundance and biomass. The fisheries lpuue shows an increasing trend but since 2010 is influenced by the seasonal closure introduced between May-July.

RECENT MANAGEMENT ADVICE: ICES advises on the basis of the approach for data limited stocks that catches should be no more than 1100 tonnes.

To protect the stock in this functional unit, management should be implemented at the functional unit level.

Other considerations:

ICES approach to data limited stocks

For data limited stocks with an approximate natural mortality rate of <0.2 and only catch or landings data available, ICES considers the Depletion-Corrected Average Catch (MacCall, 2009), an extension of the potential-yield formula, as a method for estimating sustainable yield for data-poor fisheries on long-lived species.

The recent landings (last three year average) in this FU are less than the average DCAC suggested catch. Therefore, a step increase of 10% over the recent landings is advised for 2013. This corresponds to catches of no more than 1100 t.

STECF COMMENTS: STECF agrees with the ICES assessment of the state of the stock and the advice for 2013.

STECF notes that the catches and landings are uncertain. The unallocated catches include an estimate of Spanish landings.

STECF considers that management of fishing mortality on Nephrops stocks would best be achieved if measures, including catch restrictions, were implemented at the level of the functional unit.

3.1.5. Norway lobster (*Nephrops norvegicus*) in FU 17, Aran Grounds (Division VIIb)

FISHERIES: Reported landings (almost entirely by Irish vessels) from this FU were around 1000 t in 2010, but decreased to 600 t in 2011. In the Aran Grounds landings and effort by twin rig vessels have increased to constitute more than 90 % of the fishery. Effort decreased in 2009 due to decommissioning of several vessels that actively participated in the fishery but effort in 2010 increased again. In recent years several newer vessels specialising in *Nephrops* fishing have participated in this fishery. These vessels target *Nephrops* on several other grounds within the TAC area and move around to optimise catch rates. Since the introduction of effort management associated with the cod long term plan (EC 1342/2008) there have been concerns that effort could be displaced towards the Aran and other *Nephrops* grounds where effort control has not been put in place.

The *Nephrops* trawl fishery takes bycatches of other species, especially plaice, but also, whiting, cod, hake, megrim and monkfish.

SOURCE OF MANAGEMENT ADVICE: The main management advisory body is ICES. The assessment is based on an UWTV surveys. The F_{MSY} proxies were derived from Separable Cohort Analysis (SCA) and yield per recruit analysis based on 2008 and 2009 sampling. However, the fit to the SCA model was problematic so F_{MSY} proxies are likely to be uncertain.

REFERENCE POINTS:

	Type	Value	Technical basis
MSY	MSY $B_{trigger}$	Not defined	
Approach	F_{msy}	HR 10.5%	Equivalent to $F_{35\%SPR}$ for combined sex in 2010
Precautionary Approach			No reference points are defined

Harvest ratio reference points (2010):

	Male	Female	Combined
F_{max}	9.8%	13.0%	11.1 %
$F_{0.1}$	6.4%	9.1%	7.2 %
$F_{35\%SpR}$	8.4%	12.8%	10.5 %

STOCK STATUS:

F (Fishing Mortality)			
	2009	2010	2011
MSY (F_{MSY})	✓	✓	✓ Below target
Precautionary approach (F_{pa}, F_{lim})	?	?	? Undefined

SSB (Spawning Stock Biomass)		
2010	2011	2012

MSY ($B_{trigger}$)	?	?	?	Undefined
Precautionary approach (B_{pa}, B_{lim})	?	?	?	Undefined

The UWTV surveys conducted since 2002 give estimates of abundance that have fluctuated widely without a significant trend. The generally low harvest rate appears to have little impact on observed stock fluctuations and is below F_{MSY} .

RECENT MANAGEMENT ADVICE:

ICES advises on the basis of the MSY approach that landings in 2013 should be no more than 890 tonnes.

To protect the stock in this functional unit, management should be implemented at the functional unit level.

Other considerations:

MSY approach

No MSY $B_{trigger}$ has been identified for this FU. Hence the ICES MSY approach has been applied only in relation to FMSY. This implies harvest ratio of 10.5 %, resulting in landings of 890 t in 2013.

STECF COMMENTS: STECF agrees with the ICES assessment of the state of the stock and the advice for 2013.

STECF considers that management of fishing mortality on Nephrops stocks would best be achieved if measures, including catch restrictions, were implemented at the level of the functional unit.

STECF notes that the landings corresponding to ICES advice for 2013 imply a 36% increase on the status quo harvest ratio (and 37% more in landings) from this functional unit.

STECF notes that in recent years several newer vessels specialising in Nephrops fishing have participated in this fishery. These vessels target Nephrops on several other grounds within the TAC area and move around to optimise catch rates. Since the introduction of effort management associated with the cod long term plan (EC 1342/2008) there have been concerns that effort could be displaced towards the Aran and other Nephrops grounds where effort control has not been put in place.

3.2. Norway lobster (*Nephrops norvegicus*) in Celtic and Irish Seas

Norway lobster in this region contains 5 Functional Units:

FU no.	Name	ICES Divisions	Statistical rectangles
14	Irish Sea East	VIIa	35–38E6; 38E5
15	Irish Sea West	VIIa	36E3; 35–37 E4–E5; 38E4
19	Ireland SW and SE coast	VII,g,j	31–33 D9–E0; 31E1; 32E1–E2; 33E2–E3
20–21	Labadie, Baltimore, Jones and Cockburn	VIIg,h	28–30 E1; 28–31 E2; 30E3
22	Smalls	VIIg,f	31–32E2, 31–32E4

Of these, FU 14 (Irish Sea E.), FU 15 (Irish Sea W.), FU19 (Ireland SW and SE coast) and FU 22 (Smalls) are currently assessed on basis of UWTV surveys. On basis on the UWTV surveys current stock abundance and harvest ratios are estimated.

MSY approach

There are no precautionary reference points defined for *Nephrops*. Under the new ICES MSY framework, exploitation rates which are likely to generate high long-term yield (and low probability of stock overfishing) have been explored and proposed for each functional unit. Owing to the way *Nephrops* are assessed, it is not possible to estimate F_{msy} directly and hence proxies for F_{msy} are determined. Three stock-specific candidates for F_{msy} ($F_{0.1}$, $F_{35\%SpR}$ and F_{max}) have been derived from a length-based per recruit analysis. There may be strong difference in relative exploitation rates between the sexes in many stocks. To account for this values for each of the candidates have been determined for males, females and the two sexes combined. The appropriate F_{msy} candidate has been selected for each Functional Unit independently according to the perception of stock resilience, factors affecting recruitment, population density, knowledge of biological parameters and the nature of the fishery (relative exploitation of the sexes and historical Harvest Rate vs. stock status).

A decision making framework based on the table below was used in the selection of preliminary stock specific F_{msy} proxies. These may be modified following further data exploration and analysis. The combined sex F_{msy} proxy should be considered appropriate provided that the resulting percentage of virgin spawner per-recruit for males or females does not fall below 20%. In such a case a more conservative sex specific F_{msy} proxy should be picked over the combined proxy.

		Burrow Density (average numbers/m2)		
		Low	Med	High
		<0.3	0.3-0.8	>0.8
Observed larvest rate or landings compared to stock status	> F_{max}	F35%	F_{max}	F_{max}
	F_{max} - $F_{0.1}$	$F_{0.1}$	F35%	F_{max}
	< $F_{0.1}$	$F_{0.1}$	$F_{0.1}$	F35%
	Unknown	$F_{0.1}$	F35	F35%
Stock Size Estimates	Variable	$F_{0.1}$	$F_{0.1}$	F35%
	Stable	$F_{0.1}$	F35%	F_{max}
Knowledge of biological parameters	Poor	$F_{0.1}$	$F_{0.1}$	F35%
	Good	F35%	F35%	F_{max}
History Fishery	Stable spatially and temporally	F35%	F35%	F_{max}
	Sporadic	$F_{0.1}$	$F_{0.1}$	F35%
	Developing	$F_{0.1}$	F35%	F35%

The lowest observed UWTV abundance has been proposed as a preliminary MSY $B_{trigger}$ for *Nephrops* in other areas. However, the time series for many of the UWTV surveys in Subarea VII are too short for such an approach to be used. For FU 15 where a longer series of survey trawl cpue was available this has been used to estimate a preliminary MSY $B_{trigger}$ (scaled to the UWTV abundance).

Data limited stocks

Not all Functional Units areas are covered by TV surveys and in some cases the biological data are also sparse which has resulted in qualitative advice based on trends in catch rates and size composition. For 2012, the basis for advice has been developed from the TV survey methodology in order to provide a quantitative estimate of fishing opportunity likely to be compliant with MSY considerations. This approach has been implemented for *Nephrops* on the Labadie and other banks in the Celtic Sea (FU 20–21).

The approach is based on habitat extent and population characteristics. The physical area of the FU has been determined either through knowledge of the sediment type, or from the fishery itself (e.g. VMS positions). Estimates of total abundance are calculated by taking the physical area and multiplying by potential values of *Nephrops* density which are drawn either from neighbouring FUs with existing TV surveys or from preliminary TV surveys of the specific FU. The numbers removed corresponding to the average (10 years) and maximum observed landings were estimated using mean weights and appropriate discard rates. Finally, the harvest rates for these removal numbers were calculated for each of the possible density values and these are laid down in a table:

Basis: Surface area FU 20–21: 3710 km², Mean weight: 34 g, Discards: 25% in number

Basis	Landings	Range of potential densities (<i>Nephrops</i> per m ²)						
		0.2	0.25	0.3	0.35	0.4*	0.45	0.5
average (3yr)	2058	10.3%	8.3%	6.9%	5.9%	5.2%	4.6%	4.1%
average (10yr)	2464	12.4%	9.9%	8.3%	7.1%	6.2%	5.5%	5.0%
maximum	3145	15.8%	12.6%	10.5%	9.0%	7.9%	7.0%	6.3%
Minimum	1152	5.8%	4.6%	3.9%	3.3%	2.9%	2.6%	2.3%

Shaded areas indicate harvest rates > 7.5 % (lowest F_{MSY} proxy of *Nephrops* across the Celtic Seas Ecoregion)

* Most recent density estimate (preliminary TV survey results)

STECF COMMENTS: The management approach with an aggregated TAC is a major obstacle for the application of the rules in the Commissions Communication on Fishing opportunities for 2012 ([COM\(2012\) 278-FINAL](#)) which requires a TAC for each stock (in this case FU). It furthermore runs the risk of unbalanced effort distribution. This is known to have been a particular problem in the Porcupine bank (FU 16) in the past, where large increases in effort were followed by a substantial decline in the stock (and subsequently quotas were introduced for the FU 16 component of Sub-area VII for 2011).

STECF notes that there are also *Nephrops* catches in “other rectangles” in Sub-area VII (including the north-west coast of Ireland which has previously been treated as a separate FU (18)). To provide some guidance on appropriate future landings for these areas, the use of an average landings figure (2009-2011) of around 270 tonnes could be considered (On the basis of ICES advice that catches from ‘other areas’ should not increase).

3.2.1. Norway lobster (*Nephrops norvegicus*) in FU 14, Irish Sea East (Division VIIa)

FISHERIES: Prior to 2007 landings from this FU were believed to be underreported. However, new legislation in 2007 increased the reliability of the landings data. The landings have fallen from a peak of 960 t in 2007 to 561 t in 2011. Most of the landings are taken by the UK with the Republic of Ireland taking the remainder. The *Nephrops* trawl fisheries take by-catches of other species especially plaice, but also whiting and cod. UK *Nephrops* directed effort in FU14 has declined since 2007 and is estimated to be at the lowest value in 2011 since 1974. .

SOURCE OF MANAGEMENT ADVICE: The main management advisory body is ICES. The assessment in 2012 is based UWTV surveys of absolute abundance. In 2012 ICES revised the abundance estimations using a

more precise field of view (0.75 m) and a bias of 1.2. The new estimates show a decrease around 10% in abundance compared with last year estimations for the data series.

REFERENCE POINTS:

	<i>Type</i>	<i>Value</i>	<i>Technical basis</i>
MSY	MSY B_{trigger}	Not defined	No available reference. UWTV time series too short.
Approach	F_{msy}	Harvest ratio 9.8 %	Equivalent to $F_{0.1}$ for combined sexes.
Precautionary Approach	Not defined		

Harvest ratio reference points (2010):

	Male	Female	Combined
F_{max}	15.8%	17.4%	16.4%
$F_{0.1}$	9.6%	10.2%	9.8%
$F_{35\%SpR}$	12.5%	13.5%	13.0%

STOCK STATUS:

F (Fishing Mortality)			
	2009	2010	2011
MSY (F_{MSY})	✓	✓	✓ Below target
Precautionary approach ($F_{\text{pa}}, F_{\text{lim}}$)	?	?	? Undefined

SSB (Spawning Stock Biomass)			
	2010	2011	2012
MSY (B_{trigger})	?	?	? Undefined
Precautionary approach ($B_{\text{pa}}, B_{\text{lim}}$)	?	?	? Undefined

There is not a long enough time series to determine a candidate for MSY B_{trigger} . Current harvest rate is below the F_{MSY} proxy.

RECENT MANAGEMENT ADVICE:

ICES advises on the basis of the MSY approach that landings in 2013 should be no more than 880 t.

To protect the stock in this functional unit, management should be implemented at the functional unit level.

Other considerations:

MSY approach

Following the ICES MSY approach implies the harvest ratio to be no more than 9.8%, resulting in landings of no more than 880 t in 2013.

STECF COMMENTS: STECF agrees with the ICES assessment of the state of the stock and the advice for 2013.

STECF considers that management of fishing mortality on *Nephrops* stocks would best be achieved if measures, including catch restrictions, were implemented at the level of the functional unit.

STECF notes that the landings corresponding to ICES advice for 2013 imply a 30% increase on the status quo harvest ratio (and 29% more in landings) from this functional unit.

STECF notes that by-catches of cod, whiting and undersized plaice occur in this fishery and agrees that selectivity of this fishery should be improved.

3.2.2. Norway lobster (*Nephrops norvegicus*) in FU 15, Irish Sea West (Division VIIa)

FISHERIES: Prior to 2007, landings from this FU are believed to be underreported. However, new legislation in 2007 increased the reliability of the landings data. Estimated landings in 2008 were more than 10500 t from the Irish Sea West. Landings in 2009 and 2010 decreased to around 9000 t but increased again to more than 10000 t in 2011. Most of the landings are taken by the UK and the Republic of Ireland. The *Nephrops* trawl fisheries take by-catches of other species such as cod and particularly juvenile whiting. Around 16% of Irish vessels are using separator trawls and Swedish grids to reduce by-catch.

SOURCE OF MANAGEMENT ADVICE: The main management advisory body is ICES. The assessment in 2012 is based on trends in population indicators and catch options derived from UWTV surveys as last year..

REFERENCE POINTS:

	<i>Type</i>	<i>Value</i>	<i>Technical basis</i>
MSY	MSY B _{trigger}	3 billion individuals	Minimum abundance observed based in a scaled trawl survey
Approach	F _{msy}	HR 17.1%	Equivalent to F _{max} for combined sexes in 2010.
Precautionary Approach	Not defined		

Harvest ratio reference points (2010):

	Male	Female	Combined
F _{max}	17.1%	17.1%	17.1%
F _{0.1}	11.0%	10.2%	10.6%
F _{35%SpR}	14.1%	12.7%	13.4%

STOCK STATUS:

F (Fishing Mortality)		
2009	2010	2011

MSY (F_{MSY})				Above target
Precautionary approach (F_{pa}, F_{lim})				Undefined

SSB (Spawning Stock Biomass)				
	2010	2011	2012	
MSY ($B_{trigger}$)				Above trigger
Precautionary approach (B_{pa}, B_{lim})				Undefined

The stock abundance is stable and is above MSY Btrigger. Recent harvest rates have fluctuated around FMSY. This stock has sustained landings at around 9000 t for many years.

RECENT MANAGEMENT ADVICE:

ICES advises on the basis of the MSY approach that landings in 2013 should be no more than 9300 t.

To protect the stock in this functional unit, management should be implemented at the functional unit level.

Other considerations:

MSY approach

Following the ICES MSY approach implies a harvest ratio to be less than 17.1%, resulting in landings of 9300 t in 2013.

STECF COMMENTS: STECF agrees with the ICES assessment of the state of the stock and the advice for 2013.

STECF considers that management of fishing mortality on Nephrops stocks would best be achieved if measures, including catch restrictions, were implemented at the level of the functional unit.

STECF notes that the landings corresponding to ICES advice for 2013 imply a 12% decrease on the status quo harvest ratio (and 12% less in landings) from this functional unit.

STECF notes that the Nephrops trawl fishery takes bycatches of other species, especially plaice, but also, whiting and cod. Selectivity of this fishery needs to be improved to reduce bycatches of cod, whiting and undersized plaice.

3.2.3. Norway lobster (*Nephrops norvegicus*) in FU19, SW and SE Ireland (Divisions VII g, j)

FISHERIES: Reported landings for this FU were 833 t in 2009, but decreased to 700 t in 2010 and decreased further to 608 t in 2011. Similar to the situation in Aran Grounds the most recent change in the fishery is the proportion of twin-rig vessels, which has increased to over 90 % of the fleet in the past eight years. This implies a large increase in effective effort, even if such an increase is not observed in the nominal effort figures.

SOURCE OF MANAGEMENT ADVICE: The main management advisory body is ICES. The 2012 assessment is based on data from UWTV survey begun in 2011. The absolute abundance estimate and the corresponding Fmsy harvest rate are considered conservative because only around 60% of the *Nephrops* grounds are included in the estimates of abundance.

REFERENCE POINTS:

	Type	Value	Technical basis
MSY	MSY Btrigger	Not defined	
Approach	FMSY	HR 7.5%	Equivalent to F0.1 for combined sex in 2011
Precautionary Approach	Not defined		

Harvest ratio reference points (2012):

	Male	Female	Combined
F_{max}	10.4%	21.9%	12.7 %
$F_{0.1}$	6.5%	14.2%	7.5 %
$F_{35\%SpR}$	8.3%	21.8%	12.1 %

STOCK STATUS:

F (Fishing Mortality)			
	2009	2010	2011
MSY (F_{MSY})	?	?	✓ Below target
Precautionary approach (F_{pa}, F_{lim})	?	?	? Undefined

SSB (Spawning Stock Biomass)	
	2009-2011
Qualitative evaluation	→ Without trend

The current harvest rates are below MSY reference points. Biomass in relation to MSYBtrigger cannot be evaluated. LPUE has fluctuated without trend since 1995.

RECENT MANAGEMENT ADVICE:

ICES advises on the basis of the MSY approach that landings in 2013 should be no more than 820 t.

To protect the stock in this functional unit, management should be implemented at the functional unit level.

Other considerations

MSY approach

No MSY Btrigger has been identified for this FU. Hence the ICES MSY framework has been applied only in relation to FMSY. This implies harvest ratio of 7.5%, resulting in landings of 820 t in 2013.

STECF COMMENTS: STECF agrees with the ICES assessment of the state of the stock and the advice for 2013.

STECF considers that management of fishing mortality on Nephrops stocks would best be achieved if measures, including catch restrictions, were implemented at the level of the functional unit.

STECF notes that the landings corresponding to ICES advice for 2013 imply a 7% increase on the status quo harvest ratio (and 8% more in landings) from this functional unit.

STECF notes that the *Nephrops* fisheries in this area are fairly mixed also landing megrim, anglerfish, haddock and other demersal species. The main discarded species are haddock, whiting and dogfish.

3.2.4. Norway lobster (*Nephrops norvegicus*) in FU 20-22, Celtic Sea (Divisions VIIf, g, h)

FISHERIES: There are three Functional Units in the Celtic Sea area but FU 20 and 21 are treated together. Landings from these Functional Units are reported by France, the Republic of Ireland and the UK, the main contributors being France and Ireland. In 2008 total reported landings from all 3 FUs amounted to more than 6000 t, but have since decreased, and in 2011 total landings were around 2850 t of which 1240 were taken in FU 20-21. There has been a considerable decrease in French landings and effort (due to decommissioning) whilst Irish landings have increased. There has also been increasing effort by Irish vessels targeting *Nephrops* in the Celtic Sea in recent years. Discarding and high-grading takes place, but varies between fleets and areas


SOURCE OF MANAGEMENT ADVICE: The main management advisory body is ICES. For FUs 20 and 21, The advice is based on a calculation of potential landing options and harvest rates given the known surface area of *Nephrops* habitat and assumed potential densities of the functional unit.. For FU 22 the assessment and advice is based on UWTV abundance estimates and indicators of mean size


REFERENCE POINTS:

	<i>Type</i>	<i>Value</i>	<i>Technical basis</i>
MSY Approach	MSY $B_{trigger}$	Not defined	
	Whole FU20-22) harvest rate	Not defined	
	F_{MSY} (FU22) harvest rate	10.9%	<i>MSY under SCA model</i>
Precautionary Approach		Not defined	




STOCK STATUS:

FU 20-21

F (Fishing Mortality)		
2009–2011		
Qualitative evaluation		Decreasing

SSB (Spawning Stock Biomass)		
2009–2011		
Qualitative evaluation		Unknown

FU 22

F (Fishing Mortality)				
	2009	2010	2011	
MSY (F_{MSY})				Appropriate

Precautionary approach (F_{pa}, F_{lim})	?	?	?	Unknown
SSB (Spawning Stock Biomass)				
	2009–2011			
Qualitative evaluation	→		Stable	

For the FU 20-21 stock component, for a long period, the stock was considered to be stable based on long term indicators (lpue, mean size, discard rates). There have been indications of strong recruitment in recent years (e.g. 2006) resulting in an increase in commercial lpue for Irish and for French trawlers in 2008 and 2009. Lpue decreased in the last two years suggesting a decline in abundance since the peak in 2008–2009. Landings in 2010 and 2011 have declined substantially (potentially explained by a decreased targeting of Nephrops by the French fleet).

The FU 22 stock component is considered to be stable based on indicators (lpue, mean size) and recent UWTV survey data. Harvest rates have decreased since 2007 and are below FMSY.

RECENT MANAGEMENT ADVICE:

FU 20-21

Based on the ICES approach for data limited stocks, ICES advises that landings should be no more than 2500 tonnes. This is the first year that ICES is providing quantitative advice for data limited stocks.

To protect the stock in this functional unit, management should be implemented at the functional unit level.

FU 22

ICES advises on the basis of the MSY approach that landings from FU22 in 2013 should be no more than 2600 t.

To protect the stock in this functional unit, management should be implemented at the functional unit level.

Other considerations

FU 20-21

ICES approach to data limited stocks

For this stock, the last 10 years average landings correspond to a Harvest Rate below the range of MSY harvest rates calculated for other Nephrops FUs (between 7.5–17%) provided that the Nephrops density is at least 0.35. The most recent density estimate (from 2006) is 0.4 Nephrops per m². Even though this density estimate is six years old, the stock development since then (as indicated by commercial effort and lpue trends) does not give reason for concern that the burrow density may have declined significantly. Therefore, ICES advises that landings should not increase in relation to the ten year average landings, which corresponds to landings of no more than 2500 tonnes.

FU 22

MSY approach:

No MSY Btrigger has been identified for FU 22. Hence the ICES MSY approach has been applied only in relation to FMSY. This implies the harvest ratio for the Smalls FU22 to be less than 10.9 %, resulting in landings of less than 2600 t in 2013.

STECF COMMENTS: STECF agrees with the ICES assessment of the state of the FU 20-21 stock and the advice basis for 2013 and 2014. In addition, STECF agrees with the advice for 2013 for FU 22.

STECF considers that management of fishing mortality on Nephrops stocks would best be achieved if measures, including catch restrictions, were implemented at the level of the functional unit.

STECF notes that the landings corresponding to ICES advice for 2013 imply a 106% increase on the status quo harvest ratio (and 100% more in landings) from the functional unit 22.

3.3. Cod (*Gadus morhua*) in Division VIa (West of Scotland)

FISHERIES: Cod is taken in mixed demersal fisheries and in Division VIa is now regarded as a by-catch species. The fleets involved include French vessels targeting saithe and Scottish whitefish trawlers. Landings are predominantly taken by EU fleets and were sustained at about 21,000 t until the late 1980s. Landings have since declined markedly to a level of about 220 t in 2009. Landings restrictions in the first half of the 1990s led to considerable misreporting. Legislation introduced in Britain and Ireland in 2006 has reduced misreporting. Observer data, however, show an increase in discards starting in 2006. The management area for this stock also includes cod in VIb, Vb, XII and XIV with a specified share allocated to VIa.

SOURCE OF MANAGEMENT ADVICE: The main management advisory body is ICES. A catch-at-age model using catch data up to 1994 tuned by survey data and utilizing survey information alone from 1995 onward was used to evaluate trends in spawning-stock biomass and recruitment. Trends in SSB are similar to results from a model based on survey data alone.

REFERENCE POINTS:

	<i>Type</i>	<i>Value</i>	<i>Technical basis</i>
MSY	MSY B _{trigger}	22 000 t	B _{pa}
Approach	F _{MSY}	0.19	Provisional proxy by analogy with North Sea cod F _{max} . Fishing mortalities in the range 0.17–0.33 are consistent with F _{MSY} .
Precautionary Approach	B _{lim}	14 000 t	B _{lim} = B _{loss} , the lowest observed spawning stock estimated in previous assessments.
	B _{pa}	22 000 t	Considered to be the minimum SSB required to ensure a high probability of maintaining SSB above B _{lim} , taking into account the uncertainty of assessments. This also corresponds with the lowest range of SSB during the earlier, more productive historical period.
	F _{lim}	0.8	Fishing mortalities above this have historically led to stock decline.
	F _{pa}	0.6	This F is considered to have a high probability of avoiding F _{lim} .

(unchanged since: 2010)

STOCK STATUS:

STOCK STATUS: F (Fishing Mortality)				
	2009 2010		2011	
MSY (F _{MSY})	✘	✘	✘	Above target
Precautionary approach (F _{pa} , F _{lim})	✘	✘	✘	Harvest unsustainable
SSB (Spawning-Stock Biomass)				

	2010 2011		2012	
MSY (B_{trigger})	✘	✘	✘	Below trigger
Precautionary approach ($B_{\text{pa}}, B_{\text{lim}}$)	✘	✘	✘	Reduced reproductive capacity

Total mortality is high, and is increasingly the result of mortality due to discarding. The spawning-stock biomass continues to increase from an all-time low in 2006, but remains at a very low level (well below B_{lim}). Recruitment has been estimated to be low over the last decade. The 2005 and 2008 year classes are estimated to be above recent average.

MANAGEMENT OBJECTIVES:

The fishery is managed by a combination of TAC, area closures, technical measures, and effort restrictions.

The EU has adopted a long-term plan for cod stocks and the fisheries exploiting those stocks (Council Regulation (EC) 1342/2008 and 237/2010). This regulation repeals the recovery plans in Regulation (EC) No 423/2004, and has the objective of ensuring the sustainable exploitation of the cod stocks on the basis of maximum sustainable yield while maintaining a target fishing mortality of 0.4 on specified age groups. The regulation is complemented by a system of fishing effort limitation (see EC 57/2010 for latest revision).

In **2009** ICES evaluated this revised long-term plan in relation to the precautionary approach and concluded that (assuming TAC and effort constraints would lead to rapid declines in fishing mortality) the stock would recover by 2015. However, given the recent changes in discarding in response to moderate year classes, ICES could not conclude the plan was precautionary. Discards reported to ICES (all fleets combined) are 11 times greater than landings, making catch (landings + discards) 12 times greater than landings.

RECENT MANAGEMENT ADVICE

ICES advises on the basis of the MSY approach that there should be no directed fisheries and that bycatch and discards should be minimized in 2013 and 2014.

Other Considerations

MSY approach:

Following the ICES MSY framework implies fishing mortality to be reduced to 0.03 (lower than F_{MSY} because SSB in 2013 is 84% below MSY B_{trigger}), resulting in landings of no more than 30 tonnes in 2013. This is expected to lead to an SSB of 6630 tonnes in 2014.

Following the transition scheme towards the ICES MSY framework implies fishing mortality to be reduced to 0.34, based on $(F_{2010} * 0.4) + ((F_{\text{MSY}} * (SSB_{2013} / MSY B_{\text{trigger}})) * 0.6)$, resulting in landings of no more than 270 t in 2013. This is expected to lead to an SSB of 5240 tonnes in 2014.

However, considering the low SSB and low recruitment over the last decade, it is not possible to identify any non-zero catch which would be compatible with the MSY approach. Also, bycatches including discards of cod in all fisheries in Division VIa should be reduced to the lowest possible level and further technical measures to reduce catches should be implemented.

PA Considerations:

Given the low SSB and low recruitments in recent years, it is not possible to identify any non-zero catch which would be compatible with the precautionary approach. No targeted fishing should take place on cod in Division VIa. Bycatches, including discards of cod in all fisheries in Division VIa, should be reduced to the lowest possible level.

Management plan:

Following the agreed management plan implies $F(2013) = 0.75 F(2012)$, where $F(2012)$ has been assumed to correspond to the same reduction from $F(2011)$ as the effort reduction imposed in 2012 with respect to the effort allowed in 2011. The effort reduction in 2011 was 25%. This results in a TAC of 460 t.

Additional Considerations

A negative impact on recruitment with rising sea temperature has been shown for cod in the warmer waters of this species' range, including west of Scotland.

Grey seal abundance is significant to the west of Scotland where seals are known to feed on cod, among other species. The latest estimates of grey seal abundance over time shows the population in the area to have remained stable since the mid-1990s (Thomas, 2011). The contribution of seal predation to total cod mortality is likely to be significant and this may impair the ability of the stock to recover, but data is limited. New mean weight at age dependent natural mortalities-at-age have been adopted to better take account of higher natural mortality at younger ages, but it is not certain these values fully accommodate the possible large source of natural mortality from seals.

STECF COMMENTS:

STECF agrees with the ICES advice that there should be no directed fisheries and that bycatch and discards should be minimized in 2013 and 2014. STECF advises that this advice should be interpreted to mean that in 2013 and 2014, catches of cod from Division VIa should be reduced to the lowest possible level.

STECF notes that there is an inconsistency between the ICES estimate of catches from VIa in 2011 and the catches reported to the STECF under the 2011 catch and effort data call. The reasons for the observed inconsistency are unknown, but as a consequence STECF considers that the estimates of F and Biomass from the ICES assessment for 2011 are sufficiently uncertain that they should not be used as a basis for catch predictions for 2013. Consequently, STECF considers that there is a lack of sufficiently accurate and representative information to give advice allowing the Council to set the TACs in accordance with Articles 7 or 8 of Council Regulation ((EC) No. 1342/2008 and that Article 9 should be invoked.

STECF notes that Article 9 of Council Regulation ((EC) No. 1342/2008) establishing measures for the recovery and long-term management of cod stocks stipulates the following:

Where, due to lack of sufficiently accurate and representative information, STECF is not able to give advice allowing the Council to set the TACs in accordance with Articles 7 or 8, the Council shall decide as follows: (a) where STECF advises that the catches of cod should be reduced to the lowest possible level, the TACs shall be set according to a 25 % reduction compared to the TAC in the previous year; (b) in all other cases the TACs shall be set according to a 15 % reduction compared to the TAC in the previous year, unless STECF advises that this is not appropriate.

STECF therefore notes that in keeping with the above advice from ICES and STECF, the provisions of Article 9(a) of Council Regulation ((EC) No. 1342/2008) apply, prescribe that the TAC for cod in waters to the West of Scotland in 2013 shall be set according to a 25% reduction compared to the TAC in 2012. The agreed TAC for 2012 is 0 t implying that the TAC for 2013 should also be set at 0 t.

STECF notes that whereas the fishery is managed by a combination of TAC, area closures, technical measures, and effort restrictions, current management measures are not controlling mortality levels on cod in Division VIa.

3.4. Cod (*Gadus morhua*) in Division VIb (Rockall)

FISHERIES: Rockall cod has been exploited predominantly by Scottish, Irish and Norwegian vessels using towed gears. Landings have fluctuated between 500 t and 2,000 t (1984-2000) but thereafter showed a steady decline to a level of about 60 t from 2005. In 2008 - 2011 landings fluctuated between 60 and 100t.

The management area for this stock also includes cod in Vb, XII and XIV.

SOURCE OF MANAGEMENT ADVICE: The main management advisory body is ICES but no explicit management advice is given for this stock.

REFERENCE POINTS: No reference points are defined for this stock.

STOCK STATUS:

F (Fishing Mortality)

	2009–2011
Qualitative evaluation	? Insufficient information

SSB (Spawning-Stock Biomass)	
	2009–2011
Qualitative evaluation	? Insufficient information

MANAGEMENT OBJECTIVES:

The fishery is managed by a combination of TAC, area closures, technical measures, and effort restrictions.

RECENT MANAGEMENT ADVICE:

Based on the ICES approach for data-limited stocks, ICES advises that catches should be no more than 70 tonnes. This is the first year ICES is providing quantitative advice for data-limited stocks (see Quality considerations).

Other Considerations

ICES approach to data-limited stocks

For data-limited stocks without information on abundance or exploitation ICES considers that a precautionary reduction of catches should be implemented, unless there is ancillary information clearly indicating that the current level of exploitation is appropriate for the stock.

For this stock, ICES advises that catches should decrease by 20% in relation to the last three years' average landings, corresponding to catches of no more than 70 t.

STECF COMMENTS: STECF notes that the state of the stock is unknown. The value of 70 t advised by ICES represents a reduction of 20% on the average reported landings over the period 2009-2011. STECF therefore advises that it seems more appropriate to express the advice for 2013 in terms of landings instead of catches. STECF therefore advises that based on the ICES approach for data limited stocks, landings of cod should be no more than 70 t in 2013.

STECF advises that because cod are taken in a mixed fishery with haddock, management measures adopted for VIb cod should also be consistent with the management measures adopted for VIb haddock.

3.5. Haddock (*Melanogrammus aeglefinus*) in Division VIa (West of Scotland)

FISHERIES: Haddock to the West of Scotland are taken as part of a mixed demersal fishery, with the biggest landings reported by UK (mainly Scottish) trawlers (2,407 tonnes in 2010 representing 83% of the landings); Irish trawlers (396 tonnes in 2010 representing 14% of the landings); and with smaller landings reported by other nations including France, Germany and Norway. Landings by non-EU fleets have not exceeding 50 tonnes over the reported period (2001 – 2010). Catches are widely distributed and are concentrated in several areas, e.g. Butt of Lewis and on the shelf west of the Outer Hebrides.

In 2006, landings of 5,833 tonnes were reported for this stock, representing an 80% increase on the (previous) record low landings of 2,561 tonnes reported in 2005. Subsequently reported landings fell to 3,773 tonnes in 2007 and varied between 2,850 to 2,900 tonnes between 2008 and 2010. Preliminary figures for 2011 indicate landings have fallen to 1,743t.

Recruitment to this stock has varied greatly over the entire time series, however. in recent years recruitment has shown a general and dramatic decline from >450 million in 2000 (the largest on record) to an estimated recruitment of approximately 8 million in 2008 and 2009. Last year's assessment forecasted a small increase in

the recruitment for 2010 while the current recruitment forecast (for the 2011 year-class) is estimated to be ~15 million; higher than in 2010.

The total catch for haddock is estimated to be 5830 tonnes; 51% of these are discards. Splitting discards by fleet shows that *Nephrops* vessels (TR2) are responsible for ~88% of all discards while landing only 21 tonnes, less than 1% of the total landings (2882 tonnes).

In Scotland the ‘Conservation Credits Scheme’ (CCS) was implemented at the beginning of February 2008. The two central themes of CCS are aimed at reducing the amount of cod caught by (i) avoiding areas with elevated abundances of cod and (ii) the use of more species-selective gears. Within the scheme, efforts are also being made to reduce discards generally. Although the scheme is intended to reduce cod mortality, it may also affect the mortality of haddock, in either a positive or negative manner.

SOURCE OF MANAGEMENT ADVICE: The management advisory body is ICES. In recent years a catch-at-age model using catch data up to 1994 tuned by survey data and utilizing survey information alone from 1995 onward was used to evaluate trends in spawning-stock biomass and recruitment and the model estimated total catch from the fishery without the ability to distinguish between landings and discards. From 2009 catch data were re-introduced for years since 2006

REFERENCE POINTS:

	<i>Type</i>	<i>Value</i>	<i>Technical basis</i>
MSY	MSY $B_{trigger}$	30 000 t	B_{pa}
Approach	F_{MSY}	0.3	Provisional proxy by analogy with North Sea haddock. Fishing mortalities in the range of 0.19–0.41 are consistent with F_{MSY} .
Precautionary	B_{lim}	22 000 t	$B_{lim} = B_{loss}$, the lowest observed spawning stock estimated since the reference point was established in 1998.
	B_{pa}	30 000 t	$B_{pa} = B_{lim} * 1.4$. This is considered to be the minimum SSB required to obtain a high probability of maintaining SSB above B_{lim} , taking into account the uncertainty of assessments.
Approach	F_{lim}	Not defined.	
	F_{pa}	0.5	The F below which there is a high probability of avoiding $SSB < B_{pa}$.

STOCK STATUS:

F (Fishing Mortality)				
	2009 2010		2011	
MSY (F_{MSY})				Below target
Precautionary approach (F_{pa}, F_{lim})				Harvested sustainably

SSB (Spawning-Stock Biomass)

	2010 2011		2012	
MSY (B_{trigger})	✘	✘	✘	Below trigger
Precautionary approach ($B_{\text{pa}}, B_{\text{lim}}$)	✘	✘	○	Increased risk

The 2009 year class is strong relative to others in the recent period, but still below the long-term average. Nevertheless, this year class contributes to the rise of the SSB in 2011 estimated at 20.8 thousand tonnes. F has been above F_{pa} in most years since 1987, but dropped below F_{pa} in 2007 and at F_{MSY} since 2008.

RECENT MANAGEMENT ADVICE:

ICES advises on the basis of the MSY framework that landings in 2013 should be no more than 9,300 t. Effective technical measures should be implemented to reduced high discard rates in the *Nephrops* fleet (TR2).

Other Considerations

Management plan

An EU management plan proposal has been evaluated by ICES and is considered to be precautionary. The aim of this plan is to keep the SSB above 30 000 tonnes with a fishing mortality of no more than 0.3. The main elements in the plan are a 25% constraint on TAC change between years and lower fishing mortality rates whenever the SSB is lower than 30,000 t.

Following the plan would result in a 25% TAC increase resulting in removals from the stock of 13,400 tonnes, and landings of 7,519 tonnes in 2013. This is expected to lead to an SSB of 35,500 tonnes in 2014.

MSY approach

Following the ICES MSY framework implies a fishing mortality less than 0.3, resulting in landings of 9,300 tonnes in 2013. This is expected to lead to an SSB of 33 300 tonnes in 2014. Since F is below F_{MSY} in 2011, the transition to MSY option is not relevant.

PA approach

A fishing mortality of 0.38 is needed to increase SSB to around B_{pa} in 2014. This corresponds to landings no more than 11,450 tonnes in 2013.

STECF COMMENTS:

STECF agrees with the ICES assessment of the state of the stock.

STECF notes that landings in 2013 based on the ICES MSY framework implies a fishing mortality less than 0.3, resulting in landings of 9,300 tonnes in 2013.

Applying the harvest rules in the management plan proposed for this stock would imply that the TAC for 2013 should be set at 7,519 t corresponding to a 25% increase in the TAC compared to 2012.

STECF notes that both of the above options are predicted to give rise to an increase in SSB in 2014 to levels that are above $MSY_{B_{\text{trigger}}}$

STECF notes that as in previous years discarding remained a problem in 2011(46% by weight discarded in 2011). An increase in the TAC for haddock in 2012 and changes to the catch composition rules are likely to result in reduced discarding of haddock from 2012.

3.6. Haddock (*Melanogrammus aeglefinus*) in Division VIb (Rockall)

FISHERIES: The haddock stock at Rockall is an entirely separate stock from that on the continental shelf of the British Isles. Rockall haddock have lower growth rates and reach a lower maximum size than other haddock populations in the Atlantic.

Until recently the Rockall haddock fishery largely occurred in summer months, when conditions are easier and particularly when fishing at Rockall was more profitable compared with the North Sea or West of Scotland. A number of Irish vessels did however exploit this stock on a more regular basis.

Haddock are caught in a mixed fishery together with blue whiting and a number of non-assessed species such as grey gurnard. Traditionally Scottish and Irish trawlers target haddock, whilst Russian trawlers also fish for species such as gurnard. UK, Russian and Irish vessels account for the highest proportion of the landings, with smaller quantities taken by other nations including Iceland, France, Spain and Norway.

Since 1987 reported landings have varied between 2,300 t and 8,000 tonnes. For 2009 total landings were 3,400t. As part of this stock area now falls outside the EU EEZ there was an increase in activity by non-EU fleets, notably Russian Federation vessels, from 1999 onwards, although this has declined in recent years. Landings by non-EU fleets reached a peak in 2004, when reported landings by the Russian Federation amounted to 5,844 t or some 90% of the total. For 2010 the officially reported landings from the Russian Federation and Norway were 198 t and 65 t respectively compared with 55 t and 71 t in 2009.

Effort by the Scottish and Irish fleets increased in recent years following a period of reduced effort 2004 – 2006, and anecdotal information suggests this is partly as consequence of effort restrictions introduced as part of the 2009 long-term plan for cod.

Following the NEAFC agreement in March 2001, an area of the NEAFC zone around Rockall was closed to fishing using demersal trawls; in spring 2002 part of the shallow water in the EU component also. Effort in the rectangle containing the closure declined when the closure came into effect. There was also a decline in UK effort across the bank as a whole at this time, but an increase of effort in other areas of Division VIIb. However, it is difficult to determine to what extent these closures have contributed to protecting juveniles.

SOURCE OF MANAGEMENT ADVICE: The management advisory body is ICES.

The assessment is based on catch numbers-at-age and one survey index (Rock-WIBTS-Q3). In 2011 the survey was resumed with a new gear but an analysis showed that there was no detectable difference between it and the older gear. The 2012 assessment is thus more robust than 2011 one.

REFERENCE POINTS:

	<i>Type</i>	<i>Value</i>	<i>Technical basis</i>
MSY	MSY B _{trigger}	9000 t	B _{pa}
Approach	F _{MSY}	0.3	Provisional proxy by analogy with North Sea haddock. Fishing mortalities close to F _{sq} in 2010.
Precautionary Approach	B _{lim}	6000 t	B _{lim} = B _{loss} , the lowest observed spawning stock estimated in previous assessments.
	B _{pa}	9000 t	B _{pa} = B _{lim} * 1.4. This is considered to be the minimum SSB required to obtain a high probability of maintaining SSB above B _{lim} , taking into account the uncertainty of assessments.
	F _{lim}	Not defined.	Not defined due to uninformative stock recruitment data.
	F _{pa}	0.4	This F is adopted by analogy with other haddock stocks as the F that provides a small probability that SSB will fall below B _{pa} in the long term.

STOCK STATUS:

F (Fishing Mortality)

	2009	2010	2011	
MSY (F_{MSY})	✘	✔	✔	Below target
Precautionary approach (F_{pa}, F_{lim})	✔	✔	✔	Harvest sustainably

SSB (Spawning-Stock Biomass)				
	2010	2011	2012	
MSY ($B_{trigger}$)	✔	✔	✔	Above trigger
Precautionary approach (B_{pa}, B_{lim})	✔	✔	✔	Full reproductive capacity

Recruitments since 2007 are estimated to be extremely weak. The spawning-stock biomass increased up to 2008 as a result of the 2001 and 2005 year classes and has decreased constantly since then. SSB has been above MSY $B_{trigger}$ since 2003 but is now expected to decrease below B_{lim} . Fishing mortality has declined over time and is now below F_{MSY} .

RECENT MANAGEMENT ADVICE:

ICES advises on the basis of the MSY approach that there should be no directed fisheries and that bycatch and discards should be minimized in 2013.

Note: Annual recruitment to this stock is estimated to have been extremely weak every year since 2007. While the spawning-stock biomass increased up to 2008 (as a result of the 2001 and 2005 year classes) it has decreased constantly since then and is predicted to decrease strongly and be below B_{lim} in 2013 and 2014.

Other Considerations

Management plans

A management plan is under development and is currently being evaluated by ICES.

MSY approach

Following the ICES MSY framework implies fishing mortality at $F_{MSY-HCR} = F_{MSY} * SSB_{2013} / MSY B_{trigger} = 0.19$, resulting in landings of no more than 1,700 t in 2013. This is expected to lead to an SSB of 3,400 t in 2014, which is below MSY $B_{trigger}$. However, considering the extremely low recruitment since 2007 and that SSB will be below MSY $B_{trigger}$ in 2014 for all catch scenarios, it is not possible to identify any non-zero catch which would be compatible with the MSY approach. Also, bycatches including discards of haddock in all fisheries in Division VIb should be reduced to the lowest possible level. Further management measures should be introduced to reduce discarding of small haddock in order to maximize their contribution to future yield and SSB.

PA approach

SSB in 2014 is estimated to be below B_{lim} for all scenarios. It is not possible to identify any non-zero catch which would be compatible with the precautionary approach.

STECF COMMENTS: STECF agrees with the ICES assessment of the state of the stock and the advice for that there should be no directed fisheries and that bycatch and discards should be minimized in 2013. STECF advises that this advice should be interpreted to mean that in 2013 catches of haddock from Division VIb (Rockall) should be reduced to the lowest possible level.

3.7. Saithe (*Pollachius virens*) in Div's Vb (EU zone), VI, XII and XIV

The assessment has been combined with that in Sub-Area IV – see Section 2.7.

3.8. Whiting (*Merlangius merlangus*) in Division VIa (West of Scotland)

FISHERIES: Whiting occur throughout northeast Atlantic waters in a wide range of depths, from shallow inshore waters down to 200 m. Adult whiting are widespread throughout Division VIa, while high numbers of juvenile fish occur in inshore areas. There may be a degree of mixing of adult fish between IVa whiting and the VIa component off the northwest of Scotland.

Whiting has never been a particularly valuable species and is primarily taken as a bycatch with other species, such as haddock, cod and anglerfish. Scottish trawlers take most of the whiting catch in Division VIa, Ireland takes a smaller proportion of the catch and all the remaining catch is taken by EU vessels. Whiting in Division VIa are caught mainly by 80–120 mm trawls. There has been a reduction in trawl and seine effort, with a more moderate reduction by *Nephrops* trawlers. At present a higher proportion of the overall effort is by relatively small-meshed trawls. There has been a tendency to shift from the use of heavy groundgear (like rockhopper) to lighter groundgear.

Since 1987, human consumption landings declined from about 11,500 t to an historic low of 290 t reported officially in 2005. Total catch in 2011 was 569 t, of which 40% were landings (230 t) and 60% discards; 83% of these discards come from the TR2 (*Nephrops*) fishery.

The increase in minimum mesh size from 100 to 120 mm in 2001/2002 (before the introduction of effort regulation 27/2005) partly caused a shift to 80-mm mesh sizes in the mixed fishery trawls, due to the loss of valuable *Nephrops* catches. Poorer selectivity at this mesh size may have led to increased discarding and high grading.

SOURCE OF MANAGEMENT ADVICE: The management advisory body is ICES. In 2010 a survey-based assessment was used to evaluate trends in SSB, total mortality, and recruitment.

REFERENCE POINTS:

	<i>Type</i>	<i>Value</i>	<i>Technical basis</i>
MSY	MSY B _{trigger}	Not defined.	
Approach	F _{MSY}	Not defined.	
Precautionary	B _{lim}	16 000 t	Blim = Bloss(1998), the lowest observed spawning stock estimated in previous assessments.
	B _{pa}	22 000 t	Bpa = Blim * 1.4. This is considered to be the minimum SSB required to have a high probability of maintaining SSB above Blim, taking into account the uncertainty of assessments.
Approach	F _{lim}	1.0	Flim is the fishing mortality above which stock decline has been observed.
	F _{pa}	0.6	Fpa = 0.6 * Flim. This F is considered to have a high probability of avoiding Flim.

(unchanged since: 1998)

STOCK STATUS:

F (Fishing Mortality)

	2009	2010	2011	
MSY (F_{MSY})	?	?	?	Unknown
Precautionary approach (F_{pa}, F_{lim})	✓	✓	✓	Harvested sustainably

SSB (Spawning Stock Biomass)				
	2010	2011	2012	
MSY ($B_{trigger}$)	?	?	?	Unknown
Precautionary approach (B_{pa}, B_{lim})	✗	✗	✗	Reduced reproductive capacity

The spawning-stock biomass has increased slightly since an all-time low in 2005, but remains very low compared to the historical estimates (and well below B_{lim}). Fishing mortality has declined continuously since around 2000 and is now very low. Recruitment is estimated to have been very low over the last decade. The 2009 year class is estimated to be above the recent average.

RECENT MANAGEMENT ADVICE:

ICES advises on the basis of the precautionary approach that catches in 2013 should be reduced to the lowest possible level and that effective technical measures should be implemented to reduce discards in the *Nephrops* (TR2) fleet.

Other Considerations

MSY considerations

No new advice given. Advice from previous year considers that while biomass has declined to record low level in recent years, exploitation status is unknown with regards to MSY levels. To allow the stock to rebuild, catches (more than half of which are discarded) should be reduced. There are strong indications that TAC management control is not effective in limiting the catch.

PA considerations

Given the low SSB and low recruitments in recent years, it is not possible to identify any non-zero catch which would be compatible with the precautionary approach. Catches should be reduced to the lowest possible level.

Effective technical measures should be implemented to improve the selection pattern and reduce discards in the *Nephrops* (TR2) fleet.

STECF COMMENTS: STECF agrees with the ICES assessment of the state of the stock and the advice for 2013.

3.9. Whiting (*Merlangius merlangus*) in Division VIb (Rockall)

FISHERIES: Landings of whiting from Division VIb are negligible, 9 t (preliminary) in 2011.

SOURCE OF MANAGEMENT ADVICE: The management advisory body is ICES. No assessment has been carried out.

REFERENCE POINTS: No precautionary reference points or reference points related to fishing at MSY have been proposed.

STOCK STATUS: The state of the stock is unknown.

F (Fishing Mortality)	
	2009–2011
Qualitative evaluation	? Insufficient information

SSB (Spawning Stock Biomass)	
	2009–2011
Qualitative evaluation	? Insufficient information

RECENT MANAGEMENT ADVICE:

Based on the ICES approach for data limited stocks, ICES advises that catches should be no more than 11 tonnes.

ICES approach to data limited stocks

For data limited stocks without information on abundance or exploitation ICES considers that a precautionary reduction of catches should be implemented, unless there is ancillary information clearly indicating that the current level of exploitation is appropriate for the stock.

For this stock, ICES advises that catches should decrease by 20% in relation to the last three years average landing (14 t), corresponding to catches of no more than 11 t.

STECF COMMENTS: STECF agrees with the ICES assessment of the state of the stock.

The value of 14 t advised by ICES represents a reduction of 20% on the average reported landings over the period 2009-2011. STECF therefore advises that it seems more appropriate to express the advice for 2013 in terms of landings instead of catches. STECF therefore advises that based on the ICES approach for data limited stocks, landings of whiting should be no more than 14 t in 2013.

STECF notes that the TAC is for the combined Divisions VIa and VIb; therefore, the TAC is unlikely to be effective in limiting catches in Division VIb (Rockall).

3.10. Anglerfish (*Lophius piscatorius* & *Lophius budegassa*) in ICES Divisions IIIa & Vb , Subareas IV, VI, XII & XIV.

FISHERIES: Anglerfish mature at large size, resulting in a high fraction of the catch consisting of immature fish. Catches of anglerfish on the northern shelf (from Division VIb to IIIa) come from the same biological stock. Spawning appears to occur largely in deep water off the edge of the continental shelf, although mature females are rarely encountered. Anglerfish are caught widely in VIa with the highest catch rates occurring along the shelf edge in deeper waters.

Anglerfish are caught in a targeted anglerfish fishery in Sub-Area VI and as a bycatch in other demersal fisheries, including roundfish fisheries in Division VIa, the haddock fishery on Rockall Bank, *Nephrops* fisheries, and fisheries in deeper waters. In the North Sea, anglerfish are caught mainly as a bycatch in demersal fisheries for mixed roundfish and *Nephrops* and to a lesser extent in small meshed *Pandalus* fisheries.

Vessels from EU Member States take most of the catch. ICES estimates of landings show an increase from around 8,000 t in the mid 70's to a peak in 1995 around 35,000 t. Since then landings have declined to levels close to the historic period around 12,000 t. Discards in the Scottish fleet is negligible at less than 0.5 t in the North Sea.


SOURCE OF MANAGEMENT ADVICE: The management advisory body is ICES. The assessment area (Divisions IIIa and IIIa & Subareas IV and VI) includes anglerfish from Sub-area IV. The information basis for anglerfish is being developed, with improvements to both industry related data and surveys. There is currently insufficient data to support an analytic assessment of the state of the stock. Landings information provided in the ICES advice does not include Divisions XII and XIV but these represent only a small fraction of the stock.

REFERENCE POINTS:

ICES (2012) report that: “No reference points have been defined for these stocks. Because of identified problems with growth estimates and uncertainties in ageing, previous reference points are no longer considered to be valid”.

STOCK STATUS:

F (Fishing Mortality)		
2009–2011		
MSY (F_{MSY})	?	Unknown
Precautionary approach (F_{pa}, F_{lim})	?	Unknown

SSB (Spawning-Stock Biomass)		
2007–2011		
MSY ($B_{trigger}$)	?	Unknown
Precautionary approach (B_{pa}, B_{lim})	?	Unknown
Qualitative evaluation		Decreasing

Recent dedicated anglerfish surveys, the Scottish and Irish anglerfish and megrim industry/science survey for the Northern shelf (SCO-IV-VI-AMISS-Q2) in Division IVa and Subarea VI, indicate a decline in abundance and biomass since 2008. The average biomass over this area in the last two years (2010–2011) is 20% lower than the average biomass of the three previous years (2007–2009).

MANAGEMENT OBJECTIVES: There are no explicit management objectives for this stock but the European Community and Norway are in discussions regarding the joint management of this shared stock.

RECENT MANAGEMENT ADVICE:

Based on the ICES approach to data-limited stocks, ICES advises that catches should be reduced by 20% in relation to the average of the last three years. Due to the uncertainty in the landings data, ICES is not able to quantify the resulting catch.

This is the first year ICES is providing quantitative advice for data-limited stocks.

ICES advises that the management area should be consistent with the assessment area.

Other considerations

ICES approach to data-limited stocks

For data-limited stocks for which biomass estimates are available, ICES uses as harvest control rule an index-adjusted *status quo* catch. The advice is based on a comparison of the two most recent biomass values with the three preceding values, combined with recent catch or landings data. Knowledge about the exploitation status also influences the advised catch.

For this stock the biomass is estimated to have decreased by 20% in 2007–2009 (average of the three years) and 2010–2011 (average of the two years). This implies a 20% decrease in catches. Due to the uncertainty of landings, ICES is not able to quantify the resulting catch. Considering that the effort in the main fisheries has decreased significantly no additional precautionary reduction is needed.

STECF COMMENTS: STECF notes that the trend in annual landings largely reflects the trends in survey biomass and abundance, which could indicate that F has remained relatively constant. Furthermore, survey data indicate that stock abundance and biomass were lower in the recent 2-3 years than in previous 4-5 years which could imply that F has generally been too high to maintain stable stock abundance. STECF therefore advises that in the absence of reliable biological reference points, it would be appropriate to adopt a precautionary approach and reduce F.

STECF considers that reported landings are likely to be a reasonable representation of the catch of anglerfish since discards are likely to be low. In an attempt to reduce F on anglerfish, STECF therefore suggests that to be precautionary, it would be appropriate to restrict catches of anglerfish from Division IIIa and Subareas IV, V and VI to a level less than the average level of landings reported for 2010 and 2011 which are the lowest in the available time series. This would imply that catches in 2013 should be less than 12,464 t.

Applying the ICES advice of a 20% reduction on the average reported landings over the most recent 3 years, implies that landings in 2013 should be no greater than 11,018 t.

STECF also notes that the assessment and management areas for anglerfish do not coincide and the basis of the assessments are dedicated bottom trawl surveys covering only part of Division IVa and subarea VI. Furthermore, the survey data are for *Lopius piscatorius* and the trends in stock biomass and abundance for *Lophius budegassa* are not considered in the assessment or advice. The consequences for the *Lophius budegassa* stock of any management measure therefore remain unknown.

STECF notes that landings from subarea XII and division Vb are not included in the ICES assessment.

3.11. Megrim (*Lepidorhombus whiffiagonis* and *Lepidorhombus boscii*) in ICES Subarea VI (West of Scotland and Rockall).

The stock summary and advice for megrim in Subarea VI is given together with Divisions Iva, Vb, XII and XIV in Section 3.12.

3.12. Megrim (*Lepidorhombus whiffiagonis*) in IVa, Vb (EU zone), VI, XII & XIV

FISHERIES: The main fishery is in Sub-Area VI where megrim is taken as a by-catch in trawl fisheries targeting anglerfish, roundfish species and *Nephrops*. There is however increasing targeting of megrim in response to more restrictive fishing opportunities for other species. Since 2009, ICES also provides advice on megrim in Subarea IV (North Sea). This is because the spatial distribution of landings data and survey catches provide good evidence to suggest that megrim population is contiguous between Divisions IVa and VIa.

The main exploiters are the UK ($\geq 80\%$ of catch in the past 4 years), Ireland, France and Spain.

Between 1990 and 2011 nominal catches of Megrim in Division VIa, VIb and subarea IV as officially reported to ICES have ranged from 934 t in 2005 to 3276 t in 1995. Combined landings generally declined from their peak in 1995 to the low in 2005, but have been fluctuating around 1,300 t since then with a report of 1,208 t for 2011.

It is unclear if the trends in landings reflects trends in abundance or are a consequence of the reduction in trawl effort observed over the period.

Area misreporting has been prevalent as megrim catches were misreported from Subarea VI into Subarea IV, due to restrictive quotas for anglerfish (i.e. vessels targeting anglerfish misreported all landings including megrim from Subarea VI into Subarea IV). However, in the most recent years there is evidence to suggest that this has reversed as the subarea IV TAC has become more restrictive and increasing targeting of megrim in response to more restrictive fishing opportunities for other species e.g. cod. The extent of this problem is unknown and should be quantified through integrated logbook and VMS analysis. As a consequence, the management of anglers and megrim which in the past has been thought to be strongly coupled is now likely to significantly less so.

SOURCE OF MANAGEMENT ADVICE:

The management advisory body is ICES.

ICES consider that there is little evidence to suggest that the megrim in Subarea IV and Division VIa are separate stocks and concluded that megrim in Divisions VIa and IVa should be treated as a single stock and megrim in Division VIb (Rockall) should be treated as a separate stock. Consequently it provides advice, separately, for each. In both cases these assessments are landings and survey trends based rather than analytical.

REFERENCE POINTS:

Divisions IVa and VIa:

	<i>Type</i>	<i>Value</i>	<i>Technical basis</i>
MSY	MSY B_{trigger}	9 700 t	50% B_{MSY}
Approach	F_{MSY}	0.29	Estimated directly from the model.
Precautionary	B_{lim}	5 800 t	30% B_{MSY}
	B_{pa}	Not defined.	
Approach	F_{lim}	Not defined.	
	F_{pa}	Not defined.	

STOCK STATUS:

Divisions IVa and VIa:




F (Fishing Mortality)				
	2009	2010	2011	
MSY (F_{MSY})	✓	✓	✓	Appropriate
Precautionary approach ($F_{\text{pa}}, F_{\text{lim}}$)	✓	✓	✓	Harvested sustainably




Biomass				
	2010	2011	2012	
MSY (B_{trigger})	✓	✓	✓	Above trigger
Precautionary approach ($B_{\text{pa}}, B_{\text{lim}}$)	✓	✓	✓	Full reproductive capacity

The state-space surplus production model indicates that the overall mortality rate has declined and stabilised at the level of around 40% of F_{MSY} . Biomass has been fluctuating but stable at around 1.5 times B_{MSY} .

Division VIb (Rockall)

F (Fishing Mortality)

	2009-2011	
MSY (F_{MSY})		Unknown
Precautionary approach (F_{pa}, F_{lim})		Unknown
Qualitative evaluation		Below poss. reference points

SSB (Spawning Stock Biomass)		
	2007-2011	
MSY ($B_{trigger}$)		Unknown
Precautionary approach (B_{pa}, B_{lim})		Unknown
Qualitative evaluation		Decreasing

There is no analytical assessment for this stock. Survey indices for Division VIb show an increase in biomass over the time series from 2005 to 2010, followed by a decline in 2011. The average of the stock size indicator, biomass from the survey, in the last two years (2010–2011) is 7% lower than the average of the three previous years (2007–2009). The harvest ratio has been on a low and stable level since 2007.

RECENT MANAGEMENT ADVICE:

Divisions IVa and VIa: ICES advises on the basis of the MSY approach that landings in 2013 and 2014 should be no more than 4700 t.

Division VIb (Rockall): Based on the ICES approach for data limited stocks, ICES advises that catches in 2013 should be no more than 160 tonnes. This is the first year that ICES is providing quantitative advice for data limited stocks.

STECF COMMENTS:

Division VIb (Rockall): STECF agrees with the ICES assessment of the state of the stock. The value of 160 t advised by ICES represents a reduction of 7% on the average reported landings over the period 2009-2011. STECF therefore considers it more appropriate to express the advice for 2013 in terms of landings instead of catches. Adopting such an approach implies landings of megrim of no more than 160 t in 2013.

Divisions IVa and VIa: STECF agrees with the ICES assessment of the state of the stock and the ICES advice for 2013 and 2014.

Allocation of catches to Management areas.

STECF notes that separate TACs are set for the following areas:

IIa and IV

VI, EU and international waters of Vb, international waters of XII and XIV

Assuming a combined TAC for the above areas for 2013 and 2014 of 4860 t including an allocation for Division VIb of 160 t, STECF suggests that to derive separate allocations for Subarea IV and division VIa, the relative proportions of megrim biomass observed from the SAMISS/IAMISS surveys in IV and VIa could be used. In an attempt to take account of any year effects in survey biomass estimates, STECF suggests using average values based on the most recent three years (2009-2011). Adopting such an approach indicates that average survey biomass estimates are as follows: IV – 60 %; VIa - 40%.

Applying these estimates to the catches corresponding to ICES advice for IV and VIa implies that catches in 2013 and 2014 should be as follows: IIa and IV - 2820 t; VI, EU and international waters of Vb, international waters of XII and XIV 2040 t, including an allocation of 160 t for division VIb.

3.13. Plaice (*Pleuronectes platessa*) - Vb (EU zone), VI, XII, XIV

STECF did not have access to any stock assessment information on plaice in these areas.

3.14. Sole (*Solea solea*) – VIIhjk

FISHERIES: Sole are predominantly caught within mixed species otter trawl fisheries in Division VIIj. These vessels target mainly hake, anglerfish, and megrim. Beam trawlers and seiners generally take a lesser catch of sole. The major participants in this fishery are Ireland, the UK and France with a smaller contribution from Belgium. Between 1973 and 1998 landings fluctuated between 650 t and 1,100 t (with the exception of 1978/79 when they fell to 450-550t). Since 1999 landings have generally been less than 500 t and since 2006 less than 300 t. Landings in 2011 were 217t .

SOURCE OF MANAGEMENT ADVICE: The main management advisory body is ICES.




REFERENCE POINTS:

No reference point table was provided by ICES in 2012, though it appears from the text that the old version below is still applicable.

	<i>Type</i>	<i>Value</i>	<i>Technical basis</i>
MSY	MSY B _{trigger}	Not defined	
Approach	F _{msy}	0.31	Provisional proxy based on WGCSE 2010 estimate of F _{max}
Precautionary Approach	B _{lim}	Not defined	
	B _{pa}	Not defined	
	F _{lim}	Not defined	
	F _{pa}	Not defined	

(unchanged since 2010)

STOCK STATUS:

F (Fishing Mortality)		
	2009–2011	
MSY (F_{MSY})		Unknown
Precautionary approach (F_{pa}, F_{lim})		Unknown
Qualitative evaluation		close to current proxy for F _{MSY}

SSB (Spawning-Stock Biomass)	
	2009–2011
Qualitative evaluation	Unknown

The state of sole stock biomass in Divisions VIIh–k is unknown. However, exploratory estimates of mortality suggest that the current fishing mortality in Divisions VIIj,k has increased since 2007, but it remains below the current proxy for F_{MSY} .

RECENT MANAGEMENT ADVICE:

Based on the ICES approach for data-limited stocks, ICES advises that landings should be no more than 200 t.

Management of sole should take into account the advice for reduced bycatches and discards of plaice in this management area.

Other consideration

ICES approach to data-limited stocks

For data-limited stocks for which fishing mortality is available and estimated below F_{MSY} , ICES catch advice is based on an increase in landings proportional to the ratio of F_{MSY} to the current F .

Given that F_{MSY} (0.31) is 15% higher than the average $F_{2009-2011}$ (0.27), an increase of 15% with respect to the last 3 years average landings may be authorised, corresponding to catches of 253 t. Additionally, considering fishing mortality is progressively increasing since 2007 and that the SSB level is unknown, ICES advises that catches should decrease by 20% as a precautionary buffer. This results in catch advice of no more than 200 t.

STECF COMMENTS: STECF notes that the ICES advice for 2013 is based on the choice of F_{MAX} as a proxy for F_{MSY} , without any evidence to suggest that this level of F is sustainable. STECF suggests the use of $F_{0.1}$ as a more precautionary proxy in the absence of such additional information. In that case, the resulting catches would be lower than those advised by ICES but in the absence of an estimate of $F_{0.1}$, STECF is unable to provide the equivalent value.

STECF also notes that the landings corresponding to ICES advice for 2013 imply a 5% increase on the average reported landings over the years 2009-2011.

STECF further notes that following the ICES approach to data-limited stocks, the advised catches for this stock for 2013 would have been greater than 200 t, if all Member States had fully-utilised their quota entitlements over the years 2009-2011.

3.15. Sole (*Solea solea*) - VIIbc

FISHERIES: Ireland is the major participant in this fishery. Sole are normally caught in mixed species otter trawl fisheries in Division VIIb. These vessels mainly target other demersal fish species and *Nephrops*. Recent catches have varied between 77 t in 2000 and 43 t in 2010 and have been close to the TAC. In 2011 official landings figures suggest landings of 27 t, with WG estimates indicated to be around half the TAC of 43t (22t).

SOURCE OF MANAGEMENT ADVICE: The main management advisory body is ICES.

REFERENCE POINTS: No reference points have been proposed for this stock.

STOCK STATUS:

F (Fishing Mortality)	
	2009–2011
Qualitative evaluation	Insufficient information

SSB (Spawning-Stock Biomass)	
	2009–2011
Qualitative evaluation	? Insufficient information

RECENT MANAGEMENT ADVICE:

Based on the ICES approach for data-limited stocks, ICES advises that catches should be no more than 30 tonnes.

Other considerations

ICES approach to data-limited stocks

There is insufficient information to evaluate the status of the stock. For data-limited stocks without information on abundance or exploitation ICES considers that a precautionary reduction of catches should be implemented unless there is ancillary information clearly indicating that the current exploitation is appropriate for the stock.

For this stock, ICES advises that catches should decrease by 20% in relation to the average landings of the last three years, corresponding to catches of no more than 30 t.

STECF COMMENTS: STECF agrees with the ICES assessment of the state of the stock. The value of 30 t advised by ICES represents a reduction of 20% on the average reported landings over the period 2009-2011. STECF therefore considers it more appropriate to express the advice for 2013 in terms of landings instead of catches. Adopting such an approach implies landings of sole of no more than 30 t in 2013.

STECF notes that following the ICES approach to data-limited stocks, the advised catches for this stock for 2013 would have been greater than 30 t, if all Member States had fully-utilised their quota entitlements over the years 2009-2011.

3.16. Sole (*Solea solea*) – Vb, VI, XII and XIV

STECF did not have access to any stock assessment information on plaice in these areas.

3.17. Norway pout (*Trisopterus esmarki*) in Division VIa (West of Scotland)

The most recent advice for this stock was provided by ICES in 2011. Hence, the following text remains unchanged from the Consolidated STECF Review of Advice for 2012. Advice for 2013 will be provided in Part 3 of the STECF review of Advice for 2013 which will be available in November 2012.

FISHERIES Total landings are available for this stock for the years 1971 – 2009. Landings during this period have varied considerable, from a high in 1987 of some 38,000 tonnes to less than 50 tonnes every year since 2005 and zero tonnes since 2007. Historically the majority of landings have been taken by Danish fleets with lesser catches by UK, Netherlands and Germany.

There are currently no dedicated fisheries for Norway Pout in Division VIa (West of Scotland).

SOURCE OF MANAGEMENT ADVICE: The main management advisory body is ICES. ICES has not provided advice for 2012

REFERENCE POINTS: No fishing mortality or biomass reference points are defined for this stock.

STOCK STATUS: No assessment is conducted for this stock.

RECENT MANAGEMENT ADVICE:

There is insufficient information to evaluate the status of this stock. Therefore, based on precautionary considerations, ICES advises that no increase of the catches should take place unless there is evidence that this will be sustainable.

FISHING OPPORTUNITIES FOR 2012 according to COM(2011/298) - final

STECF notes that with reference to COM(2011) 298-final this stock is classified under category 3.

STECF COMMENTS: STECF agrees with the ICES advice that as there is insufficient information to evaluate the status of stock, based on precautionary considerations, no increase of the catches should take place unless there is evidence that this will be sustainable.

3.18. Sandeel (*Ammodytes spp. And Gymnammodytes spp.*) in Division VIa

FISHERIES: Landings of sandeel from Division VIa are negligible, 0 t (2008 – 2011).

A directed industrial fishery existed in the past but this fishery has ceased to exist. If industrial fisheries resumes in this area they may take a bycatch of juvenile herring and other species.

SOURCE OF MANAGEMENT ADVICE: The management advisory body is ICES. No assessment has been carried out.

REFERENCE POINTS: No precautionary reference points or reference points related to fishing at MSY have been proposed.

STOCK STATUS:

F (Fishing Mortality)	
	2009–2011
Qualitative evaluation	? Insufficient information

SSB (Spawning Stock Biomass)	
	2009–2011
Qualitative evaluation	? Insufficient information

The available information is inadequate to evaluate stock trends relative to risk, so the state of the stock is unknown. The only recent data available are official landings statistics which have been very low and do not provide an adequate basis for scientific advice. The stock was last assessed in 1996

RECENT MANAGEMENT ADVICE:

Advice for 2013 and 2014: Based on the ICES approach to data limited stocks, and taking into account the absence of landings in recent years, ICES advises that no increase of the catches should take place unless there is evidence that this will be sustainable.

STECF COMMENTS:

STECF agrees with the ICES advice for 2013 and 2014.

3.19. Rays and skates in ICES Subareas VI and VII

The most recent advice for this stock was provided by ICES in 2011. Hence, the following text remains unchanged from the Consolidated STECF Review of Advice for 2012. Advice for 2013 will be provided in Part 3 of the STECF review of Advice for 2013 which will be available in November 2012.

FISHERIES: Rays and skates are taken as target and by-catches in most demersal fisheries in the ICES area. There are some directed fisheries, for example, in VIIa, but most ray and skate landings are by-catches in trawl and in seine fisheries. A generic TAC introduced for all skate and rays species in North Sea in 1999 but not yet for Celtic Seas. Prior there has been no obligation for fishermen to record catches in the logbooks used for monitoring quota uptake of TAC species. As a consequence, there is a lack of information on the fisheries for rays. Statistical information by species is also limited because few European countries differentiate between species in landings

statistics and they are collectively recorded as skates and rays. The main exception is France, for which the cuckoo ray and the thornback ray are the most important species of skates and rays landed.

SOURCE OF MANAGEMENT ADVICE: The main advisory body is ICES. The assessment is based on survey and landing trends.

REFERENCE POINTS:

	<i>Type</i>	<i>Value</i>	<i>Technical basis</i>
MSY	MSY B _{trigger}	Not defined	
Approach	F _{MSY}	Not defined	
Precautionary	B _{lim}	Not defined	
	B _{pa}	Not defined	
Approach	F _{lim}	Not defined	
	F _{pa}	Not defined	

F_{MSY} is not currently definable for these stocks, unless further information is available, including a better assessment of the species composition of the landings. Reference points cannot be defined.

STOCK STATUS:

F (Fishing Mortality)		
	2007	2008
		2009
F _{msy}	?	
F _{pa} / F _{lim}	?	

SSB (Spawning Stock Biomass)		
	2008	2009
		2010
MSY B _{trigger}	?	
B _{pa} / B _{lim}	?	

In the absence of defined reference points, the status of the stocks of demersal skates and rays (members of the family Rajidae) cannot be evaluated. The following provides a qualitative summary of the general status of the major species based on surveys and landings:

Species	Area	State of stock
Common skate complex	VI	Depleted. The stock likely extends into IIa and IVa
	VII	Depleted. Near extirpated from the Irish Sea (VIIa)

<i>R. clavata</i> (thornback ray)	VI	Stable/increasing.
	VIIa,f,g	Stable/increasing.
	VIIe	Uncertain
<i>R. montagui</i> (spotted ray).	VI	Stable/increasing.
	VIIa,f,g	Stable/increasing.
	VIIe	Uncertain
<i>L. naevus</i> (cuckoo ray)	VI	Uncertain. The stock area is not known, and may merge with sub-areas IV and VII. Survey catches in VIa are increasing.
	VII	Uncertain. The stock area is not known, and may merge with sub-areas VI and VIII. French LPUE in the Celtic Sea has declined. Survey catches appear stable
<i>R. brachyura</i> (blonde ray)	VIa	Uncertain. No trends are apparent from surveys.
	VIIa	Uncertain. No trends are apparent from surveys.
	VIIe	Uncertain
	VIIIf	Uncertain. No trends are apparent from surveys.
<i>R. undulata</i> (undulate ray)	VIIj	Uncertain. Locally common in discrete areas.
	VIIId,e	Uncertain. Locally common in discrete areas.
<i>R. microocellata</i> (small-eyed ray)	VIIIf	Stable/increasing.
<i>L. circularis</i> (sandy ray)	VI	Uncertain.
	VIIb,c,h-k	Uncertain – stable/increasing in VIIj
<i>R. fullonica</i> (shagreen ray)	VI	Uncertain. There is a poor signal from surveys for this species.
	VIIb,c,g-k	Uncertain. There is a poor signal from surveys for this species.
<i>Dipturus oxyrinchus</i> (long-nose skate)	VI-VII	Uncertain
<i>Dipturus nidarosiensis</i> (Norwegian skate)	VI	Uncertain

Stock trends from fishery-independent trawl surveys are available in most cases, however, for most stocks, it is not possible to identify whether overfishing takes place.

Landings of skates and rays in the Celtic Seas have generally declined, and this is associated with changes in species composition and relative abundance.

There is not enough information to assess the status of any species in the Rockall area. The assessments below refer to the other divisions within this eco-region.

RECENT MANAGEMENT ADVICE:

Advice Summary for 2011-2012

Management Objective (s)	Landings in 2011 and 2012
Transition to an MSY approach	Less than 9.9 thousand t for the main species

with caution at low stock size	
Cautiously avoid impaired recruitment (Precautionary Approach)	No target fishery on <i>Raja undulata</i> and <i>Dipturus batis</i> complex
Cautiously avoid impaired recruitment and achieve other objective(s) of a management plan (e.g., catch stability)	n/a

Advice for 2011 and 2012 by individual stocks

Species	Area	Advice
Common skate complex (= <i>D. batis</i> , which has recently been differentiated into <i>D. flossasda</i> and <i>D. intermedia</i> , see Additional Considerations)	VI	No targeted fishery
	VII	No targeted fishery
<i>R. clavata</i> (thornback ray)	VI	Status quo catch
	VIIa,f,g	Status quo catch
	VIIe	Status quo catch
<i>R. montagui</i> (spotted ray).	VI	Status quo catch
	VIIa,f,g	Status quo catch
	VIIe	Status quo catch
<i>L. naevus</i> (cuckoo ray)	VI	Reduce from recent catch level
	VII	Reduce from recent catch level
<i>R. brachyura</i> (blonde ray)	VIa	No advice
	VIIa	No advice
	VIIe	No advice
	VIIIf	No advice
<i>R. undulata</i> (undulate ray)	VIIj	No targeted fishery
	VIIId,e	No targeted fishery
<i>R. microocellata</i> (small-eyed ray)	VIIIf	Status quo catch
<i>L. circularis</i> (sandy ray)	VI	No advice
	VIIbc,h-k	No advice
<i>R. fullonica</i> (shagreen ray)	VI	No advice
	VIIbc,g-k	No advice
<i>Dipturus oxyrinchus</i> (long-nose skate)	VI-VII	No advice
<i>Dipturus nidarosiensis</i> (Norwegian skate)	VI	No advice
<i>Rostroraja alba</i> (White skate)	VII	Retain on prohibited species list

Outlook for 2011-2012

No analytical assessment or forecast can be presented for these stocks. The main cause of this is the lack of a time-series of species specific landings data.

No targeted fishing should be permitted for *Raja undulata* and the *Dipturus batis* complex.

MSY approach

Advice by species/stock is provided in the table above. This advice is based on an application of the MSY approach for stocks without population size estimates. This advice applies to 2011 and 2012. Given the stable, possibly increasing stock trend for the main commercial skate species, as indicated by fishery-independent trawl surveys, but that the exploitation status is unknown, the catch should be maintained at recent levels.

Advice is provided based on an examination of the stock status of each of the different stocks in the divisions within the ecoregion, with the advice for the majority of the stocks provided.

Policy paper

In terms of the EU policy paper on fisheries management (17 May 2010, [COM\(2010\) 241](#)) the stocks in this multispecies complex are classified under a range of categories. The main commercial stocks are classified under categories 6-9, Annex IV, Rule 4. This implies an unchanged TAC.

However, the status of some other skate stocks is unknown, which following category 11 would suggest an adjustment in the TAC to recent catch levels, but by no more than 15%. This would imply a maximum reduction in TAC to 11,379 tonnes in 2011. TACs for individual species within the demersal elasmobranch assemblage are not appropriate, with the exception of a zero TAC for those stocks known to be severely depleted (i.e., *D. batis*, *R. undulata*, *S. squatina*, and *R. alba*).

Species	Area	Policy Category
Common skate complex	VI	Annex III, Category 10
	VII	Annex III, Category 10
<i>R. clavata</i> (thornback ray)	VI	Annex III, Category 8. Annex IV Rule 4 applies
	VIIa,f,g	Annex III, Category 8. Annex IV Rule 4 applies
	VIIe	Annex III, Category 6, Annex IV, Rule 4 applies
<i>R. montagui</i> (spotted ray).	VI	Annex III, Category 8. Annex IV Rule 4 applies
	VIIa,f,g	Annex III, Category 8. Annex IV Rule 4 applies
	VIIe	Annex III, Category 6, Annex IV, Rule 4 applies
<i>L. naevus</i> (cuckoo ray)	VI	Annex III, Category 9 Annex IV, Rule 4 applies
	VII	Annex III, Category 9 Annex IV, Rule 4 applies
<i>R. brachyura</i> (blonde ray)	VIa	Annex III, Category 11
	VIIa	Annex III, Category 11
	VIIe	Annex III, Category 11
	VIIIf	Annex III, Category 11
<i>R. undulata</i> (undulate ray)	VIIj	Annex III, Category 10
	VIIId,e	Annex III, Category 10
<i>R. microocellata</i> (small-eyed ray)	VIIIf	Annex III, Category 6, Annex IV, Rule 4 applies
<i>L. circularis</i> (sandy ray)	VI	Annex III, Category 11
	VIIbc,h-k	Annex III, Category 11

<i>R. fullonica</i> (shagreen ray)	VI	Annex III, Category 11
	VIIbc,g-k	Annex III, Category 11
<i>Dipturus oxyrinchus</i> (long-nose skate)	VI-VII	Annex III, Category 11
<i>Dipturus nidarosiensis</i> (Norwegian skate)	VI	Annex III, Category 11
<i>Rostroraja alba</i> (White skate)	VII	Annex III, Category 10

FISHING OPPORTUNITIES FOR 2012 according to COM(2011) 298-Final.

STECF notes that with reference to COM(2011) 298-final this stock is classified under category 3.

STECF COMMENTS: STECF agrees with the ICES advice.

TACs for individual species within the demersal elasmobranch assemblage are not appropriate, with the exception of a zero TAC for those stocks known to be severely depleted (i.e., *D. batis*, *R. undulata*, *S. squatina*, and *R. alba*).

3.20. Catsharks and Nursehounds (*Scyliorhinus canicula* and *Scyliorhinus stellaris*) in Subareas VI and VII

The most recent advice for this stock was provided by ICES in 2011. Hence, the following text remains unchanged from the Consolidated STECF Review of Advice for 2012. Advice for 2013 will be provided in Part 3 of the STECF review of Advice for 2013 which will be available in November 2012.

FISHERIES: This species is taken primarily as a by-catch in demersal fisheries targeting other species and a large proportion of the catch is discarded, although in some coastal areas there are seasonal small-scale directed fisheries.

SOURCE OF MANAGEMENT ADVICE: The main advisory body is ICES. The assessment is based on survey and landing trends.

REFERENCE POINTS:

	<i>Type</i>	<i>Value</i>	<i>Technical basis</i>
MSY	MSY B _{trigger}	Not defined	
Approach	F _{MSY}	Not defined	
Precautionary	B _{lim}	Not defined	
	B _{pa}	Not defined	
Approach	F _{lim}	Not defined	
	F _{pa}	Not defined	

F_{MSY} is not currently definable for these stocks, unless further information is available, including a better assessment of the species composition of the landings. Reference points cannot be defined.

STOCK STATUS:

F (Fishing Mortality)		
2007	2008	2009

F_{msy}		?	
F_{pa} / F_{lim}		?	

SSB (Spawning Stock Biomass)			
	2008	2009	2010
MSY $B_{trigger}$?	
B_{pa} / B_{lim}		?	

In the absence of formal stock assessments and defined reference points for *Scyliorhinus spp.* in this eco-region, the following provides a qualitative evaluation of the general status of the major species, based on surveys and landings.

Species	Area	State of stock
<i>S. canicula</i> (lesser spotted dogfish)	VI and VII	Stable/increasing in all areas.
<i>S. stellaris</i> (greater spotted dogfish)	VIIa,e,f	Locally common. Survey catches appear to be increasing in VIIa, but there is a poor signal in other areas due to low catches.

RECENT MANAGEMENT ADVICE:

Scyliorhinus canicula (Lesser-spotted dogfish)

Management Objective (s)	Landings in 2011 and 2012
Transition to an MSY approach with caution at low stock size	Maintain catch at recent level
Cautiously avoid impaired recruitment (Precautionary Approach)	Maintain catch at recent level
Cautiously avoid impaired recruitment and achieve other objective(s) of a management plan (e.g., catch stability)	n/a

There is no TAC in place for *Scyliorhinus canicula*.

Advice for 2011 and 2012 by individual stocks

Species	Area	Advice
<i>S. canicula</i> (lesser spotted dogfish)	VI and VII	Status quo catch
<i>S. stellaris</i> (greater spotted dogfish)	VIIa,e,f	No advice

Outlook for 2011-2012

No analytical assessment or forecast can be presented for these stocks. The main cause of this is the lack of a time-series of species specific landings data.

MSY approach

Advice by species/stock is provided in the table above. This advice is based on an application of the MSY approach for stocks without population size estimates. This advice applies to 2011 and 2012.

Policy paper

In terms of the EU policy paper on fisheries management (17 May 2010, [COM\(2010\) 241](#)) the stocks of *Scyliorhinus spp.* are classified under a range of categories.

Species	Area	Policy Category
<i>S. canicula</i> (lesser spotted dogfish)	VI and VII	No TAC is in place, but Annex III, Rule 8, Annex IV Rule 4 would apply.
<i>S. stellaris</i> (greater spotted dogfish)	VIIa,e,f	No TAC is in place , but Annex III, Category 11 would apply

STECF COMMENTS: STECF agrees with the ICES advice.

3.21. Tope (*Galleorhinus galeus*) in ICES Subareas VI and VII

Stock summaries and advice for tope is provided at the NE Atlantic regional level in Section 8.6 STECF is unable to provide additional information and advice for subareas VI and VII separately.

3.22. Other demersal elasmobranchs West of Scotland

The most recent advice for this stock was provided by ICES in 2011. Hence, the following text remains unchanged from the Consolidated STECF Review of Advice for 2012. Advice for 2013 will be provided in Part 3 of the STECF review of Advice for 2013 which will be available in November 2012.

FISHERIES: Historically the increase of commercial fisheries directed at elasmobranch species, and their economic value, rank them low among marine commercial fisheries (Bonfil 1994). In the Northeast Atlantic, although some elasmobranchs are taken in directed fisheries, the majority are landed as bycatch from fisheries targeting commercial teleost species. Recreational fisheries, including charter angling, may be an important component of the tourist industry in some areas.

SOURCE OF MANAGEMENT ADVICE: The main advisory body is ICES. The assessment is based on survey and landing trends.

REFERENCE POINTS:

	Type	Value	Technical basis
MSY	MSY $B_{trigger}$	Not defined	
Approach	F_{MSY}	Not defined	
Precautionary	B_{lim}	Not defined	
	B_{pa}	Not defined	
Approach	F_{lim}	Not defined	

	F_{pa}	Not defined	
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F_{MSY} is not currently definable for these stocks, unless further information is available, including a better assessment of the species composition of the landings. Reference points cannot be defined.

STOCK STATUS:

	F (Fishing Mortality)		
	2007	2008	2009
MSY (F_{msy})		?	
Precautionary approach (F_{pa}, F_{lim})		?	

	SSB (Spawning Stock Biomass)		
	2008	2009	2010
MSY ($B_{trigger}$)		?	
Precautionary approach (B_{pa}, B_{lim})		?	

In the absence of formal stock assessments and defined reference points for *Mustelus* and *Squatina* in this ecoregion, the following provides a qualitative evaluation of the general status of the major species, based on surveys and landings.

Species	Area	State of stock
<i>Mustelus</i> spp. (smooth-hounds)	VII	The stock area is not known, but may merge with sub-areas IV, VI and VIII. Increasing in most surveys.
<i>Squatina squatina</i> (Angel shark)	VI,VII	Rare in this ecoregion, and near extirpated from parts of its former range

RECENT MANAGEMENT ADVICE:

Advice for 2011 and 2012 by individual stocks

Species	Area	Advice
<i>Mustelus</i> spp. (smooth-hounds)	VII	Status quo catch
<i>Squatina squatina</i> (Angel shark)	VI,VII	Retain on prohibited species list

There is not enough information to assess the status of any species in the Rockall area.

Outlook for 2011-2012

No analytical assessment or forecast can be presented for these stocks. The main cause of this is the lack of a time-series of species specific landings data.

MSY approach

Advice by species/stock is provided in the table above. This advice is based on an application of the MSY approach for stocks without population size estimates. This advice applies to 2011 and 2012.

Policy paper

In terms of the EU policy paper on fisheries management (17 May 2010, [COM\(2010\) 241](#)) the stocks of these species are classified under a range of categories.

Species	Area	Policy Category
<i>Mustelus</i> spp. (smooth-hounds)	VII	No TAC is in place, but Annex III, Rule 8, Annex IV Rule 4 would apply.
<i>Squatina squatina</i> (Angel shark)	VI,VII	Annex III, Category 10

3.23. Herring (*Clupea harengus*) in Division VIa North

FISHERIES: Historically, catches have been taken from this area by three fisheries:

- 1) A Scottish domestic pair trawl fleet and the Northern Irish fleet operating in shallower, coastal areas, principally fishing in the Minches and around the Island of Barra in the south; younger herring are found in these areas. This fleet has reduced in recent years.
- 2) The Scottish single-boat trawl and purse seine fleets, with refrigerated seawater tanks, targeting herring mostly in the northern North Sea, but also operating in the northern part of Division VIa (N). This fleet now operates mostly with trawls, but many vessels can deploy either gear.
- 3) An international freezer-trawler fishery has historically operated in deeper water near the shelf edge where older fish are distributed. These vessels are mostly registered in the Netherlands, Germany, France, and England, but most are Dutch owned.

In recent years the age structure of the catch of these last two fleets has become more similar. A stricter enforcement regime in the UK is responsible for the major decrease in area misreporting in 2006.

The fishery is conducted by single and pair Refrigerated Sea Water (RSW) trawlers and single-trawl freezer trawlers. Prior to 2006 there was a fairly even distribution of effort, both temporally and spatially. Since 2006 the majority has been fished in the northern part of Division VIa (North) in the 3rd quarter. Catches in 2011 were 17,800t.

SOURCE OF MANAGEMENT ADVICE: The main management advisory body is ICES. The assessment is based on catch data and an acoustic survey. This assessment is considered to be noisy but unbiased. Misreporting has decreased since 2006 and the quality of the catch data has improved.

REFERENCE POINTS:

	Type	Value	Technical basis
Management	SSB _{MGT}	Not defined.	

plan	F_{MGT}	$F_{3-6} = 0.25$	If SSB in TAC year $\geq 75\ 000$ t ((EC) 1300/2008, Art. 3).
		$F_{3-6} = 0.20$	If SSB in TAC year $<75\ 000$ t and $\geq 50\ 000$ t ((EC) 1300/2008, Art. 3).
		$F_{3-6} = 0.00$	If SSB in TAC year $<50\ 000$ t ((EC) 1300/2008, Art. 3).
MSY	MSY $B_{trigger}$	Not defined.	
Approach	F_{MSY}	0.25	Simulations under different productivity regimes
Precautionary approach	B_{lim}	50 000 t	Lowest reliable estimate of SSB.
	B_{pa}	Not defined.	
	F_{lim}	Not defined.	
	F_{pa}	Not defined.	

(unchanged since: 2010)

STOCK STATUS:

F (Fishing Mortality)				
	2009	2010	2011	
MSY (F_{MSY})	✓	✓	✓	Below target
Precautionary approach (F_{pa}, F_{lim})	?	?	?	Undefined
Management plan (F_{MGT})	✓	✓	✓	Below target

SSB (Spawning-Stock Biomass)				
	2010	2011	2012	
MSY ($B_{trigger}$)	?	?	?	Undefined
Precautionary approach (B_{lim})	✓	✓	✓	Above limit

ICES considers that the stock over recent years has been fluctuating at a low level. Fishing mortality has fluctuated around F_{MSY} in recent years. The current recruitment is lower than in the historical period.

MANAGEMENT AGREEMENT: The EU management plan (Council Regulation (EC) 1300/2008) is based on the following rule.

SSB in the year of the TAC	Fishing mortality	Maximum TAC variation
SSB > 75 000 t	F = 0.25	20%
SSB < 75 000 t	F = 0.2	20%
SSB < 62 500 t	F = 0.2	25%
SSB < 50 000 t (B _{lim})	F = 0	-

ICES has evaluated the plan and concludes that it is in accordance with the precautionary approach.

Agreed Management Plan for VIaN herring: Council Regulation 1300/2008

1. Each year, the Council, acting by qualified majority on the basis of a proposal from the Commission, shall fix for the following year the TAC applicable to the herring stock in the area west of Scotland, in accordance with paragraphs 2 to 6.

2. When STECF considers that the spawning stock biomass level will be equal or superior to 75 000 tonnes in the year for which the TAC is to be fixed, the TAC shall be set at a level which, according to the advice of STECF, will result in a fishing mortality rate of 0.25 per year. However, the annual variation in the TAC shall be limited to 20%.

3. When the STECF considers that the spawning stock biomass level will be less than 75 000 tonnes but equal or superior to 50 000 tonnes in the year for which the TAC is to be fixed, the TAC shall be set at a level which, according to the advice of STECF, will result in a fishing mortality rate of 0,2 per year. However, the annual variation of the TAC shall be limited to:

(a) 20% if the spawning stock biomass level is estimated to be equal or superior to 62 500 tonnes but less than 75 000 tonnes;

(b) 25% if the spawning stock biomass level is estimated to be equal or superior to 50 000 tonnes but less than 62 500 tonnes.

4. When STECF considers that the spawning stock biomass level will be less than 50 000 tonnes in the year for which the TAC is to be fixed, the TAC shall be set at 0 tonnes.

5. For the purposes of the calculation to be carried out in accordance with paragraphs 2 and 3, STECF shall assume that the stock will experience a fishing mortality rate of 0,25 in the year prior to the year for which the TAC is to be fixed.

6. By way of derogation from paragraphs 2 or 3, if STECF considers that the herring stock in the area west of Scotland is failing properly to recover, the TAC shall be set at a level lower than that provided for in those paragraphs.

RECENT MANAGEMENT ADVICE

ICES advises on the basis of the agreed West of Scotland herring management plan that landings in 2013 should be no more than 27,480 t.

ICES advises that activities that impact on the seabed should not take place in spawning grounds unless they can be shown not to have a negative impact on spawning, larval production, or stock dynamics.

Management plan

The EU management plan (Council Regulation (EC) 1300/2008) is based on the following rule;

SSB in the year of the TAC	Fishing mortality	Maximum TAC variation
SSB > 75 000 t	F = 0.25	20%
SSB < 75 000 t	F = 0.2	20%
SSB < 62 500 t	F = 0.2	25%
SSB < 50 000 t (B _{lim})	F = 0	-

Following the agreed management plan implies a TAC of 27 480 t in 2013. This is based on a maximum TAC increase of 20%. SSB in 2013 is estimated to be above 75 000 t implying an F target of $F = 0.25$, constrained by a maximum 20% TAC increase.

A similar management plan was evaluated by ICES in 2005 and found to be consistent with the precautionary approach. In 2008 ICES checked that the changes in stock dynamics and the changes to the plan had not significantly increased the risks.

Other considerations

MSY approach

Following the ICES MSY framework implies a fishing mortality at $F_{MSY} = 0.25$, resulting in landings of less than 31 000 t in 2013. This is expected to lead to an SSB of 98 000 t in 2014. As no MSY $B_{trigger}$ has been identified for this stock, the ICES MSY framework has been applied with F_{MSY} without consideration of SSB in relation to MSY $B_{trigger}$.

STECF COMMENTS: STECF agrees with the ICES assessment of the state of the stock and the advice for 2013.

3.24. Herring (*Clupea harengus*) in the Clyde (Division VIa)

The most recent advice for this stock was provided by ICES in 2005. Hence, with the exception of the TAC proposal arising from the direct application of the rules prescribed in COM(2011) 298-Final, the following text remains unchanged from the Consolidated STECF Review of Advice for 2011.

FISHERIES: There are two stock components present on the fishing grounds, resident spring-spawners and immigrant autumn-spawners. The UK exploits the small stock of herring in this area. TACs have been set at 800 t since 2006. Since 1999, annual landings have varied from no fishing in 2004 to around 600 t in 2007.

SOURCE OF MANAGEMENT ADVICE: The main management advisory body is ICES. No analytical assessment has been made in recent years and no independent survey data are available for recent years.

REFERENCE POINTS: No precautionary reference points have been proposed for this stock.

STOCK STATUS The available information is inadequate to evaluate stock trends, and the state of the stock is uncertain.

RECENT MANAGEMENT ADVICE: Until new evidence is obtained on the state of the stock, existing time and area restrictions on the fishery should be continued in 2010.

STECF COMMENTS: STECF did not have access to any recent stock assessment information on herring in the Clyde (Division VIa).

3.25. Herring (*Clupea harengus*) in Division VIa south and VIIbc

FISHERIES: Since 2008 only Ireland has recorded catches from this area. Between 1988 and 1999 catches varied between 26,109 and 43,969 tonnes. Catches have declined in recent years with 13,040 t reported in 2008, falling to 6,900t in 2011.

The fishery exploits a mixture of autumn-and winter/spring-spawning fish. The winter/spring-spawning component is distributed in the northern part of the area. The main decline in the overall stock appears to have taken place on the autumn-spawning component.

SOURCE OF MANAGEMENT ADVICE: The main management advisory body is ICES. The exploratory separable VPA assessment is uncertain as it is based on catch at age data only. The current survey series is short (2008–2011) and has been used in a new exploratory ICA assessment. This ICA assessment gave similar results to the separable VPA for SSB, but resulted in very different trends in F. The inclusion of fisheries independent information in the ICA run is considered to be an improvement in 2012.

REFERENCE POINTS:

Type	Value	Technical basis
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MSY	MSY B_{trigger}	Undefined.	Under development.
Approach	F_{MSY}	0.25	Stochastic simulations on segmented regression stock recruit relationship, under different productivity regimes.
Precautionary approach	B_{lim}	81 000 t	Lowest reliable estimate.
	B_{pa}	110 000 t	$1.4 B_{\text{lim}}$
	F_{lim}	0.33	F_{loss}
	F_{pa}	Undefined.	

STOCK STATUS:

F (Fishing Mortality)			
	2009	2010	2011
MSY (F_{MSY})	✘	✘	✘ Above target
Precautionary approach ($F_{\text{pa}}, F_{\text{lim}}$)	?	?	? Undefined

SSB (Spawning Stock Biomass)			
	2010	2011	2012
MSY (B_{trigger})	?	?	? Undefined
Precautionary approach ($B_{\text{pa}}, B_{\text{lim}}$)	✘	✘	✘ Reduced reproductive capacity

An exploratory assessment (including survey data from the Malin shelf acoustic survey) shows that SSB is below B_{lim} . The exploratory assessments show different trends in F: one assessment shows a stable trend at high values, whereas another one shows a decrease since 2006. In both cases F is still above F_{MSY} . Recruitment has been low since 2000.

RECENT MANAGEMENT ADVICE

ICES advises on the basis of MSY approach that there should be no catches of this stock unless a rebuilding plan is implemented.

ICES advises that activities that impact on the seabed should not take place in spawning grounds unless they can be shown not to have a negative impact on spawning, larval production or stock dynamics.

Other considerations

Management plans

There is currently no explicit management plan for this stock. A rebuilding plan was proposed by the Pelagic RAC in 2011. ICES has not been requested to evaluate this plan.

MSY considerations

The stock trend is uncertain in recent years, but the stock is considered well below biomass reference points. Exploitation is considered to be above F_{MSY} . There should be no catches of this stock unless a rebuilding plan is implemented.

The proposed plan from the Pelagic RAC can form the basis for this. Such a plan should include possible area closures, and should cover all areas where the stock is caught.

STECF COMMENTS: STECF agrees with the ICES assessment of the state of the stock and the advice for 2013 that there should be no catches from this stock unless a rebuilding plan is put in place.

STECF has advised that the proposed rebuilding plan from the pelagic RAC could not be considered to be precautionary because it lacked provisions for closing the fishery if the stock fell very low. In addition, the assessment results from ICES are too unreliable to be used as a basis for a catch forecast. As a result STECF is unable to provide the forecast catches corresponding to a value for F of $F=0.2$ prescribed in the proposed management plan.

3.26. Herring (*Clupea harengus*) in Division Vb and VIb.

No assessment is made for these areas and no information was available to STECF from these areas.

3.27. Pollack (*Pollachius pollachius*) in western waters

FISHERIES: French and Irish data indicate that most pollack in the Celtic Sea ecoregion is caught by trawls and gillnets. Other gears such as lines, seine nets and beam trawls contribute to a lesser extent. In 2010, 98% of the landings originated from Subarea VII, and Ireland, UK and France together comprised 99% of the official landings. Landings in 2011 were 4,100t.

SOURCE OF MANAGEMENT ADVICE: The main management advisory body is ICES.

REFERENCE POINTS:

No reference points have been defined for this stock.

STOCK STATUS:

F (Fishing Mortality)			
	2009–2011		
Qualitative evaluation	<table border="1"> <tr> <td>?</td> <td>Insufficient information</td> </tr> </table>	?	Insufficient information
?	Insufficient information		

SSB (Spawning-Stock Biomass)			
	2009–2011		
Qualitative evaluation	<table border="1"> <tr> <td>?</td> <td>Insufficient information</td> </tr> </table>	?	Insufficient information
?	Insufficient information		

The available information is insufficient to evaluate the exploitation and the trends of pollack in the Celtic Sea ecoregion.

RECENT MANAGEMENT ADVICE

Based on the ICES approach for data limited stocks, ICES advises that catches should be no more than 4,200t.

This is the first year that ICES is providing quantitative advice for data limited stocks.

Other considerations

ICES approach to data limited stocks

For data limited stocks with an approximate natural mortality rate of < 0.2 and only catch or landings data available, ICES considers the Depletion-Corrected Average Catch (MacCall, 2009), an extension of the potential-yield formula, as a method for estimating sustainable yield for data-poor fisheries.

For these subareas VI and VII, historic catch statistics from 1986 to 2011 were used. The recent catch (last three year average) in VI is less than average DCAC suggested catch. For this area a step increase of 10% is applied to the recent catch. In area VII the recent catch was very similar to the average DCAC suggested catch. This corresponds to catches of no more than 4200 tonnes for subareas VI and VII, which is roughly 1% more than recent catch.

STECF COMMENTS:

STECF agrees with the ICES assessment of the state of the stock and the advice for 2013.

STECF notes that the landings corresponding to ICES advice for 2013 imply a 10% increase on the average reported landings over the years 2009-2011.

STECF further notes that following the ICES approach to data-limited stocks, the advised catches for this stock for 2013 would have been greater than 4200t, if all Member States had fully-utilised their quota entitlements over the years 2009-2011.

STECF notes that ICES reported recreational catches to be 3500 t and these are not included in the DCAC analysis.

3.28. Greenland halibut (*Reinhardtius hippoglossoides*) in western waters

Greenland halibut is a deep sea species and widely distributed in the Northeast Atlantic covering various ICES Divisions. The different management areas are those in

Norwegian waters and international waters (I and II),

Greenland waters and international waters (Va and XIV),

Icelandic waters (Va),

Faroese (Vb) and

EU waters of IIa and IV; EU and international waters of Vb and VI.

Low landings are also taken in international waters of XII.

For advice on the stock component in subareas V and VI refer to Section 5.6 which provides the stock summary and management advice covering the management areas in Greenland waters (XIV and Va), Icelandic waters (Va), Faroese waters Vb, European waters in VI as well as international waters in VI, XII and XIV.

3.29. Grey Gurnard (*Eutrigla gurnardus*) in western waters


FISHERIES: Currently, grey gurnard is a bycatch species in demersal fisheries, mainly by trawlers. Catches are largely discarded. Official landings for 2011 were 82t. Discards are unknown.

SOURCE OF MANAGEMENT ADVICE: The main management advisory body is ICES.

REFERENCE POINTS:

No reference points have been defined for this stock.

STOCK STATUS:

F (Fishing Mortality)	
Qualitative evaluation	2009–2011
	 Insufficient information
SSB (Spawning-Stock Biomass)	

	2009–2011
Qualitative evaluation	Insufficient information

The available information is inadequate to evaluate overall biomass or abundance trends. Landings data are not presented for this species because gurnard catches were often reported in one generic category of “gurnards” until 2010. In addition, landings data are considered only marginally informative because catches are mainly discarded.

RECENT MANAGEMENT ADVICE: ICES advises on the ICES approach to data-limited stocks, implying that catches in 2013 should be reduced by 20% in relation to the average catch of the last three years. Because the data for catches of grey gurnard are considered highly unreliable, ICES is not in a position to quantify the result.

This is the first year ICES is providing quantitative advice for data-limited stocks.

ICES advises that the management area should be consistent with the assessment area.

Other considerations

ICES approach to data-limited stocks

For data-limited stocks without information on abundance or exploitation ICES considers that a precautionary reduction of catches should be implemented, unless there is ancillary information clearly indicating that the current exploitation is appropriate for the stock.

For this stock, the ICES approach to data-limited stocks implies that catches should decrease by 20% in relation to the average catch of the last three years. Because the data for catches of grey gurnard are considered highly unreliable, ICES is not in a position to quantify the result.

STECF COMMENTS: STECF agrees with the ICES assessment of the state of the stock and notes that there is no rational basis for providing a catch figure for 2013.

STECF notes that ICES has a difficulty providing a catch figure as the available information is inadequate to evaluate overall biomass or abundance trends.

STECF notes that gurnard catches were often reported in one generic category of “gurnards” until 2010. In addition

STECF notes that landings data are considered only marginally informative because catches are mainly discarded.

3.30. Red Gurnard (*Aspitrigla cuculus*) in western waters

STECF did not have access to any recent stock assessment information on red gurnard in western waters. Advice for red gurnard in the Northeast Atlantic will provided by ICES in September 2012 and STECF advice will be provided in Part 3 of the STECF review of Advice for 2013 which will be available in November 2012.

3.31. Red mullet (*Mullus barbatus and Mullus surmelutus*) in western waters

STECF did not have access to any recent stock assessment information on red mullet in western waters. Advice for striped red mullet (*Mullus surmelutus*) in Subarea VI, VIII and Divisions VIIa-c,e-k and IXa will provided

by ICES in September 2012 and STECF advice will be provided in Part 3 of the STECF review of Advice for 2013 which will be available in November 2012.

3.32. Sea bass (*Dicentrarchus labrax*) in western waters

STECF did not have access to any recent stock assessment information on sea bass in western waters. Advice for European seabass in the Northeast Atlantic will be provided by ICES in September 2012 and STECF advice will be provided in Part 3 of the STECF review of Advice for 2013 which will be available in November 2012.

3.33. Cod (*Gadus morhua*) in area VIIa (Irish Sea Cod)

FISHERIES: The Irish Sea cod fishery has traditionally been carried out by otter trawlers targeting spawning cod in spring and juvenile cod in autumn and winter. Activities of these vessels have decreased, whilst a fishery for cod and haddock using large pelagic trawls increased substantially during the 1990s. In recent years the pelagic fishery has also targeted cod during the summer. Cod are also taken as a by-catch in fisheries for *Nephrops*, plaice, sole and rays. Landings are taken entirely by EU fleets and were between 6,000 t and 15,000 t from 1968 to the late 1980s. There has since been a steep decline in landings to levels as low as 1,300 t in 2000. There has been a slight increase from this level in 2001 and 2002 (up to 2,700 t) but since then, landings have continuously declined to the record low value of 460 t in 2010. The quality of the commercial landings and catch-at-age data for this stock deteriorated in the 1990s following reductions in the TAC without associated control of fishing effort. Legislation introduced in Britain and Ireland in 2006 has reduced misreporting. Total catches (2011) are unknown. Landings are estimated at 370 t, but official landings were 24% higher, due to inaccurate area reporting. Discard estimates are available, but are not included in the assessment.

SOURCE OF MANAGEMENT ADVICE: The main management advisory body is ICES. The advice is based on an age-based assessment using commercial and survey data (SAM). Reported landings are replaced by estimates derived from a port sampling scheme for the years 1991-1999. From 2000 the model estimates the removals needed for abundance estimates to follow the same trends as observed by surveys in the area.

REFERENCE POINTS:

	Type	Value	Technical basis
MSY	MSY B _{trigger}	10 000 t	B _{pa}
Approach	F _{MSY}	0.4	Provisional proxy. Fishing mortalities in the range of 0.25–0.54 are consistent with F _{MSY} .
Precautionary	B _{lim}	6000 t	B _{lim} = B _{loss} , lowest observed level.
	B _{pa}	10 000 t	B _{pa} = MBAL; this level affords a high probability of maintaining the SSB above B _{lim} . Below this value the probability of below-average recruitment increases.
Approach	F _{lim}	1.00	F _{lim} = F _{med}
	F _{pa}	0.72	F _{pa} : F _{med} * 0.72. This F is considered to have a high probability of avoiding F _{lim} . Fishing mortalities above F _{pa} have been associated with the observed stock decline.

(unchanged since: 2010)

STOCK STATUS:

F (Fishing Mortality)			
	2009	2010	2011
MSY (F _{MSY})	✘	✘	✘ Above target

Precautionary approach (F_{pa}, F_{lim})	×	×	×	Harvested unsustainably
SSB (Spawning-Stock Biomass)				
	2010	2011	2012	
MSY ($B_{trigger}$)	×	×	×	Below trigger
Precautionary approach (B_{pa}, B_{lim})	×	×	×	Reduce reproductive capacity

The fishing mortality in recent years is declining and uncertain, but total mortality remains very high. The spawning-stock biomass has declined ten-fold since the late 1980s and has had reduced reproductive capacity since the mid-1990s. The spawning-stock biomass increased from 2010 but remains well below B_{lim} . Recruitment has been low for the last ten years.

MANAGEMENT AGREEMENTS:

To rebuild the SSB of the stock, a spawning closure was introduced in 2000 for ten weeks from mid-February which was argued to maximize the reproductive output of the stock (EU Regulations 304/2000 and 549/2000). The measures were revised in 2001, 2002, 2003 and 2004, involving a continued, but smaller spawning ground closure, coupled with changes in net design to improve selectivity.

The EU has adopted a long-term plan for cod stocks and the fisheries exploiting those stocks (Council Regulation (EC) 1342/2008). This regulation repeals the recovery plans in Regulation (EC) No 423/2004, and has the objective of ensuring the sustainable exploitation of the cod stocks on the basis of maximum sustainable yield while maintaining a target fishing mortality of 0.4 on specified age groups.

The regulation is complemented by a system of fishing effort limitation (see EC 43/2009 for latest revision).

ICES has evaluated the management plan and found that all scenarios with the TAC constraints imposed ($\pm 20\%$) show very low probabilities of recovering the stock to B_{lim} by 2015. ICES therefore considers the management plan not to be in accordance with the precautionary approach. If the TAC constraint is taken off, the chances of recovering the stock before 2015 increase significantly, although they remain low.

RECENT MANAGEMENT ADVICE:

ICES advises on the basis of the MSY approach that there should be no directed fisheries, and bycatch and discards should be minimized in 2013 and 2014.

Other considerations

Management plan(s)

A long-term plan has been agreed by the EU in 2008 (Council Regulation (EC) 1342/2008) which results in a TAC of 285 t and effort reduction of 25% in 2013.

ICES (2009a, 2009b) evaluated the plan and considers the management plan not to be in accordance with the precautionary approach.

MSY approach

Fishing mortalities in the range of 0.25–0.54 are consistent with maximizing long-term yield for cod in Division VIIa. This is consistent with the management plan target fishing mortality of 0.4. Given the low SSB and low recruitment it is not possible to identify any non-zero catch which would be compatible with the MSY approach. This implies no targeted fishing should take place on cod in Division VIIa. Bycatches including discards of cod in all fisheries in Division VIIa should be reduced to the lowest possible level, and further technical measures to reduce catches should be implemented.

PA considerations

No targeted fishing should take place on cod in Division VIIa. Bycatches including discards of cod in all fisheries in Division VIIa should be reduced to the lowest possible level.

.STECF COMMENTS:

STECF agrees with the ICES assessment of the state of the stock and the advice for 2013 and 2014

STECF notes that following to the agreed Management Plan would imply a TAC of 285 t in 2013.

STECF also reiterates the considerable problems with the assessment for this stock. STECF believes that the bias and uncertainty in the assessment are being exacerbated by the deterioration in availability and reliability of catch and effort data although the recent implementation of stricter landings enforcement has improved the quality of the landings data from 2006 onwards.

3.34. Cod (*Gadus morhua*) in areas VIIe-k

FISHERIES: Cod in Divisions VIIe-k are taken as a component of mixed trawl fisheries. Landings are made mainly by French gadoid trawlers, which prior to 1980 were mainly fishing for hake in the Celtic Sea. Landings peaked in 1989 at 20,000 t following which they have been maintained between 6,000 and 13,000 t until 2003 since when landings have been around 3,500 t. All landings are taken by EU fleets.

Cod is caught in a range of fisheries, including gadoid trawlers, Nephrops trawlers, otter trawlers, beam trawlers, and gillnetters. Landings are made throughout the year, but are generally more abundant during the first semester. The TACs have constrained catches since 2003 and the impact of the Trevoise Head Closure applied since 2005 has resulted in landings being spread across the year.

Highgrading occurred during the first part of 2011 before the TAC was revised.

Total catch (2011) = 7,300 t, where 65% were landings (76% otter trawl, 12% beam trawl, 4% gillnets, and 8% other gears) and 35% discards (70% highgrading).




SOURCE OF MANAGEMENT ADVICE: The main management advisory body is ICES. The advice is based on an age-based assessment using commercial and survey data.

REFERENCE POINTS:

	<i>Type</i>	<i>Value</i>	<i>Technical basis</i>
MSY	MSY $B_{trigger}$	10 300t	Provisionally set at B_{pa} .
Approach	F_{MSY}	0.40	Provisional proxy based on F_{max} (ICES, 2011).
Precautionary	B_{lim}	7 300 t	$B_{lim} = B_{loss}$ (B76), the lowest observed spawning-stock biomass.
	B_{pa}	10 300 t	$B_{pa} = B_{lim} * 1.4$. Biomass above this value affords a high probability of maintaining SSB above B_{lim} , taking into account the variability in the stock dynamics and the uncertainty in assessments.
Approach	F_{lim}	Undefined.	
	F_{pa}	Undefined.	

(unchanged since: 2012)

STOCK STATUS:

	F (Fishing Mortality)		
	2009	2010	2011
MSY (F_{MSY})			 Appropriate

Precautionary approach (F_{pa}, F_{lim})	?	?	?	Undefined
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SSB (Spawning-Stock Biomass)				
	2010	2011	2012	
MSY ($B_{trigger}$)	✘	✔	✔	Above trigger
Precautionary approach (B_{pa}, B_{lim})	✘	✔	✔	Full reproductive capacity

SSB has increased from below B_{lim} to well above $MSY B_{trigger}$ since 2010. Recruitment has been highly variable over time with occasional very high recruitment (1987, 2010). Fishing mortality increased from around 0.5 in 1971 to 0.8 in 1981 and varied without trend around this level until 2005, when it sharply declined to around F_{MSY} in 2011.

RECENT MANAGEMENT ADVICE:

ICES advises on the basis of the MSY approach that landings in 2013 should be no more than 10,200 t.

Other considerations

MSY approach

Based on the MSY framework ICES advises that fishing mortality in 2013 should be set at 0.4, resulting in landings of 10,200 t.

Since the fishing mortality has reached F_{MSY} in 2011, the transition to MSY option is not relevant.

Precautionary considerations

This stock is currently exploited at F_{MSY} and SSB is above B_{pa} . In the absence of an F_{pa} reference point for application of the precautionary approach, keeping SSB above B_{pa} in 2014 would allow a considerable increase in fishing mortality in 2013, which is not considered appropriate.

STECF COMMENTS:

STECF agrees with the ICES assessment of stock status and advice.

STECF also notes that the proposed proxy ($F_{max 2011}$) for $F_{MSY}=0.4$ may not be appropriate ($F_{MAX 2012}=0.37$). In the absence of an estimate of F_{MSY} , STECF recommends that $F_{0.1}$ ($F=0.20$) is a more appropriate proxy for F_{MSY} and should be used.

STECF notes that TAC for cod relates for Divisions VIIb,c,e-k, Subareas VIII, IX, X, and CECAF 34.1.1. However the assessment area covers Divisions VIIe-k and the ICES advice applies to these areas only.

STECF notes that given the apparent quick recovery of the stock in response to a single strong year-class and the complexity of the mixed fishery for other gadoids and ground fish it is very difficult to manage fishing mortality on cod. An adaptive mixed fishery management plan with effective measures to control fishing mortality on a number of species is required.

3.35. Haddock (*Melanogrammus aeglefinus*) in Division VIIa (Irish Sea)

FISHERIES: Haddock in Division VIIa are taken in *Nephrops* and mixed demersal trawl fisheries, using mid-water trawls and otter trawls. Landings are made throughout the year, but are generally more abundant during the third quarter. Discarding is high and additional technical measures should be introduced, for example the use of sorting grids or large square mesh (>120 mm) panels in *Nephrops* fisheries. Discard estimates are very variables and estimates are large in some years.

Total catch (2011) is unknown. 813 t landings (42% Nephrops otter trawl, 32% seine, 13% midwater otter trawl, 2% beam, and 10% other gears), with discards data not raised to fleet level.



SOURCE OF MANAGEMENT ADVICE: The management advisory body is ICES who advises on the basis of a trends based analysis based on a single survey.




REFERENCE POINTS:

	<i>Type</i>	<i>Value</i>	<i>Technical basis</i>
MSY	MSY B_{trigger}	Not defined.	
Approach	F_{MSY}	Not defined.	
Precautionary	B_{lim}	Not defined.	
	B_{pa}	Not defined.	
Approach	F_{lim}	Not defined.	
	F_{pa}	0.5	ICES proposed that F_{pa} be set at 0.5 by association with other haddock stocks.

(unchanged since: 1998)

STOCK STATUS:

F (Fishing Mortality)		
	2009–2011	
MSY (F_{MSY})		Unknown
Precautionary approach ($F_{\text{pa}}, F_{\text{lim}}$)		Unknown

SSB (Spawning-Stock Biomass)		
	2008–2012	
MSY (B_{trigger})		Unknown
Precautionary approach ($B_{\text{pa}}, B_{\text{lim}}$)		Unknown
Qualitative evaluation		Decreasing

The assessment is indicative of trends only. Trends in SSB from the assessment indicate that the average of the biomass indicator in the last two years (2011–2012) is 18% lower than the average of the three previous years (2008–2010). SSB trends are fluctuating due to the dependence of incoming year classes. The strength of the 2011 year class is uncertain and the response in SSB is unknown.

Management plans

There is currently no explicit management plan for this stock.

RECENT MANAGEMENT ADVICE:

Based on the ICES approach for data-limited stocks, ICES advises that catches should be no more than 710 tonnes and further technical measures should be introduced to reduce discards.

Other considerations

ICES approach to data-limited stocks

For data-limited stocks for which a biomass index is available, ICES uses a harvest control rule based on index-adjusted *status quo* catch. The advice is based on a comparison of the two most recent index values with the three preceding values, combined with recent catch or landings data. Knowledge about the exploitation status also influences the advised catch.

For this stock the biomass is estimated to have decreased by 18% in 2008–2010 (average of the three years) and 2011–2012 (average of the two years). This implies a decrease of catches of 18% in relation to the average landings of the last three years, corresponding to catches of no more than 710 t. Considering that SSB has increased very significantly from the early 1990s and that the effort in the main fisheries has decreased, no additional precautionary reduction is needed.

Precautionary considerations

Management by TAC is inappropriate for this stock because landings – but not catches – are controlled. Management measures should be introduced in the Irish Sea to reduce discarding of small haddock in order to maximize their contribution to future yield and SSB.

STECF COMMENTS: STECF agrees with the ICES assessment of the state of the stock and the advice for 2013 interpreting the advice as a call for further uptake of technical measures.

The value of 710 t advised by ICES represents a reduction of 18% on the average reported landings over the period 2009-2011. STECF therefore considers it more appropriate to express the advice for 2013 in terms of landings instead of catches. Adopting such an approach implies landings of haddock of no more than 710 t in 2013.

3.36. Haddock (*Melanogrammus aeglefinus*) in Division VIIb-k (Celtic Sea and West of Ireland)

FISHERIES: In this area, haddock is taken in mixed fisheries along with cod, whiting, plaice, *Nephrops*, sole and rays. Most catches come from otter trawlers, mainly from France and Ireland. The TAC has not been restrictive for haddock. Landings peaked at about 11,000 t in 1997 and have fluctuated between about 5,000 t and 8,000 t since then. In 2010, total ICES estimated (preliminary) catches amounted to 22,200 t of which 44% are landings and 56% discards.

Total catch (2011) = 26,800 t, of which 47% are landings (all fleets combined) and 53% discards.

SOURCE OF MANAGEMENT ADVICE: The management advisory body is ICES. The basis of its advice is and age-based analytical assessment (XSA) including discard data and two survey and two commercial tuning series deemed to be indicative of trends only.

REFERENCE POINTS:

	<i>Type</i>	<i>Value</i>	<i>Technical basis</i>
MSY	MSY B_{trigger}	7500 t	B_{loss}
Approach	F_{MSY}	0.33	F_{max} (landings: 0.28 + discards: 0.05)
Precautionary	B_{lim}	Undefined.	
	B_{pa}	Undefined.	
Approach	F_{lim}	Undefined.	
	F_{pa}	Undefined.	

(established in 2012)

STOCK STATUS:

F (Fishing Mortality)			
	2009	2010	2011
MSY (F_{MSY})	✘	✘	✘ Above target
Precautionary approach (F_{pa}, F_{lim})	?	?	Undefined

SSB (Spawning-Stock Biomass)			
	2010	2011	2012
MSY ($B_{trigger}$)	✓	✓	✓ Above trigger
Precautionary approach (B_{pa}, B_{lim})	?	?	Undefined

SSB shows a slowly increasing trend over the time-series and is well above MSY $B_{trigger}$. Fishing mortality remains above F_{MSY} and shows a declining trend over the time-series with some fluctuations. Recruitment is highly variable and in the past the SSB and catches have increased after good recruitment. Recruitment of the 2009 year class was exceptionally good, and catches have increased since 2010. However, most of the increase in catch is being discarded because these fish were under the minimum landing size (mainly in 2010) and over-quota (mainly in 2011).

Management plans

There is currently no explicit management plan for this stock.

RECENT MANAGEMENT ADVICE:

ICES advises on the basis of the MSY transition that landings should be no more than 9,500 tonnes.

Technical measures should be introduced to reduce discard rates in fisheries catching haddock.

Other considerations

MSY approach

Following the ICES MSY framework implies fishing mortality to be reduced to 0.33 (F_{MSY}), resulting in landings of no more than 7,500 t and discards of 2,100 t in 2013. This is expected to lead to an SSB of 36,900 t in 2014.

Following the transition scheme towards the ICES MSY framework implies fishing mortality to be reduced to 0.43 based on $(F_{2010} * 0.4) + (F_{MSY} * 0.6)$ (higher than F_{MSY}), resulting in landings of no more than 9,500 t and discards of no more than 2,700 t in 2013. This is expected to lead to an SSB of 34,000 t in 2014.

ICES continues to advise that effective measures be implemented to reduce the high discards of haddock in the Celtic Sea.

STECF COMMENTS:

STECF agrees with the ICES assessment of stock status and the advice for 2013.

STECF notes that the introduction of increased codend mesh sizes and square mesh (escape) panels to demersal towed gears appears to have delivered significant reductions in fishing mortality on haddock in the North Sea and west of Scotland. It is logical to assume that similar measures would be appropriate for haddock in area VII. Such measures would most likely lead to an improved exploitation pattern and improved yields and SSB and a reduction in discards of haddock.

STECF recommends that square mesh (escape) panels and/or an increase in the minimum permissible codend mesh size be introduced for the demersal fleets that catch haddock in Divisions VIIb-k, Subareas VIII, IX and

IX. An analysis should be undertaken to estimate the appropriate mesh sizes for the panels and codends for each of the fleets concerned.

3.37. Saithe (*Pollachius virens*) in Div's VII, VIII, IX, X

STECF did not have access to any recent stock assessment information on saithe in Subareas VII, VIII IX and X.

3.38. Whiting (*Merlangius merlangus*) in VIIa (Irish Sea)

FISHERIES: Whiting is taken mainly as a by-catch in mixed-species otter trawl fisheries for *Nephrops*, cod, and other demersal species. Landings of whiting by all vessels, and discards of whiting estimated for *Nephrops* fisheries, have declined substantially. From 1989 to 2006, reported landings declined from 11,300 t to less than 100 t. Reported landings in 2010 were 120 t, but discarding is an order of magnitude greater. Only EU vessels exploit the stock, with the UK and Ireland accounting for the majority of the landings, with much smaller quantities landed by Belgium and France. Reports of significant under-reporting of landings indicate that the current implementation of the TAC system is not able to restrict fishing. Total catch (2011): >1.2 kt, total landings: 0.1 kt; estimated discards:>1.2 kt.

SOURCE OF MANAGEMENT ADVICE: The management advisory body is ICES. Advice is based on survey information only and is considered to be indicative of trends only due to the difficulty in raising discard information and the lack of available landings for sampling at the currently very low retention levels.

REFERENCE POINTS:

	<i>Type</i>	<i>Value</i>	<i>Technical basis</i>
MSY	MSY B _{trigger}	Undefined	
Approach	F _{MSY}	Undefined	
Precautionary	B _{lim}	5 000 t	B loss (1998); the lowest observed SSB as estimated in previous assessment. There is no clear evidence of reduced recruitment at the lowest observed SSBs.
	B _{pa}	7 000 t	B loss * 1.4; considered to be the minimum SSB required to ensure a high probability of maintaining SSB above its lowest observed value, taking into account the uncertainty of assessments.
Approach	F _{lim}	0.95	The fishing mortality above which stock decline has been observed.
	F _{pa}	0.65	This F is considered to have a high probability of avoiding F _{lim} . It implies an equilibrium SSB of 10.6 kt, and a relatively low probability of SSB < B _{pa} (= 7 kt), and is within the range of historic Fs.

(unchanged since: 1998)

STOCK STATUS

F (Fishing Mortality)

	2009–2011	
MSY (F_{MSY})	?	Unknown
Precautionary approach (F_{pa}, F_{lim})	?	Unknown
Qualitative evaluation	✗	Above poss. reference points

SSB (Spawning Stock Biomass)		
	2009–2011	
MSY ($B_{trigger}$)	?	Unknown
Precautionary approach (B_{pa}, B_{lim})	?	Unknown
Qualitative evaluation	✗	Below poss. reference points

The state of the stock is uncertain. Long-term information on the historical yield and catch composition indicate that the present stock size is extremely low and likely to be well below Blim. Landings have been declining since the early 1980s, reaching lowest levels in the 2000s. The survey results indicate a decline in relative SSB. Total mortality has been variable over the time series. Current fishing mortality is likely to be above possible MSY targets.

RECENT MANAGEMENT ADVICE:

ICES advises on the basis of precautionary considerations that catches should be reduced to the lowest possible levels and that effective technical measures should be implemented to reduce discards.

Other considerations

Precautionary considerations

SSB has declined to a very low level. Even though the underlying data do not support the provision of estimates of F_{MSY} , it is likely that current F is above F_{MSY} . Given the poor stock status, using the survey trends to identify a non-zero catch is not considered appropriate. Therefore, ICES advises that catches (mainly discards) of whiting should be reduced to the lowest possible levels.

Management by TAC is inappropriate for this stock because landings – but not catches – are controlled. Further management measures should be introduced in the Irish Sea to reduce discarding of small whiting in order to maximize their contribution to future yield and SSB.

STECF COMMENTS: STECF agrees with the ICES assessment of the state of the stock and the advice for 2013.

STECF notes that further reductions of the TAC will not lead to the desired decrease in fishing mortality as the vast majority of catches are discarded. STECF therefore recommends that the TAC system is supplemented with enhanced technical measures to substantially reduce discards and a mixed fisheries based approach to the management.

3.39. Whiting (*Merlangius merlangus*) in VIIb-k

FISHERIES: Celtic Sea whiting are taken in mixed fisheries along with cod, whiting, hake, and *Nephrops*. French trawlers account for about 60% of the total landings, Ireland takes about 30%, and the UK (England and Wales) 7%, while Belgian vessels take less than 1%. Catches peaked in the late nineties with over 23,000 t

reported by ICES and subsequently declined to less than 10,000 t in 2006. Discard rates are very high (mainly ages 1 and 2) due to the low market value of this species, particularly for smaller sizes. Otter trawlers are the primary gear associated with whiting landings from the Celtic Sea.

Total landings (2011) were 8,600 t while an estimated additional 5,700 t was discarded. Preliminary figures suggest 85% of the total international catch discards are from the otter trawl fleets, 1% seiners, <1% beam trawlers and 14% others,

Management regulations, particularly effort control regimes in other areas (VIIa, VI, & IV), became increasingly restrictive in 2004 and 2005 and resulted in a displacement of effort into the Celtic Sea.

Since 2005, ICES rectangles 30E4, 31E4, and 32E3 have been closed during the first quarter (Council Regulations 27/2005, 51/2006, 41/2007 and 40/2008) with the intention of reducing fishing mortality on cod. The effects of the closure on whiting are not known although there have been spatial and temporal changes in the distribution of effort.

SOURCE OF MANAGEMENT ADVICE: The management advisory body is ICES. Age based analytical assessment (XSA) using 2 survey and 3 commercial tuning series. However the assessment is considered for trends only, mainly due to the lack of discard information.

REFERENCE POINTS:

	<i>Type</i>	<i>Value</i>	<i>Technical basis</i>
MSY	MSY $B_{trigger}$	21 000 t	Provisionally based on B_{pa}
Approach	F_{MSY}	0.36	$F_{35\% SPR}$ by analogy with other gadoid stocks
Precautionary	B_{lim}	15 000 t	B_{loss} , the lowest observed spawning-stock biomass.
	B_{pa}	21 000 t	$B_{pa} = B_{lim} * 1.4$. Biomass above this affords a high probability of maintaining SSB above B_{lim} , taking into account the uncertainty of the assessment.
Approach	F_{lim}	Undefined	
	F_{pa}	Undefined	

(unchanged since: 2012)

STOCK STATUS:

F (Fishing Mortality)				
	2009 2010		2011	
MSY (F_{MSY})	✘	✘	✔	Appropriate
Precautionary approach (F_{pa}, F_{lim})	?	?	?	Undefined

SSB (Spawning Stock Biomass)				
	2010	2011	2012	
MSY ($B_{trigger}$)	✔	✔	✔	Above trigger

Precautionary approach (B_{pa}, B_{lim})	✓	✓	✓	Full capacity	reproductive
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Spawning stock biomass has been increasing and is well above MSY Btrigger. Fishing mortality has shown a declining trend since 2007 and is now below FMSY. There have been two above average recruitments (2008 and 2009) entering the fishery and spawning stock.

Management plans

No specific management objectives are known to ICES.

RECENT MANAGEMENT ADVICE:

ICES advises based on MSY approach that landings in 2013 should be no more than 17,500 tonnes. Technical measures should be introduced to reduce discard rates in fisheries catching whiting.

Other considerations

MSY approach

Following the ICES MSY framework implies fishing mortality at $F_{MSY}=0.36$ resulting in landings of 17 500 t in 2013. This is expected to lead to an SSB of 53 700 t in 2014. ICES continues to advise that effective measures should be implemented to reduce the high discards of whiting in the Celtic Sea.

Additional considerations

Historically, discarding of this stock for different fleets is substantial and highly variable. ICES notes that the NWWRAC have recently supported the introduction of square mesh panels in all trawl fisheries operating in ICES Divisions VIIg. These measures have already been introduced by the main fleets operating in this area. It is important that these are fully implemented and their effectiveness in reducing discards and the impact on commercial catches is monitored and evaluated.

STECF COMMENTS: STECF agrees with the ICES assessment of the state of the stock and advice for 2013.

STECF notes the mismatch between management areas and assessments units. Whiting in VIIe-k is assessed as one stock, VIId whiting are included in the North Sea whiting and whiting from VIIf,c is not included in any assessment.

3.40. Anglerfish (*Lophius piscatorius* & *Lophius budegassa*) in Div. VII and VIII a,b,d,e

Anglerfish within the two management areas VII and VIII a,b,d,e are assessed together and comprise of two species (*Lophius piscatorius* & *Lophius budegassa*) which are not always separated for market purposes. The management area for this stock also includes the Irish Sea (VIIa) where catches since 1995 have been between about 300t and 1,300 t, (330 t officially reported in 2007). These catches are not included in the assessment.


FISHERIES: The trawl fishery for anglerfish in the Celtic Sea and Bay of Biscay developed in the 1970s. Anglerfish are also taken as a by-catch in other demersal fisheries in the area. Landings of both species have fluctuated over the last 20 years. Landings of *L. piscatorius* have declined steadily from 23 700 t in 1986 to 12 800 t in 1992, then increased to 22 100 t in 1996 and declined to 14 900 t in 2000. The landings have increased since then reaching the maximum of the time series in 2007 (29 700 t). In 2011, preliminary landings estimates were 17,100 t but do not include Spanish landings. Landings of *L. budegassa* have fluctuated all over the studied period between 5 700 t to 9 600 t with a succession of high (1989-1992, 1998 and 2003) and low values (1987, 1994 and 2001). The preliminary total estimated landings for 2011 are 4,800 t, but do not include Spanish landings.

SOURCE OF MANAGEMENT ADVICE: The management advisory body is ICES. Lacking an analytical assessment the advice is based on survey data and catch information.


REFERENCE POINTS: There are no reference points defined for these stocks. As a consequence of recently identified problems with growth estimates, previous reference points are not considered to be valid.

STOCK STATUS:

Lophius piscatorius

	F (Fishing Mortality)		
	2009–2010	2011	
MSY (F_{MSY})	?	?	Not available
Precautionary approach (F_{pa}, F_{lim})	?	?	Not available
	Total Stock Biomass		
	2007–2011		
MSY ($B_{trigger}$)	?	Unknown	
Precautionary approach (B_{pa}, B_{lim})	?	Unknown	
Qualitative evaluation		Decreasing	

Lophius budegassa

	F (Fishing Mortality)		
	2009–2010	2011	
MSY (F_{MSY})	?	?	Not available
Precautionary approach (F_{pa}, F_{lim})	?	?	Not available
	Total Stock Biomass		
	2007–2011		
MSY ($B_{trigger}$)	?	Unknown	
Precautionary approach (B_{pa}, B_{lim})	?	Unknown	
Qualitative evaluation		Decreasing	

The long-term trend in biomass is stable for both species. Survey data indicate that the biomass of both species has been increasing until 2008. This is followed by a biomass decline in recent years. For *L. piscatorius* the average of the stock biomass indicator in the last two years (2010–2011) is 14% lower than the average of the three previous years (2007–2009). For *L. budegassa* the average of the stock biomass indicator in the last two years (2010–2011) is 29% lower than the average of the three previous years (2007–2009). For *L. piscatorius* there is evidence of good recruitments in the period 2008 to 2011, whereas strong recruitment for *L. budegassa* is evident in 2008 and 2011. Landings data in 2011 are incomplete, therefore only landings until 2010 were considered in this year's assessment.

RECENT MANAGEMENT ADVICE:

Based on the ICES approach for data-limited stocks, ICES advises that catches should be no more than 24 800 tonnes.

This is the first year ICES is providing quantitative advice for data-limited stocks.

Other considerations

ICES approach to data-limited stocks

For data-limited stocks for which a biomass index is available, ICES uses a harvest control rule based on an index-adjusted *status quo* catch. The advice is based on a comparison of the two most recent biomass index values with the three preceding values, combined with recent catch or landings data. Knowledge about the exploitation status also influences the advised catch.

For *L. piscatorius* the biomass is estimated to have decreased by 14% in 2007–2009 (average of the three years) and 2010–2011 (average of the two years). This implies a 14% decrease in catches compared to the average of the last three years with landings information (2008–2010), corresponding to catches of no more than 17 900 t.

Considering that effort in the main fisheries has decreased steadily, no additional precautionary reduction is needed.

For *L. budegassa* the biomass is estimated to have decreased by more than 20% in 2007–2009 (average of the three years) and 2010–2011 (average of the two years). This implies a 20% decrease in catches compared to the average of the last three years with landings information (2008–2010), corresponding to catches of no more than 6900 t. Considering that effort in the main fisheries has decreased steadily, no additional precautionary reduction is needed.

The catch advice for the two species combined is 24 800 t.

STECF COMMENTS: STECF agrees with the ICES assessment of the state of the stock. The value of 24,800 t advised by ICES represents reductions of 14% and 20% on the average reported landings over the period 2009-2011 for *L. piscatorius* and *L. budegassa* respectively. STECF considers it more appropriate to express the advice for 2013 in terms of landings instead of catches. Adopting such an approach implies landings of anglerfish of no more than 24,800 t in 2013.

STECF notes that the management area (division VII) is inconsistent with the stock area (Divisions VIIb–k and VIIa,b,d). The TAC area includes VIIa, however the advice covers the majority of the area as recent landings in Division VIIa have been relatively small compared to the total TAC. The division VIII stocks are dealt with in sections 4.5 and 4.6, but are based on the same advice.

3.41. Megrim (*Lepidorhombus whiffiagonis* and *Lepidorhombus boscii*) in VII and VIIIabde.

Megrim in management areas VII and VIIIabde are assessed as a single stock although assessments and advice are for *L. whiffiagonis* only.

FISHERIES: Megrim to the west of Ireland and Britain and in the Bay of Biscay are caught predominantly by Spanish and French vessels, which together have reported more than 60% of the total international landings, and by Irish and UK demersal trawlers. Megrim is mostly taken in mixed fisheries for hake, anglerfish, *Nephrops*, cod, and whiting. Catches for this stock have been between 16 and 20 kt, with the most recent catches estimated to be around 7,200 t tonnes though this figure includes no information from Spain. Around 25% of the catches are discarded.

SOURCE OF MANAGEMENT ADVICE: The management advisory body is ICES. Advice is based on trends only assessment.

REFERENCE POINTS:

No new reference point table provided by ICES, but it is suggested in the advice sheet that the old reference points are no longer appropriate.

STOCK STATUS:

F (Fishing Mortality)			
	2002 -2010	2011	
MSY (F_{MSY})	?	?	Not available
Precautionary approach (F_{pa}, F_{lim})	?	?	Not available
Qualitative evaluation	→	?	Not available

SSB (Spawning Stock Biomass)		
	2006 - 2010	2011

MSY ($B_{trigger}$)	?	?	Not available
Precautionary approach (B_{pa}, B_{lim})	?	?	Not available
Qualitative evaluation	↗	↗	Increasing

The stock status is based on an assessment using data only until 2010. The analytical assessment should only be considered as indicative of trends. Trends in SSB from the assessment which includes surveys and commercial data indicate an SSB increase of 25% in the last two years (2009–2010) relative to the three previous years (2006–2008). However, the stock is below the long term average. Fishing mortality in the last decade has been stable but above long-term average.

RECENT MANAGEMENT ADVICE:

Based on the ICES approach for data limited stocks, ICES advises that landings should be no more than 12 000 tonnes.

This is the first year that ICES is providing quantitative advice for data limited stocks

Other considerations

ICES approach to data limited stocks

For data limited stocks for which a biomass index is available, ICES uses a harvest control rule based on an index-adjusted *status-quo* catch. The advice is based on a comparison of the two most recent index values with the three preceding values, combined with recent catch or landings data. Knowledge about the exploitation status also influences the advised catch.

For this stock the spawning stock biomass is estimated to have increased by more than 20% between 2006–2008 (average of the three years) and 2009–2010 (average of the two years). This implies an increase of landings of at most 20% in relation to the average of the last three years of available landings (2008–2010), corresponding to landings of no more than 14 954 t. Additionally, considering that exploitation is unknown, ICES advises that landings should decrease by 20% as a precautionary buffer. This results in landings of no more than 12 000 t in 2013.

STECF COMMENTS: STECF agrees with the ICES assessment of the state of the stock.

The value of 12,000 t advised by ICES represents a reduction of 4% on the average reported landings over the period 2009-2011. STECF therefore considers it more appropriate to express the advice for 2013 in terms of landings instead of catches. Adopting such an approach implies landings of megrim of no more than 12,000 t in 2013.

3.42. Plaice (*Pleuronectes platessa*) in Division VIIa (Irish Sea)

FISHERIES: Plaice are taken mainly in long-established UK and Irish otter trawl fisheries for demersal fish. They are also taken as a by-catch in the beam trawl fishery for sole. The main fishery is concentrated in the northeast Irish Sea. Catches are predominantly taken by the UK, Belgium and Ireland, with smaller catches by France and at the end of the 1990s by The Netherlands. Landings were sustained between 2,900 t and 5,100 t from 1964-1986. Landings declined from the 1987 peak of 6,200 t to between 1,100-1,500 t from 1999-2005, well below the agreed TAC. Recently landings have continued to decline reaching the lowest ever level in 2010 376 t rebounding to 594 t in 2011. In 2011 in excess of 50% of catches were discarded.


SOURCE OF MANAGEMENT ADVICE: The main management advisory body is ICES. ICES considered that the Aarts and Poos assessment model might no longer be appropriate due to the revision of recruitment trends after the inclusion of the 2011 data. The assessment this year uses all survey data in addition to the Aarts and Poos (2009) assessment model to show SSB and mortality trends. All survey information is displaying similar trends. Given the existing information, ICES considers the recent trends from the Aarts and Poos


assessment model still to be relevant. Therefore, the advice is based on relative trends of SSB derived from Aarts and Poos (2009) assessment model.

REFERENCE POINTS:

No new reference point table provided by ICES. No changes to the reference point table were suggested.

STOCK STATUS:

F (Fishing Mortality)		
	2009-2011	
MSY (F_{MSY})	?	Unknown
Precautionary approach (F_{pa}, F_{lim})	?	Unknown
Qualitative evaluation		Below poss. reference points

SSB (Spawning Stock Biomass)		
	2008-2012	
MSY ($B_{trigger}$)	?	Unknown
Precautionary approach (B_{pa}, B_{lim})	?	Unknown
Qualitative evaluation		Above poss. reference points

The average of the stock size indicator (mean standardized SSB from the A&P model output) in the last two years (2010–2011) is about 2% higher than the average of the three previous years (2007–2009).

The surveys and SSB trends show an increase in stock size since the mid-1990s to a stable level. Fishery-independent estimates of plaice SSB from the annual egg production method (AEPM) surveys increased from 9000 t in 1995 to 14000–15000 t since 2006. The recent fishing mortality is likely to be very low as the estimates of total catch (landings and discards) since 2006 are only around 15% of the AEPM estimates of SSB over this period, and the catches also include immature plaice. Total mortality from the assessment shows a declining trend since the early 1990s to a stable level. The recruitment as assessed by the beam trawl survey has been varying without trends in recent years.

RECENT MANAGEMENT ADVICE:

Based on the ICES approach for data limited stocks, ICES advises that landings should be no more than 490 tonnes.

This is the first year that ICES is providing quantitative advice for data limited stocks.

Other considerations

ICES approach to data limited stocks

For data limited stocks for which an abundance index is available, ICES uses as a harvest control rule an index-adjusted status-quo catch. The advice is based on a comparison of the two most recent index values with the three preceding values, combined with recent catch or landings data. Knowledge about the exploitation status also influences the advised catch.

For this stock the abundance is estimated to have increased by about 2% between 2007–2009 (average of the three years) and 2010–2011 (average of the two years). This implies an increase of landings of at most 2% in relation to the last three years average landings, corresponding to landings of no more than 490 t.

Considering that the stock is below possible fishing mortality reference points, no additional precautionary reduction is needed.

STECF COMMENTS: STECF agrees with the ICES assessment of the state of the stock and the advice for 2013. The value of 490 t advised by ICES represents an increase of 2% on the average reported landings over the period 2009-2011.

3.43. Plaice (*Pleuronectes platessa*) in the Celtic Sea (Divisions VIIf and g)

FISHERIES: The fishery for Celtic Sea plaice involves vessels from France, Belgium, England and Wales and Ireland. In the 1970s, the VIIfg plaice fishery was mainly carried out by Belgian beam trawlers and Belgian and UK otter trawlers. Effort in the UK and Belgian beam-trawl fleets increased in the late 1980s but has since declined. Recently, many otter trawlers have been replaced by beam trawlers, which target sole. Landings increased in the late eighties to its record high (2100t) and have declined since.

Currently the main fishery occurs in the spawning area off the north Cornish coast, at depths greater than 40 m, about 20 to 25 miles offshore. Although plaice are taken throughout the year, the larger landings occur during February–March after the peak of spawning, and again in September. Recent increases in fuel costs are thought to have restricted the range of some fleets and may have resulted in a reduction in effort in Divisions VIIf,g.

Since 2000 the estimated landings have been below the TACs, and lowest catch levels of 389 t were recorded in 2005 and have remained around that level since then (2011 landings = 420t). Discards have fluctuated in that period between 500 and 1,300 t.

Plaice in the Bristol Channel and Celtic Sea (ICES Divisions VIIf and VIIg) is managed by TAC and technical measures. Technical measures in force for this stock are minimum mesh sizes, minimum landing size, and restricted areas for certain classes of vessels. Technical regulations regarding allowable mesh sizes for specific target species, and associated minimum landing sizes, came into force on 1 January 2000. The minimum landing size for plaice in Divisions VIIf,g is 27 cm.

SOURCE OF MANAGEMENT ADVICE: The main management advisory body is ICES. The assessment is based on an Aarts and Poos (2009) statistical catch-at-age model including one survey and two commercial indices as well as discard information 2004-2011. Due to the uncertainty in historic discard practices the model is deemed representative of trends only.

REFERENCE POINTS:

No new reference point table provided by ICES. Last year no reference points were available.

STOCK STATUS:

F (Fishing Mortality)				
	2009	2010	2011	
MSY (F_{MSY})	?	?	?	Unknown
Precautionary approach (F_{pa}, F_{lim})	?	?	?	Unknown
Qualitative evaluation	↗	↗	✘	Above poss. reference points

SSB (Spawning Stock Biomass)	
	2007-2011

MSY ($B_{trigger}$)	?	Unknown
Precautionary approach (B_{pa}, B_{lim})	?	Unknown
Qualitative evaluation	✗	Below poss. reference points

The assessment is indicative of trends only. SSB has increased since 2004 but is considered to be well below historic levels (based on commercial lpu series starting in the 1970s). Fishing mortality remained stable from 2000, but is estimated to have increased in 2011 resulting from increased discarding. The increase in F in 2011 is considered uncertain but fishing mortality is considered to be well above levels that would increase SSB to historic levels and achieve high long term yields. Recruitment has been fluctuating without clear trend in recent years.

The average of the stock size indicator (SSB) in the last two years (2010–2011) is 1.5 % higher than the average of the three previous years (2007–2009).

RECENT MANAGEMENT ADVICE:

Based on the ICES approach for data limited stocks, ICES advises that landings should be no more than 360 tonnes.

This is the first year that ICES is providing quantitative advice for data limited stocks (see Quality considerations).

Discards exceed landings and technical measures should be introduced to reduce discard rates.

Other considerations

ICES approach to data limited stocks

For data limited stocks for which an abundance index is available, ICES uses as harvest control rule an index-adjusted status-quo landings. The advice is based on a comparison of the two most recent index values with the three preceding values, combined with recent catch or landings data. Knowledge about the exploitation status also influences the advised landings.

For this stock the abundance is estimated to have increased by 1.5% between 2007–2009 (average of the three years) and 2010–2011 (average of the two years). This implies an increase of landings of at most 1.5% in relation to the last three years average landings, corresponding to landings of no more than 446 t. Additionally, considering that is considered overexploited, ICES advises that landings should decrease by a further 20% as a precautionary buffer. This results in landings of no more than 360 t in 2013.

STECF COMMENTS: STECF agrees with the ICES assessment of the state of the stock and the advice for 2013. The value of 360 t advised by ICES represents a reduction of 18% on the average reported landings over the period 2009-2011.

3.44. Plaice (*Pleuronectes platessa*) in Divisions VIIe (Western English Channel)

FISHERIES: The fisheries taking plaice in the Western Channel mainly involve vessels from the bordering countries: the total landings (2008) are split among UK vessels (80%), France (12%), and Belgium (8%). Landings of plaice in the Western Channel were low and stable between 1950 and the mid-1970s, and increased rapidly during 1976 to 1988 as beam trawls began to replace otter trawls, although plaice are taken mainly as a by-catch in beam-trawling directed at sole and more recently anglerfish. Estimated landings have been fairly stable since 1994. Landings have continued to decrease in recent years to a similar low level as in the late-1970s. The main fishery is south and west of Start Point. Although plaice are taken throughout the year, the larger landings are made during February, March, October, and November. WKFLAT 2010 indicated that in addition to the landings in VIIe the stock suffers considerable fishing mortality in the first quarter in division VIIId during their annual spawning migration. Landings from this stock (including a migration component

caught in Division VIIId) were 1,510 t in 2011. Discarding in this fishery is minor compared to other plaice fisheries as the fishery is spatially separated from the juvenile areas.

The TAC for plaice in the English Channel is set for Divisions VIIId,e combined.

SOURCE OF MANAGEMENT ADVICE: The main management advisory body is ICES. The advice is based on an age-based assessment using commercial and survey data.

REFERENCE POINTS:

	<i>Type</i>	<i>Value</i>	<i>Technical basis</i>
MSY	MSY B_{trigger}	1650	Preliminary based on lowest SSB (in converged part of XSA) from which the stock has recovered.
Approach	F_{MSY}	0.24	$F_{\text{max}2012}$. This value is stock specific.
Precautionary Approach	B_{lim}	Not defined.	
	B_{pa}	Not defined.	
	F_{lim}	Not defined.	
	F_{pa}	Not defined.	

STOCK STATUS:

F (Fishing Mortality)			
	2009	2010	2011
MSY (F_{MSY})	✘	✘	✘ Above target
Precautionary approach ($F_{\text{pa}}, F_{\text{lim}}$)	?	?	? Undefined

SSB (Spawning Stock Biomass)			
	2010	2011	2012
MSY (B_{trigger})	✔	✔	✔ Above trigger
Precautionary approach ($B_{\text{pa}}, B_{\text{lim}}$)	?	?	? Undefined

The large reduction of F in 2009 is confirmed in subsequent years' estimates, but remains well above F_{MSY} . SSB has increased in the last three years and is currently well above $MSY B_{\text{trigger}}$ due to the large recruitment in 2010. The recent dynamics of the stock has caused a revision of $MSY B_{\text{trigger}}$.

RECENT MANAGEMENT ADVICE:

ICES advises on the basis of the transition to the MSY approach that landings of plaice in Division VIIe in 2013 should be no more than 2100 t.

Other considerations

MSY approach

Following the ICES MSY framework implies fishing mortality to be reduced to 0.24 (at FMSY as SSB in 2013 is above MSY Btrigger), resulting in landings of 1400 t in 2013. This is expected to lead to an SSB of 6700 t in 2014.

Following the transition scheme towards the ICES MSY framework implies fishing mortality of 0.36 for 2013. This results in landings of 2100 t in 2013. This is expected to lead to an SSB of 6000 t in 2014.

STECF COMMENTS: STECF agrees with the ICES assessment, but notes that the choice of FMAX as a proxy for FMSY without any evidence to suggest that this level of F is sustainable. STECF suggests the use of F0.1 as a more precautionary proxy in the absence of such additional information. Adopting F0.1 for FMSY would imply landings in 2013 lower than those advised by ICES.

3.45. Plaice (*Pleuronectes platessa*) in VIIhjk

FISHERIES: Ireland, UK, France and Belgium are the major participants in this fishery. Plaice are predominantly caught within coastal mixed species otter trawl fisheries in Division VIIj.

Official landings peaked at 790 t in 1998 and have declined dramatically stabilizing at around 150 t recently.

SOURCE OF MANAGEMENT ADVICE: The main management advisory body is ICES. The assessment is based on a catch curve through landings-at-age data for plaice in Division VIIjk

REFERENCE POINTS:

	<i>Type</i>	<i>Value</i>	<i>Technical basis</i>
MSY	MSY B _{trigger}	Not defined	
Approach	F _{MSY}	0.24	Provisional proxy based on WGCSE 2010 estimate of F _{max}
Precautionary	B _{lim}	Not defined	
	B _{pa}	Not defined	
Approach	F _{lim}	Not defined	
	F _{pa}	Not defined	

STOCK STATUS:

F (Fishing Mortality)		
	2009-2011	
MSY (F_{MSY})	?	Unknown
Precautionary approach (F_{pa}, F_{lim})	?	Unknown
Qualitative evaluation	✗	Above poss. reference points

SSB (Spawning Stock Biomass)			
	2009-2011		
Qualitative evaluation	<table border="1"> <tr> <td>?</td> <td>Unknown</td> </tr> </table>	?	Unknown
?	Unknown		

The state of the stock is unknown; however, exploratory estimates show that fishing mortality has decreased since 2008, but it remains above potential F_{MSY} proxies. Recent values of Z ranged from 0.55 to 1.2, with $M=0.12$ this would result in an F of between 0.43 and 1.08.

RECENT MANAGEMENT ADVICE:

Based on the ICES approach for data limited stocks, ICES advises that catches should be no more than 100 tonnes, and by-catch and discards should be reduced.

This is the first year that ICES is providing quantitative advice for data limited stocks.

Other considerations

ICES approach to data limited stocks

For data limited stocks for which fishing mortality is available and estimated above F_{MSY} , ICES advice is based on a reduction of the catches equal to the reduction from current F to F_{MSY} .

For this stock, the ratio of F_{MSY} to current F (2009-2011 average) is 0.4. However, as a 20% uncertainty cap is applied, this results in a decrease of 20% with respect to the last three years landings average, corresponding to catches of no more than 128 t. Additionally, considering that the stock is estimated to be overexploited and that the SSB level is unknown, ICES advises that catches should decrease by a further 20% as a precautionary buffer. This results in catches of no more than 100 t.

STECF COMMENTS: STECF agrees with the ICES assessment and the state of the stock. The value of 100 t advised by ICES represents a reduction of 36% on the average reported landings over the period 2009-2011. STECF therefore considers it more appropriate to express the advice for 2013 in terms of landings instead of catches. Adopting such an approach implies landings of plaice of no more than 100 t in 2013. STECF further notes that the choice of F_{MAX} as a proxy for F_{MSY} is not supported by any evidence to suggest that this level of F is sustainable. STECF suggests the use of $F_{0.1}$ as a more precautionary proxy in the absence of such additional information, although the advice in this instance is unaffected by the choice of reference point.

3.46. Plaice (*Pleuronectes platessa*) in Division VIIbc

FISHERIES: Ireland is the major participant in this fishery with around 90% of the international landings over the period 1993-2006. Plaice are normally caught in mixed species otter trawl fisheries in Division VIIb. These vessels mainly target other demersal fish species and *Nephrops*. Official landings have declined from 251 t in 1996 to 18 t in 2011.

SOURCE OF MANAGEMENT ADVICE: The main management advisory body is ICES. No assessment was carried out for this stock in 2012.

REFERENCE POINTS: No reference points are defined for this stock.

STOCK STATUS:

F (Fishing Mortality)			
	2009-2011		
Qualitative evaluation	<table border="1"> <tr> <td>?</td> <td>Insufficient information</td> </tr> </table>	?	Insufficient information
?	Insufficient information		

SSB (Spawning Stock Biomass)	
	2009-2011
Qualitative evaluation	? Insufficient information

The stock status is unknown and the available catch statistics are not considered reliable indicators of abundance.

RECENT MANAGEMENT ADVICE:

Based on the ICES approach for data limited stocks, ICES advises that catches should be no more than 30 tonnes.

This is the first year that ICES is providing quantitative advice for data limited stocks.

Other considerations

ICES approach to data limited stocks

For data limited stocks without information on abundance or exploitation ICES considers that a precautionary reduction of catches should be implemented, unless there is ancillary information clearly indicating that the current level of exploitation is appropriate for the stock.

For this stock, ICES advises that catches should decrease by 20% in relation to the last three years average landings, corresponding to catches of no more than 30 t.

STECF COMMENTS: STECF agrees with the ICES assessment of the state of the stock. The value of 30 t advised by ICES represents a reduction of 20% on the average reported landings over the period 2009-2011. STECF therefore considers it more appropriate to express the advice for 2013 in terms of landings instead of catches. Adopting such an approach implies landings of plaice of no more than 30 t in 2013.

3.47. Sole (*Solea solea*) in Division VIIa (Irish Sea)

FISHERY: Sole are taken mainly in a beam trawl fishery that commenced in the 1960s and are also taken as a by-catch in the long established otter trawl fisheries. Effort in the Belgian beam trawl fleet increased in the late 1980s as vessels normally operating in the North Sea were attracted into the Irish Sea by better fishing opportunities. In recent years, however, catch rates of sole have been low in the Irish Sea, and part of the beam trawl fleet has moved to other sole fishing grounds. Over the last 30 years, the total landings have been in the order of 1,000 t to 2,000 t. Landings in have declined sharply since 2007 to around 300 t (330 t in 2011).

SOURCE OF MANAGEMENT ADVICE: The main management advisory body is ICES. The advice is based on an age-based assessment which uses commercial landings data and a scientific surveys.

REFERENCE POINTS:

	<i>Type</i>	<i>Value</i>	<i>Technical basis</i>
MSY	MSY B _{trigger}	3100 t	Default to value of B _{pa}
Approach	F _{MSY}	0.16	Provisional proxy based on stochastic simulations assuming a Ricker

		S/R relationship (range 0.1–0.25)	
Precautionary Approach	B_{lim}	2200 t	$B_{lim} = B_{loss}$. The lowest observed spawning stock, followed by an increase in SSB.
	B_{pa}	3100 t	$B_{pa} \sim B_{lim} * 1.4$. The minimum SSB required ensuring a high probability of maintaining SSB above its lowest observed value, taking into account the uncertainty of assessments.
	F_{lim}	0.40	$F_{lim} = F_{loss}$. Although poorly defined, there is evidence that fishing mortality in excess of 0.4 has led to a general stock decline and is only sustainable during periods of above-average recruitment.
	F_{pa}	0.30	This F is considered to have a high probability of avoiding F_{lim} .

STOCK STATUS:

F (Fishing Mortality)			
	2009	2010	2011
MSY (F_{MSY})			Above target
Precautionary approach (F_{pa}, F_{lim})			Increased risk

SSB (Spawning Stock Biomass)			
	2010	2011	2012
MSY ($B_{trigger}$)			Below trigger
Precautionary approach (B_{pa}, B_{lim})			Reduced capacity reproductive

SSB has continuously declined since 2001 and is below B_{lim} since 2006. In 2012 SSB reached the lowest level. The fishing mortality shows a declining trend since the mid 1980s to a stable level in recent years, well above F_{MSY} . Recent recruitment levels have been lower than earlier in the time-series, with the 2011 recruitment being the lowest in the time series.

RECENT MANAGEMENT ADVICE:

ICES advises on the basis of the MSY approach that there should be no directed fisheries and that bycatch and discards should be minimised.

Other considerations

MSY approach

Following the ICES MSY framework implies fishing mortality to be reduced to 0.06 (63% lower than F_{MSY} because SSB is 64% below MSY $B_{trigger}$), resulting in landings of less than 60 t in 2013. This is expected to lead to a SSB of 1500 t in 2014.

Following the transition scheme towards the ICES MSY framework implies fishing mortality of 0.14 for 2012. This results in landings of 140 t in 2013. This is expected to lead to an SSB of 1400 in 2014.

However, considering the low SSB and low recruitment since 2000, it is not possible to identify any non-zero catch which would be compatible with the MSY approach.

STECF COMMENTS: STECF agrees with the advice for 2013.

STECF COMMENTS: STECF agrees with the ICES assessment of the state of the stock and the advice that there should be no directed fisheries and that bycatch and discards should be minimized in 2013 and 2014. STECF advises that this advice should be interpreted to mean that in 2013 and 2014, catches of sole from Division VIIa should be reduced to the lowest possible level.

3.48. Sole (*Solea solea*) in Divisions VIIf,g (Celtic Sea)

FISHERIES: The sole fishery is concentrated on the north Cornish coast off Trevoze Head and around Lands End. Reported landings have generally declined since the mid 1980s, up to 1998. Since then they increased to around 1,300 t in the early 2000's. The total landings were 1030 t in 2011.

Sole are taken mainly in a beam trawl fishery that started in the early 1960s and, to a lesser extent, in the longer established otter trawl fisheries. In the beam trawl fishery sole is mainly taken as part of a mixed demersal fishery with plaice and, to a lesser extent, cod. Both of the latter stocks require a reduction in fishing mortality.

In the 1970s, the fishery was mainly carried out by Belgian beam trawlers and Belgian and UK otter trawlers. The use of beam trawls (to target sole and plaice) increased during the mid-1970s, and the Belgian otter trawlers have now been almost entirely replaced by beam trawlers. Effort in the Belgium beam trawl fleet increased in the late 1980s as vessels normally operating in the North Sea were attracted to the west by improved fishing opportunities. Beam trawling by UK vessels increased substantially from 1986, reaching a peak in 1990 and decreasing thereafter. In the Celtic Sea, the beam and otter trawl fleets also take other demersal species such as plaice, cod, rays, brill, turbot, and anglerfish.

Currently the fisheries for sole in the Celtic Sea and Bristol Channel involve vessels from Belgium, taking around 65%, the UK around 25%, France around 5% and Ireland also around 5%.

The Celtic Sea is an area without days-at-sea limitations for demersal fisheries. In the past this has resulted in increased effort in the Celtic Sea as a direct result of restrictive effort in other areas. This was particularly the case in 2004–2005 when effort in the sole fishery increased because of restrictive days at sea in the eastern channel (Division VIIId).

SOURCE OF MANAGEMENT ADVICE: The advice is based on an analytical age-based assessment using landings, two commercial cpue series, and one survey index.

REFERENCE POINTS:

	<i>Type</i>	<i>Value</i>	<i>Technical basis</i>
MSY	MSY B_{trigger}	2200 t	B_{pa}
Approach	F_{MSY}	0.31	Provisional proxy based on stochastic simulations
Precautionary Approach	B_{lim}	Not defined	
	B_{pa}	2200 t	There is no evidence of reduced recruitment at the lowest biomass observed and B_{pa} can therefore be set equal to the lowest observed SSB.
	F_{lim}	0.52	$F_{\text{lim}}: F_{\text{loss}}$.
	F_{pa}	0.37	This F is considered to have a high probability of avoiding F_{lim} and maintaining SSB above B_{pa} in 10 years, taking into account the uncertainty of assessments. $F_{\text{pa}}: F_{\text{lim}} \times 0.72$ implies a less than 5% probability that ($\text{SSB}_{\text{MT}} < B_{\text{pa}}$).

STOCK STATUS:

F (Fishing Mortality)			
	2009	2010	2011
MSY (F_{MSY})	✓	✓	✓ Appropriate
Precautionary approach (F_{pa}, F_{lim})	✓	✓	✓ Harvested sustainably

SSB (Spawning Stock Biomass)			
	2010	2011	2012
MSY ($B_{trigger}$)	✓	✓	✓ Above trigger
Precautionary approach (B_{pa}, B_{lim})	✓	✓	✓ Full reproductive capacity

The spawning stock biomass has been above MSY $B_{trigger}$ since 2001. Fishing mortality has decreased from F_{lim} in 2003 to the lowest levels in the time series and is now below F_{MSY} . The 2007 year class is estimated to be above average while the 2009 year class is the lowest of the time series.

RECENT MANAGEMENT ADVICE:

ICES advises on the basis of the MSY approach that landings in 2013 should be no more than 1100 t.

Other considerations

MSY approach

Following the ICES MSY framework implies fishing mortality to be 0.31, resulting in landings of 1100 t in 2013. This is expected to lead to an SSB of 4000 t in 2014.

Precautionary approach

The fishing mortality in 2013 should be no more than F_{pa} corresponding to landings of less than 1300 t in 2013. This is expected to keep SSB above B_{pa} in 2014.

STECF COMMENTS: STECF agrees with the ICES assessment of the state of the stock and the advice for 2013.

3.49. Sole (*Solea solea*) in Division VIIe (Western English Channel).

FISHERIES: Total landings reached a peak in the early 1980s, initially because of high recruitment in the late 1970s and later because of an increase in exploitation. In recent years, English vessels have accounted for around 60% of the total landings, with France taking approximately a third, and Belgian vessels the remainder. UK landings were low and stable between 1950 and the mid-1970s, but increased rapidly after 1978 due to the replacement of otter trawlers by beam trawlers.

Sole are widespread and usually taken in conjunction with other species to varying degrees, dependent on location and season. The most productive sole fishery grounds are located close to ports, while the highest catches of anglerfish for example are taken further south and west in Division VIIe.

The principal gears used are otter-trawls and beam-trawls, and sole tends to be the target species of an offshore beam-trawl fleet, which is concentrated off the south Cornish coast and also catches plaice and anglerfish. The total landings have been stable over 1991-1999 and amounts to around 900 t. Since 2000, landings have been around 1,000 until 2009 since when due to the introduction (in late 2008) of a single area licensing scheme compliance improved dramatically and landings dropped to around 700 t. Since then landings have been in

creasing in line with the management plan described landings. Discarding is estimated to be low in this fishery although the use of experimental gears in the fishery may alter this perception in the future.

SOURCE OF MANAGEMENT ADVICE: The main management advisory body is ICES. Analytical assessment based on landings, survey and commercial CPUE data.

REFERENCE POINTS:

	<i>Type</i>	<i>Value</i>	<i>Technical basis</i>
MSY	MSY B_{trigger}	2800 t	Based on the lower 95% confidence limits with exploitation at $F=0.27$ from LT simulations.
Approach	F_{MSY}	0.27	Based on stochastic LT simulations.
Precautionary approach	B_{lim}	1300 t	WKFRAME 2 meta-analysis (ICES, 2011).
	B_{pa}	1800 t	WKFRAME 2 meta-analysis (ICES, 2011).
	F_{lim}	Not defined.	
	F_{pa}	Not defined.	

STOCK STATUS:

F (Fishing Mortality)				
	2009	2010	2011	
MSY (F_{MSY})	✓	✓	✓	Appropriate
Precautionary approach ($F_{\text{pa}}, F_{\text{lim}}$)	?	?	?	Undefined

SSB (Spawning Stock Biomass)				
	2010	2011	2012	
MSY (B_{trigger})	✓	✓	✓	Above trigger
Precautionary approach ($B_{\text{pa}}, B_{\text{lim}}$)	✓	✓	✓	Full reproductive capacity

The significant reduction of F in 2009 reflects the reduction in fishing effort. SSB has been around $MSY B_{\text{trigger}}$ for about two decades, with an increase since 2009. Recruitment has been fluctuating without trend.

MANAGEMENT AGREEMENT: Council Regulation (EC) No. 509/2007 establishes a multi-annual plan for the sustainable exploitation of Division VIIe sole.

RECENT MANAGEMENT ADVICE:

ICES advises on the basis of the MSY framework that landings in 2013 should be less than 960 tonnes.

Other considerations

MSY approach

Following the ICES MSY framework implies fishing mortality to be at 0.27. This implies landings of less than 960 t in 2012.

Management plan

Council Regulation (EC) No. 509/2007 establishes a multi-annual plan for the sustainable exploitation of sole in Division VIIe. The years 2007–2009 were deemed a recovery plan, with subsequent years being deemed a management plan.

Following the agreed management plan implies an F for 2013 of 0.27 (FMP, the management plan long-term target), suggesting a TAC of 958 t in 2013 which is greater than the 15% TAC increase cap in the plan. Consequently the management plan implies a TAC for 2013 of 894 t ($F = 0.25$). Fishing at this level is expected to lead to an SSB increase of 2% in 2014. ICES has not evaluated this management plan.

STECF COMMENTS: STECF agrees with the ICES assessment of the state of the stock and with the ICES advice for 2013.

STECF notes that the agreed management plan which has been evaluated by STECF to be consistent with the precautionary approach, prescribes fishing at F_{MSY} in 2013, implying that landings in 2013 should be 894 t.

3.50. Demersal elasmobranchs in the Celtic and Irish Seas

The most recent advice for this stock was provided by ICES in 2010. Hence, the following text remains unchanged from the Consolidated STECF Review of Advice for 2011. Advice for 2013 will be provided in Part 3 of the STECF review of Advice for 2013 which will be available in November 2012.

FISHERIES: Historically the increase of commercial fisheries directed at elasmobranch species, and their economic value, rank them low among marine commercial fisheries (Bonfil 1994). In the Northeast Atlantic, including the Celtic and Irish Seas, although some elasmobranchs are taken in directed fisheries, the majority are landed as bycatch from fisheries targeting commercial teleost species. Recreational fisheries, including charter angling, may be an important component of the tourist industry in some areas.

SOURCE OF MANAGEMENT ADVICE: The main advisory body is ICES. The assessment is based on survey and landing trends.

REFERENCE POINTS:

	<i>Type</i>	<i>Value</i>	<i>Technical basis</i>
MSY	MSY	Not defined	
Approach	$B_{trigger}$	Not defined	
	F_{MSY}	Not defined	
Precautionary	B_{lim}	Not defined	
	B_{pa}	Not defined	
Approach	F_{lim}	Not defined	
	F_{pa}	Not defined	

F_{MSY} is not currently definable for these stocks, unless further information is available, including a better assessment of the species composition of the landings. Reference points cannot be defined.

STOCK STATUS:

F (Fishing Mortality)				
		2007	2008	2009
MSY (F_{msy})			?	
Precautionary approach (F_{pa}, F_{lim})			?	

SSB (Spawning Stock Biomass)				
		2008	2009	2010
MSY ($B_{trigger}$)			?	
Precautionary approach (B_{pa}, B_{lim})			?	

In the absence of formal stock assessments and defined reference points for *Mustelus* and *Squatina* in this eco-region, the following provides a qualitative evaluation of the general status of the major species, based on surveys and landings.

Species	Area	State of stock
<i>Mustelus</i> spp. (smooth-hounds)	VII	The stock area is not known, but may merge with sub-areas IV, VI and VIII. Increasing in most surveys.
<i>Squatina squatina</i> (Angel shark)	VI,VII	Rare in this ecoregion, and near extirpated from parts of its former range

RECENT MANAGEMENT ADVICE:

Advice for 2011 and 2012 by individual stocks

Species	Area	Advice
<i>Mustelus</i> spp. (smooth-hounds)	VII	Status quo catch
<i>Squatina squatina</i> (Angel shark)	VI,VII	Retain on prohibited species list

There is not enough information to assess the status of any species in the Rockall area.

Outlook for 2011-2012

No analytical assessment or forecast can be presented for these stocks. The main cause of this is the lack of a time-series of species specific landings data.

MSY approach

Advice by species/stock is provided in the table above. This advice is based on an application of the MSY approach for stocks without population size estimates. This advice applies to 2011 and 2012.

Policy paper

In terms of the EU policy paper on fisheries management (17 May 2010, [COM\(2010\) 241](#)) the stocks of these species are classified under a range of categories.

Species	Area	Policy Category
<i>Mustelus</i> spp. (smooth-hounds)	VII	No TAC is in place, but Annex III, Rule 8, Annex IV Rule 4 would apply.
<i>Squatina squatina</i> (Angel shark)	VI,VII	Annex III, Category 10

STECF COMMENTS: STECF agrees with the ICES advice

With reference to the Communication from the Commission (COM (2010) 241 FINAL), STECF notes the stocks of *Mustelus* and *Squatina* in VI and VII are classified under a range of categories.

3.51. Herring (*Clupea harengus*) in the Irish Sea (Division VIIa North)

FISHERIES: This herring stock is mainly exploited by the UK with Ireland taking a small proportion of the catches in some years. Since 1987 the landings have fluctuated between about 2,000 t and 10,000 t. From 2002 to 2010 the TAC had been 4,800 t. Landings in 2011 were 5,200t.

SOURCE OF MANAGEMENT ADVICE: The main management advisory body is ICES. The exploratory assessment of the stock is based on survey data and catch-at-age data. Last year the assessment was based on trends only. This year an analytical assessment and short term forecast are presented for this stock. The advice for 2012 is based on MSY approach (F_{MSY}).

REFERENCE POINTS:

	Type	Value	Technical basis
MSY	MSY $B_{trigger}$	9500 t	Provisional based on B_{pa}
Approach	F_{MSY}	0.26	Based on stochastic simulations (ICES, 2012a)
Precautionary approach	B_{lim}	6000 t	Lowest observed SSB.
	B_{pa}	9500 t	$B_{pa} = B_{lim} * 1.58$
	F_{lim}	Not defined.	
	F_{pa}	Not defined.	

STOCK STATUS:

F (Fishing Mortality)

	2009	2010	2011	
MSY (F_{MSY})	✘	✔	✔	Appropriate
Precautionary approach (F_{pa}, F_{lim})	?	?	?	Undefined

SSB (Spawning Stock Biomass)				
	2010	2011	2012	
MSY ($B_{trigger}$)	✔	✔	✔	Above trigger
Precautionary approach (B_{pa}, B_{lim})	✔	✔	✔	Full reproductive capacity

The spawning stock biomass has been above MSY $B_{trigger}$ since 2006. Fishing mortality has decreased since 2003 to the lowest in the time series and is now around F_{MSY} . Recruitment is increasing and estimated to be above the average of the time series since 2006 (2004 year class).

Management plans

No specific management objectives are known to ICES. ICES recommends that a management plan for Division VIIa (North) should be developed.

RECENT MANAGEMENT ADVICE:

ICES advises on the basis of MSY approach that landings in 2013 should be no more than 5100 t.

ICES advises that activities that impact on the seabed should not take place in spawning grounds unless they can be shown not to have a negative impact on spawning, larval production or stock dynamics.

Other considerations

MSY approach

Following the ICES MSY framework implies fishing mortality at $F_{MSY} = 0.26$, resulting in landings of less than 5100 t in 2013. This is expected to lead to an SSB of 18 000 t in 2014.

Precautionary approach

The SSB is well above B_{pa} and F_{pa} is undefined but current F is just below F_{MSY} . ICES does not advise to use B_{pa} as a target in 2013.

STECF COMMENTS: STECF agrees with the ICES assessment of the state of the stock and the advice for 2013.

3.52. Herring (*Clupea harengus*) in the Celtic Sea (VIIg and VIIa South), and in VIIj Division VIIg,h,j,k

FISHERIES: France, Germany, Ireland, Netherlands and UK have participated in the herring fisheries in this area. However in recent years the fishery has mainly been exploited by Irish vessels and Ireland has been allocated nearly 90% of the overall quota. Until the late nineties, landings fluctuated between about 19,000 and 23,600 t. From 1998 to 2009, landings decreased from 20,300t to just under 5,800t. Since then landings increased to 8,400t in 2010 and 11,500t in 2011.

The fishery exploits a stock, which is considered to consist of two spawning components (autumn and winter). The stock is exploited by two types of vessels, larger boats with Refrigerated Sea Water (RSW) storage, and smaller dry hold vessels. The smaller vessels are confined to the spawning grounds (VIIaS and VIIg) during the winter period. The RSW vessels target the stock inshore in winter and offshore during the summer feeding phase (VIIg). The number of vessels participating in the fishery has decreased in recent years. However,

efficiency has increased, especially in the RSW vessels. An increasing proportion of the catch is now being taken by RSW vessels and lower amounts by dry-hold vessels. There has been little fishing in VIIj in recent seasons, and there is evidence that stock abundance in this area is currently low as corroborated by survey information. Other surveys indicate that abundance has increased considerably in the other areas particularly the inshore areas in VIIj.

SOURCE OF MANAGEMENT ADVICE: The main management advisory body is ICES. The assessment is based on catch-at-age data and acoustic survey data. There is no recruitment index available for this stock.

REFERENCE POINTS:

	Type	Value	Technical basis
MSY	MSY $B_{trigger}$	Not defined.	
Approach	F_{MSY}	0.25	Stochastic simulations on segmented regression stock recruit relationship.
Precautionary approach	B_{lim}	26 000 t	The lowest stock observed.
	B_{pa}	44 000 t	Low probability of low recruitment.
	F_{lim}	Not defined.	
	F_{pa}	Not defined.	

(Unchanged since 2010)

STOCK STATUS:

F (Fishing Mortality)				
	2009	2010	2011	
MSY (F_{MSY})				Below target
Precautionary approach (F_{pa}, F_{lim})				Undefined

SSB (Spawning-Stock Biomass)				
	2010	2011	2012	
MSY ($B_{trigger}$)				Undefined
Precautionary approach (B_{pa}, B_{lim})				Full reproductive capacity

The current assessment shows SSB at the highest level since the 1960s. F is well below F_{MSY} but has increased slightly in 2011. There are three recent strong year classes (2003/4, 2005/6, and 2007/8) in the fishery. The 2008–2009 year classes also look above average.

MANAGEMENT AGREEMENT:

The Irish Celtic Sea Herring Management Advisory Committee was established to manage the Irish fishery for this herring stock. This Committee manages the Irish quota and implements measures in addition to the EU regulations. The committee proposed a rebuilding plan in 2008. The TAC for 2009 was set by the Council

accordingly. This plan has not been formally agreed yet and implies fishing at $F_{0.1}$ (In 2007: 0.19, in 2008/2009=0.17).

Rebuilding Plan Proposed by the Celtic Sea Management Advisory Committee, Ireland, for this stock.

1. For 2009, the TAC shall be reduced by 25% relative to the current year (2008).
2. In 2010 and subsequent years, the TAC shall be set equal to a fishing mortality of $F_{0.1}$.
3. If, in the opinion of ICES and STECF, the catch should be reduced to the lowest possible level, the TAC for the following year will be reduced by 25%.
4. Division VIIaS will be closed to herring fishing for 2009, 2010 and 2011.
5. A small-scale sentinel fishery will be permitted in the closed area, Division VIIaS. This fishery shall be confined to vessels, of no more than 65 feet length. A maximum catch limitation of 8% of the Irish quota shall be exclusively allocated to this sentinel fishery.
6. Every three years from the date of entry into force of this Regulation, the Commission shall request ICES and STECF to evaluate the progress of this rebuilding plan.
7. When the SSB is deemed to have recovered to a size equal to or greater than B_{pa} in three consecutive years, the rebuilding plan will be superseded by a long-term management plan.

ICES has evaluated the plan and considers it is precautionary within the estimated stock dynamics. If a sequence of low recruitments takes place then the harvest control rule may have to be re-evaluated.

The Council and the Commission in 2009 agreed that until a plan is adopted, it would be appropriate to set the TAC for herring in Celtic Sea and Division VIIj according to the following rule:

- For 2010 and subsequent years, the TAC is and should be set corresponding to a fishing mortality of $F_{0.1} = 0.19$.
- If, in the opinion of ICES and STECF, the catch should be reduced to the lowest possible level, the TAC for the following year will be reduced by 25%.

In 2011 the Celtic Sea Management Advisory Committee proposed the following long term management plan;

1. Every effort shall be made to maintain a minimum level of Spawning Stock Biomass (SSB) greater than 41,000 t, the level below which recruitment becomes impaired.
2. Where the SSB, in the year for which the TAC is to be fixed, is estimated to be above 61,000 t ($B_{trigger}$) the TAC will be set consistent with a fishing mortality, for appropriate age groups, of 0.23 (F_{target}).
3. Where the SSB is estimated to be below 61,000 tonnes, the TAC will be set consistent with a fishing mortality of:
$$SSB * 0.23 / 61,000$$
4. Where the rules in paragraphs 2 and 3 would lead to a TAC which deviates by more than 30 % from the TAC of the preceding year, the TAC will be fixed such that it is not more than 30 % greater or 30 % less than the TAC of the preceding year.
5. Where the SSB is estimated to be below 41,000 tonnes, Subdivision VIIaS will be closed until the SSB has recovered to above 41,000 tonnes.
6. Where the SSB is estimated to be below 41,000 tonnes, and Sub-Division VIIaS is closed, a small-scale sentinel fishery will be permitted in the closed area. This fishery will be confined to vessels, of no more than 50 feet in registered length. A maximum catch limitation of 8% of the Irish quota will be exclusively allocated to this sentinel fishery.
7. Notwithstanding paragraphs 2, 3 and 4, if the SSB is estimated to be at or below the level consistent with recruitment impairment (41,000 t), then the TAC will be set at a lower level than that provided for in those paragraphs.
8. No vessels participating in the fishery, if requested, will refuse to take on-board any observer for the purposes of improving the knowledge on the state of the stock. All vessels will, upon request, provide samples of catches for scientific analyses.
9. Every three years from the date of entry into force of this Regulation, the Commission will request ICES and STECF to review and evaluate the plan.

10. This arrangement enters into force on 1st January, 2012.

RECENT MANAGEMENT ADVICE:

ICES advises on the basis of the MSY approach that landings in 2013 should be no more than 19, 000 t

ICES advises that activities that impact on the seabed should not take place in spawning grounds unless they can be shown not to have a negative impact on spawning, larval production or stock dynamics.

Other considerations

Management plan

A rebuilding, proposed by the Irish industry in 2008, implies a TAC of 15 000t in 2013. This plan was evaluated by ICES and found to be precautionary and was subsequently used to set the catch levels, although it was never formally adopted in EU legislation. By 2011, the stock had been above B_{pa} (44 000 t) for three consecutive years and the rebuilding plan expired. Under the terms of this rebuilding plan it should have been replaced by a long term management plan in 2012. However, the HCR within the rebuilding plan were used to set the TAC (21 100 t) for 2012.

In 2011 the Pelagic RAC agreed a new proposed long term management plan. This plan has a target F of 0.23 and a 30% constraint in TAC change. This TAC constraint prevents sudden changes of the TAC and accounts for uncertainties in the assessment and forecast in case of strong incoming recruitment. This plan would lead to a TAC in 2013 of 17 000 t. This plan has not yet been evaluated by ICES, but initial evaluation by the Irish Marine Institute concluded it to be precautionary. An evaluation of the management plan will be conducted in 2012 on the basis of a request by Ireland.

MSY approach

Following the ICES MSY framework implies fishing mortality be increased to 0.25 which is higher than current F (0.15), resulting in landings of less than 19 000 t in 2013. This is expected to lead to an SSB of 73 000 t in 2014. No MSY $B_{trigger}$ has been derived for this stock although it is likely that the current SSB would be above any candidate value.

Precautionary approach

The SSB is well above B_{pa} and F_{pa} is undefined but current F is well below F_{MSY} . ICES does not advise to use B_{pa} as a target in 2013.

STECF COMMENTS: STECF agrees with the ICES assessment of the state of the stock and the advice for 2013.

3.53. Herring (*Clupea harengus*) in Division VIIe,f

STECF did not have access to any new information on Herring in Divisions VIIe,f and ICES has not undertaken any assessments or issued any recent advice. The text below remains unchanged from the STECF Consolidated review advice for 2012.

FISHERIES: This stock is exploited by the UK and France. The TAC for this stock has been set at 1,000 t and has remained unchanged in recent years. This TAC is divided equally between the UK and France. Landings have fluctuated over the last ten years, from a low of 176 t to a high of 1,040 t. In 2004, 2005, 2006 and 2007 landings have been between 700 and 800 t. Landings in 2007 and 2008 were 602 t respectively 614 t.

SOURCE OF MANAGEMENT ADVICE: The main management advisory body is ICES. No analytical assessment has been made in recent years.

REFERENCE POINTS: No reference points have been defined for this stock.

STOCK STATUS:

F (Fishing Mortality)	
2007 2008	2009

MSY (F_{msy})	?	?	?
Precautionary approach (F_{pa}, F_{lim})	?	?	?

The available information is inadequate to evaluate stock trends, and the state of the stock is uncertain.

RECENT MANAGEMENT ADVICE: No management advice is provided for this stock.

STECF COMMENTS: STECF agrees with the ICES advice

3.54. Sprat (*Sprattus sprattus*) in Divisions VIIId,e.

FISHERIES: Only the UK carries out a sprat fishery in this area. For the last 20 years the annual landings have been in the order of 1,200 to 5,400 t. Landings have decreased since 1999. Landings in 2004 were the lowest in the time series, at about 800 t. Slight increases in landings were seen in 2005 and 2006 with about 1,600t and 2,000t reported respectively. Landings in 2008 and 2009 were around 3,400t and 2,800t respectively, rising to 4,400t in 2010. In 2011 landings were 3,100t.

SOURCE OF MANAGEMENT ADVICE: The main management advisory body is ICES. The advice last year was based on precautionary considerations. This year the advice is based on the ICES approach to data limited stocks.

REFERENCE POINTS: No reference points are defined.

STOCK STATUS:

F (Fishing Mortality)	
	2009–2011
Qualitative evaluation	? Insufficient information

The information available is insufficient to evaluate stock trends and exploitation.

SSB (Spawning Stock Biomass)	
	2009–2011
Qualitative evaluation	? Insufficient information

RECENT MANAGEMENT ADVICE:

Based on the ICES approach for data limited stocks, ICES advises that catches should be no more than 2800 t.

STECF COMMENTS: STECF agrees with

the ICES assessment of the state of the stock.

STECF notes that the value of 2,800 t advised by ICES represents a reduction of 20% on the average reported landings over the period 2009-2011. STECF therefore advises that it seems more appropriate to express the advice for 2013 in terms of landings instead of catches. Adopting such an approach implies landings of sprat in Divisions VIIId,e should be no more than 2,800 t in 2013.

4. ECO-REGION 3: RESOURCES IN THE BAY OF BISCAY AND IBERIAN WATERS

4.1. Norway lobster (*Nephrops norvegicus*) in Southwestern waters

For all *Nephrops* Functional Units in Southwestern waters, ICES provided biennial advice in 2012 which is valid for both 2013 and 2014. The advice sheets provided by ICES this year, are all based on the ICES approach for data-limited stocks. Assessment/evaluation of stock status is therefore mainly based on updated landings and lpue figures.

Norway lobster in Divisions VIII, contains 4 Functional Units:

- Divisions VIIIa, b: Bay of Biscay North and south (FU 23 & FU 24)
- Divisions VIIIc: North Galicia (FU 25) and Cantabrian Sea (FU 31)

Of the 4 *Nephrops* FUs in ICES div. VIII the *Nephrops* in Bay of Biscay (FUs 23 and 24) is the major contributor to *Nephrops* landings from this area. All the fisheries in VIII taking *Nephrops* are mixed fisheries, in which a single target species often may be difficult to identify. A major fin-fish component is hake. None of these 4 FUs are assessed by UWTV surveys. Even if the FUs 23 and 24 are subject to analytical assessments (length based cohort analysis) the results are considered indicative only and are not used for catch projections. The two other FUs are data-poor stocks with negligible landings and no assessments are provided. These *Nephrops* FUs are assessed by the ICES Working Group on the Assessment of Southern Shelf Stocks of Hake, Monk and Megrim (WGHMM),

4.1.1. Norway lobster (*Nephrops norvegicus*) in FU 23 & FU 24, Bay of Biscay (Divisions VIIIa, b)

FISHERIES: There are two Functional Units in these divisions VIIIa & VIIIb: a) Bay of Biscay North (FU 23) and b) Bay of Biscay South (FU 24), together called Bay of Biscay. Nearly all landings are taken by French trawlers. Landings have fluctuated between 3,500 and 6,000 t during the time-series. These fluctuations may be explained by variability in recruitment. In 2011 total landings amounted to 3559 t. The corresponding estimated discards were 1263 t. Despite a decommissioning programme for French vessels, it is likely that effective effort has stabilised since 1994 or even increased due to increased gear efficiency.

SOURCE OF MANAGEMENT ADVICE: The main management advisory body is ICES. The length based assessment includes fishery-independent data for the first time (LANGOLF survey), which provides information for the southern part of the fishery. Furthermore probabilistic estimations of discards for years with no sampling on board were included. The assessment should only be considered as indicative of trends.

MANAGEMENT AGREEMENT: There are no specific management agreements for Norway lobster in FU 23 and 24

REFERENCE POINTS: No reference points have been defined for this stock.

STOCK STATUS:

F (Fishing Mortality)		
	2009–2011	
MSY (F_{MSY})	?	Unknown
Precautionary approach (F_{pa}, F_{lim})	?	Unknown
Qualitative evaluation	✗	Above poss. reference points

SSB (Spawning-Stock Biomass)		
	2007–2011	
MSY ($B_{trigger}$)	?	Unknown
Precautionary approach (B_{pa}, B_{lim})	?	Unknown

Qualitative evaluation		Increasing
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Trends in SSB from the assessment which includes surveys and commercial data indicate that the average of SSB in the last two years (2010–2011) is 19% higher than in the average of the three previous years (2007–2009). Fishing mortality has been declining in recent years. Recruitment has shown a downwards trend in recent years.

RECENT MANAGEMENT ADVICE:

Based on the ICES approach for data-limited stocks, ICES advises that landings should be no more than 3200 tonnes.

This is the first year ICES is providing quantitative advice for data-limited stocks.

Other considerations

No reliable forecast can be presented for this stock, because the assessment is only indicative of trends and the absolute level of stock size is uncertain.

ICES approach to data-limited stocks

For data-limited stocks for which a biomass index is available, ICES uses a harvest control rule based on an index-adjusted status quo catch. The advice is based on a comparison of the two most recent index values with the three preceding values, combined with recent catch or landings data. Knowledge about the exploitation status also influences the advised catch.

For this stock the SSB is estimated to have increased by 19% in 2007–2009 (average of the three years) and 2010–2011 (average of the two years). This implies an increase of landings of at most 19% in relation to the average landings of the last three years (2009–2011), corresponding to landings of no more than 3942 t.

Additionally, considering that the stock is likely to be overexploited and recruitment shows a downwards trend in recent years, ICES advises that landings should decrease by 20% as a precautionary buffer. This results in landings of no more than 3200 t in 2013.

STECF COMMENTS: STECF agrees with the ICES assessment of the state of the stock and the advice for 2013 and 2014.

STECF considers that management of fishing mortality on Nephrops stocks would best be achieved if measures, including catch restrictions, were implemented at the level of the functional unit.

STECF notes that although an age-structured stock assessment is performed for these FUs, the results are insufficiently reliable to be used in catch forecasts or to estimate reference points.

4.1.2. Norway lobster (*Nephrops norvegicus*) in Division VIIIc (FU 25 & FU 31)


FISHERIES: There are two Functional Units in this Management Area: a) North Galicia (FU 25) and b) Cantabrian Sea (FU 31). All catches from these FUs are taken by Spain. *Nephrops* constitutes a small component of mixed fishery landings taken by bottom trawlers. Hake constitutes a main component of these landings. Landings and effort in both functional units have declined and landings are now at extremely low levels compared to earlier years (34 t in 2010 for FU 25 and 9 t for FU 31, no figures available for 2011) compared to landings of about 500 t in the early 1990s).



SOURCE OF MANAGEMENT ADVICE: The main management advisory body is ICES. No assessment has been carried out in 2012.

MANAGEMENT AGREEMENT: A recovery plan for Southern hake and Iberian *Nephrops* has been agreed by the EC in 2006 (Council Regulation (EC) 2166/2005). The aim of the recovery plan is to rebuild the stocks within 10 years, with a reduction of 10% in F relative to the previous year and the TAC set accordingly. ICES has not evaluated this recovery plan.

REFERENCE POINTS: No precautionary reference points are defined for this stock.

STOCK STATUS (for both FU 25 and FU 31):

F (Fishing Mortality)			
	1975–2010	2011	
MSY (F_{MSY})	?	?	Not available
Precautionary approach (F_{pa}, F_{lim})	?	?	Not available
Qualitative evaluation		?	Not available

SSB (Spawning-Stock Biomass)			
	1975–2010	2011	
MSY ($B_{trigger}$)	?	?	Not available
Precautionary approach (B_{pa}, B_{lim})	?	?	Not available
Qualitative evaluation			Decreasing

The stock status is based on the time-series of available data. All information indicates that the stock is at a very low abundance level. Landings and l_{pue} have fluctuated along a continuous downward trend and are currently very low. Mean sizes in the landings have shown a continuous increasing trend over the time-series, which may reflect poor recruitment.

RECENT MANAGEMENT ADVICE (for both FU 25 and FU 31):

ICES advises on the basis of the precautionary considerations that catches should be zero.

To protect the stock in this functional unit, management should be implemented at the functional unit level.

Other considerations

No analytical assessment is available for this stock. Therefore, fishing possibilities cannot be projected.

Precautionary considerations

Even with the decrease in effort, a continuous decline in landings has been observed together with the continuous decline in stock indices. In addition, the combined TAC for FU25 and FU 31 has not been taken for a number of years. In order to reverse the stock decline, a zero catch is advised.

Management plan

The calculation of a TAC corresponding to a reduction in F of 10% as called for in the recovery plan (Council Regulation (EC) 2166/2005) was not feasible because short-term forecasts are not available. ICES has not evaluated this recovery plan.

Additional consideration

Even with the decrease in effort, a continuous decline in landings has been observed together with the continuous decline in stock indices. In addition, the combined TAC for FU25 and FU 31 has not been taken for a number of years. In order to reverse the stock decline, a zero catch is advised. Since the landings are well below the agreed TAC, TAC reductions of 10% have been ineffective in reducing the fishing mortality as called for in the recovery plan. In addition, because the TAC covers both fishery units FU 25 and FU 31, a disproportionate

amount could be taken from one or the other of the units. This could result in a fishing mortality on one of the stocks which was higher than anticipated.

STECF COMMENTS STECF agrees with the ICES assessment of the state of the stock and the advice for 2013 and 2014

STECF considers that management of fishing mortality on *Nephrops* stocks would best be achieved if measures, including catch restrictions, were implemented at the level of the functional unit.

STECF recommends that management should be at the functional unit rather than ICES division level in order to ensure that catch opportunities and effort are in line with the scale of the resources in each of the stocks defined by functional units.

STECF notes that an agreed management plan for *Nephrops* in Division VIIIc (Council Regulation (EC) 2166/2005) has been in effect since 2006. However seemingly without any measurable effect on the *Nephrops* stock.

4.1.3. Norway lobster (*Nephrops norvegicus*) in Divisions VIII d, e

FISHERIES: There are no reported landings of *Nephrops* from this area

RECENT MANAGEMENT ADVICE: ICES has suggested that a zero TAC be set for this area to prevent misreporting.

STECF COMMENTS: STECF notes that the most recent information for this stock relates to the year 2002. The above text is unchanged from the STECF Review of Scientific advice on stocks of Community interest for 2004. STECF agrees with the advice from ICES.

4.1.4. Norway lobster (*Nephrops norvegicus*) in Division IX and X.

Norway lobster in Divisions IX contains 5 Functional Units:

FU no.	Name	ICES area	Statistical rectangles
26	West Galicia	IXa	13-14 E0-E1
27	North Portugal (N of Cape Espichel)	IXa	6-12E0; 9-12E1
28	South-West Portugal (Alentejo)	IXa	3-5 E0-E1
29	South Portugal (Algarve)	IXa	2E0-E2
30	Gulf of Cadiz	IXa	2-3 E2-E3

FISHERIES: There are five Functional Units (FU) in Division IXa: a) West Galicia (FU 26), b) North Portugal (FU 27), c) Southwest Portugal (FU 28), d) South Portugal (FU 29), and e) Gulf of Cadiz (FU 30). These *Nephrops* FUs are assessed by the ICES Working Group on the Assessment of Southern Shelf Stocks of Hake, Monk and Megrim (WGHMM),

Nephrops represents a small, but valuable by-catch in these fisheries targeting mainly demersal fish species. In the Southwest and South SW and S Portugal there is a crustacean trawl fishery, targeting mainly deepwater crustaceans. The fishery in West Galicia, North Portugal and Gulf of Cádiz is mainly conducted by Spanish vessels, and that in Southwest and South Portugal by Portuguese vessels, on deep water grounds (200-750 m). The Portuguese fleet comprises two components: demersal fish trawlers and crustacean trawlers. Total landings from Div. IXa (FUs 26-30) have decreased dramatically during the last 30 years. In 1980 total landings exceeded


2000 t, while they were 140 t in 2011, of which 133 t were taken from FUs 28 - 29. It should be noted that there was no information available from Spain which take about 45% of the landings in recent years.



SOURCE OF MANAGEMENT ADVICE: The management advisory body is ICES. Biennial advice (for 2013 and 2014) for these FUs was provided in 2012. The advice for FUs 28 -29 is based on trends in cpue (biomass indices from scientific surveys as well as commercial cpue figures (fisheries targeting Nephrops). The advice for FU 30 (Gulf og Cadiz) stock is also based on commercial CPUE figures up to 2010. The advice for the stocks in FUs 26 and 27 (West Galicia and North Portugal) is a continuation of the advice given in 2010 and is also based on trends in commercial lpue

REFERENCE POINTS: No reference points have been defined for FUs 26-30.

MANAGEMENT AGREEMENT: A recovery plan for Southern hake and Iberian Nephrops has been agreed by the EC in 2006 (Council Regulation (EC) 2166/2005). The aim of the recovery plan is to rebuild the stocks within 10 years, with a reduction of 10% in F relative to the previous year and the TAC set accordingly. ICES has not evaluated this recovery plan.

STOCK STATUS: (for FU 26, 27, 28, 29 and 30):

F (Fishing Mortality)			
	1984–2010	2011	
MSY (F_{MSY})	?	?	Unknown/insufficient information
Precautionary approach (F_{pa}, F_{lim})	?	?	Unknown/insufficient information
Qualitative evaluation		?	Decreasing/Not available

SSB (Spawning-Stock Biomass)			
	1984–2010	2011	
MSY ($B_{trigger}$)	?	?	Unknown/insufficient information
Precautionary approach (B_{pa}, B_{lim})	?	?	Unknown/insufficient information
Qualitative evaluation			Decreasing

Although the exact stock status is unknown, all information indicates that all stocks are at a very low abundance level. Landings and lpue have fluctuated along a marked downward trend and are currently very low.

West Galicia (FU 26) and North Portugal (FU 27): No assessment has been carried out in 2012. The stock status is based on the time-series of available data. The stock size in FUs 26–27 is very small. Increasing mean sizes in landings in combination with record low lpues since 2000–2001 indicate that the recruitment has been weak. Landings are still decreasing and are excessively small compared with historical values.

SW and S Portugal (FU 28 & FU 29): Fishing effort has decreased in the period 2001–2009 and remained at the 2009 level, considered to be record low. The biomass indices (crustacean trawl commercial fleet and survey cpues) show a decreasing trend since 2005, taking into account that the 2010 survey value is considered uncertain. The average of the commercial cpue assumed to be indicative of stock size in the last two years (2010–2011) is 14% lower than the average of the three previous years (2007–2009).

RECENT MANAGEMENT ADVICE:

The 2012 advice for these Nephrops stocks is biennial and valid for 2013 and 2014. Management should be implemented at the functional unit level.

West Galicia (FU 26) and North Portugal (FU 27):

ICES advises on the basis of the precautionary considerations that catches should be zero.

To protect the stock in these functional units, management should be implemented at the functional unit level.

SW and S Portugal (FU 28 & FU 29):

Based on the ICES approach for data-limited stocks, ICES advises that catches should be no more than 110 tonnes. This is the first year ICES is providing quantitative advice for data-limited stocks (see Quality considerations).

To protect the stock in this functional unit (FU), management should be implemented at the functional unit level.

Gulf of Cadiz (FU 30):

Based on the ICES approach for data-limited stocks, ICES advises that catches should be no more than 90 tonnes. This is the first year ICES is providing quantitative advice for data-limited stocks (see Quality considerations).

To protect the stock in this functional unit, management should be implemented at the functional unit level.

Other considerations

FU 26 and FU 27

No analytical assessment is available for this stock. Therefore, fishing possibilities cannot be projected.

Precautionary considerations

Even with the decrease in effort, a continuous decline in landings along with the continuous decline in stock indices has been observed. In order to reverse the stock decline, a zero catch is advised.

Management plan

The calculation of a TAC corresponding to a reduction in F of 10% as called for in the recovery plan (Council Regulation (EC) 2166/2005) was not feasible because short-term forecasts could not be conducted.

FU 28 & FU 29

No analytical assessment is available for this stock. Therefore, fishing possibilities cannot be projected.

ICES approach to data-limited stocks

For data-limited stocks for which a biomass index is available, ICES uses as harvest control rule an index-adjusted *status quo* catch. The advice is based on a comparison of the two most recent index values with the three preceding values, combined with recent catch or landings data. Knowledge about the exploitation status also influences the advised catch.

For this stock the biomass information from the lpue from the fishery is estimated to have decreased 14% in 2007–2009 (average of the three years) and 2010–2011 (average of the two years). This implies a 14% decrease in catches compared to last year's landings (2011), corresponding to catches of no more than 110 t.

Considering that the effort has decreased significantly even though the exploitation status is unknown, no additional precautionary reduction is needed.

Management plan

The calculation of a TAC corresponding to a reduction in F of 10% as called for in the recovery plan (Council Regulation (EC) [2166/2005](#)) was not feasible because short-term forecasts could not be conducted.

FU 30

No analytical assessment is available for this stock. Therefore, fishing possibilities cannot be projected.

ICES approach to data-limited stocks

For data-limited stocks for which a biomass index is available, ICES uses as harvest control rule an index-adjusted *status quo* catch. The advice is based on a comparison of the two most recent index values with the three preceding values, combined with recent catch or landings data. Knowledge about the exploitation status also influences the advised catch.

For this stock the biomass information from the CPUE from the fishery is estimated to have decreased by more than 20% in 2006–2008 (average of the three years) and 2009–2010 (average of the two years). This implies a 20% decrease in catches compared to the last available year with landings (2010), corresponding to catches of no more than 90 t. The survey information confirms the decreasing trend in stock size.

Considering that the effort has decreased even though the exploitation status is unknown, no additional precautionary reduction is needed.

Management plan

The calculation of a TAC corresponding to a reduction in F of 10% as called for in the recovery plan (Council Regulation (EC) [2166/2005](#)) was not feasible because short-term forecasts could not be conducted.

STECF COMMENTS: STECF agrees with the ICES assessment and advice for 2013 and 2014.

STECF notes that the overriding management consideration for these stocks is that management should be at the functional unit (FU) rather than the ICES division level. Management at the functional unit level should provide the controls to ensure that catch opportunities and effort are compatible and in line with the scale of the resources in each of the stocks defined by the functional units. Current management of *Nephrops* in Division IXa does not provide adequate safeguards to ensure that local effort is sufficiently limited to avoid depletion of resources in functional units. In the current situation vessels are free to move between grounds, allowing effort to develop on some grounds in a largely uncontrolled way and this has historically resulted in inappropriate harvest rates from some areas.

STECF has previously advised on annual 10 % reductions for the TAC for *Nephrops* in Division IXa in an attempt to limit fishing mortality in line with the intended reduction for hake (as required by the recovery plan). However, STECF notes that the southern hake and Norway lobster recovery plan (Council Regulation (EC) No 2166/2005) has not been effective in reducing fishing mortality and rebuilding the spawning stock biomass to the desired levels. STECF has recently been asked to provide guidance on the utility and effectiveness of alternative management approaches for southern hake and *Nephrops* (including improved effort regimes and management of *Nephrops* by FU) (STECF-11-07c) and potential revisions to the plan are under consideration.

4.2. Hake (*Merluccius merluccius*) in Divisions VIIIc, IX and X (Southern hake)

FISHERIES: This stock is exploited in a mixed fishery by Spanish and Portuguese trawlers and artisanal fleets. Landings fluctuated between 6,700 and 35,000 t (1972-2009). In recent years, they increased from 6,700t in 2003 to 19,200t in 2009. Landings in 2010 were equal to 10,700t. There were insufficient data to update this information for 2011.

SOURCE OF MANAGEMENT ADVICE: The main management advisory body is ICES. A new assessment model has been adopted. The advice is now based on a length-age analytical assessment (GADGET) using catch data, commercial CPUE series and survey data. This new assessment includes the Gulf of Cadiz landings which were excluded from the assessment in recent years. It was not possible to include Spanish commercial data for 2011 in the assessment. Therefore, the assessment model could not be updated this year. Projections for catch options and management advice for 2013 were based on the assessment conducted in 2011.

REFERENCE POINTS:

	<i>Type</i>	<i>Value</i>	<i>Technical basis</i>
MSY	MSY B_{trigger}	Not defined.	
Approach	F_{MSY}	0.24	F_{max} (ICES, 2010).
Precautionary Approach	B_{lim}	Not defined.	
	B_{pa}	Not defined.	
	F_{lim}	Not defined.	
	F_{pa}	Not defined.	

STOCK STATUS:

F (Fishing Mortality)				
	2009	2010	2011	
MSY (F_{MSY})	✘	✘	?	Not available
Precautionary approach ($F_{\text{pa}}, F_{\text{lim}}$)	?	?	?	Not available

SSB (Spawning-Stock Biomass)				
	2010	2011	2012	
MSY (B_{trigger})	?	?	?	Not available
Precautionary approach ($B_{\text{pa}}, B_{\text{lim}}$)	?	?	?	Not available
Qualitative evaluation	↗	↗	↗	Increasing

No assessment has been carried out in 2012. The stock status is based on last year's assessment. Fishing mortality has been stable over the last decade and about three times above FMSY. In 2010 fishing mortality was estimated to have decreased by 37% relative to 2009. SSB has increased since 1998 and is estimated to have increased considerably in 2011. Recruitment has been high since 2005.

MANAGEMENT OBJECTIVES: A recovery plan has been agreed by EU in 2005 (EC Reg. No. 2166/2005). The aim of the plan is to recover the stock to a spawning-stock biomass above 35 000 tonnes by 2016 and to reduce fishing mortality to 0.27. The main elements in the plan are a 10% annual reduction in F and a 15% constraint on TAC change between years. ICES has not evaluated the plan.

RECENT MANAGEMENT ADVICE: ICES advises on the basis of the transition to the MSY approach that landings in 2013 should be no more than 10 600 tonnes.

Other considerations

Management plan

Following the agreed recovery plan (EC Reg. No. 2166/2005) implies a 15% TAC increase to 14 144 t in 2013, which is expected to lead to an SSB of 22 074 t in 2014. ICES did not evaluate the plan; however, some elements of the recovery plan were evaluated by ICES in 2010 (Section 7.3.3.1 in ICES, 2010).

The aim of the plan is to recover the stock to a spawning-stock biomass above 35 000 tonnes, based on the previous Bpa. This target is no longer valid due to a new perception of the historical stock dynamics.

MSY approach

No MSY Btrigger has been identified for this stock. The stock status in relation to any potential biomass reference points is unknown. In view of the optimistic signs of the stock, i.e. i) increasing trend in SSB in the last three years (2008–2010); ii) high recent recruitments; and iii) a decrease in fishing mortality in 2010, ICES will follow the MSY framework, assuming that SSB in 2013 will be above any potential candidate of MSY Btrigger.

Following the ICES MSY framework implies a reduction in fishing mortality to 0.24, resulting in landings of no more than 7800 t in 2013. This is expected to lead to an SSB of 29 300 t in 2014.

Following the transition scheme towards the ICES MSY framework implies a reduction in fishing mortality to 0.35, resulting in landings of no more than 10 600 t in 2013. This is expected to lead to an SSB of 26 200 t in 2014.

STECF COMMENTS: STECF agrees with the ICES assessment of the state of the stock and the advise for 2013.

STECF notes that the aim of the recovery plan is to recover the stock to a spawning-stock biomass above 35,000 tonnes. Since the new assessment method changes the historic dynamic of the stock, previous precautionary reference points for F and SSB may no longer be valid.

STECF further notes that the 2010 recruitment has been replaced with an average value. This has resulted in a larger uncertainty in the results of the forecast for 2013 and 2014. The proportion of 2013 landings that depends on average recruitment assumptions (year classes 2010–2013) is 62%.

4.3. Whiting (*Merlangius merlangus*) in Subareas VIII, IX and X

FISHERIES: Whiting is taken in a mixed demersal fishery, mainly in Divisions VIIIa,b by France and Spain. The fishery is mostly dominated by bottom trawl. Fishery statistics are currently being compiled. At present, only official landings are available, which are considered to be preliminary for the purpose of stock assessment. There are concerns about the reliability of the 2008-2009 French data. Landings statistics need to be quality-assured and confirmed for the region. Spanish commercial data for 2011 were not available.

SOURCE OF MANAGEMENT ADVICE: The main management advisory body is ICES. The assessment area is Subarea VIII and Division IXa.

REFERENCE POINTS: No reference points have been defined for this species in the Bay of Biscay and Atlantic Iberian waters ecoregion.

STOCK STATUS:

F (Fishing Mortality)		
	2009–2011	
Qualitative evaluation	?	Insufficient information

SSB (Spawning-Stock Biomass)		
	2009–2011	
Qualitative evaluation	?	Insufficient information

The available information is insufficient to evaluate stock trends and exploitation status. Therefore, the state of the whiting in the Bay of Biscay and Atlantic Iberian waters ecoregion is unknown.

MANAGEMENT OBJECTIVES: No management objectives have been defined for this stock

RECENT MANAGEMENT ADVICE: Based on the ICES approach to data-limited stocks, ICES advises that catches should decrease by 20% in relation to the last three years average. Due to the uncertainty in the landings data, ICES is not able to quantify the resulting catch.

This is the first year ICES is providing quantitative advice for data-limited stocks.

Other considerations

ICES approach for data-limited stocks

For data-limited stocks without information on abundance or exploitation ICES considers that a precautionary reduction of catches should be implemented, unless there is ancillary information clearly indicating that the current exploitation is appropriate for the stock.

For this stock, ICES advises that catches should decrease by 20% in relation to the last three years average. Due to the uncertainty in the landings data, ICES is not able to quantify the resulting catch.

STECF COMMENTS: STECF agrees with the ICES advice for 2013. STECF notes that the stock unit definition of whiting in this area is not clear and that further work is required.

4.4. Whiting (*Merlangius merlangus*) - IX, X

This stock is dealt with in Section 4.3

4.5. Anglerfish (*Lophius piscatorius* and *Lophius budegassa*) in Div’s VIIIa, b, d, e

Anglerfish within the two management areas VII and VIIIabde are assessed together and comprise of two species (*L. piscatorius* and *L. budegassa*), which are not always separated for market purposes. Details of stock status and advice are given in Section 3.40.

4.6. Anglerfish (*Lophius piscatorius* and *Lophius budegassa*) in VIIIc, IX, X

FISHERIES: Anglerfish species, *L. piscatorius* and *L. budegassa*, are caught together by bottom trawlers and gillnet fisheries. Anglerfishes, hake, *Nephrops*, and megrim are partly caught in the same mixed fisheries. Spanish trawl discards have increased to 11% of their catch in 2010. Discards in the Portuguese trawl fisheries seem to be negligible. There is no minimum landing size for anglerfish, but in order to ensure marketing standards a minimum landing weight of 500 g was fixed in 1996.

For *Lophius piscatorius* total landings in 2010 were 1600 t; 33% were taken by bottom trawl, 60% by Spanish gillnet, and 7% by Portuguese artisanal gear types. Discarding rate in the Spanish bottom trawl fishery was 2.1%. For *Lophius budegassa*, total landings in 2010 were 750 t; 78% were taken by bottom otter trawl, 11% Spanish gillnet, and 11% Portuguese artisanal gear types. The discarding rate in Spanish bottom trawl was 11%. There were insufficient data to update this information for 2011; however, values for 2010 are still considered appropriate.

SOURCE OF MANAGEMENT ADVICE: The management advisory body is ICES. For *Lophius budegassa* a surplus production model (ASPIC) is used to provide estimates of stock biomass and fishing mortality relative to maximum sustainable yield (MSY) values. For *Lophius piscatorius*, the assessment is carried out with a length-based assessment model, SS3. It was not possible to include Spanish commercial data for 2011 in the assessment. Therefore, the assessment model could not be updated this year. Projections for catch options and management advice for 2013 were based on the assessment conducted in 2011.

REFERENCE POINTS

Lophius piscatorius

	<i>Type</i>	<i>Value</i>	<i>Technical basis</i>
MSY	MSY B _{trigger}	Not defined.	

Approach	F_{MSY}	0.19	$F_{0.1}$ (ICES, 2012b).
Precautionary	B_{lim}	Not defined.	
	B_{pa}	Not defined.	
Approach	F_{lim}	Not defined.	
	F_{pa}	Not defined.	

Lophius budegassa

	Type	Value	Technical basis
MSY	MSY $B_{trigger}$	50% B_{MSY}	B_{MSY} is implicit estimated from surplus production model (ICES, 2012).
Approach	F_{MSY}	Relative value	Implicit, estimated from surplus production model (ICES, 2012). Fishing mortality values expressed relative to F_{MSY} .
Precautionary	B_{lim}	Not defined.	
	B_{pa}	Not defined.	
Approach	F_{lim}	Not defined.	
	F_{pa}	Not defined.	

STOCK STATUS:

Lophius piscatorius

F (Fishing Mortality)				
	2009	2010	2011	
MSY (F_{MSY})	✘	✘	?	Not available
Precautionary approach (F_{pa}, F_{lim})	?	?	?	Not available

Spawning-Stock Biomass (SSB)			
	2005–2011		2012
MSY ($B_{trigger}$)	?	?	Not available
Precautionary approach (B_{pa}, B_{lim})	?	?	Not available
Qualitative evaluation	→	→	Stable

The stock status is based on an assessment using data only until 2010. Fishing mortality has decreased since 2005, and for 2010 fishing mortality was estimated to be 26% lower than in 2009. SSB has been increasing since 1994 and remained stable from 2009.

Lophius budegassa

F (Fishing Mortality)				
	2009	2010	2011	
MSY (F_{MSY})	✓	✓	?	Not available
Precautionary approach (F_{pa}, F_{lim})	?	?	?	Not available

Biomass				
	2010	2011	2012	
MSY ($B_{trigger}$)	✓	✓	?	Not available
Precautionary approach (B_{pa}, B_{lim})	?	?	?	Not available

The stock status is based on an assessment using data only until 2010. Fishing mortality has decreased since 1999, remaining below FMSY since 2001. Biomass has increased since 2002, and is far above MSY Btrigger.

MANAGEMENT OBJECTIVES: No management objectives have been defined for these stocks.

RECENT MANAGEMENT ADVICE:

For *Lophius piscatorius*, ICES advises on the basis of the MSY transition that landings in 2013 should be no more than 1350 t. For *Lophius budegassa* ICES advises on the basis of the MSY transition that landings in 2013 should be no more than 740 t. Combined landings of *Lophius piscatorius* and *Lophius budegassa* should be no more than 2090 t.

Other considerations

MSY approach

Lophius piscatorius

No MSY $B_{trigger}$ has been defined for this stock. The status of the stock in relation to any potential biomass reference point is unknown.

Following the ICES MSY framework implies fishing mortality to be reduced to 0.19, resulting in landings of no more than 1320 t in 2013. This is expected to lead to a 7% SSB increase in 2014.

Following the transition scheme towards the ICES MSY framework implies fishing mortality to be reduced to 0.19, based on $(F_{2010} * 0.4) + (F_{MSY} * 0.6)$, resulting in landings of no more than 1350 t in 2013. This is expected to lead to a 6% increase in SSB in 2014.

Lophius budegassa

The stock is below FMSY and above any candidate of MSY Btrigger. Following the ICES MSY framework implies a fishing mortality equal to FMSY. However, the *L. piscatorius* F-multiplier should be applied, since *L. piscatorius* is the stock exploited with an F higher than F_{MSY} . This will result in maximum landings in 2013 of 730 t and is expected to lead to a 3% biomass increase.

Applying the F-multiplier of the transition to the ICES MSY approach of *L. piscatorius* will correspond to landings of 740 tonnes in 2013, and is expected to lead to a 3% biomass increase.

Both stocks

As both species of anglerfish (*L. piscatorius* and *L. budegassa*) are caught in the same fisheries and are subject to a combined TAC, the same reduction from current fishing mortality is assumed for both species. The reduction is driven by *L. piscatorius*, as it is the species in poor condition and whose current fishing levels are above F_{msy} .

STECF COMMENTS: STECF agrees with the ICES assessment of the state of the stocks and the advice for 2013.

STECF notes that both stocks are caught together in most fisheries and managed under a common TAC, and that the advice depends on the stock in the poorer condition

STECF notes that anglerfish in VIIIc and IXa are caught in the same fisheries as hake and *Nephrops*.

To ensure recovery of anglerfish in VIIIc and IXa, it is essential that the provisions of the management plan for hake and *Nephrops* are fully implemented and enforced. Failure to do so may severely compromise any recovery of the anglerfish stocks. STECF therefore recommends that enforcement of the provisions of the management plan for hake and *Nephrops* is given high priority and that measures to ensure compliance with the TAC for anglerfish and effort restrictions are put in place as a matter of urgency.

4.7. Megrim (*Lepidorhombus whiffiagonis*) in VIIIa,b,d,e.

Megrim in Divisions VIIIa,b,d,e are assessed together with megrim in Sub area VII (Section 3.41).

4.8. Megrim (*Lepidorhombus whiffiagonis* & *Lepidorhombus boscii*) in VIIIc, IX & X

FISHERIES: Both species of megrim in the Iberian region are caught as a by-catch in the mixed bottom trawl fisheries by Portuguese and Spanish vessels and also in small quantities by the Portuguese artisanal fleet. Two species (*Lepidorhombus whiffiagonis* & *L. boscii*) are caught and they are not usually separated for market purposes and a combined advice is provided for the two stocks. Changes in the demersal fisheries in recent years have reduced the fishing effort on megrim. In 2010, landings were 1297 t for *L. boscii* and 83 t for *L. whiffiagonis*. For both species, there were insufficient data to update this information for 2011; however, values for 2010 are still considered appropriate.

SOURCE OF MANAGEMENT ADVICE: The management advisory body is ICES. The advice is based on an age-based analytical assessment based on landings and CPUE data series from surveys and commercial fleets. Bycatch and discards are not incorporated in the assessment. The two stocks are caught together and the fisheries advice therefore combines both stocks. It was not possible to include Spanish commercial data for 2011 in the assessment. Therefore, the assessment model could not be updated this year. Projections for catch options and management advice for 2013 were based on the assessment conducted in 2011.

Lepidorhombus boscii

	<i>Type</i>	<i>Value</i>	<i>Technical basis</i>
MSY	MSY $B_{trigger}$	Not defined.	
Approach	F_{MSY}	0.18	$F_{40\%SPR}$ (ICES, 2010).
Precautionary	B_{lim}	Not defined.	
	B_{pa}	Not defined.	
Approach	F_{lim}	Not defined.	
	F_{pa}	Not defined.	

Lepidorhombus whiffiagonis

	<i>Type</i>	<i>Value</i>	<i>Technical basis</i>
MSY	MSY B_{trigger}	Not defined.	
Approach	F_{MSY}	0.17	$F_{40\%SPR}$ (ICES, 2010).
Precautionary Approach	B_{lim}	Not defined.	
	B_{pa}	Not defined.	
	F_{lim}	Not defined.	
	F_{pa}	Not defined.	

STOCK STATUS:

Lepidorhombus boscii

F (Fishing Mortality)				
	2009	2010	2011	
MSY (F_{MSY})	✘	✘	?	Not available
Precautionary approach ($F_{\text{pa}}, F_{\text{lim}}$)	?	?	?	Not available


SSB (Spawning-Stock Biomass)				
	2010	2011	2012	
MSY (B_{trigger})	?	?	?	Not available
Precautionary approach ($B_{\text{pa}}, B_{\text{lim}}$)	?	?	?	Not available
Qualitative evaluation	→	→	→	Stable

No assessment has been carried out in 2012. The stock status is based on last year's assessment. SSB has decreased from the late 1980s to a minimum in 2001, but since then been slowly increasing. Fishing mortality has been stable and above F_{MSY} . Recruitment has been around average since 2000.

Lepidorhombus whiffiagonis

F (Fishing Mortality)				
	2009	2010	2011	
MSY (F_{MSY})	✓	✓	?	Not available
Precautionary approach ($F_{\text{pa}}, F_{\text{lim}}$)	?	?	?	Not available

SSB (Spawning-Stock Biomass)				

	1990–2011	2012	
MSY ($B_{trigger}$)	?	?	Not available
Precautionary approach (B_{pa}, B_{lim})	?	?	Not available
Qualitative evaluation		?	Not available

No assessment has been carried out in 2012. The stock status is based on last year's assessment. SSB has decreased from the late 1980s, and has been low since 2004. Fishing mortality has fluctuated over the time-series, but has decreased after 2006. Recruitment has been low for over a decade with the exception of the high 2009 year-class estimate.

RECENT MANAGEMENT ADVICE:

ICES advises on the basis of the MSY approach. For *Lepidorhombus boscii* landings in 2013 should be no more than 780 t and for *L. whiffiagonis* landings in 2013 should be no more than 110 t. Combined landings of *Lepidorhombus boscii* and *Lepidorhombus whiffiagonis* should be no more than 890 t.

Other considerations

MSY approach

Since the two megrim species (*L. whiffiagonis* and *L. boscii*) are not separated in the landings, the advice of the two stocks is linked. The reduction in fishing mortality applied to the stock with highest fishing mortality in relation to FMSY (*L. boscii*) should be applied to both stocks. Given the low population level of *L. whiffiagonis* (below any potential MSY $B_{trigger}$), the MSY transition framework is not appropriate for advice for both megrim stocks and advice is given using the MSY framework. This approach was already applied in 2010 and 2011.

For *L. boscii* fishing mortality must be reduced to 0.18, resulting in maximum landings of 780 t in 2013. This is expected to lead to an SSB of 5210 t in 2014. For *L. whiffiagonis*, this implies fishing mortality to be reduced to 0.08, resulting in landings of 110 t in 2013. This is expected to lead to an SSB of 1210 t in 2014.

STECF COMMENTS: STECF agrees with the ICES assessment of the state of the stock and the advice for 2013.


4.9. Plaice (*Pleuronectes platessa*) in VIII, IX and X.

FISHERIES: Plaice is fished by various fleets and gear types covering small-scale artisanal and trawl fisheries. Only preliminary landings are available. 2011 landings for Subarea VIII and division IXa were equal to 266t.

SOURCE OF MANAGEMENT ADVICE: The main management advisory body is ICES. ICES advice is for Subarea VIII and Division IXa.

REFERENCE POINTS: No reference points have been defined for this species in the Bay of Biscay and Atlantic Iberian waters ecoregion.

STOCK STATUS:

F (Fishing Mortality)	
	2009–2011
Qualitative evaluation	 Insufficient information

SSB (Spawning-Stock Biomass)	
------------------------------	--

	2010–2011	
Qualitative evaluation	?	Insufficient information

The available information is insufficient to evaluate stock trends and exploitation status. Therefore, the state of the plaice in Bay of Biscay and Iberian waters ecoregion is unknown.

MANAGEMENT OBJECTIVES: No management objectives have been defined for this stock

RECENT MANAGEMENT ADVICE: Based on the ICES approach to data-limited stocks, ICES advises that catches should decrease by 20% in relation to the last three years average. Due to the uncertainty in the landings data, ICES is not able to quantify the resulting catch. This is the first year ICES is providing quantitative advice for data-limited stocks.

STECF COMMENTS: STECF agrees with the ICES for 2013.

STECF notes that the stock unit definition of plaice in this area is not clear and that further work is required.

4.10. Sole (*Solea solea*) in Divisions VIIIa,b (Bay of Biscay)

FISHERIES: The French fleet, which consists mainly of trawlers and fixed-nets, is the major participant in the Bay of Biscay sole fishery with landings comprising about 90% of the total official international landings over the historical series. The remaining part is landed by the Belgian beam trawler fleet. The landings of the French fixed-net fishery have increased from less than 5% of total landings prior to 1985 to around 65% in recent years. This shift between fleets has resulted in a change in the selection pattern towards older fish.

Total landings in 2011 were 4,600t (inshore trawlers 7%, offshore otter trawlers 17%, offshore beam-trawlers 8%, and fixed nets 67%).

SOURCE OF MANAGEMENT ADVICE: The main management advisory body is ICES.

The advice is based on an age-based analytical assessment based on landings and CPUE data series from surveys and commercial fleets. Discards are not included in the assessment. No recruitment indices are available for this stock.

There is a need to incorporate fisheries-independent data to improve the stock assessment and the estimation of recruitment, when the existing survey (ORHAGO) time-series is long enough. This assessment relies on time series of commercial fleets. Following a benchmark in 2011, the two RESSGASC survey series (which ended in 2002) were replaced by two commercial lpue series from offshore and inshore French trawlers. These changes have resulted in a slightly revised perception of the stock status in relation to reference points.

REFERENCE POINTS:

	<i>Type</i>	<i>Value</i>	<i>Technical basis</i>
MSY	MSY B_{trigger}	13 000 t	B_{pa} (provisional estimate.)
Approach	F_{MSY}	0.26	F_{max} (ICES, 2010) because stock–recruitment relationship, limited variations of recruitment, and fishing mortality pattern are known with low uncertainty.

Precautionary	B_{lim}	Not defined.	
	B_{pa}	13 000 t	The probability of reduced recruitment increases when SSB is below 13 000 t, based on the historical development of the stock.
Approach	F_{lim}	0.58	Based on the historical response of the stock.
	F_{pa}	0.42	$F_{lim} * 0.72$

MANAGEMENT AGREEMENT: A multiannual plan has been agreed by EU in 2006 (EC Reg. No. 388/2006). The aim of the plan was first to bring the spawning-stock biomass above 13 000 tonnes in 2008 and thereafter to ensure the sustainable exploitation of the stock. ICES has not evaluated the plan

STECF has evaluated a new management plan proposal and concluded that exploiting the Bay of Biscay sole stock at F_{msy} (0.26) can be considered precautionary. An F target of 0.26 does not produce significantly higher long term yields relative to F_s in the range of 0.15-0.35. Two possible F_{msy} transition options were considered: 1) A strategy of gradual annual reductions in F towards achieving F_{msy} in 2015 may be combined with the current 15% constraint in interannual variation in TAC. 2) With a constant TAC strategy of 4100t from 2012 onwards, F_{msy} could be reached with a 50% probability by 2015. Both strategies assume that F is maintained at F_{msy} (0.26) once F has declined to that level.

STOCK STATUS:

F (Fishing Mortality)			
	2009	2010	2011
MSY (F_{MSY})	✘	✘	✘ Above target
Precautionary approach (F_{pa}, F_{lim})	✔	✔	⚠ Increased risk

SSB (Spawning-Stock Biomass)			
	2010	2011	2012
MSY ($B_{trigger}$)	✔	✔	✔ Above trigger
Precautionary approach (B_{pa}, B_{lim})	✔	✔	✔ Full reproductive capacity

The most recent estimates of SSB are above the MSY $B_{trigger}$ and B_{pa} . Fishing mortality, since 2003, has been around F_{pa} and above F_{MSY} . The fishing mortality for 2011 has increased. Recruitment values since 2004 are among the lowest in the time-series, with the exception of the 2009 recruitment which is the highest since 1993.

RECENT MANAGEMENT ADVICE:

ICES advises on the basis of the transition to the MSY approach that landings in 2013 should be no more than 3500 t.

Other considerations

Management plan

The multiannual plan for the Bay of Biscay sole ([EC Reg. No. 388/2006](#)) does not provide any basis for a TAC advice for 2012. The aim of the plan was first to bring the spawning-stock biomass above 13 000 tonnes. This

target is estimated to have been achieved. According to the plan, the Council must decide on (a) a long-term target fishing mortality rate; and (b) the rate of reduction in the fishing mortality rate that should apply until the target fishing mortality rate decided under (a) has been reached. The EC has not yet defined the values for items (a) and (b). ICES has not evaluated this plan.

MSY approach

To follow the ICES MSY framework the fishing mortality must be reduced to 0.26, resulting in landings of no more than 3000 t in 2013. This is expected to lead to an SSB of 17 000 t in 2014, corresponding to a 14% increase compared with the 2013 SSB.

To follow the transition scheme towards the ICES MSY framework the fishing mortality must be reduced to 0.31, resulting in landings of 3500 t in 2013. This is expected to lead to an SSB of 16 000 t in 2014, corresponding to a 10% increase compared with the 2013 SSB.

PA approach

The fishing mortality in 2013 should be no more than F_{pa} , corresponding to landings of less than 4500 t in 2013. This is expected to keep SSB above B_{pa} in 2014.

STECF COMMENTS: STECF agrees with the ICES assessment of the state of the stock and the advice for 2013.

STECF notes that the 2012 assessment shows an increase in the fishing mortality in 2011 which is largely supported by the catch increase, but there are concerns that incorrect age reading in 2011 may have amplified this increase.

4.11. Sole (*Solea* spp.) - VIIIcde, IX, X

FISHERIES: Sole is caught mainly in a small-scale multi-gear coastal mixed fishery. Only preliminary landings are available. 2011 landings for division VIIIc, Division IXa and Subarea IX (excluding landings specifically identified as Division IXb) were equal to 698t.

SOURCE OF MANAGEMENT ADVICE: The main management advisory body is ICES.

REFERENCE POINTS: No reference points have been defined for sole in Divisions VIIIc and IXa.

STOCK STATUS:

F (Fishing Mortality)			
	1977–2011		
Qualitative evaluation	<table border="1"> <tr> <td style="text-align: center;">?</td> <td>Insufficient information</td> </tr> </table>	?	Insufficient information
?	Insufficient information		

SSB (Spawning-Stock Biomass)			
	1977–2011		
Qualitative evaluation	<table border="1"> <tr> <td style="text-align: center;">?</td> <td>Insufficient information</td> </tr> </table>	?	Insufficient information
?	Insufficient information		

The available information is insufficient to evaluate stock trends and exploitation status. Therefore, the state of the sole in Divisions VIIIc and IXa is unknown. Landings are mainly taken in Division IXa.

MANAGEMENT OBJECTIVES: No management objectives have been defined for this stock

RECENT MANAGEMENT ADVICE: Based on the ICES approach to data-limited

stocks, ICES advises that catches should decrease by 20% in relation to the last three years average. Due to the uncertainty in the landings data, ICES is not able to quantify the resulting catch. This is the first year ICES is providing quantitative advice for data-limited stocks

Other considerations

ICES approach to data-limited stocks

For data-limited stocks without information on abundance or exploitation ICES considers that a precautionary reduction of catches should be implemented, unless there is ancillary information clearly indicating that the current exploitation is appropriate for the stock.

For this stock, ICES advises that catches should decrease by 20% in relation to the last three years average. Due to the uncertainty in the landings data, ICES is not able to quantify the resulting catch.

STECF COMMENTS: STECF agrees with the ICES advice for 2013.

STECF notes that the stock unit definition of sole in this area is not clear and that further work is required.

4.12. Rays and skates in ICES Subareas VIII and IX

The most recent advice for this stock was provided by ICES in 2010. Hence, the following text remains unchanged from the Consolidated STECF Review of Advice for 2011. Advice for 2013 will be provided in Part 3 of the STECF review of Advice for 2013 which will be available in November 2012.

FISHERIES: *No specific information for this area area available.*

SOURCE OF MANAGEMENT ADVICE: The main advisory body is ICES. The assessment is based on survey and landing trends.

REFERENCE POINTS:

	<i>Type</i>	<i>Value</i>	<i>Technical basis</i>
MSY	MSY B _{trigger}	Not defined	
Approach	F _{MSY}	Not defined	
Precautionary	B _{lim}	Not defined	
	B _{pa}	Not defined	
Approach	F _{lim}	Not defined	
	F _{pa}	Not defined	

STOCK STATUS:

F (Fishing Mortality)			
	2007	2008	2009
F _{msy}		?	
F _{pa} / F _{lim}		?	

SSB (Spawning Stock Biomass)			
	2008	2009	2010
MSY B _{trigger}		?	

Status of individual stocks is given in the table below.

Species	Area	State of stock
<i>Raja clavata</i> (thornback ray)	VIIIabd	Stable /increasing
<i>Leucoraja naevus</i> (cuckoo ray)	VIIIabd	Stable /increasing
other species	VIIIabd	Uncertain
<i>Raja clavata</i> (thornback ray)	VIIIc	Uncertain
<i>Leucoraja naevus</i> (cuckoo ray)	VIIIc	Uncertain
other species	VIIIc	Uncertain
<i>Raja clavata</i> (thornback ray)	IXa	Stable
<i>Leucoraja naevus</i> (cuckoo ray)	IXa	Uncertain
other species	IXa	Uncertain
<i>Dipturus batis</i> (Common skate) complex	All areas	Depleted

RECENT MANAGEMENT ADVICE:

Advice Summary for 2011-2012

Management Objective (s)	Landings in 2011 and 2012
Transition to an MSY approach with caution at low stock size	Less than 4.2 thousand t for the main species
Cautiously avoid impaired recruitment (Precautionary Approach)	No target fishery on <i>Raja undulata</i> and <i>Dipturus batis</i> complex
Cautiously avoid impaired recruitment and achieve other objective(s) of a management plan (e.g., catch stability)	n/a

Advice for 2011-2012 by individual stocks

Species	Area	Advice
<i>Raja clavata</i> (thornback ray)	VIIIabd	Maintain the catches at recent level
<i>Leucoraja naevus</i> (cuckoo ray)	VIIIabd	Maintain the catches at recent level
Other species	VIIIabd	No advice
<i>Raja clavata</i> (thornback ray)	VIIIc	No advice
<i>Leucoraja naevus</i> (cuckoo ray)	VIIIc	No advice

<i>Other species</i>	VIIIc	No advice
<i>Raja clavata</i> (thornback ray)	IXa	Maintain the catches at recent level
<i>Leucoraja naevus</i> (cuckoo ray)	IXa	No advice
<i>Other species</i>	IXa	No advice
<i>Raja alba</i>	All areas	Retain on prohibited species list
<i>Dipturus batis</i> (Common skate) complex	All areas	Retain on prohibited species list

Outlook for 2011 and 2012

No analytical assessment or forecast can be presented for these stocks. The main cause of this is the lack of a time-series of species specific landings data. No targeted fishing should be permitted for *Raja undulata* and the *Dipturus batis* complex.

MSY transition scheme

Advice by species/stock is provided in the table above. This advice is based on an application of the MSY approach for stocks without population size estimates. This advice applies to 2011 and 2012. The rate of exploitation of these stocks relative to F_{MSY} is not currently known. Advice is provided based on an examination of the stock status of each of the different stocks in the divisions within the ecoregion, with the most appropriate advice for the majority of the stocks provided.

PA approach

White skate (Rostroraja alba) – No reliable recent records. The status is uncertain, although it is considered near-extirpated from parts of its former range.

Policy paper

In the light of the EU policy paper on fisheries management (17 May 2010, [COM\(2010\) 241](#)) the stocks in this multispecies complex are classified under a range of categories. Some of the main commercial stocks are classified under categories 6-9, Annex IV, Rule 4. This implies an unchanged TAC.

Species	Area	Policy Category
<i>Raja clavata</i> (thornback ray)	VIIIabd	Annex III, Rule 6. Annex IV Rule 4 applies.
<i>Leucoraja naevus</i> (cuckoo ray)	VIIIabd	Annex III, Rule 6. Annex IV Rule 4 applies.
<i>Other species</i>	VIIIabd	Annex III, Rule 6. Annex IV Rule 4 applies.
<i>Raja clavata</i> (thornback ray)	VIIIc	Annex III, Rule 6. Annex IV Rule 4 applies.
<i>Leucoraja naevus</i> (cuckoo ray)	VIIIc	Annex III, Rule 6. Annex IV Rule 4 applies.
<i>Other species</i>	VIIIc	Annex III, Rule 6.
<i>Raja clavata</i> (thornback ray)	IXa	Annex III, Rule 6. Annex IV Rule 4 applies.
<i>Leucoraja naevus</i> (cuckoo ray)	IXa	Annex III, Rule 6. Annex IV Rule 4 applies.
<i>Other species</i>	IXa	Annex III, Rule 6.
<i>Raja alba</i>	All areas	Annex III, Rule 10

<i>Dipturus batis</i> (Common skate) complex	Areas	Annex III, Rule 10
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FISHING OPPORTUNITIES FOR 2012 according to COM(2011) 298-Final.

STECF notes that with reference to COM(2011) 298-final this stock is classified under category 3.

STECF COMMENTS: STECF agrees with the ICES advice.

4.13. Catsharks and Nursehounds (*Scyliorhinus canicula* and *Scyliorhinus stellaris*) in Subareas VIII, IX and X

The most recent advice for these stocks were provided by ICES in 2010. Hence, the following text remains unchanged from the Consolidated STECF Review of Advice for 2011. Advice for 2013 will be provided in Part 3 of the STECF review of Advice for 2013 which will be available in November 2012.

FISHERIES: Lesser spotted dogfish *Scyliorhinus canicula* is taken primarily as a by-catch in demersal fisheries targeting other species and a large proportion of the catch is discarded, although in some coastal areas there are seasonal small-scale directed fisheries. In the Bay of Biscay and Iberian waters landings of *Scyliorhinus* spp. have recorded since the mid 1990s and have fluctuated between 1500t and 2000t. Landings were 1688t in 2005 and 1572 in 2006.

SOURCE OF MANAGEMENT ADVICE: The main advisory body is ICES. The assessment is based on survey and landing trends.

REFERENCE POINTS:

	<i>Type</i>	<i>Value</i>	<i>Technical basis</i>
MSY	MSY $B_{trigger}$	Not defined	
Approach	F_{MSY}	Not defined	
Precautionary	B_{lim}	Not defined	
	B_{pa}	Not defined	
Approach	F_{lim}	Not defined	
	F_{pa}	Not defined	

STOCK STATUS:

F (Fishing Mortality)			
	2007	2008	2009
F_{msy}		?	
F_{pa} / F_{lim}		?	

SSB (Spawning Stock Biomass)			
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	2008	2009	2010
MSY $B_{trigger}$?	
B_{pa} / B_{lim}		?	

In the absence of defined reference points, the status of the stocks of *Scyliorhinus canicula* cannot be evaluated. The following provides a qualitative summary of the general status of the stocks based on surveys and landings:

Species	Area	State of stock
<i>Scyliorhinus canicula</i> (lesser spotted dogfish)	VIIIabd	Increasing
<i>Scyliorhinus canicula</i> (lesser spotted dogfish)	VIIIc	Stable /increasing
<i>Scyliorhinus canicula</i> (lesser spotted dogfish)	IXa	Stable

RECENT MANAGEMENT ADVICE:

Scyliorhinus canicula (Lesser-spotted dogfish)

Management Objective (s)	Landings in 2011 and 2012
Transition to an MSY approach with caution at low stock size	Less than 1.7 thousand t
Cautiously avoid impaired recruitment (Precautionary Approach)	Less than 1.7 thousand t
Cautiously avoid impaired recruitment and achieve other objective(s) of a management plan (e.g., catch stability)	n/a

There is no TAC in place for *Scyliorhinus canicula*.

Advice for 2011-2012 by individual stocks

Species	Area	Advice
<i>Scyliorhinus canicula</i> (lesser spotted dogfish)	VIIIabd	Maintain the catches at recent level
<i>Scyliorhinus canicula</i> (lesser spotted dogfish)	VIIIc	Maintain the catches at recent level
<i>Scyliorhinus canicula</i> (lesser spotted dogfish)	IXa	Maintain the catches at recent level

Outlook for 2011 and 2012

No analytical assessment or forecast can be presented for these stocks. The main cause of this is the lack of a time-series of species specific landings data.

MSY transition scheme

Advice by species/stock is provided in the table above. This advice is based on an application of the MSY approach for stocks without population size estimates. This advice applies to 2011 and 2012. The rate of exploitation of these stocks relative to F_{MSY} is not currently known.

Policy paper

In the light of the EU policy paper on fisheries management (17 May 2010, [COM\(2010\) 241](#)) the stocks of *Scyliorhinus canicula* are classified under a range of categories.

Species	Area	Policy Category
<i>Scyliorhinus canicula (lesser spotted dogfish)</i>	VIIIabd	No TAC is in place, but Annex III, Rule 8 would apply.
<i>Scyliorhinus canicula (lesser spotted dogfish)</i>	VIIIc	No TAC is in place, but Annex III, Rule 6, Annex IV Rule 4 would apply.
<i>Scyliorhinus canicula (lesser spotted dogfish)</i>	IXa	No TAC is in place, but Annex III, Rule 6, Annex IV Rule 4 would apply.

FISHING OPPORTUNITIES FOR 2012 according to COM(2011) 298-Final.

STECF notes that with reference to COM(2011) 298-final this stock is classified under category 3.

STECF COMMENTS: STECF agrees with the ICES advice.

4.14. Tope (*Galleorhinus galeus*) in ICES Subareas VIII, IX and X

Previous stock summaries and advice for tope has been provided at the NE Atlantic regional level (see section 8.6). STECF is unable to provide additional information and advice for subareas VIII, IX and X separately. Advice for 2013 will be provided in Part 3 of the STECF review of Advice for 2013 which will be available in November 2012.

4.15. Other demersal elasmobranches in the Bay of Biscay and Iberian Waters

The most recent advice for these stocks were provided by ICES in 2010. Hence, the following text remains unchanged from the Consolidated STECF Review of Advice for 2011. Advice for 2013 will be provided in Part 3 of the STECF review of Advice for 2013 which will be available in November 2012.

FISHERIES: No specific information is available for this area

SOURCE OF MANAGEMENT ADVICE: The main advisory body is ICES. The assessment is based on survey and landing trends.

REFERENCE POINTS:

	Type	Value	Technical basis
MSY	MSY B _{trigger}	Not defined	
Approach	F _{MSY}	Not defined	
Precautionary	B _{lim}	Not defined	
	B _{pa}	Not defined	
Approach	F _{lim}	Not defined	
	F _{pa}	Not defined	

STOCK STATUS:

F (Fishing Mortality)

	2007	2008	2009
MSY (F_{msy})		?	
Precautionary approach (F_{pa}, F_{lim})		?	

SSB (Spawning Stock Biomass)			
	2008	2009	2010
MSY ($B_{trigger}$)		?	
Precautionary approach (B_{pa}, B_{lim})		?	

In the absence of formal stock assessments and defined reference points for *Mustelus* and *Squatina* in this eco-region, the following provides a qualitative evaluation of the general status of the major species, based on surveys and landings.

Species	Area	State of stock
<i>Mustelus spp</i>	VIIIabd	Increasing
<i>Mustelus spp</i>	VIIIc	Uncertain
<i>Mustelus spp</i>	IXa	Uncertain
<i>Squatina squatina</i>	VIIIabd	Depleted
<i>Squatina squatina</i>	VIIIc	Depleted
<i>Squatina squatina</i>	IXa	Uncertain

RECENT MANAGEMENT ADVICE:

Advice for 2011-2012 by individual stocks

Species	Area	Advice
<i>Mustelus spp</i>	VIIIabd	No advice
<i>Mustelus spp</i>	VIIIc	No advice
<i>Mustelus spp</i>	IXa	No advice
<i>Squatina squatina</i>	VIIIabd	Retain on prohibited species list
<i>Squatina squatina</i>	VIIIc	Retain on prohibited species list

<i>Squatina squatina</i>	IXa	Retain on prohibited species list
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Outlook for 2011 and 2012

No analytical assessment or forecast can be presented for these stocks. The main cause of this is the lack of a time-series of species specific landings data.

MSY transition scheme

Advice by species/stock is provided in the table above. This advice is based on an application of the MSY approach for stocks without population size estimates. This advice applies to 2011 and 2012.

PA approach

Angel shark (Squatina squatina) – Landings of this species have almost ceased, with only occasional individuals landed. It is an inshore species, distinctive, and may have a relatively good discard survivorship. Given the concern over *S. squatina* in this and adjacent ecoregions, and that it is not subject to any conservation legislation, a zero TAC for Subareas VII–VIII, or listing this species as a prohibited species would benefit this species.

Landings of *Mustelus spp.* come mainly from Division VII that is outside Bay of Biscay and Western Iberian Seas.

Policy paper

In the light of the EU policy paper on fisheries management (17 May 2010, [COM\(2010\) 241](#)) the stocks of these species are classified under a range of categories.

Species	Area	Policy Category
<i>Mustelus spp</i>	VIIIabd	No TAC, but Annex III, Rule 8 would apply
<i>Mustelus spp</i>	VIIIc	No TAC, but Annex III, Rule 11 would apply
<i>Mustelus spp</i>	IXa	No TAC, but Annex III, Rule 11 would apply
<i>Squatina squatina</i>	VIIIabd	Annex III, Rule 10
<i>Squatina squatina</i>	VIIIc	Annex III, Rule 10
<i>Squatina squatina</i>	IXa	Annex III, Rule 10

FISHING OPPORTUNITIES FOR 2012 according to COM(2011) 298-Final. STECF notes that with reference to COM(2011) 298-final this stock is classified under category 3.

STECF COMMENTS: STECF agrees with the ICES advice.

4.16. Anchovy (*Engraulis encrasicolus*) in Division VIII (Bay of Biscay)

FISHERIES: Anchovy is targeted by trawlers and purse-seiners. The Spanish and French fleets fishing for anchovy in Subarea VIII are spatially and temporally well separated. The Spanish fleet operates mainly in Divisions VIIIc and VIIIb in spring, while the French fleets operate in Division VIIIa in summer and autumn and in Division VIIIb in winter and summer. Since 2003 the fleets of both countries have decreased.

After 5 years of closure, the anchovy fishery was re-opened in 2010. Catches in 2011 were 14 530 t.

SOURCE OF MANAGEMENT ADVICE: The main management advisory body is ICES.

REFERENCE POINTS:

	Type	Value	Technical basis
MSY Approach	MSY $B_{\text{escapement}}$	33 000 t	Provisional value based on B_{pa} .
	F_{MSY}	Not defined.	
Precautionary approach	B_{lim}	21 000 t	$B_{\text{lim}} : B_{\text{esc}} = 21\,000\text{ t (1989 SSB)}$
	B_{pa}	33 000 t	$B_{\text{pa}} = B_{\text{lim}} \times \exp(1.645\sigma)$
	F_{c}		Not defined
	F_{pa}	1.0–1.2	$F_{\text{pa}} = F$ for 50% spawning potential ratio, i.e. the F at which the SSB/R is half of what it would have been in the absence of fishing.

(unchanged since 2010)

STOCK STATUS:

F (Fishing Mortality)			
	2009	2010	2011
MSY (F_{MSY})	?	?	Undefined

SSB (Spawning-Stock Biomass)			
	2010	2011	2012
MSY (B_{trigger})	✓	✓	✓ Above trigger
Precautionary approach ($B_{\text{pa}}, B_{\text{lim}}$)	✓	✓	✓ Full reproductive capacity

The spawning stock biomass has been above the limit reference point since 2006 and above the MSY Bescapement since 2010. Recruitment in 2012 is around the 30th percentile of the historical series. The harvest rate in 2011 was below the average of the historical series from 1987 to 2011 (2005–2009 were excluded due to fishery closures).

RECENT MANAGEMENT ADVICE: ICES advises on the basis of the precautionary approach that catches from 1 July 2012 to 30 June 2013 should be no more than 28 000 tonnes.

Other considerations

Management plan

Following the management plan proposed by the European Commission, the TAC for the fishing season running from 1 July 2012 to 30 June 2013 should be established at 20 700 tonnes (as stated in Annex 1 of the proposal for an SSB in the range 68 001–69 000 t).

MSY approach

If the objective is to maintain the spawning-stock biomass above the provisional MSY Bescapement in 2013, a catch of

less than 65 000 t can be taken in the period 1 July 2012 to 30 June 2013. However, such a catch is not considered precautionary as it leads to a 34% probability of SSB being less than B_{lim} by 2013.

PA approach

To reduce the risk to less than 5% of the SSB in 2013 falling below B_{lim} , catches in the period 1 July 2012–30 June 2013 should be less than 28 000 t

Additional considerations

In the past, a TAC was set independently of the state of the stock in the range of 30 000–33 000 t, and the TAC had limited impact on regulating catches in the fishery.

Recent developments in management have been moving towards an in-year monitoring regime, as recommended previously by ICES. The assessment of anchovy is based on the survey results in the spring and catch data. Hence, the most up-to-date assessment can be obtained in June as done in this assessment. TACs may be set for the whole period July–June.

Harvest control rules (HCR) for anchovy have been tested outside ICES, for the EC proposal of a long-term management plan for this fishery. A draft management plan has been proposed by the EC in cooperation between STECF and the South Western RAC. This plan has not yet been formally adopted by the EU. The plan is based on a constant harvest rate (30%), and sets a TAC as a percentage of the point estimate of the SSB as assessed at the start of the TAC period which runs from 1st July to 30th June, but with an upper bound on the TAC (of 33 000 t), and with a minimum TAC level (of 7000 t) applicable at SSB estimates between 24 000 t and 33 000 t. ICES notes that the criterion for accepting the HCR as precautionary would include rules that imply a low risk of reducing the SSB to a level which may imply further reduction in recruitment. Supplementary measures (area closures, minimum landing size) may be considered in addition to TACs.

Catch options for the next year depends very much on the next coming recruitment for which there is no information yet. The autumn JUVENA survey has now been conducted for nine years. Although the nature of the relationship between the juvenile abundance index and the resulting recruitment is still unclear, ICES considers that the JUVENA acoustic index of juveniles is a valid indicator of the strength of the incoming recruitment and hence useful improving the forecast of the population and potentially its assessment. The use of this index as a tool to forecast the population in next year, should serve to either review the TAC set currently from July to June, or to generate an advice for a TAC going from January to December based on the autumn acoustic survey.

STECF COMMENTS: STECF agrees with the ICES assessment of the state of the stock but notes that the ICES advice is not consistent with the provisions of the proposed management plan. In June 2008 STECF endorsed the approach and findings of the evaluation of the management plan presented in the report of the SGBRE-08-01 Working Group.

STECF notes that the proposed management plan has been applied to derive annual TACs for the past 3 years (2009-10, 2010-2011 and 2011-12). Therefore STECF advises that the management plan should be followed in setting a TAC of 20 700 tonnes for the period 1 July 2012 to 30 June 2013 (as stated in Annex 1 of the proposal for an SSB in the range 68 001–69 000 t).

4.17. Anchovy (*Engraulis encrasicolus*) in Sub-area IX



FISHERIES: Fisheries for anchovy take place mainly by purse-seiners in Division IXa South. Contribution from other fleets in the recent fishery is almost negligible. The fleets in the northern part of Division IXa, which target sardine, occasionally target anchovy when abundant, as occurred in 1995. Total catch in 2011 were 10,076 t (99% purse-seiners, 1% other gear types)

SOURCE OF MANAGEMENT ADVICE: The main management advisory body is ICES.

REFERENCE POINTS: No reference points have been set for this stock. The observed harvest on the southern stock has been in the range of 10–40% which has not resulted in a detrimental effect on the productivity of the stock. These harvest rates correspond to approximately 90–66% spawning biomass per recruit (SBPR). Harvest rate in 2011 of the north-western stock was around 14%.

STOCK STATUS:

F (Fishing Mortality)	
	2009-2011
Qualitative evaluation	? Insufficient information
SSB (Spawning Stock Biomass)	
	2009-2011

Qualitative evaluation	North  North: 10 fold increase
	South  South: Variable without trend

Survey results demonstrate independent dynamics of the anchovy in the north-western part of Division IXa from the dynamics of the stock in Division IXa South. For anchovy in Division IXa South (where the main part of the catch is taken), survey biomass indices show no clear long term trends and fishery seems to have been sustainable over the period. For anchovy in the north-western area the biomass index shows a more than ten-fold increase, with an acoustic estimate of 29 000 t in 2011. The situation in 2012 is unknown as no survey index was available.

RECENT MANAGEMENT ADVICE: ICES cannot give catch advice for 2013. This is due to the lack of available data on year classes that constitute the bulk of the biomass and catches. ICES notes, however, that the historic fisheries and management measures seem to have been sustainable.

Other considerations

Precautionary considerations

The available information for anchovy in this area shows different trends by region:

- There is no long term stock trend for anchovy in the southern area. The historical fishery seems to have been sustainable.
- The biomass in the north-western area shows sporadic population explosions, the last one in 2011.

Concluding, historic management seems to have been sustainable, but this cannot be translated into catch advice for 2013 because of lack of available data on the year classes that will constitute the bulk of the biomass and catches.

Additional considerations

Advice for this stock has traditionally concentrated on the anchovy in Division IXa South, where the majority of the catches were taken (with the exception of 1995/1996). The perception of the anchovy in the north-western areas of Division IXa is that they are marginal populations with dynamics independent of the anchovy stock in Division IXa South. As such the advice was based solely on the information coming from the anchovy in Division IXa South (Algarve and Cádiz).

Survey results demonstrate that the dynamics of the anchovy in the northwestern part of Division IXa are independent of the dynamics of the stock in Division IXa South (for example in the period 1995/96 and in 2011). Furthermore, genetics indicates that the stocks in the southern and north-western regions are genetically differentiated. Therefore, one management advice for the anchovy in the whole of Division IXa may be inadequate, since both the fishery and the exploited populations are spatially separated and have independent dynamics. In future, ICES therefore could accordingly provide advice for the stock in Division IXa South separately from the rest of the anchovy in the division (occupying the western waters of the Iberian peninsula: Division IXa North, Central–North, and Central–South). This might imply separate management in these two regions of Division IXa.

The state of the stock in the southern area is derived from trends in survey indices, landings, effort and l_{pue} as well as age distribution from landings and surveys. Commercial l_{pue} has been relatively stable in recent years; however, l_{pue} for a schooling species like anchovy is a weak indicator for stock abundance. The age group 0 constitutes a significant component of the catches. Scientific surveys do not show any clear trend in the series. The acoustic survey (PELAGO) showed a declining trend between 2007–2010 and a further decline to 0 in 2011. But this estimate in 2011 was, however, contradicted by the high CUFES egg abundance from this survey which showed an increase from past year. New indications about the state of the anchovy biomass were made available through the anchovy DEPM survey carried out in late July 2011 which pointed towards the same biomass levels as in 2008.

The state of the stock in the north-western area changed in 2011. According to the Portuguese acoustic survey in 2011 an anchovy outburst happened in the northernmost area of the region, with a biomass estimate of 29 000. This is the highest recorded biomass in the area, four times higher than the second highest recorded in 2008. A

former outburst of biomass might also have happened in the mid-nineties, as record high catches appeared in 1995, but this cannot be confirmed from acoustic surveys. However, similar outbursts in the past have not been sustained in the following year. Length samples of the anchovy this year indicate that the outburst is due to recruitment from the area..

STECF COMMENTS: STECF agrees with the ICES assessment of the state of the stock and the advice for 2013.

4.18. Anchovy (*Engraulis encrasicolus*) in Sub-area X

ICES has not assessed this stock and STECF has no access to any stock assessment information on anchovy in this area.

4.19. Horse mackerel (*Trachurus trachurus*) in ICES division IXa

FISHERIES: The Horse mackerel is caught in mixed fisheries. Changes in the availability of other species caught in the same fisheries could affect the targeting of horse mackerel. Traditionally, horse mackerel catches show a large proportion of juveniles. Recently the importance of the Spanish bottom trawl fleet, targeting mainly adult fish, is increasing.

Catches decreased from the early 1960s but have been relatively stable since the early 1990s at 20 000 t – 25 000 t. Total catches in 2010 reached 26 600 t, while the average during the last five years (2006-2010) was around 24 600 t. Catches reported in 2011 were not considered reliable for assessment.

SOURCE OF MANAGEMENT ADVICE: The main management advisory body is ICES.

REFERENCE POINTS: No MSY and precautionary reference points have been defined for this stock.

MANAGEMENT AGREEMENTS: No specific management objectives are known to ICES. Historical fishing mortalities have on average (0.09) been below any candidate reference points (e.g. $F_{0.1}=0.14$)

STOCK STATUS:

F (Fishing Mortality)				
	2009	2010	2011	
MSY (F_{MSY})	?	?	?	Not available
Precautionary approach (F_{pa}, F_{lim})	?	?	?	Not available
Qualitative evaluation			?	Not available

SSB (Spawning Stock Biomass)				
	2010	2011	2012	
MSY ($B_{trigger}$)	?	?	?	Not available
Precautionary approach (B_{pa}, B_{lim})	?	?	?	Not available
Qualitative evaluation			?	Not available

No assessment has been carried out in 2012. The stock status is based on last year's assessment. Catches and fishing mortality have been relatively stable since 1999. Biomass has been stable during the assessment period. Recruitment is variable with occasional large peaks.

RECENT MANAGEMENT ADVICE:

ICES advises on the basis of precautionary considerations that landings in 2013 should be no more than 26 000 tonnes.

Other considerations

PA approach

In absence of precautionary reference points the stock status cannot be evaluated in reference to those. The current fishing mortality does not seem to be detrimental to the stock.

The wide confidence intervals indicate high uncertainty in the assessment estimates and particularly in the current trends of the stock. Therefore, based on precautionary considerations, ICES recommends that fishing mortality should not be allowed to increase from the present level. This would imply landings of less than 26 000 t.

Other considerations

It was not possible to include Spanish commercial data for 2011 in the assessment. Therefore, the assessment model could not be updated this year. Projections for catch options and management advice for 2013 were based on the assessment conducted in 2011. This implies that assumptions on mean recruitment were made for 2010-2013 and on fishing mortality for two intermediate years (2011 and 2012) instead of one (2012). This has resulted in a larger uncertainty in the results of the forecast for 2013 and 2014. The proportion of 2013 landings that depends on average recruitment assumptions (year classes 2010–2013) is 45%.

STECF COMMENTS: STECF agrees with the ICES assessment of the state of the stock and the advice for 2013.

STECF notes that in the absence of Spanish commercial data for 2011, the projections for catch options and management advice for 2013 were carried out with assumptions on fishing mortality for 2011 and 2012 and on recruitment for the period 2010-2013. As a result, predicted catches are uncertain.

4.20. Horse mackerel (*Trachurus spp*) in CECAF areas (Madeira Island)

The most recent advice for this stock was provided by ICES in 2011. Hence, the following text remains unchanged from the Consolidated STECF Review of Advice for 2012. Advice for 2013 will be provided in Part 3 of the STECF review of Advice for 2013 which will be available in November 2012.

ICES has reported that catches of horse mackerel have been around 1500 tonnes from 1986 to 1990. Since then catches have declined to less than 700 t. STECF did not have access to any other stock assessment information on horse mackerel in this area. A TAC in area X for 2010 was set to 1,229 t and is taken exclusively by Portugal

STECF COMMENTS: No comments

4.21. Horse mackerel (*Trachurus spp*) in CECAF areas (Canary Islands)

The most recent advice for this stock was provided by ICES in 2011. Hence, the following text remains unchanged from the Consolidated STECF Review of Advice for 2012. Advice for 2013 will be provided in Part 3 of the STECF review of Advice for 2013 which will be available in November 2012.

STECF did not have access to any stock assessment information on horse mackerel in this area.

A TAC in area X for 2010 was set at 1,229 t. It is taken exclusively by Spain.

STECF COMMENTS: No comments

4.22. Horse mackerel (*Trachurus spp*) in ICES Subarea X (Azores Islands)

Horse mackerel in Subarea X is almost exclusively *Trachurus picturatus* and the review of advice is given in Section 4.24 of this report.

4.23. Sardine (*Sardina pilchardus*) in VIIIc and IXa

FISHERIES: Most landings are taken by purse-seiners. Sardine catches are highest in the second semester of the year and catches are concentrated to southern Galician and Cantabrian waters. In Spain, vessels target anchovy, mackerel, sardine, and horse mackerel; in summer, part of the fleet switches to tuna fishing. In Portugal, sardine is the main target species, but chub mackerel, horse mackerel, and anchovy are also landed. Most of the landings are taken off the northern coast. Discards and slippage are uncertain, with slipping estimates only available for the Portuguese fleet but with a limited coverage in time and extent. Total catch in 2011 was 80 000 t (99% from purse seine and 1% from other gear-types)

SOURCE OF MANAGEMENT ADVICE:

The main management advisory body is ICES.

REFERENCE POINTS:

No reference points are defined for this stock.

STOCK STATUS:

F (Fishing Mortality)		
		2009–2011
MSY (F_{MSY})	?	Undefined
Precautionary approach (F_{pa}, F_{lim})	?	Undefined
Qualitative evaluation	→	Stable

SSB (Spawning Stock Biomass)		
		2010–2012
MSY ($B_{trigger}$)	?	Undefined
Precautionary approach (B_{pa}, B_{lim})	?	Undefined
Qualitative evaluation	→	Stable

The biomass of age 1 and older fish has been at stable at a historical low since 2009, 37% below the long term average. Recruitment has been below the long term average since 2005. Fishing mortality fluctuated without a clear trend. In 2008-2011 fishing mortality was higher than in preceding years and it currently around the long term average

RECENT MANAGEMENT ADVICE:

ICES advises on the basis of precautionary considerations that landings in 2013 should be no more than 55 000 tonnes.

Other considerations

Precautionary considerations

Fishing mortality has increased and SSB has decreased in the most recent years despite advice not to increase F since 2002. F should be brought back to where it was before the start of this increase, i.e. the 2002–2007 average, which is 0.22. This corresponds to landings of no more than 55 000 t in 2013.

Additional considerations

No management objectives for these fisheries are known to ICES and there is no international TAC. Almost all catches are taken by Spanish and Portuguese purse-seiners in a directed human consumption fishery. The fisheries are managed by Portugal and Spain through minimum landing size, maximum daily catch, days fishing limitations, and closed areas.

Sardine is distributed in the Iberian region, to the north in Subareas VII and VIII and in the North Sea, and to the south on the Moroccan shelf. The information presented here assumes that sardine in Divisions VIIIc and IXa is a unit stock, based on biological characteristics. However, some movement of fish between Divisions VIIIb and VIIIc is known to occur. The effect of this movement is uncertain but is presently considered to have little influence on the estimation of the stock in the assessed area (Divisions VIIIc and IXa).

The MSY reference points have not been established so far. Candidate reference points have been outlined this year but require further evaluation in light of the recruitment dynamics observed in the stock.

A long-term plan should take into account the spatial distribution of the stock and poor relationship between stock biomass and future recruitment. A long-term management plan would be useful if stability of catches is desired. Such a strategy should be sufficiently flexible with respect to catch limitation to protect the stock under periods of poor recruitment, but also avoid unnecessary fluctuations in the catches when the stock biomass is higher.

STECF COMMENTS: STECF agrees with the ICES assessment of the state of the stock and the advice for 2013.

4.24. Blue jack mackerel (*Trachurus picturatus*) in Subdivision Xa2 (Azores)

The most recent advice for this stock was provided in 2011. Hence, the following text remains unchanged from the Consolidated STECF Review of Advice for 2012. Advice for 2013 will be provided in Part 3 of the STECF review of Advice for 2013 which will be available in November 2012.

FISHERY: The blue jack mackerel (*Trachurus picturatus*) is the only *Trachurus* species around the Azores Islands. It has traditionally been one of the favourite species for human consumption in the Azores and is targeted by an artisanal fleet using seine nets close to the coast of the Azorean islands. The blue jack mackerel is also the main species used as live bait by the local bait boat fleet, which targets tuna species. The demersal fleet also catches blue jack mackerel, usually large specimens, in the multispecies fishery for deep-water species, where several types of hooks and lines gears are used. Those gears vary from handlines, using one to several hundred hooks, to the bottom longlines.

ICES has reported that landings of *T. picturatus* have been around 3000 t between 1986 and 1990. From 1991 onwards, they followed a general decreasing trend to minimum values around 650 t in 1999-2000. A new increasing trend was registered in the last decade, with an average landing value for the last five years (2006-2010) of 1100 t. However, landings may not represent the actual catches because discards or fish used for bait are not accounted for. A TAC in the subarea X for 2010 was set to 3,072 t, which is taken exclusively by Portugal.

SOURCE OF MANAGEMENT ADVICE: The main management advisory body is ICES.

REFERENCE POINTS: No reference points have been defined.

STOCK STATUS: No assessment can be presented for this species in the waters of the Azores.

F (Fishing Mortality)	
Qualitative evaluation	2008–2010
	<div style="display: flex; align-items: center;"> <div style="border: 1px solid black; border-radius: 50%; width: 20px; height: 20px; margin-right: 5px; display: flex; align-items: center; justify-content: center;">?</div> <div>Insufficient information</div> </div>
SSB (Spawning-Stock Biomass)	
	2008–2010

Qualitative evaluation		Increase
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The available information shows an increasing trend in abundance indices over the last ten years. However, landings per unit effort should be interpreted with caution, as discards or fish used for bait are not accounted for.

RECENT MANAGEMENT ADVICE: This is the first time that ICES analyses data for *T. picturatus* in the waters of the Azores. The l_{pue} index shows an increasing trend during the last decade. However, the exploitation status is unknown as there is insufficient information to assess it. Therefore on the basis of precautionary considerations, ICES advises that catch should not be allowed to increase in 2012.

FISHING OPPORTUNITIES FOR 2012 according to COM(2011) 298-Final.

STECF notes that with reference to COM(2011) 298-final this stock is classified under category 3.

STECF COMMENTS: STECF agrees with the ICES assessment of the state of the stock and the advice for 2012.



4.25. Grey Gurnard (*Trigla gurnardus*) in the Bay of Biscay and Iberian waters

FISHERIES: Currently, grey gurnard is a bycatch species in demersal fisheries. Catches are largely discarded. Catch statistics are incomplete for several years: some countries reported no landings at all, other countries reported exceptionally high landings. Because the species is largely discarded, landings data will not reflect the actual catches.

SOURCE OF MANAGEMENT ADVICE: The main management advisory body is ICES.

REFERENCE POINTS: No reference points have been defined for grey gurnard in the Bay of Biscay and Iberian waters.

STOCK STATUS:

F (Fishing Mortality)		
	2009–2011	
Qualitative evaluation		Insufficient information
SSB (Spawning-stock Biomass)		
	2008–2011	
Qualitative evaluation		Insufficient information

The available information is inadequate to evaluate overall biomass or abundance trends. Landings data are not presented for this species because the landings were reported as one generic category of “gurnards” until 2010. In addition, landings data are considered only marginally informative because catches are mainly discarded.

MANAGEMENT OBJECTIVES: No management objectives have been defined for this stock. There is no TAC for this species.

RECENT MANAGEMENT ADVICE: Based on the ICES approach to data-limited stocks, ICES advises that catches should decrease by 20% in relation to the last three years average. Due to the uncertainty in the landings data, ICES is not able to quantify the resulting catch.

This is the first year ICES is providing quantitative advice for data-limited stocks.

Other considerations

ICES approach to data-limited stocks

For data-limited stocks without information on abundance or exploitation ICES considers that a precautionary reduction of catches should be implemented, unless there is ancillary information clearly indicating that the current level of exploitation is appropriate for the stock.

For this stock, ICES advises that catches should decrease by 20% in relation to the last three years' average catch. Because the data for catches of grey gurnard are considered highly unreliable, ICES is not in a position to quantify the result.

STECF COMMENTS: STECF agrees with the ICES advice for 2013.

STECF notes that in 2011, advice for grey gurnard was given for the Northeast Atlantic as a whole. This year, biennial advice is given for three separate ecoregions: Bay of Biscay and Atlantic Iberian waters, North Sea, and Celtic Seas.

STECF notes that the stock unit definition of grey gurnard in this area is not clear and that further work is required.

4.26. Pollack (*Pollachius pollachius*) in the Bay of Biscay and Iberian waters

FISHERIES: Pollack is mainly a bycatch species in different fisheries. In France, pollack is mainly caught in nets, and to a lesser degree in trawl and lines. In Spain, pollack is caught in small-scale fisheries with a wide variety of fishing gears (different types of lines and gillnets), and to a lesser extent with bottom trawl. Portuguese catches are mainly from a wide variety of static gear types. A UK fixed-net fishery has developed since 2006 in Division VIIIa. Fishery statistics are currently being compiled. At present, only official landings are available, which are considered to be preliminary for the purpose of stock assessment. There are concerns about the reliability of the 2008-2009 French data. Landings statistics need to be quality-assured and confirmed for the region.

SOURCE OF MANAGEMENT ADVICE: The main management advisory body is ICES.

REFERENCE POINTS: No reference points have been defined for pollack in the Bay of Biscay and Iberian waters.

STOCK STATUS:

F (Fishing Mortality)	
	1977–2011
Qualitative evaluation	<div style="display: flex; align-items: center;"> <div style="border: 1px solid black; border-radius: 50%; width: 20px; height: 20px; display: flex; align-items: center; justify-content: center; margin-right: 5px;">?</div> <div>Insufficient information</div> </div>

SSB (Spawning-Stock Biomass)	
	1977–2011
Qualitative evaluation	<div style="display: flex; align-items: center;"> <div style="border: 1px solid black; border-radius: 50%; width: 20px; height: 20px; display: flex; align-items: center; justify-content: center; margin-right: 5px;">?</div> <div>Insufficient information</div> </div>

The available information is insufficient to evaluate stock trends and exploitation status in the Bay of Biscay and Atlantic Iberian waters ecoregion. Higher landings were obtained in the 1980s than in the past two decades.

MANAGEMENT OBJECTIVES: No management objectives have been defined for this stock.

RECENT MANAGEMENT ADVICE: Based on the ICES approach to data-limited stocks, ICES advises that catches should decrease by 20% in relation to the last three years average. Due to the uncertainty in the landings data, ICES is not able to quantify the resulting catch.

This is the first year ICES is providing quantitative advice for data-limited stocks.

Other considerations

ICES approach to data-limited stocks

For data-limited stocks without information on abundance or exploitation ICES considers that a precautionary reduction of catches should be implemented, unless there is ancillary information clearly indicating that the current level of exploitation is appropriate for the stock.

For this stock, ICES advises that catches should decrease by 20% in relation to the last three years average. Due to the uncertainty in the landings data, ICES is not able to quantify the resulting catch.

STECF COMMENTS: STECF agrees with the ICES advice for 2013.

STECF notes that in the absence of specific information on stock structure, the ICES ecoregions are chosen as a minimum level of disaggregation for the definition of stock units. This is an interim solution until more information is available on stock units

4.27. Red Gurnard (*Aspitrigla cuculus*) in the Bay of Biscay and Iberian waters

STECF did not have access to any recent stock assessment information on red gurnard in western waters. Advice for red gurnard in the Northeast Atlantic will be provided by ICES in September 2012 and STECF advice will be provided in Part 3 of the STECF review of Advice for 2013 which will be available in November 2012.

4.28. Red mullet (*Mullus surmuletus* and *Mullus barbatus*) in the Bay of Biscay and Iberian waters

STECF did not have access to any recent stock assessment information on red gurnard in western waters. Advice for red gurnard in the Northeast Atlantic will be provided by ICES in September 2012 and STECF advice will be provided in Part 3 of the STECF review of Advice for 2013 which will be available in November 2012.

4.29. Sea bass (*Dicentrarchus labrax*) in the Bay of Biscay and Iberian waters

STECF did not have access to any recent stock assessment information on red gurnard in western waters. Advice for red gurnard in the Northeast Atlantic will be provided by ICES in September 2012 and STECF advice will be provided in Part 3 of the STECF review of Advice for 2013 which will be available in November 2012.

5. ECO-REGION 4: RESOURCES IN ICELANDIC AND EAST GREENLAND WATERS

5.1. Cod (*Gadus morhua*) in ICES Subarea XIV and NAFO Subarea 1 (Greenland cod)

FISHERIES: Commercial fisheries for Greenland cod started along the Greenland West coast in the 1910's (inshore) and 1920's (offshore). The fishery gradually developed culminating with catch levels above 400,000 tons annually in the 1960s. The East Greenland offshore cod fishery started in the 1950's. Due to overfishing and deteriorating environmental conditions, the stock size declined and the fishery completely collapsed in the early 1990's. The 1990s stock collapse was followed by a decade of very limited fishing, with inshore catches falling below 1000 t annually and with no directed offshore fisheries taking place. The dynamics of recent year classes differ for inshore and offshore areas, indicating differences in environment and stock dynamics. The recruitment index of the 2009 year class is the highest recorded in the time-series in the northern part of the

survey area (Figure 2.4.1b.1). A large 2005 year class is recognized, which is believed to be partly of offshore origin.

Total catch (2011) of **offshore component** was 5,129 t, where 97% are landings (79% trawl, 21% long-line), 0% discards, 3% industrial bycatch, and 0% unaccounted removals.

In 2011 90% of the landings of offshore cod were taken in East Greenland. Cod is taken in a targeted trawl fishery and to a lesser extent by longliners. Bycatches of juvenile cod occur mainly in the shrimp fishery. Before the introduction of the sorting grid in 2002, a large amount of juvenile cod may have been caught in the shrimp fishery, but the present bycatches are estimated to be insignificant.

In 2011 the catches from the **inshore component** amounted to 11,007 t.. where 100% landings (80% gear-type poundnet and 20% handlines, longlines, gillnets, and other gear types). 0% discards, 0% industrial bycatch, and 0% unaccounted removals.

The TAC for the coastal fleet is set at 15 000 t in 2012. The fleet is limited by gear, vessel size, and minimum landing size (40 cm), and operates in inshore and coastal waters.

SOURCE OF MANAGEMENT ADVICE: An Analytical assessment is available up to 1992. After the stock depletion in 1992, the stock trends have been based on research survey indices. Cod in Greenland derives from three stock components, labelled by their spawning areas: I) an offshore Greenland spawning stock, II) inshore West Greenland fiords spawning populations, and III) Icelandic spawned cod that drift to Greenland with the Irminger Current.

REFERENCE POINTS: No reference points have been proposed by ICES for this stock.

5.1.1. Offshore cod in ICES Subarea XIV and NAFO Subarea 1 (Greenland cod)

STOCK STATUS:

f	
	2009-2011
MSY (F_{MSY})	? Unknown
Precautionary approach (F_{pa}, F_{lim})	? Unknown
SSB (Spawning-Stock Biomass)	
	2009-2011
MSY ($B_{trigger}$)	? Unknown
Precautionary approach (B_{pa}, B_{lim})	? Unknown
Qualitative evaluation	➔ Local high densities

All information indicates that the offshore cod biomass is low compared to before the 1990s. The offshore component has been severely depleted since 1990, but has started to recover since 2005. An offshore cod directed fishery has started for the first time since 1992 with recent annual catches up to 22 000 t. Surveys indicate a large 2003 year-class, and the first significant year-class since 1985. Following the 2003 year class

recruitment has been low. Dense concentrations of large spawning cod have been found off East Greenland in 2007 and 2009.

MANAGEMENT AGREEMENTS: Greenland and EC established an agreement on offshore fisheries valid from 2007 to 2012. A variable TAC regulation has been agreed. The agreement also provides for a transfer of unutilized quota into future years, should a rapid increase in the stock occur. None of the management plans have been evaluated by ICES.

RECENT MANAGEMENT ADVICE:

ICES advises on the basis of precautionary considerations that no offshore fishery should take place in 2013, to improve the likelihood of establishing offshore spawning stocks in West and East Greenland.

Other considerations

PA approach

Offshore cod:

ICES advises that no fishery should take place in 2013 to allow for rebuilding of the offshore spawning stocks in West and East Greenland in accordance with the management plan. Though the stock has been slightly increasing in recent years, it is still far below any possible biomass reference points.

Management agreement

In 2011 a management plan was agreed for the offshore cod stocks. The overall objective is to rebuild the stock and the following objectives are defined:

- Establishment of offshore spawning population in both West and East Greenland;
- Stable recruitment from this spawning population as an indicator of a stable/robust condition of the spawning population.

Overall strategy to fulfill the objective:

ICES advice must be followed.

The management plan has not been evaluated by ICES.

STECF COMMENTS: STECF agrees with the ICES assessment of the state of the offshore stock component and the advice in 2013.

**5.1.2. Inshore cod in ICES Subarea XIV and NAFO Subarea 1
(Greenland cod)**

STOCK STATUS

F (Fishing Mortality)	
	2009–2011
MSY (F_{MSY})	? Unknown
Precautionary approach (F_{pa}, F_{lim})	? Unknown
SSB (Spawning-Stock Biomass)	
	2009–2011
MSY ($B_{trigger}$)	? Unknown

Precautionary approach (B_{pa}, B_{lim})	?	Unknown
Qualitative evaluation	↗	Increasing

The recruitment and the biomass of the Greenland **inshore cod** have been increasing in recent years, and catches have been increasing. Several year classes are seen in the landings and the average size in landings has increased in the past six years. The stock size and exploitation rates are however unknown.

MANAGEMENT AGREEMENTS: Greenland and EC established an agreement on offshore fisheries valid from 2007 to 2012. A variable TAC regulation has been agreed. The agreement also provides for a transfer of unutilized quota into future years, should a rapid increase in the stock occur. None of the management plans have been evaluated by ICES.

RECENT MANAGEMENT ADVICE: ICES advises, based on the precautionary approach, that catches should not increase beyond 8000 t on basis of average catches over the last 10 years.

Other considerations

PA approach

ICES advises that catches should not exceed 8,000 t, which is the average catch for the past 10 years and represents the latest period of fishery.

Management agreement

There is no management plan for the inshore component of the Greenland cod.

STECF COMMENTS: STECF agrees with the ICES assessment of the state of the stock and the advice for 2013. The landings, however should be taken from inshore component only. STECF also notes that for inshore component of Greenland cod the advised 8,000 t, is the average catch for the past 10 years. While applying the ICES approach for data-limited stocks, the advice would be 7,453 t (-20% of average landings of 3 most recent years).

5.2. Cod (*Gadus morhua*) in ICES Subarea XII

STECF does not have access to any information on cod in ICES Subarea XII

5.3. Cod (*Gadus morhua*) in Division Va (Icelandic cod)

FISHERIES: Icelandic cod is primarily caught by bottom otter trawlers. Historically, the landings of bottom trawlers constituted a larger portion of the total catches than today, in some years prior to 1990 reaching 60% of the total landings. In the 1990's, the landings from bottom trawlers declined significantly and have been just above 40% of the total landings in the last decade. The share of long-lining has tripled over the last 20 years and is now on par with bottom trawling. The share of gill netting has over the same time period declined and is now only half of what it was in the 1980's. Since the size of cod caught by the gillnet fleet is generally much larger than caught by other fleets, this change in fishing pattern is likely to have caused a significant reduction in the fishing mortality of older fish.

Total landings (2011) are estimated 173,000 t (45% bottom trawl, 35% longline, 10% gillnet, 5% Danish seine, and 5% hooks). Discards are in the range of 1.4–4.3%.

Estimates of annual cod discards since 2001 are in the range of 0.4-1.8% of weight landed. Mean annual discard of cod over the period 2001-2008 was around 2,000 t, or just over 1% of landings. In 2008, estimates of cod discards amounted 0.8% of the landings. The method used for deriving these estimates assumes that discarding only occurs as high-grading. In recent years, misreporting has not been regarded as a major problem in the fishery of this stock. No study is though available to support that general perspective.

SOURCE OF MANAGEMENT ADVICE: The data used in the assessment are landings-at-age and two age-structured survey indices. The analytical assessment is based on landings and survey data using a forward based

statistical catch-at-age model, implemented in AD model builder. The modelling setup is the same as last year. This year both the spring and the fall survey indices are used in the final assessment, last year only the spring survey was used. Landings-at-age data as well as survey indices are considered reliable.

REFERENCE POINTS:

	<i>Type</i>	<i>Value</i>	<i>Technical basis</i>
Management plan	MP _{Btrigger}	220 000 t	Set by managers, consistent with ICES MSY framework.
	Harvest Rate _{MP}	0.2	Set by managers, consistent with ICES MSY framework.
MSY Framework	MSY B _{trigger}	220 000t	Trigger point in HCR considered consistent with ICES MSY framework.
	F _{MSY}	Not relevant	
Precautionary Approach	B _{lim}	125 000 t	B _{loss}
	B _{pa}	Not defined	
	F _{lim}	Not defined	
	F _{pa}	Not defined	

STOCK STATUS:

F (Fishing Mortality)				
	2009	2010	2011	
MSY (F_{MSY})	✓	✓	✓	Below possible candidate
Precautionary approach (F_{pa}, F_{lim})	✓	✓	✓	Below possible candidate F _{pa} and F _{lim}
Management plan (HR_{MP})	✓	✓	✓	Within expected range

SSB (Spawning-stock Biomass)				
	2010	2011	2012	
MSY (B_{trigger})	✓	✓	✓	Above trigger
Precautionary approach (B_{lim})	✓	✓	✓	Full reproductive capacity
Management plan (MP_{Btrigger})	✓	✓	✓	Above trigger

The spawning stock reached a historical low in 1993 (120,000 t) but has since then increased and is estimated to be 300,000 t at present. The current value is very low compared to the early historic period. Recent low

recruitment combined with historically low weight-at-age result in a very low productivity of the stock at present.

Fishing mortality has declined significantly in the last decade and is presently at a historical low and below likely candidates for F_{pa} and F_{lim} . Year classes since early 1990s are estimated to be stable around lower values than previously.

MANAGEMENT AGREEMENTS: Since 1994, TACs for the Icelandic cod stock have been based on a 25% harvest control rule with four amendments on the catch stabilizer. The Icelandic Government has adopted a management plan for the Icelandic cod stock for the next five fishing years based on a 20% exploitation rate. The main objective of the management plan is to ensure an increase the size of the cod stock towards the size that generates maximum sustainable yield and that the spawning stock biomass (SSB) will with high probability (>95%) be above the 220,000 t by the year 2015. The rule is as follows:

$TAC_{y+1} = (\alpha B_{4+,y} + TAC_y)/2$, where y refers to the assessment year and B_{4+} to biomass of 4 year and older cod and α to the harvest rate. α is set to 0.2 when SSB is higher than 220 thousand tonnes (SSBTRIGGER) but set to $\alpha = 0.2 SSB_y / SSBTRIGGER$

ICES evaluated this plan and concluded that the management plan has a high probability of resulting in an increase in the size of spawning stock from the current estimated level by 2015 and beyond.

RECENT MANAGEMENT ADVICE: ICES advises on the basis of the Icelandic 2009 management plan that landings in the fishing year 2012/2013 should be no more than 196,000 t.

Other considerations

Management plan

The TAC value is given for the calendar year (i.e. 2013) while it is applied in the fishery for the fishing year (September 2012 to August 2013).

Following the agreed management plan implies a TAC of 196,000 t in the fishing year 2012/2013. The management plan has been evaluated to be in conformity with the ICES MSY framework.

STECF COMMENTS: STECF agrees with the ICES assessment of the state of the stock and the advice for 2013.

STECF notes that cod and haddock are often caught in the same fishing operation. The TAC constraint on cod is expected to result in a significant reduction in fishing mortalities. Recent reduction of fishing mortality for cod is not in line with development of fishing mortality for haddock. Anecdotal information from the fisheries indicates that the restrictions on the landings of cod are presently changing the behavior of the fishing fleet, with fishers trying to avoid catching cod but targeting haddock.

5.4. Haddock (*Melanogrammus aeglefinus*) in Division Va (Icelandic haddock)

FISHERIES: Icelandic haddock is caught around Iceland with bottom otter trawls, Danish seine and longline. The share of different gears in the haddock catches have been varying with time, with the share of longlines and Danish seine increasing in recent years while the proportion of haddock caught in gillnets is now very small. Landings of Icelandic haddock in 2010 are estimated to have been 64,000tonnes and in 2011 49,500 t. For comparison the landings in 2009 were 82,043, in 2008 103,000 t. and in 2007 108,000 tonnes which is the highest for over 40 years. 44% of landings were taken by bottom trawl, 41% by longlines, 13% by Danish seine, and 2% by other gear in 2011. Discarding is considered minor since 2001.

SOURCE OF MANAGEMENT ADVICE: The assessment is based on age-disaggregated landings from 1979 to 2010 and on survey data from the March survey 1985–2011 and the October survey 1995–2010. The model used is an Adapt type model. The assessment does not include discards.

REFERENCE POINTS:

	<i>Type</i>	<i>Value</i>	<i>Technical basis</i>
MSY	MSY $B_{trigger}$	Not defined	

Approach	F_{MSY}	Not defined	
Precautionary Approach	B_{lim}	45,000 t	B_{loss} (ICES, 2011).
	B_{pa}	Not defined	
Approach	F_{lim}	Not defined	
	F_{pa}	0.47 0.35	$F_{pa} = F_{med}$ proposed in 2000 with normal/high growth rate. Adjusted to 0.35 with low growth rate.

STOCK STATUS:

F (Fishing Mortality)			
	2009	2010	2011
MSY (F_{MSY})	?	?	? Undefined
Precautionary approach (F_{pa})	✗	✗	✗ Harvested unsustainably

SSB (Spawning-Stock Biomass)			
	2010	2011	2012
MSY ($B_{trigger}$)	?	?	? Undefined
Precautionary approach (B_{lim})	✓	✓	✓ Full reproductive capacity

SSB increased from 2001 to 2005 after several strong year classes. Since then the spawning stock has decreased. Fishing mortality is currently above F_{pa} (0.35, accounting for low growth). Recruitment was high for the year classes 1998–2003, with five strong year classes of which the 2003 year class was very strong. Recruitment has been below the long-term average since the 2004 year class. The 2008–2011 year classes are estimated to be very poor.

MANAGEMENT AGREEMENTS: A management plan in accordance with the MSY approach is under development and will likely be put into force this year.

RECENT MANAGEMENT ADVICE: ICES advises on the basis of the precautionary approach that catches in 2013 should be no more than 32,000 t.

Other considerations

Management Considerations

Given the low incoming recruitment, fishing at F_{pa} in 2012–2014 would result in a non-negligible probability of SSB falling below B_{lim} within 3 years. F around 0.28 will lead to the probability of $SSB_{2015} < B_{lim}$ being around 5%.

Work is in progress to evaluate harvest control rule candidates for Icelandic haddock that are in conformity with the ICES MSY framework. This work is based on the same approach as already for Icelandic saithe and cod. The proposed rule is based on landings as a proportion of biomass of fish above a certain size and is presented in the Working Group report (ICES, 2012).

STECF COMMENTS: STECF agrees with the ICES assessment of the state of the stock and the advice for 2013.

STECF notes that haddock and cod are often caught in the same fishing operation. The TAC constraint on cod is expected to result in a low fishing mortality for cod. Recent reduction of fishing mortality for cod is not in line with development of fishing mortality for haddock. Anecdotal information from the fisheries indicates that the restrictions on the landings of cod are presently changing the behavior of the fishing fleet, with fishers trying to avoid catching cod but targeting haddock.

5.5. Saithe (*Pollachius virens*) in Division Va (Icelandic saithe)

FISHERIES: Icelandic saithe are caught around Iceland in directed saithe fisheries as well as in mixed demersal fisheries which target cod, mainly with bottom otter trawls and at a smaller proportion with gill nets and by jigging. Landings of saithe in Icelandic waters have peaked at 102,000 t in 1991, decreased to 31,000 t in 1998 and increased again to around 70,000 t in recent years. In 2010, landings are estimated to have been 53,772 tonnes, predominantly taken by Iceland.

Total landings of 2011 were 51,000 t, where 80% were caught by bottom trawl and 7% by gillnet, with jiggers and Danish seine taking the majority of the rest. 1–2% discards by numbers.

SOURCE OF MANAGEMENT ADVICE: A separable, forward projection, statistical catch-age model is used to fit the catch at age data from the commercial fleets (ages 3–14, years 1980–2010) and using the Spring bottom-trawl survey index (ages 3–10, year 1985–2011) as a tuning series. Commercial cpue from the most important fleets targeting saithe are available for 20 years or more. Although these indices have been explored for inclusion in the past, they were not considered for calibrating the assessment as they are not considered to be a reliable indicator of abundance. The Icelandic discards monitoring program has not detected large amount of discards in the saithe fishery. Not including discards in the assessment is thus not considered to cause a significant bias in the assessment and the advice. The assessment is relatively uncertain due to high variances in survey measurements and due to lack of reliable recruit estimates. Increased proportion of gillnets landing in most recent years might violate the assumption of selection patterns assumed.

REFERENCE POINTS:

	<i>Type</i>	<i>Value</i>	<i>Technical basis</i>
MSY	MSY B_{trigger}	65 000 t	Stochastic projections based on hockeystick S–R function.
Approach	F_{MSY}	0.28	Stochastic projections based on hockeystick S–R function.
Precautionary	B_{lim}	65 000 t	B_{loss} estimate in 2010.
	B_{pa}	Not defined	
Approach	F_{lim}	Not defined	
	F_{pa}	Not defined	

STOCK STATUS:

F (Fishing Mortality)			
	2009	2010	2011
MSY (F_{MSY})	✘	✘	✔ Appropriate
Precautionary approach ($F_{\text{pa}}, F_{\text{lim}}$)	?	?	? Undefined

SSB (Spawning-Stock Biomass)			
	2010	2011	2012
MSY (B_{trigger})	✓	✓	✓ Above target
Precautionary approach (B_{lim})	✓	✓	✓ Full reproductive capacity

The fishing mortality has fluctuated around 0.3 between 1998 and 2011, decreasing from around 0.4 in the mid-1990s. SSB has been declining since 2006 and is at present close to the long-term average. Year classes 1998–2000 and 2002 were large, but recruitment since then has been around the long-term average, except for the 2008 cohort which is estimated to be large.

MANAGEMENT AGREEMENTS: A management plan in accordance with the MSY approach is under development and will likely be put into force this year.

RECENT MANAGEMENT ADVICE: ICES advises on the basis of the MSY approach (B-rule) that catches in 2013 should be no more than 49,000 t.

Other considerations

MSY approach

Following the ICES MSY framework (B-rule) implies that the TAC is based on the average of 20% of the reference biomass in 2012 (4+) and last year's advice (2011). This implies that the TAC should be no more than 49,000 t.

STECF COMMENTS: STECF agrees with the ICES assessment of the state of the stock and the advice for 2013.

5.6. Greenland halibut (*Reinhardtius hippoglossoides*) in Sub-areas V, VI, XII and XIV

FISHERIES: Most of the fishery for Greenland halibut in Divisions Va, Vb and XIVb is a directed fishery. During the period 1982–1986, landings were stable at about 31,000–34,000 t. In the years 1987–1989, landings increased to about 62,000 t. This was followed by a decline to around 20,000 t in 1999. In the recent period 2000 to 2011, landings were in the range 21,000 to 32,000 t. Total landings (2011) were 26,424 t (96% bottom trawl and 4% gillnets/longlines). Discarding is considered to be minor (less than 1% by weight).

Landings in Icelandic waters have historically predominated the total landings in areas V+XIV, but since the mid 1990s also fisheries in XIV and Vb have developed. A smaller part of the landings and fishery relates to the Greenland EEZ part of XIVb as well as international waters on the Reykjanes Ridge.

In 2010 quotas in Greenland EEZ were utilised by most of the principal fleets. Within the Iceland EEZ, quotas in the fishing year 2009/2010 were fully utilized as in the preceding fishing years. In the Faroe EEZ the fishery is regulated by a fixed numbers of licenses and technical measures like by-catch regulations for the trawlers and depth and gear restrictions for the gillnetters. Most of the fishery for Greenland halibut in Divisions Va, Vb and XIVb is a directed trawl fishery, and only minor catches in Va by Iceland, and in XIVb by Germany and the UK comes partly from a redfish fishery

SOURCE OF MANAGEMENT ADVICE: The main management advisory body is ICES. The data are insufficient for an analytical assessment. A probabilistic (Bayesian) version of a surplus-production model was used to assess the stock. Biomass is expressed on a scale relative to B_{msy} and F relative to F_{msy} . The assessment uses biomass indices from a standardized cpue series of the Icelandic trawl fleet (1985–2010) and two trawl surveys (Va: 1996–2010, XIV: 1998–2010). Discards are not included in the assessment.

REFERENCE POINTS:

Relative reference points are defined for this stock. Fishing mortality is estimated in relation to F_{MSY} and total stock biomass is estimated in relation to B_{MSY} . A possible candidate for MSY B_{trigger} will be within the range of 30%–50% B_{MSY} . MSY B_{trigger} values in this range have been adopted for a number of ICES and NAFO stocks.

STOCK STATUS:

F (Fishing Mortality)			
	2009	2010	2011
MSY (F_{MSY})			Above target
Precautionary approach (F_{pa} , F_{lim})			Undefined

SSB (Spawning-Stock Biomass)			
	2010	2011	2012
MSY ($B_{trigger}$)			Undefined
Precautionary approach (B_{pa} , B_{lim})			Undefined
Qualitative evaluation	Above possible reference points		

The assessment is indicative of stock trends, and provides relative measures of stock status. The stock has been below B_{MSY} since the early 1990s and is presently at 55% of B_{MSY} . Since the record-low biomass observed in 2004 the stock has been stable with signs of slow increase. Landings have for more than a decade been between 20,000 and 30,000 t. Present fishing mortality is estimated to be 1.4 times the F_{MSY} .

MANAGEMENT AGREEMENTS: No regional management agreement is in place, TACs are set separately for Iceland and Greenland EEZs, and the number of licences is set separately by the Faroe Islands. In 2012 the coastal states have initiated work on a common management plan for Greenland halibut in Subareas V, XII, and XIV. The plan will move in two steps; first, a gradual lowering of the total catches until biological reference points have been evaluated by ICES, and thereafter implementation of a harvest control rule in accordance with ICES MSY approach. The plan will include continuous monitoring of the resources and the requirements on information from the fishery. The management plan will include monitoring of the effort and stock development as well as a framework for adapting future fishing according to the response of the stock, aiming at a harvest control rule in accordance with MSY. Since Greenland halibut is a slow-growing species, it is expected that a change in stock dynamics may take several years and this will be taken into consideration in the management plan. The plan is intended to be fully implemented in 2015; however, a stepwise reduction in catches is predicted to take place already from 2013 until MSY reference points have been evaluated by ICES for this stock.

RECENT MANAGEMENT ADVICE:

ICES advises on the basis of the MSY approach that landings in 2013 should be no more than 20,000 t.

Other considerations

MSY approach

The stock is considered to be above any potential MSY $B_{trigger}$ (30%–50% B_{MSY}). Following the ICES MSY framework implies that the advised fishing mortality should be F_{MSY} or a transitional F_{MSY} .

Because this is a vulnerable long lived species, aiming directly for a harvest at F_{MSY} will correspond to maximum landings in 2013 of less than 20,000 t which is expected to lead to a status quo in stock size in 2013. 20,000 t offers a 50% probability of reaching F_{MSY} in five to ten years.

Additional considerations:

The stock has sustained catches between 20 000 t and 30 000 t in the past decades. However, catches at or exceeding the present level have resulted in a rapid decline of the stock biomass. The high catches of the late 1980s and the increase in the early 2000s have particularly contributed to the decline of the stock. It should be taken into account that Greenland halibut is a slow-growing and long-lived species and rebuilding the stock is therefore only likely to be achieved within a long time frame. The medium-term forecasts suggest that stock recovery is slow under all fishing scenarios, even in the case of no fishery.

Available biological information such as tagging and genetic studies and the distribution of the fisheries suggest that Greenland halibut in Subareas XIV and V belong to the same stock entity and that a common management is therefore required.

Because the nursery grounds are not known, there is no monitoring of recruits and juveniles. Because Greenland halibut is a slow-growing species that first appears in catches at ages 4–6, recruitment failure will only be detected in the fishery some 5–10 years after it occurs. The management plan that is under development should consider these features.

STECF COMMENTS: STECF agrees with the ICES assessment of the state of the stock and the advice for 2013.

5.7. Golden Redfish (*Sebastes marinus*) in Sub-areas V, VI, XII and XIV

FISHERIES: *S. marinus* are mainly taken by bottom otter trawlers in depths down to 500 m. Icelandic trawlers account for the majority of the catches from Division Va, while Faroese trawlers take most of the catches from Division Vb. In Sub-area XIV, the catches are mainly a by-catch in shrimp fisheries. In order to reduce the catches of *S. marinus* in Division Va, an area closure was imposed in 1994 and the quotas have been reduced in recent years.

The total catch of *S. marinus* in Divisions Va and Vb and in the Sub-areas VI and XIV has decreased from about 130,000 t in 1982 to about 40,000 t during the mid-1990s. Since then, the annual catches varied without a clear trend between 40,000 - 50,000 t. In recent years, around 98% of total catches were taken in Division Va. Total catch of 2010 (39,000 t), was taken by trawls. Total landings of 2011 were (44,800 t), where 94% was taken by bottom trawls and 6% by other gear-types. Discards considered very small.

SOURCE OF MANAGEMENT ADVICE: The main management advisory body is ICES. The 2010 assessment was based on survey trends only. Since 2011 assessment the relative state of the stock is based on projection derived from the GADGET model and survey index series. The GADGET model used only catches and survey indices from Division Va. The survey index is the basis for the stock status and the Gadget model is the basis for advice.

Survey data are available from the Icelandic spring groundfish survey 1985–2011, the German groundfish survey 1985–2011 in Subarea XIV, and the Faroese spring (1994–2012) and summer (1996–2011) surveys in Division Vb. Data from the commercial catch in Division Va include length distribution, age–length key, and mean length-at-age. The relative state of the stock is assessed through a survey index series (U) in Icelandic waters.

REFERENCE POINTS:

	Type	Value	Technical basis
MSY	MSY B _{trigger}	Undefined	
Approach	F _{MSY}	Undefined	
Precautionary approach	U _{lim}	55	20% of highest observed survey index*.
	U _{pa}	155	60% of highest observed survey index*.
	F _{lim}	Undefined	

	F_{pa}	Undefined	
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(unchanged since 1998)

**Technical basis for the survey index*

The basis for the calculation of the U_{pa} is the Icelandic spring groundfish survey index series starting in 1985. Since 1990 the average U has been around half of U_{max} – the highest observed index in the time-series (276 in 1987). This has not resulted in any strong year classes compared to higher U 's. A precautionary U_{pa} is therefore proposed at $U_{max} * 0.6$, corresponding to the U 's associated with the most recent strong year class. U is regarded as a proxy for SSB but represents the fishable biomass.

STOCK STATUS:

F (Fishing Mortality)		
		2009–2011
MSY (F_{MSY})	?	Unknown
Precautionary approach (F_{pa}, F_{lim})	?	Unknown
SSB (Spawning-Stock Biomass)		
		2010–2012
MSY ($B_{trigger}$)	?	Unknown
Precautionary approach (B_{pa}, B_{lim})	✓	Full reproductive capacity
Qualitative evaluation	↗	Increasing in main area

In Division Va the survey index (U) has been increasing since 2008 and is currently far above U_{pa} . In Division XIVb (East Greenland) survey indices of both pre-fishery recruits and fishable size have increased in recent years. In Division Vb the Faroese groundfish survey indicates that the abundance has been decreasing since 2001.

MANAGEMENT AGREEMENTS: The regulation is based on TAC in Iceland and in Greenland, but through an effort system in the Faroe Islands. The separation of golden redfish and Icelandic slope *S. mentella* in the quota was implemented in the 2010/2011 fishing season. The TAC in Greenland is set for redfish, with no distinction being made between *S. marinus* and *S. mentella*.

RECENT MANAGEMENT ADVICE:

ICES advises on the basis of precautionary considerations that catches should be no more than 40,000 t in 2013.

Other considerations

No analytical assessment can be presented for this stock, therefore, fishing possibilities cannot be projected.

Precautionary considerations

The new data (landings and surveys) suggest the stock is increasing. The stock seems to have increased, with catches around 40,000 t since 1995. ICES advises that catches in 2013 should be no more than 40,000 t.

STECF COMMENTS: STECF agrees with the ICES assessment that the state of the stock is unknown but has no objective means to advice on a suitable catch level. STECF also notes that landing figures do not allow to conclude the stock increase in recent years (fluctuating between 39,000 and 49,000 t since 2005). Also the recruitment biomass trend is decreasing since 2007.

STECF also notes that the European TAC for redfish in Divisions Va, b and subarea XIV is a combined TAC for redfish including all *S. marinus* and *S. mentella* stocks.. The European TAC in Greenland waters of V and XIV is restricted to pelagic trawls which mainly selects *S. mentella* stocks

5.8. Beaked redfish (*Sebastes mentella*) in Division Va (Icelandic demersal stock)

The stock structure of redfish *S. mentella* in Subareas V, VI, XII and XIV, and in the NAFO Convention Area has been evaluated by ICES early 2009. The outcome is that demersal *S. mentella* in Icelandic waters (“Icelandic slope” stock in ICES Divisions Va and XIV) is to be treated as one biological stock, separated from the demersal *S. mentella* found on the continental slopes of Greenland (Division XIV) and the Faroe Islands (Vb). Regarding the latter component there is not sufficient information to allow an assessment for advice. However, Subarea XIV in Greenland waters is believed to be an important nursery area for *S. mentella* found in Icelandic waters, but data to estimate the magnitude of this contribution are not available.

FISHERIES: In Division Va, demersal *S. mentella* are taken mainly by Icelandic trawlers at depths greater than 500 m. The total annual catches almost doubled in the early 1990s, but have since then decreased to the level of the 1980s. The increase was mainly caused by an increased catch in Division Va. The increased catch of *S. marinus* in Va in 2002 and decreased catch of *S. mentella* in 2001 and 2002 is due to a joint quota for *S. marinus* and *S. mentella* on the shelf, and the fishing fleet has increased the proportion taken from *S. marinus* in most recent years. Since 2004, total annual catches varied between 18,000 and 25,000 t. Total landings of demersal *S. mentella* in Icelandic waters in 2010 were about 17,700 t, about 1, 700 t less than in 2009. Total landings of 2011 were 13,000 t, 100% bottom trawl. The catch figures of demersal *S. mentella* do include catches taken by pelagic gears close to the bottom and east of a management line in the Icelandic EEZ, which by definition separates Icelandic demersal from pelagic catches of *S. mentella*.

Beaked redfish is taken by Icelandic trawlers using bottom trawl on the continental slope at depths between 450 and 700 m. Small amounts (<2%) of *S. marinus* are caught in the fishery and are possibly classified as beaked redfish in the catches.

SOURCE OF MANAGEMENT ADVICE: The main management advisory body is ICES. Survey data are available from the Icelandic fall groundfish survey in Division Va (2000–2010). Cpue data are available from Icelandic trawlers in Division Va (1986–2010) but were not considered representative of stock trends. There are no explicit management objectives for this stock.

REFERENCE POINTS: No precautionary reference points are established.

STOCK STATUS:

F (Fishing Mortality)		
		2009–2011
MSY (F_{MSY})	?	Unknown
Precautionary approach (F_{pa}, F_{lim})	?	Unknown

SSB (Spawning-Stock Biomass)		
		2010–2012
MSY ($B_{trigger}$)	?	Unknown

Precautionary approach (B_{pa}, B_{lim})		Unknown
Qualitative evaluation		Without trend

Available survey biomass estimates indicate that in Division Va the biomass shows no trend in recent years. No survey biomass estimates were available for 2011.

In the absence of reference points, the state of the stock cannot be fully evaluated. Available survey biomass estimates indicate that in Division Va the biomass has been low but stable in the last years.

MANAGEMENT AGREEMENTS: There are no explicit management agreements for Icelandic slope *S. mentella*. Icelandic authorities give a joint quota for golden redfish (*S. marinus*) and Icelandic slope *S. mentella* in Icelandic waters. Both species are therefore treated as redfish by the Icelandic authorities. Redfish is managed under ITQ system.

RECENT MANAGEMENT ADVICE:

The 2011 data (landings and survey) do not change the perception of the stock and give no reason to change the advice from that given last year: “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 are set no higher than 10 000 t as a starting point for the adaptive part of the management plan.”

Other considerations

MSY approach

Future work on developing a management plan is required, to encompass the MSY framework.

PA approach

ICES advises that catches should be no higher than 10,000 t. This value should be a starting point for the adaptive part of a management plan.

Additional considerations:

ICES suggests that catches of *S. mentella* are set at 10 000 t as a starting point for the adaptive part of the management plan. ICES has previously advised that most deep-water 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.

A catch of 10,000 t would be a significant reduction in catches compared with the recent past. This is expected to result in a lower exploitation rate, but the absolute magnitude of this reduction cannot be estimated at this time.

Measures to protect juvenile redfish in Subarea XIV should be continued (sorting grids in the shrimp fishery).

ICES advises that separate TACs for *S. marinus* and *S. mentella* be set in Division Va.

STECF COMMENTS: STECF agrees with the ICES assessment that the state of the stock is unknown but has no objective means to advise on a suitable catch level. STECF notes that landings have been decreasing by 46% since 2008. STECF also notes that no survey biomass index from 2011 was available.

5.9. Beaked redfish (*Sebastes mentella*) in Division XIV (East Greenland demersal stock)

The stock structure of redfish *S. mentella* in Subareas V, VI, XII and XIV, and in the NAFO Convention Area has been evaluated by ICES early 2009. The outcome is that demersal *S. mentella* in Icelandic waters (“Icelandic slope” stock in ICES Divisions Va and XIV) is to be treated as one biological stock, separated from the demersal *S. mentella* found on the continental slopes of Greenland (Division XIV) and the Faroe Islands (Vb). Regarding the latter component there is not sufficient information to allow an assessment for advice.

However, Subarea XIV in Greenland waters is believed to be an important nursery area for *S. mentella* found in Icelandic waters, but data to estimate the magnitude of this contribution are not available.

FISHERIES: The fishery for *S. mentella* on the slopes in Division XIVb is an international fishery mainly conducted by factory trawlers operating with bottom trawl. From 2002 to 2008 *S. mentella* has mainly been caught as a valuable bycatch in the fishery for Greenland halibut. A directed fishery commenced in 2009.

Total catch (2010) = 6.6 kt, where 99.7% are landings (100% bottom trawl, 0% longlines), and 0.3% discards. Total catches (2011) = 6705 t, where 99.96% are landings (100% bottom trawl, 0% longlines) and 0.04% discards.

SOURCE OF MANAGEMENT ADVICE: The main management advisory body is ICES. Three survey indices (German groundfish survey, Greenland shallow water survey, and Greenland deep-water survey). The German survey is designed to estimate the biomass of cod while the Greenland deep-water survey targets Greenland halibut. Both surveys therefore do not cover the entire depth distribution of *S. mentella*. A new Greenlandic shallow water survey with better coverage regarding depth was initiated in 2008. The assessment is qualitative and as such indicative of trends only.

REFERENCE POINTS: No precautionary reference points are established.

STOCK STATUS:

F (Fishing Mortality)		
		2009–2011
MSY (F_{MSY})	?	Unknown
Precautionary approach (F_{pa}, F_{lim})	?	Unknown
SSB (Spawning-Stock Biomass)		
		2010–2012
MSY ($B_{trigger}$)	?	Unknown
Precautionary approach (B_{pa}, B_{lim})	?	Unknown
Qualitative evaluation	↘	Declining

A directed fishery started in 2009 and catches have increased from less than 100 t to nearly 7000 t in 2010–2011. Survey indices suggest that, following a stable period the biomass of the demersal *S. mentella* has been declining since 2003. The biomass found in the recent years is most likely due to one or only few year classes.

MANAGEMENT AGREEMENTS: There is presently no management plan for this fishery.

RECENT MANAGEMENT ADVICE:

Based on the precautionary approach catches should be reduced from the current level to no more than 3,500 t.

The stock is not yet evaluated as being a biological entity separated from the adjacent *Sebastes mentella* stocks. Until this has been clarified, demersal *S. mentella* on the East Greenland shelf is assessed as a separate biological unit.

Other considerations

PA approach

There is no change in the perception of the stock; however, the fishery has increased considerably. Since beaked redfish is a slow-growing, late-maturing, and aggregating species it is considered vulnerable to over-exploitation, the effects of which are difficult to predict. The stock structure is presently unknown and could be composed of various stock components which demands extra precaution. The German survey is less positive for 2010 whilst the Greenland deep-water survey on first inspection seems positive, but not significantly so. Hence, the recently developed fishery should not be allowed to expand beyond the catches taken in 2009. This means that catches should be no more than 1000 t. Additional information should be provided by the exploratory fishery to allow for a proper assessment of the fishable demersal *S. mentella* in Division XIVb.

The stock size is expected to decrease due to low recruitment. ICES advises that catch should be reduced by at least 50%, corresponding to catches of less than 3,500t.

Additional considerations:

Indices indicate that stock sizes are declining. The large increase in the fishery in a limited area containing large aggregations of fish occurred from 2009 to 2010 and was maintained at this level in 2011. *S. mentella* is a slow-growing, late-maturing, and aggregating species, and it is considered vulnerable to overexploitation. The effects of these biological characteristics are difficult to predict, especially as little is known on migration, stock affiliation, spawning areas, etc. The stock could therefore be composed of various stock components which demands extra precaution. Given current catches (2009–2011), a fishery conducted on a local high-density aggregation, and the fact that surveys have shown declining trends, catches should be reduced from the current level to avoid local depletion.

Management considerations

The recently developed directed redfish fishery (since 2009) should be reduced from the current level until stock structure and the impact of the fishery on the biomass is better understood. The rate of reduction should be re-evaluated to allow further decrease if the stock trend continues to decline.

This is the third year advice is given separately for *S. mentella* in East Greenland. Formerly, the advice of demersal *S. mentella* was provided for all demersal *S. mentella* in Subareas XIV and V. A TAC of 6000 t for demersal redfish in Division XIVb was set by Greenland in 2010. The TAC for 2011 and 2012 was set at 8500 t demersal redfish on the basis of a 70:30 *S. mentella*:*S. marinus* ratio obtained from one single sample from the commercial fishery, thus intending to end up with 6000 t *S. mentella* and 2500 t *S. marinus*. The TAC set for 2012 followed the same approach. The fishery is a mixed fishery for *S. mentella* and *S. marinus*. Survey catches suggest that at least 80% are *S. mentella*. The state of the *S. marinus* stock should therefore be considered in the management of this fishery.

The population structure of demersal *S. mentella* in Division XIVb is uncertain and the separate advice for *S. mentella* in East Greenland is considered a pragmatic solution to provide advice for a new fishery. The stock structure of demersal *S. mentella* is being investigated and results should be available in 2013.

STECF COMMENTS: STECF agrees with the ICES assessment that the state of the stock is unknown and most probably decreasing. STECF notes that despite of assumed decreasing trend in stock ICES has increased the advice from 2010 (<1,000 t). STECF further notes that directed fishery started in 2009 when according to biomass indices the stock has already declined. STECF proposes to consider closing the directed fishery of this stock in order to avoid the risk of stock collapse.

5.10. Beaked pelagic redfish (*Sebastes mentella*) in ICES areas Va, XII and XIV and NAFO Sub-areas 1-2

The “Workshop on Redfish Stock Structure” (WKREDS, 22–23 January 2009, Copenhagen, Denmark; ICES 2009) reviewed the stock structure of *Sebastes mentella* in the Irminger Sea and adjacent waters. ACOM concluded, based on the outcome of the WKREDS meeting, that there are three biological stocks of *S. mentella*:

- a ‘Deep Pelagic’ stock (NAFO 1–2, ICES V, XII, XIV >500 m) – primarily pelagic habitats, and includes demersal habitats west of the Faroe Islands;
- a ‘Shallow Pelagic’ stock (NAFO 1–2, ICES V, XII, XIV <500 m) – extends to ICES I and II, but primarily pelagic habitats, and includes demersal habitats east of the Faroe Islands;
- an ‘Icelandic Slope’ stock (ICES Va, XIV) – primarily demersal habitats.

Based on this new stock identification information, ICES recommends three management units that are geographic proxies for biological stocks that were partly defined by depth and whose boundaries are based on the spatial pattern of the fishery to minimize mixed-stock catches:

- Management unit in the northeast Irminger Sea: ICES Division Va and Subareas XII and XIV.
- Management unit in the southwest Irminger Sea: NAFO Areas 1 and 2, ICES Division Vb and Subareas XII and XIV.
- Management unit on the Icelandic slope: ICES Division Va and Subarea XIV, and to the north and east of the boundary proposed in the management unit in the northeast Irminger Sea.

STECF COMMENTS: STECF agrees with such stock structure of beaked pelagic and demersal redfish. STECF notes that ICES, since 2009, provided stock assessments and relevant advice for two demersal slope stock components of beaked redfish, i.e. one in Icelandic waters (Div. Va) and a second one off East Greenland (Div. XIVb).

5.11. Beaked pelagic redfish (*Sebastes mentella*), management unit in the northeast Irminger Sea: ICES Division Va and Subareas XII and XIV (formally beaked redfish (*Sebastes mentella*) in Subareas V, XII, XIV and NAFO Subareas 1+2, deep pelagic stock > 500 m)

FISHERIES: The fishery started around 1991–1992 when the commercial fleet of the shallow pelagic redfish moved into deeper waters. Since 1997, the main fishing season occurred from late April to August in the so-called northwest fishing area near the Greenland and Icelandic EEZ and within the Icelandic EEZ, i.e. in the area east of 32°W and north of 61°N. The trawlers participating in this fishery use large pelagic trawls (*Gloria*-type) with vertical openings of 80–150 m. The vessels have operated at a depth range of 600 to 950 m in 1998–2008. Discarding is at present not considered to be significant in this fishery. The deep pelagic fishery in the Irminger Sea only exploits the mature part of the stock. Nursery areas for the stock are found at the continental slope off East Greenland. Technical conservation measures such as mandatory sorting grids in the shrimp fishery that have been in place for several years should be continued in order to protect the juvenile redfish.

Landings of the deep pelagic *S. mentella* stock have declined from 139,000t in 1996 to 30,000 t in 2008. In 2009, this fishery was subject to a NEAFC TAC of 46,000 t, which was given for both shallow and deep stocks. Total catches of 2011 were 47,500 t, all landings (100% pelagic trawl). No discards, industrial bycatch, or unaccounted removals.

SOURCE OF MANAGEMENT ADVICE: Scientific advice is provided by ICES. The main management organisation concerned with pelagic redfish in the Irminger Sea is NEAFC. Survey indices, catches, CPUE and biological data are available for the stock, but the assessment is mainly based on surveys. The quality of the trawl biomass estimate from the international trawl-acoustic surveys since 1999 cannot be verified as the data series is relatively short and the survey is only conducted every second year. Therefore, the abundance estimates by the trawl-method must only be considered as a rough attempt to measure the abundance of the deep pelagic stock. It is not known to what extent CPUE reflect changes in the stock status of deep pelagic *S. mentella* stock. The fishery targets pelagic aggregating fish. Therefore, stable or increasing CPUEs are not considered to reflect the stock status reliably, but decreasing CPUEs likely indicate a decreasing stock.

MANAGEMENT AGREEMENT: There are no explicit management objectives for this stock.

REFERENCE POINTS: Precautionary reference points are not defined for this stock.

STOCK STATUS:

F (Fishing Mortality)		
2009–2011		
MSY (F_{MSY})	?	Unknown
Precautionary approach (F_{pa}, F_{lim})	?	Unknown

SSB (Spawning-Stock Biomass)		
	2010–2012	
MSY (B_{trigger})	?	Unknown
Precautionary approach ($B_{\text{pa}}, B_{\text{lim}}$)	?	Unknown
Qualitative evaluation	→	Stable

Trawl survey estimates in 2009 and 2011 are lower than the average for 1999–2003 and near the lowest observed. These indices in combination with a marked decrease in landings since 2004 suggest that the stock has been reduced in the past decade. The exploitation rate for this stock is unknown.

RECENT MANAGEMENT ADVICE:

The advice for the fishery in 2013 is the same as the advice given in 2011 for the 2012 fishery:

“ICES advises on the basis of the precautionary considerations that catches should be reduced to less than 20,000 t and a management plan should be developed and implemented.”

Other considerations

Precautionary approach

ICES advises on the basis of the precautionary considerations that catches should be reduced to less than 20,000 t and a management plan should be developed and implemented.

The stock is considered to have decreased over the last decade while the exploitation status is unknown. The stock is considered to be vulnerable to overexploitation because of its biological characteristics (slow-growing, late-maturing, and schooling behaviour).

Additional considerations

ICES has previously advised that most deep-water and long-living species like redfish can only sustain low rates of exploitation, since slow-growing, and 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 implemented.

ICES is concerned about the lack of agreed upon management and TAC allocation schemes. Although most nations conducting fisheries have agreed on management measures to reduce catches stepwise over the next three years, the total quotas that have been set are insufficient to constrain catches. This increases the risk of overexploitation. The autonomous quotas that have been set are insufficient to constrain catches, even though ICES acknowledges that some parties have agreed on a step-wise reduction of catches. Therefore, ICES has for the past two years advised that an adaptive management plan be implemented. ICES provided a list of potential elements that could be contained in such a management plan.

STECF COMMENTS: STECF agrees with the ICES assessment of the state of the stock and the advice for 2013.

5.12. Beaked pelagic redfish (*Sebastes mentella*) management unit in the southwest Irminger Sea: NAFO Areas 1 and 2, ICES Division Vb and Subareas XII and XIV (formally beaked redfish (*Sebastes mentella*) in Subareas V, XII, XIV and NAFO Subareas 1+2, shallow pelagic stock < 500 m)

FISHERIES: Russian trawlers started fishing on the shallow pelagic *S. mentella* stock in 1982 and covered wide areas of the Irminger Sea. Vessels from other nations soon joined this fishery. The main fishing area in the last decade has been south and southeast of Cape Farwell, Greenland, the so-called southwestern area (south of

60°N and west of about 32°W), and the area is almost entirely shallower than 500 m. Since 2000, the southwestern fishing ground extended also into the NAFO Convention Area, but in later years the fishing area has been limited to the border area between NAFO and ICES south of Greenland. Catches have in parallel with this shrinkage declined substantially. In the period 1982–1992, the fishery was carried out mainly from April to August but since then the fishery has been conducted from July–October. The trawlers participating in this fishery use large pelagic trawls (*Gloria*-type) with vertical openings of 80–150 m.

The shallow pelagic stock fishery in the Irminger Sea only exploits the mature part of the stock. Nursery areas for the stock are found at the continental slope off East Greenland. Technical conservation measures such as mandatory sorting grids in the shrimp fishery that have been in place for several years should be continued in order to protect the juvenile redfish.

Landings of the shallow pelagic *S. mentella* stock has declined from 100,000t in 1993 to 2,000 t in 2008. In 2009, this fishery was subject to a NEAFC TAC of 46,000 t, which was given for both shallow and deep stocks. Total catches (2011) = 568 t, where 100% are landings (100% pelagic trawl). No discards, industrial bycatch, or unaccounted removals.

SOURCE OF MANAGEMENT ADVICE: Scientific advice is provided by ICES. The main management organisation concerned with pelagic redfish in the Irminger Sea is NEAFC.

Survey indices, catches, CPUE and biological data are available for the stock, but the assessment is mainly based on surveys. ICES again had difficulties in obtaining landings data from some ICES' member countries. In spite of best efforts, there is a need for a special action through NEAFC and NAFO to provide ICES in time with all information that might lead to more reliable catch statistics. *Furthermore, ICES recommends that all nations should report depth information in accordance with the NEAFC logbook format.*

MANAGEMENT AGREEMENT: There are no explicit management objectives for this stock.

REFERENCE POINTS: Precautionary reference points are not defined for this stock.

STOCK STATUS:

F (Fishing Mortality)		
		2009–2011
MSY (F_{MSY})	?	Unknown
Precautionary approach (F_{pa}, F_{lim})	?	Unknown
SSB (Spawning-Stock Biomass)		
		2010–2012
MSY ($B_{trigger}$)	?	Unknown
Precautionary approach (B_{pa}, B_{lim})	?	Unknown
Qualitative evaluation	✘	Stable at very low

The biomass index from the acoustic survey in 2011 indicates that the stock has declined to roughly 5% of the estimates at the beginning of the survey time-series in the early 1990s. The exploitation rate for this stock is unknown.

The lack of accurate fisheries and survey data (especially for depths within the deep-scattering layer) and recruitment indices prevents precise determination of stock status. ICES is concerned about the lack of agreed management and TAC allocation schemes. This increases the risk of over-exploitation. The autonomous quotas that have been set are insufficient to constrain catches.

RECENT MANAGEMENT ADVICE:

The advice for the fishery in 2013 is the same as the advice given in 2011 for the 2012 fishery: “ICES advises on the basis of precautionary considerations that no directed fishery should be conducted and bycatch of this stock in non-directed fisheries should be kept as low as possible.”

A recovery plan should be developed. *Given the very low state of the stock, the directed fishery should be closed in 2010 irrespective of whether the recovery plan has been developed by that time or not.*” This advice will be updated in the fall of 2011 on the basis of new survey information.

Other considerations

Precautionary approach

ICES advises on the basis of precautionary considerations that no directed fishery should be conducted and bycatch of this stock in non-directed fisheries should be kept as low as possible. A recovery plan should be developed.

The acoustic survey biomass index shows that the stock has declined to 5% of that observed in the early 1990s and the exploitation status is unknown. The stock is considered to be vulnerable to overexploitation because of its biological characteristics (slow-growing, late-maturing, and schooling behaviour).

Management considerations

ICES is concerned about the lack of agreed management and TAC allocation schemes. This increases the risk of over-exploitation. The autonomous quotas that have been set are insufficient to constrain catches.

ICES has advised that an adaptive management plan be implemented and ICES provided a list of potential elements of such a management plan. The main management organization concerned with pelagic redfish in the Irminger Sea – NEAFC – has further requested ICES to specify these elements and also to estimate possible candidates for reference points. However, ICES has not yet been able to address this issue.

ICES has previously advised that most deep-water 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. ICES therefore, stresses the need to develop and implement a recovery plan which takes into account the uncertainties in science and the properties of the fisheries.

The relationship of the shallow pelagic component with *S. mentella* from the Greenlandic shelf remains unclear.

STECF COMMENTS: STECF agrees with the ICES assessment of the state of the stock for 2013.

5.13. Icelandic summer-spawning herring (*Clupea harengus*) Division Va

FISHERIES: Icelandic summer-spawning herring are caught with purse seines and mid-water trawls. The catches increased rapidly in the early 1960s due to the development of the purse-seine fishery off the southern coast of Iceland. This resulted in a rapidly increasing exploitation rate until the stock collapsed in the late 1960s. A fishing ban was enforced during 1972-1975. The catches have since increased gradually to over 100,000 t. Formerly, the fleet consisted of multi-purpose vessels, mostly under 300 GRT, operating purse-seines and driftnets. In recent years, larger vessels (up to 1500 GRT) have entered the fishery. These are a combination of purse-seiners and pelagic trawlers operating in the herring, capelin, and blue whiting fisheries. Since the 1997/1998 fishing season, there has been a fishery for herring both to the west and east of Iceland, which is unusual compared to earlier years when the fishable stock was only found south and east of Iceland. Pelagic trawl fisheries were introduced in 1997/98 and have since then contributed with approximately 20-60% of the catches, but with much less contribution in recent two years (<5%). By-catch in the herring fishery is normally

insignificant as the fishing season is during the over-wintering period when the herring is in large dense schools. Until the autumn 1990, the herring fishery took place during the last three months of the calendar year. During 1990-2008, the autumn fishery continued until January or early February of the following year, and has started in September/October since 1994. In 2003, the season was further extended to the end of April, and in the summers of 2002 and 2003, an experimental fishery for spawning herring with a catch of about 5,000 t each year was conducted at the south coast. The number of vessels participating in the fishery has shown a decreasing trend in the 2000s from around 30 down to 20 in 2007.

Total catch (2011/2012) was 49,000 t, where 88% are landings (99.5% purse seine, 0.5% gill nets) and 12% industrial bycatch (in mackerel fishery with pelagic trawls). the TAC was 45,000 t. There were no discards or unaccounted removals.

SOURCE OF MANAGEMENT ADVICE: The data used in the assessment are catch-at-age (from 1990 onwards) and one age-structured acoustic survey index, based on a survey conducted since 1974 in October-December and/or January. In addition to the acoustic survey aimed at the fishable part of the stock, there have been occasionally acoustic surveys off the NW, N, and NE coast of Iceland aimed to estimate the year-class strength of the juveniles. This survey has not taken place since 2003, but was partly resurrected in January 2009. The results of these measurements were normally not used in the assessment directly even if the year-class indices derived from the survey have shown a significant relationship to recruitment of the stock.

REFERENCE POINTS:

	<i>Type</i>	<i>Value</i>	<i>Technical basis</i>
MSY	MSY $B_{trigger}$	300 000 t	B_{pa} .
Approach	F_{MSY}	0.22	HCS model for simulated harvest rules.
Precautionary	B_{lim}	200 000 t	SSB with a high probability of impaired recruitment.
	B_{pa}	300 000 t	$B_{pa} = B_{lim} e^{1.645\sigma}$, where $\sigma = 0.25$.
Approach	F_{lim}	Not defined	
	F_{pa}	0.22	$F_{pa} = F_{0.1} = 0.22$ (based on a weighted average) and used as a target.

(unchanged since: 2011)

STOCK STATUS:

F (Fishing Mortality)				
	2009	2010	2011	
MSY (F_{MSY})	✓	✓	✓	Appropriate
Precautionary approach (F_{pa}, F_{lim})	✓	✓	✓	Harvested sustainably

SSB (Spawning-Stock Biomass)				
	2010	2011	2012	
MSY ($B_{trigger}$)	✓	✓	✓	Above trigger
Precautionary approach (B_{pa}, B_{lim})	✓	✓	✓	Full reproductive capacity

The spawning-stock biomass had been declining, likely related to the *Ichthyophonus* infection in recent years, but the decline seems to have stopped and the SSB is above reference points. Strong year classes, which show no signs of infection, are entering the fishable stock. Fishing mortality is currently below F_{MSY} .

MANAGEMENT AGREEMENTS:

There is no formal management plan for this stock. For more than 20 years, the practice has been to manage fisheries at $F = F_{0.1}$ (= 0.22) and this target is considered to be consistent with MSY approach.

RECENT MANAGEMENT ADVICE:

ICES advises on the basis of the MSY approach that catches in 2012/2013 should be no more than 67, 000 t.

Other considerations

Management considerations

For the fishing season 2011/2012, a regulation was enforced that prohibited fishery on the stock outside of the area of Breiðafjörður. This was because small herring were mixed with adults in the other areas and there was a lower prevalence of infection there. If similar conditions are observed in the fishing season 2012/2013 such a regulation would contribute to the protection of small fish (<27 cm). Furthermore, because of higher infection rates in the Breiðafjörður area, the fishery would target a greater proportion of fish already subjected to infection mortality.

STECF COMMENTS: STECF agrees with the ICES advice for 2013.

5.14. Capelin (*Mallotus villosus*) in Subareas V and XIV and Division IIa west of 5°W (Iceland-East Greenland-Jan Mayen area)

FISHERIES: In the mid-1960s, purse seine fishery began on capelin. It soon became a large-scale fishery. During its first 8 years, the fishery was conducted in February and March on schools of pre-spawning fish on or close to the spawning grounds south and west of Iceland. In January 1973, a successful capelin fishery began in deep waters near the shelf break east of Iceland. In July 1976, a summer capelin fishery began in the Iceland Sea. This fishery became multinational with vessels from Iceland, Norway, the Faroes and Denmark. The fishery is conducted in all years in July-March except in periods of low stock size. Over the years, the fishery has been closed during April-late June and the season has started in late June/August or later, depending on the state of the stock. In recent years, the fishery for capelin has changed from being mostly an industrial fishery to being mostly for human consumption. This is largely because of the low abundance and low TACs.. Total landings (2011/12) were 747,000 (75% purse-seine, 25% pelagic trawl). Discards are considered to be negligible.

SOURCE OF MANAGEMENT ADVICE: The basis for stock assessment and short-term forecasts are acoustic surveys and catch-at-age information.

REFERENCE POINTS:

Reference points have not been defined for this stock. An escapement target of 400,000 t can be considered as preliminary precautionary. However, this should be evaluated.

STOCK STATUS:

F (Fishing Mortality)	
	2011
MSY (F_{MSY})	Undefined

Precautionary approach (F_{pa}, F_{lim})	?	Undefined
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SSB (Spawning-Stock Biomass)		
		2012
MSY ($B_{trigger}$)	?	Undefined
Precautionary approach (B_{pa}, B_{lim})	?	Undefined
Qualitative evaluation	→	Stable above average

It is estimated that 418 000 t was left for spawning in spring 2012, which is just above the management target. In autumn 2011, the annual survey on young capelin was not conducted due to a strike. Two surveys, aimed at young capelin, conducted in November 2011 and February 2012, only covered part of the potential distribution area. The index of abundance from those surveys of young capelin was very low.

MANAGEMENT AGREEMENTS:

A two-step management plan has been agreed between Iceland, Greenland, and Norway, which aims at a spawning-stock biomass at minimum 400 000 t by the end of the fishing season. The first step in this plan is to set a preliminary TAC based on the results of an acoustic survey carried out to evaluate the immature (age 1 and most of age 2) part of the capelin stock about a year before it enters the fishable stock. The initial quota is set at 2/3 of the preliminary TAC, calculated on the condition that 400 000 t of the SSB should be left for spawning. The second step is based on the results of another survey conducted during the fishing season for the same year classes. This result is used to revise the TAC, still based on the condition that 400 000 t of the SSB should be left for spawning. ICES has not evaluated the management plan with respect to the precautionary approach.

ICES has not evaluated the management plan.

RECENT MANAGEMENT ADVICE: ICES advises on the basis of precautionary considerations that there should be no fishery until new information on stock size becomes available that proves SSB to be above the escapement threshold.

Other considerations

Management plan

According to the management plan the initial quota is 488 000 t, corresponding to two thirds of the predicted quota of 732 000 t for the fishing season 2011/2012.

PA approach

There should be no quota until new survey estimates have proven SSB to be above the escapement threshold.

A survey of the Denmark Strait and the Greenland plateau west of there is being planned. However, the timing of this survey depends on the ice coverage in the Strait and therefore it is impossible to say if or when it will be conducted.

STECF COMMENTS: STECF agrees with the ICES assessment of the state of the stock and the advice for 2013.

6. ECO-REGION 5: RESOURCES IN THE BARENT'S AND NORWEGIAN SEAS

6.1. Northern Shrimp (*Pandalus borealis*) in Sub-areas I (Barents Sea) and IIb (Svalbard Waters)

The most recent advice for this stock was provided by ICES in 2011. Hence, the following text remains unchanged from the Consolidated STECF Review of Advice for 2012. Advice for 2013 will be provided in Part 3 of the STECF review of Advice for 2013 which will be available in November 2012.

FISHERIES: The fisheries for Northern shrimp in Sub-areas I & II (Barents Sea & Svalbard area) are among the largest shrimp fisheries in the North east Atlantic. Norwegian and Russian vessels exploit the stock over the entire resource area, while vessels from other nations are restricted to the Svalbard fishery zone. No overall TAC has been established for this stock, and the fishery is partly regulated by effort control, licensing, and a partial TAC (Russian zone only). Bycatch is constrained by mandatory sorting grids and by temporary closures of areas where high bycatch occurs of juvenile cod, haddock, Greenland halibut, redfish, or small shrimp (<15 mm). The minimum mesh size is 35 mm. Norway and Russia have taken the majority of the landings in the past. In the early 1980s total landings were above 100,000 t, but have since declined. Reported landings for all countries increased between 1995 (25,000 t) and 2000 (83,000 t), but have since decreased: 60,000 t in 2002, around 40 000 t in 2003-2005, around 26 000 t in 2008 and 21,000 t in 2010. There are no reported Russian landings in 2006 and since 2009.

SOURCE OF MANAGEMENT ADVICE: This stock is currently managed jointly by Norway and Russia. ICES is providing biological advice for management of this stock.

REFERENCE POINTS:

	Type	Value	Technical basis
MSY	MSY $B_{trigger}$	0.5 of B_{MSY}^*	50% of B_{MSY} (10 th percentile of the B_{MSY} estimate); relative value
Approach	F_{MSY}	*	Resulting from the production model.
Precautionary approach	B_{lim}	0.3 of B_{MSY}^*	30% of B_{MSY} (production reduced to 50% MSY); relative value
	B_{pa}	Not defined	Not needed: Risk of transgressing limits are directly estimated
	F_{lim}	1.7 of F_{MSY}^*	1.7 F_{MSY} (the F that drives the stock to B_{lim}); relative value
	F_{pa}	Not defined	Not needed: Risk of transgressing limits are directly estimated

* Fishing mortality is estimated in relation to F_{MSY} and total stock biomass is estimated in relation to B_{MSY} .

STOCK STATUS:

	F (Fishing Mortality)		
	2008	2009	2010
MSY (F_{MSY})	✓	✓	✓ Below target
Precautionary approach (F_{lim})	✓	✓	✓ Harvested sustainably

SSB (Spawning-Stock Biomass)			
	2009	2010	2011
MSY (B_{trigger})	✓	✓	✓ Above trigger
Precautionary approach (B_{lim})	✓	✓	✓ Full reproductive capacity

The assessment is considered indicative of stock trends, and provides relative measures of stock status rather than absolute. Throughout the history of the fishery, estimates of stock biomass have been above B_{MSY} and fishing mortality below F_{MSY} . The estimated risk of exceeding B_{trigger} , B_{lim} , or F_{MSY} in 2012 is less than 1%. Recruitment indices declined from 2004 to 2008, but have since been higher.

RECENT MANAGEMENT ADVICE:

ICES advises on the basis of the MSY approach that catches in 2012 should be no more than 60 000 t.

Other considerations

MSY considerations

The stock is well above MSY B_{trigger} and F is well below F_{MSY} . Catch options of up to 60 000 t for 2012 have a low risk (<5%) of exceeding F_{MSY} and are likely to maintain the stock near its current high level.

PA considerations

There is a low risk in the near-term of the stock falling below B_{lim} or the fishing mortality rate exceeding F_{lim} .

Additional considerations

Ten-year projections of stock development assuming annual catches of 30 to 90 kt indicate that for all catch options the probability of the stock falling below B_{MSY} in the short to medium term (1–5 years) is below 10%, and less than 5% of declining below B_{trigger} . For catches higher than 60 kt the probability of exceeding F_{MSY} is above 5%.

FISHING OPPORTUNITIES FOR 2012 according to COM(2011) 298-Final.

STECF notes that with reference to COM(2011) 298-final this stock is classified under category 2. The rules for category 2 prescribe that for 2012, a TAC for Northern shrimp in Subareas I (Barent Sea) and IIb (Svalbard Waters) of 60 000t should be proposed.

STECF COMMENTS: STECF agrees with the ICES assessment of the state of the stock and the advice for 2012.

STECF notes that there is no TAC set for *Pandalus Borealis* in this area.

6.2. Cod (*Gadus morhua*) in area I and II (North East Arctic cod)

FISHERIES: Northeast arctic cod is exploited predominantly by Norway and Russia with smaller landings by countries including the UK, the Faroe Islands, Iceland, Greenland, France, Spain and Germany. The fishery for North east Arctic cod is conducted both by an international trawler fleet operating in offshore waters and by vessels using gillnets, long-lines, hand-lines and Danish seine operating both offshore and in the coastal areas. Cod is a target species caught in a mixed fishery together with haddock and saithe. In coastal areas, Northeast Arctic cod and coastal cod are caught in the same fishery during parts of the year. Redfish (both *Sebastes mentella* and *S. marinus*) are caught as bycatch in the cod fishery.

From a level of about 900,000 t in the mid-1970s, landings declined steadily to around 300,000 t in 1983-1985. Landings increased to above 500,000 t in 1987 before dropping to 212,000 t in 1990, the lowest level recorded in the post-war period. The landings increased rapidly from 1991 onwards, stabilised around 750,000 t in 1994-1997 but decreased to about 414,000 t in 2000. The landings in 2004 and 2005 are estimated to be to 606,000 t and 641,000 t. In 2006, the landings were estimated to 538,000 t, 487,000 t in 2007, 464,000 t in 2008, 523,000 t in

2009 and 610 000 t in 2010. The total landings in 2011 were 720,000 t (70% demersal trawls and 30 % other gear types).

Under-reporting of landings has been an important issue for this stock. Two sets of estimates of non-reported landings (IUU) for the period 2002–2007 were available, ranging from 41,000–166,000 t and 9,000–41,000 t. ICES does not have a basis on which to choose one estimate over the other. The series with 41,000 t – 166,000 t unallocated landings was taken forward in the calculations because this is the same method as the one used last year. The estimates of unreported landings were however reduced considerably from 2006 to 2008 and for 2009–2011 the estimate of unreported landings is close to zero.

In addition to quotas, fisheries are regulated by mesh size limitations, a minimum catching size, a maximum bycatch of undersized fish, maximum bycatch of non-target species, closure of areas with high densities of juveniles, and other seasonal and area restrictions. Since January 1997, sorting grids have been mandatory for the trawl fisheries in most of the Barents Sea and Svalbard area. Discarding is illegal in Norway and Russia. Data on discarding are scarce, but attempts to obtain better quantification continue.

From 1 January 2011, the technical regulations for the demersal fisheries were harmonized so that they are now the same in the Norwegian and Russian EEZs. From 2011 onwards, the minimum mesh size for bottom trawl fisheries for cod and haddock is 130 mm for the entire Barents Sea (before 2011 the minimum mesh size was 135 mm in the Norwegian EEZ and 125 mm in the Russian EEZ). The minimum size is now 44 cm for cod (previously 47 in the Norwegian and 42 cm in the Russian EEZ). The maximum allowable percentage of fish below the minimum size is 15% by number of cod, haddock, and saithe combined in the Norwegian EEZ, and 15% by number of cod and haddock combined in the Russian EEZ. Previously, the maximum percentage was 15% for each species (cod and haddock) in the Russian EEZ.

The fisheries are controlled by inspections of the trawler fleet at sea, i.e. by a requirement to report to catch control points when entering and leaving the EEZs and by VMS satellite tracking for some fleets.

SOURCE OF MANAGEMENT ADVICE: ICES is providing advice for management of this stock. The advice is based on analysis of catch-at-age data, using one commercial CPUE series and three survey series. Estimates of cannibalism are included in the natural mortality.

Bycatch of undersized cod in shrimp fisheries is unknown but believed to be minor. The total effect of discarding is still unclear and requires more work before it can be included in the assessments. There is still a lack of samples from certain gears and areas for this stock.

REFERENCE POINTS:

	<i>Type</i>	<i>Value</i>	<i>Technical basis</i>
Management	SSB _{MP}	460 000 t	B _{pa} , TAC linearly reduced from F _{pa} at SSB = B _{pa} to 0 at SSB equal to zero.
Plan	F _{MP}	0.40	F _{pa} , average TAC for the coming 3 years based on F _{pa} .
MSY	MSY B _{trigger}	460 000 t	B _{pa} , and trigger point in HCR.
Approach	F _{MSY}	0.40	Long-term simulations.
Precautionary Approach	B	220 000 t	Change point regression
	B _{pa}	460 000 t	The lowest SSB estimate having >90% probability of remaining above B _{lim} .
	F	0.74	F corresponding to an equilibrium stock = B
	F _{pa}	0.40	The highest F estimate having >90% probability of remaining below F _{lim} .

MANAGEMENT AGREEMENTS: A joint Norwegian and Russian scientific advisory body currently manages this stock. The fisheries are regulated according to bilateral agreements between Russia and Norway. A management plan has been implemented since 2004.

At the 38th meeting of the Joint Russian–Norwegian Fisheries Commission (JRNFC) in November 2009, the previously used management plan was amended (marked in bold) and currently states:

“The Parties agreed that the management strategies for cod and haddock should take into account the following:

- conditions for high long-term yield from the stocks*
- achievement of year-to-year stability in TACs*
- full utilization of all available information on stock development*

On this basis, the Parties determined the following decision rules for setting the annual fishing quota (TAC) for Northeast Arctic cod (NEA cod):

estimate the average TAC level for the coming 3 years based on F_{pa} . TAC for the next year will be set to this level as a starting value for the 3-year period.

the year after, the TAC calculation for the next 3 years is repeated based on the updated information about the stock development, however the TAC should not be changed by more than +/- 10% compared with the previous year’s TAC. If the TAC, by following such a rule, corresponds to a fishing mortality (F) lower than 0.30 the TAC should be increased to a level corresponding to a fishing mortality of 0.30.

if the spawning stock falls below B_{pa} , the procedure for establishing TAC should be based on a fishing mortality that is linearly reduced from F_{pa} at B_{pa} , to $F=0$ at SSB equal to zero. At SSB-levels below B_{pa} in any of the operational years (current year, a year before and 3 years of prediction) there should be no limitations on the year-to-year variations in TAC¹.

The plan was evaluated in 2010 and ICES considers that it is to be in accordance with the precautionary approach and not in contradiction to the MSY framework. At the 2010 meeting of the Joint Russian–Norwegian Fisheries Commission it was agreed that the plan will be in force until 2015.

¹ This quotation is taken from Annex 14 in the Protocol of the 38th Session of the Joint Russian–Norwegian Fisheries Commission and translated from Norwegian to English. For an accurate interpretation, please consult the text in the official languages of the Commission (Norwegian and Russian).

STOCK STATUS:

F (Fishing Mortality)				
	2009	2010	2011	
MSY (F_{MSY})	✓	✓	✓	Appropriate
Precautionary approach (F_{pa}, F_{lim})	✓	✓	✓	Harvested sustainably
Management plan (F_{MP})	✓	✓	✓	Below target

SSB (Spawning-Stock Biomass)				
	2010	2011	2012	

MSY (B_{trigger})	✓	✓	✓	Above trigger
Precautionary approach ($B_{\text{pa}}, B_{\text{lim}}$)	✓	✓	✓	Full reproductive capacity
Management plan (SSB_{MP})	✓	✓	✓	Above trigger

The SSB has been above MSY B_{trigger} since 2002 and is now at a record high. The total stock biomass is close to the highest observed. Fishing mortality was reduced from well above F_{lim} in 1997 to below F_{MSY} in 2007 and is now close to its lowest value. Surveys indicate that year classes 2009–2011 are above average.

RECENT MANAGEMENT ADVICE:

In accordance with the adopted management plan the catch in 2013 should be based on $F=0.30$, corresponding to landings of 940 000 t. This is expected to keep SSB above B_{pa} in 2014 and at the historical high. Coastal cod and *Sebastes marinus* bycatches should be kept as low as possible.

Other considerations

MSY considerations

Fishing at F_{MSY} ($= 0.40$) corresponds to landings of no more than 1,191,000 t in 2013. This is expected to keep SSB above MSY B_{trigger} in 2014 and at the historical high.

Additional considerations

The abundance of the year classes 2004 and 2005 in the last two years (at ages 6–8) is far above any previous observations for these age groups. This means that the choice of age range for stock size-dependent catchability has a considerable impact on the assessment. Also the stock dynamics (growth, maturation, cannibalism) are hard to predict at the present high stock sizes, although a further increase in stock abundance is not expected.

Adjustments for incomplete spatial coverage in some surveys in 2012 have been made. This mainly affected the recruitment estimates (2009–2011 year classes). The status quo F assumption for 2012 in the forecast implies a catch in 2012 which is 14% above the agreed TAC. However, the prediction uncertainty associated with this is less than that associated with, e.g. the choice of age range for stock size-dependent catchability.

Compared to last year's assessment, the current assessment estimate of SSB in 2011 is 40% higher and the F in 2010 is 20% lower.

STECF COMMENTS: STECF agrees with the ICES assessment of the state of the stock and the advice for 2013.

STECF notes that the landings corresponding to an F of $F=0.3$ prescribed by the management plan of 940 000 t represents a 25% increase on the agreed TAC for 2012.

6.3. Cod (*Gadus morhua*) in area I and II (Norwegian coastal cod)

FISHERIES: The geographical distribution of coastal cod and Northeast Arctic cod overlap, particularly in the first half of the year, when the Northeast Arctic cod migrates to the Norwegian coast to spawn. Also, immature Northeast Arctic cod migrate to the Norwegian coast to feed on spawning capelin. Genetic studies indicate that the cod in some fjords may be separate stocks. An assessment of the combined stocks is not likely to detect fluctuations of the smaller components, and thereby the current assessment approach involves some risk to local stocks. The stock complex is still not fully mapped, but the existence of local stocks also calls for special attention to protect genetic diversity and smaller components.

Landings of cod are nevertheless counted against the overall cod TAC for Norway, where the expected catch of coastal cod is in the order of 10%. Catches of coastal cod are thereby not effectively restricted by quotas. The fishery is regulated by the same minimum size, the same minimum mesh size on fishing gears as for Northeast Arctic cod, maximum bycatch of undersized fish, closure of areas having high densities of juveniles, and by

seasonal and area restrictions. In addition to the mixed fishery with Northeast Arctic cod, coastal cod is also caught as bycatch in the saithe fishery.

A number of regulations are aimed at the protection of coastal cod: Trawl fishing for cod is not allowed inside the 6-nautical mile line except for about ten fresh-fish trawlers which in a few areas had a dispensation until autumn 2010 to fish between the 4- and 6-mile line in the period 15 April–15 September. In 2011 no dispensations were given for fresh fish trawlers to fish inside 6 nautical miles. Since the mid-1990s the fjords in Finnmark and northern Troms (areas 03 and 04) have been closed for fishing with Danish seine. Since 2000, the large longliners have been restricted to fishing outside the 4-nautical mile line. To achieve a reduction in landings of coastal cod additional technical regulations in coastal areas were introduced in May 2004 (after the main fishing season) and continued with small modifications in 2005 and 2006. In the new regulations “fjord lines” are drawn to close the fjords for direct cod fishing with vessels larger than 15 meters. A box closed to all fishing gears except handline and fishing rod is defined in the Henningsvær–Svolvær area. This is an area where spawning concentrations of coastal cod is usually observed and where the catches of coastal cod has been high. Since the coastal cod is fished under a merged coastal cod/Northeast Arctic cod quota, the main objective of these regulations is to move the traditional coastal fishery from areas with high fractions of coastal cod to areas where the proportion of Northeast Arctic cod is higher.

Further restrictions were introduced in 2007 by not allowing pelagic gillnet fishing for cod and by reducing the allowed bycatch of cod when fishing for other species inside fjord lines from 25% to 5%, and outside fjord lines from 25% to 20%. The regulations were maintained in 2008. In addition, since 2009 the most important spawning area in the southern part of the stock distribution area (Borgundfjorden near Ålesund) has been closed to fishing (except for handline and fishing rod) during the spawning season.

The 2011 commercial landings were estimated to be 28 600 t (51% gillnets, 26% Danish seine, 21% longline / handline, 2% bottom trawl), i.e. above the expected catch (21 000 t) set at the quota agreement. In addition unreported catches in recreational fishing were estimated at 12 700 t in 2009. The regulations have not reduced catches, and current catches are considered to be too high.

In the recreational fishery the allowance for selling cod is reduced from 2000 kg to 1000 kg per person per year. The maximum gill net length per person in the recreational fishery is reduced from 210 m to 165 m. Minimum size now also applies to recreational and tourist fishing. For cod this is set to 44 cm in the area north of 62°N. In 2010 and 2011 7000 t of the Norwegian cod quota was set aside to cover the catches taken in the recreational and tourist fisheries and to cover catches taken by young fishers (to motivate young people to become fishers).

Some reallocation of unfished quotas late in the year in 2011 lead to increased cod catches for parts of the coastal fleet, thereby increasing the catch of coastal cod.

SOURCE OF MANAGEMENT ADVICE: ICES is providing advice for management of this stock. SURBA and XSA analyses are used to give broad trends, and it is based on catch-at-age data and on an acoustic survey. The assessment is considered indicative of stock trends and does not reflect absolute stock sizes. Since a trends-based assessment is provided for this stock no fishing possibilities can be projected.

Estimated catches in the recreational fishery have been added to the commercial catch. These represented about 30-35% of the total catch as estimated in 2009. The accuracy of this estimate was not available. Changes in the landings sampling programme lead to increased uncertainty in the estimated quantity and age composition of commercial landings of coastal cod in 2010. The sampling improved somewhat in 2011. This does not invalidate the overall conclusions.

REFERENCE POINTS: No reference points have been defined for this stock.

MANAGEMENT AGREEMENTS: A rebuilding plan was put into operation in 2011. The plan specifies the following reductions in fishing mortality:

Action year	1	2	3	4	5	6	7
Reduction of F relative to F ₂₀₀₉	15%	30%	45%	60%	75%	90%	100%

A new action year kicks in when the latest survey index for SSB is lower than the index in the second latest year (and at the same time the latest estimate of F is above 0.10).

The spawning biomass index in the 2010 survey was below the index in the 2009 survey. Thus 2011 was Action year 1. This means that the regulation in 2011 was aimed at a 15% reduction of F relative to F_{2009} . The 2011 survey gave a higher spawning-biomass index than in 2010, allowing the regulation for Action year 1 to continue in 2012.

If the spawning stock index in the 2012 autumn survey is lower than the index in 2011, the fisheries regulations should aim at a reduction of F in 2013 of at least 30% relative to 2009. If the survey index is above the 2011 index, the regulations should ensure that F in 2013 is at least 15% below the 2009 value. The trend for the stock appears stable. Therefore, a 30% reduction in F will imply a reduction of catches in 2013 of about 30% compared to the 2009 catch.

ICES evaluated the plan and considers it to be provisionally consistent with the precautionary approach (ICES, 2010) but it has not been evaluated against the MSY framework.

STOCK STATUS:

F (Fishing Mortality)		
		2009–2011
MSY (F_{MSY})	?	Unknown
Precautionary approach (F_{pa}, F_{lim})	?	Unknown
Qualitative evaluation	→	Variable without trend

SSB (Spawning-Stock Biomass)		
		2009–2011
MSY ($B_{trigger}$)	?	Unknown
Precautionary approach (B_{pa}, B_{lim})	?	Unknown
Qualitative evaluation	✗	Close to its lowest

This is a trends-based assessment. The survey indicates that the SSB is close to its lowest value. Recruitment has remained low in recent years. F appears variable without a clear trend since 2000.

RECENT MANAGEMENT ADVICE: ICES advises on the basis of the Norwegian rebuilding plan which require 2012 autumn survey results available in December. If the spawning-stock index in the 2012 autumn survey is lower than the index in 2011, the fisheries regulations should aim at a reduction of F in 2013 of at least 30% relative to 2009. If the survey index is higher than in 2011, the measures taken in 2012 should continue in 2013.

Other considerations

MSY approach

The survey indicates that the SSB is stable and close to its lowest value while F appears variable without a clear trend since 2000. Therefore, catches should be reduced.

PA approach

The stock situation is similar to last year. As in last year, the advice is based on the rebuilding plan, which provisionally is considered to be in accordance with the precautionary approach.

STECF COMMENTS: STECF agrees with the ICES assessment of the state of the stock and the advice for 2013.

6.4. Haddock (*Melanogrammus aeglefinus*) in subareas I and II (Northeast Arctic haddock)

FISHERIES: Haddock is mainly fished by trawl as bycatch in the fishery for cod, with some directed fisheries by longlines and trawlers. TAC regulations are in place but there was non-compliance, resulting in a significant amount of unreported landings in the past. Non-reported landings for the period 2002–2008 were estimated as ranging from 6,000 t to 40 000 t (between 4% and 34% of the international reported landings). However, IUU (Illegal, Unreported and Unregulated) catches have decreased in the last years and were close to zero in 2009 - 2011.

In recent years Norway and Russia have accounted for more than 70% of the landings. The total landings in 2007 and 2008 were estimated to be 161,000 t and 156,000 t respectively. In 2009 the total landings was 200,000 t, and in 2010 249,000 t. In 2011 total landings were 310 000 t (73% trawl, 17% longline, 10% other gear types).

The fishery is regulated by TACs. The fishery is also regulated by a minimum fish size, a minimum mesh size in trawls and Danish seine, a maximum bycatch of undersized fish, maximum bycatch of non-target species, closure of areas with high density of juveniles, and other area and seasonal restrictions. Since January 1997, sorting grids have been mandatory for the trawl fisheries in most of the Barents Sea and Svalbard area. A real-time closure system has been in force along the Norwegian coast and in the Barents Sea since 1984, aimed at protecting juvenile fish. Based on scientific research vessel data and mapping of areas by hired fishing vessels, fishing is prohibited in areas where the proportion by number of undersized cod, haddock, and saithe combined has been observed by inspectors to exceed 15% (the size limits vary by species). In addition to the temporary closed areas, some areas are permanently closed, either to protect juvenile cod and haddock (around Bear Island) or to reduce fishing pressure on coastal cod and to avoid gear conflicts. The use of selective gear technology in the demersal fisheries since 1997 has also reduced the catch and possible discarding of juveniles. From 1 January 2011 onwards, the minimum mesh size for bottom trawl fisheries for cod and haddock is 130 mm for the entire Barents Sea (before 2011 it was 135 mm in the Norwegian EEZ and 125 mm in the Russian EEZ). This change is expected to have a minor impact on the total exploitation pattern for this stock; thus, a recent average exploitation pattern is used in the predictions. From 1 January 2011, the technical regulations for the demersal fisheries were harmonized so that they now are the same in the Norwegian and Russian EEZs. The present minimum size is 40 cm for haddock (previously it was 44 cm in the Norwegian EEZ and 39 cm in the Russian EEZ). The maximum allowable percentage of fish below the minimum size is 15% by number of cod, haddock, and saithe combined in the Norwegian EEZ, and 15% by number of cod and haddock combined in the Russian EEZ. Previously, the maximum percentage was 15% for each species (cod and haddock) in the Russian EEZ. The effect of these changes is expected to be small as long as the fishing mortality is kept low, as implied by the agreed harvest control rule.

The fisheries are controlled by inspections of the trawler fleet at sea, by a requirement to report catches at control points when entering and leaving the EEZs, and by inspections of all fishing vessels when landing the fish. Keeping a detailed fishing logbook on board is mandatory for most vessels, and large parts of the fleet report to the authorities on a daily basis. Discarding is prohibited both in Russian and in Norwegian waters. However, discarding of haddock just below the minimum size is known to be a problem in the longline and trawl fisheries when those fish are abundant.

SOURCE OF MANAGEMENT ADVICE: ICES is providing advice for management of this stock. Analytical assessment based on catch-at-age data (XSA) was used to assess the stock, tuned using four survey series (1 acoustic, 3 trawl). Estimates of cod predation on young haddock are available from 1984 and varying natural mortality caused by predation from cod is taken into account in the assessment.

Discards are not included since there are no estimates of discarding although there is known to be a discarding problem in the longline and trawl fisheries. There is a lack of samples from certain gears and areas and Russian sampling of commercial catches has also shown a declining trend.

MANAGEMENT AGREEMENTS: A management plan has been in force since 2004 with the objectives of maintaining high long-term yield, year-to-year stability, and full utilization of all available information on stock dynamics. The plan aims to maintain F at $F_{pa} = 0.35$ and minimize between-year TAC change to $\pm 25\%$, unless SSB falls below B_{pa} in which case the management targets should change.

At the 36th Session of the Joint Russian–Norwegian Fishery Commission (JRNFC) in autumn 2007 the parties agreed to modify the former three-year rule to a one-year rule in accordance with the results of ICES HCR evaluation. The current HCR for haddock is as follows (see details in Protocol of the 40th Session of the Joint Russian–Norwegian Fisheries Commission, 14 October 2011):

- *TAC for the next year will be set at level corresponding to F_{msy} .*
- *The TAC should not be changed by more than $\pm 25\%$ compared with the previous year TAC.*
- *If the spawning stock falls below B_{pa} , the procedure for establishing TAC should be based on a fishing mortality that is linearly reduced from F_{msy} at B_{pa} to $F = 0$ at SSB equal to zero. At SSB-levels below B_{pa} in any of the operational years (current year and a year ahead) there should be no limitations on the year-to-year variations in TAC.*

At the 39th Session of the Joint Russian–Norwegian Fisheries Commission in 2010 it was agreed that the current management plan should be used “for five more years” before it is evaluated.

ICES has evaluated the modified management plan and concluded that it is in accordance with the precautionary approach and not in contradiction with the maximum sustainable yield (MSY) framework.

REFERENCE POINTS:

	<i>Type</i>	<i>Value</i>	<i>Technical basis</i>
Management Plan	SSB _{MP}	80 000 t	B_{pa} . TAC is linearly reduced from F_{pa} at SSB = B_{pa} to 0 at SSB equal to zero.
	F_{MP}	0.35	Previous F_{pa} estimated prior to the revision of the historical time-series for this stock.
MSY Approach	MSY $B_{trigger}$	80 000 t	B_{pa} .
	F_{MSY}	0.35	Stochastic long-term simulations.
Precautionary Approach	B_{lim}	50 000 t	B_{loss} .
	B_{pa}	80 000 t	$B_{lim} * \exp(1.645 * 0.3)$.
	F_{lim}	0.77	Corresponds to SPR value of slope of line from origin at SSB = 0 to geometric mean recruitment at SSB = B_{lim} .
	F_{pa}	0.47	$F_{lim} * \exp(-1.645 * 0.3)$.

(unchanged in 2011)

STOCK STATUS:

F (Fishing Mortality)	
2009 2010	2011

MSY (F_{MSY})	✓	✓	✓	Appropriate
Precautionary approach (F_{pa}, F_{lim})	✓	✓	✓	Harvested sustainably
Management plan (F_{MP})	✓	✓	✓	Above target Within target range

SSB (Spawning-Stock Biomass)				
	2010	2011	2012	
MSY ($B_{trigger}$)	✓	✓	✓	Above trigger
Precautionary approach (B_{pa}, B_{lim})	✓	✓	✓	Full reproductive capacity
Management plan (SSB_{MP})	✓	✓	✓	Above trigger

The SSB has been above MSY $B_{trigger}$ since 1990, increasing since 2000 and reaching the series maximum in 2011. Fishing mortality has been around F_{MSY} since the mid-1990s. Recruitment-at-age 3 has been at or above average since 2000. The year classes 2004–2006 are estimated to be very strong and are now dominating the spawning stock. Surveys indicate that the year classes 2008 and 2010 are below average, while 2009 and 2011 year classes are above average.

RECENT MANAGEMENT ADVICE:

ICES advises on the basis of the Joint Russian–Norwegian Fisheries Commission management plan that catches in 2013 should be no more than 238 000 t.

Other considerations

Management plan

The current HCR is based on F_{MSY} . ICES advises the continued use of the HCR with target $F = 0.35$ and maximum +/-25% change in TAC compared with the previous year's TAC. This implies $F_{MP} = 0.61$ in 2013, corresponding to landings of 238 000 t in 2013, which is expected to keep SSB above B_{pa} in 2014. The harvest control rule contains a 25% limit on change in TAC when the stock is above B_{pa} . Under certain circumstances this will lead to advisory F values substantially higher than F_{MSY} ; this is expected to occur in 2013 due to three very large year classes followed by average recruitment.

MSY approach

Fishing at $F_{MSY} = 0.35$ in 2013 corresponds to landings of no more than 154 000 t. This is expected to keep SSB above MSY $B_{trigger}$ in 2014.

PA approach

The fishing mortality in 2013 should be no more than F_{pa} , corresponding to landings of less than 195 000 t in 2013. This is expected to keep SSB above B_{pa} in 2014.

STECF COMMENTS: STECF agrees with the ICES assessment of the state of the stock and the advice for 2013.

STECF notes that because of the +/-25% TAC constraint the F derived from the management is substantially higher than F_{MSY} . STECF notes that catches of 238,000 t as advised by ICES on the basis of the Joint Russian–

Norwegian Fisheries Commission management plan are higher than landings would be when fishing at F_{MSY} in 2013 (154,000 t) and higher than landings would be when fishing at F_{pa} in 2013 (195,000 t).

6.5. Saithe (*Pollacius virens*) in the North East Arctic (Sub-areas I and II)

FISHERIES: Since the early 1960s, the fishery has been dominated by purse seine and trawl fisheries, with a traditional gill net fishery for spawning saithe as the third major component. The purse-seine fishery is conducted in coastal areas and fjords. Historically, purse-seiners and trawlers have taken, approximately, equal shares of the catches. Regulation changes led to a reduction in the amounts being taken by purse-seiners after 1990.

Norway accounts for more than 90% of the landings. Over the last ten years about 40% of the Norwegian landings originates from bottom trawl, 25% from purse seine, 20% from gill net and 15% from other conventional gears (long line, Danish sine and hand line). The gill net fishery is most intense during winter, purse seine in the summer months while the trawl fishery takes place more evenly all year around. Coastal cod and *S. marinus* are caught as bycatch in some of the saithe fisheries (ICES, 2011b, 2011c).

Landings of saithe were highest in 1970-1976 with an average of 238,000 t and a maximum of 265,000 t in 1970. This period was followed by a sharp decline to a level of about 160,000 t in the years 1978 - 1984. Another decline followed and from 1985 to 1991, the landings ranged from 70,000 - 122,000 t. An increasing trend was seen after 1990 to 171,498 t in 1996. Since then the annual landings have fluctuated between 136,000 and 212,480 t. with the highest figure in 2006. Landings in 2007, 2008, 2009, and 2010 were 197,000 t, 183,000 t, 161,000 t and 193,000 t respectively. Total landings in 2011 were 157,000 t (43% trawl, 29% purse-seine, 20% gillnet and 8% other gear types).

TAC regulations are in place for this stock. Norway and Russia have each set national measures applicable to their EEZ. Since 2007 the catch has been less than the TAC. However, in 2010–2011 this difference was less than in previous years. In the Norwegian fishery, quotas may be transferred between fleets if it becomes clear that the quota allocated to one of the fleets will not be taken. In addition to quotas, the fisheries are managed by minimum mesh size, minimum fish size, bycatch regulations, area closures, and other area and seasonal restrictions. Furthermore, sorting grids are used in the trawl fishery.

On 1 March 1999, the minimum fish size was increased to 45 cm for trawl and conventional gears, and to 42 cm (north of Lofoten) and 40 cm (between 62°N and Lofoten) for purse-seine, with an exception for the first 3000 t purse-seine catch between 62°N and 66°33'N, where the minimum fish size remains at 35 cm. A real-time closure system has been in force along the Norwegian coast and in the Barents Sea since 1984, aimed at protecting juvenile fish. Based on scientific research data and mapping of areas by hired fishing vessels, fishing is prohibited in areas where the proportion by number of undersized cod, haddock, and saithe combined has been observed by inspectors to exceed 15% (the size limits vary by species).

Discarding is illegal, but may occur when trawlers targeting cod catch saithe without having a quota for saithe. In the purse-seine fishery, slipping has been reported, mainly related to minimum size of fish in the catch. There is no quantitative information on discards, but they are considered minor.

SOURCE OF MANAGEMENT ADVICE: ICES is providing advice for management of this stock. The advice is based on analysis of catch-at-age data (XSA), using one commercial CPUE series and two tuning fleets with time-series split in 2002; the tuning series show divergent signals in recent years.

Lack of reliable recruitment estimates is still a major problem and the ICES working group remarked that there is a lack of samples from certain gears and areas.

MANAGEMENT AGREEMENT: This stock is currently managed by a joint Norwegian and Russian scientific advisory body. The fisheries are regulated according to bilateral agreements between Russia and Norway. The Norwegian Ministry of Fisheries and Coastal Affairs implemented a harvest control rule (HCR) in autumn 2007. The harvest control rule as communicated to ICES by the Norwegian Ministry of Fisheries and Coastal Affairs contains the following elements:

- Estimate the average TAC level for the coming 3 years based on F_{pa} . TAC for the next year will be set to this level as a starting value for the 3-year period.

- The year after, the TAC calculation for the next 3 years is repeated based on the updated information about the stock development. However, the TAC should not be changed by more than +/- 15% compared with the previous year's TAC.
- If the spawning-stock biomass (SSB) in the beginning of the year for which the quota is set (first year of prediction), is below B_{pa} , the procedure for establishing TAC should be based on a fishing mortality that is linearly reduced from F_{pa} at $SSB = B_{pa}$ to 0 at SSB equal to zero. At SSB levels below B_{pa} in any of the operational years (current year and 3 years of prediction) there should be no limitations on the year-to-year variations in TAC.

The HCR has the objectives of maintaining high long-term yield, year-to-year stability, and full utilization of all available information on the stock dynamics. The plan aims to maintain target F at $F_{pa} = 0.35$ and minimize between-year TAC change to +/- 15%, unless SSB falls below B_{pa} in which case the management targets should change.

ICES evaluated the HCR in 2007 and concluded that it is consistent with the precautionary approach, providing the assessment uncertainty and error are not greater than those calculated from historical data. This also holds true for implementation error (difference between TAC and catch).

The ICES advice is based on a harvest control rule adopted by the Norwegian authorities. The stock is exploited by fleets from a number of nations that acquire fishing rights by quota swaps with Norway. In addition, Russia sets a small quota for the Russian zone. ICES advice applies to all catches of Northeast Arctic saithe.

REFERENCE POINTS:

	Type	Value	Technical basis
Management Plan	SSB_{MP}	220 000 t	B_{pa} , TAC is linearly reduced from F_{pa} at $SSB = B_{pa}$ to 0 at SSB equal to zero.
	F_{MP}	0.35	Average TAC for the coming 3 years based on F_{pa} .
MSY Approach	MSY $B_{trigger}$	not defined	
	F_{MSY}	not defined	
Precautionary	B_{lim}	136 000 t	Change point regression.
	B_{pa}	220 000 t	$B_{lim} * \exp(1.645 * \sigma)$, where $\sigma = 0.3$.
	F_{lim}	0.58	F corresponding to an equilibrium stock = B_{lim} .
	F_{pa}	0.35	$F_{lim} * \exp(-1.645 * \sigma)$, where $\sigma = 0.3$. This value is considered to have a 95% probability of avoiding the F_{lim} .

STOCK STATUS:

	F (Fishing Mortality)		
	2009	2010	2011
MSY (F_{MSY})	?	?	Undefined
Precautionary approach (F_{pa}, F_{lim})	✓	✓	Harvested sustainably

Management plan (F_{MP})	✓	✓	✓	At target
SSB (Spawning-Stock Biomass)				
	2010	2011	2012	
MSY ($B_{trigger}$)	?	?	?	Undefined
Precautionary approach (B_{pa}, B_{lim})	✓	✓	✓	Full reproductive capacity
Management plan (SSB_{MP})	✓	✓	✓	Above trigger

Since 1995, SSB has been well above B_{pa} and has decreased in recent years. Fishing mortality was well below F_{pa} for a number of years after 1996, but has increased since 2005 to F_{pa} in 2010 and 2011. The 2005 and 2007 year classes are above average, while the 2006 and 2008 year classes seem to be below average strength.

RECENT MANAGEMENT ADVICE:

ICES advises on the basis of the management plan implemented by the Norwegian Ministry of Fisheries and Coastal Affairs that catches in 2013 should be no more than 164 000 t. Bycatches of coastal cod and *Sebastes marinus* should be kept as low as possible.

Other considerations

Management plan

Following the agreed management plan implies a TAC of 164 000 t in 2013. The SSB is expected to remain above B_{pa} at the beginning of 2014.

PA approach

The fishing mortality in 2013 should be no more than F_{pa} , corresponding to landings of less than 176 000 t in 2013. This is expected to keep SSB above B_{pa} in 2014.

STECF COMMENTS: STECF agrees with the ICES assessment of the state of the stock and the advice for 2013.

6.6. Redfish (*Sebastes mentella*) in Sub-areas I and II

FISHERIES: Traditionally, Russia and other East-European countries in the areas from south of Bear Island to Spitsbergen have conducted the directed fishery. From the mid-1970s to the mid-1980s, large catches were taken. In the mid-1980s, Norwegian trawlers started fishing along the continental slope (around 500-m depth) further south, in areas never harvested before, and inhabited primarily by mature fish. After a sharp decrease in the landings from the traditional area until 1987, this fishery on new grounds resulted in a temporary increase in the landings until 1991, after which the landings declined. Since 1991, the fishery has been dominated by Norway and Russia.

A directed pelagic fishery for *S. mentella* in the international waters of the Norwegian Sea outside EEZ has developed since 2004. In 2006, this fishery developed further to become a fishery with 13 countries; more than 40 trawlers landed around 28,000 t. Catches in 2007 and 2008 have decreased significantly (16,000 and 9,000 t, respectively) due to TACs set by the managing body, the North-East Atlantic Fisheries Commission (NEAFC), as well as a decreased economic value of redfish. Total ICES catch estimates for 2009 and in 2010 were 10, 000 and 12,000 t, respectively, including also the pelagic catches in the Norwegian Sea outside the EEZ. Total landings in 2011 were 12,400 t, of which 67% was taken by pelagic trawl in international waters in the Norwegian Sea and 33% was taken as bycatch in the Barents Sea and adjacent waters. Other catches of *S. mentella* are taken as bycatches in the demersal cod/haddock/Greenland halibut fisheries, as juveniles in the shrimp trawl fisheries, and occasionally in the pelagic blue whiting and herring fisheries in the Norwegian Sea.

Since 1 January 2003, all directed trawl fisheries for *S. mentella* have been forbidden in the Norwegian EEZ north of 62°N and in the Svalbard area. Additional protection for adult *S. mentella* comprises area closures. Outside permanently closed areas it is, however, legal to have up to 20% redfish (*S. mentella* and *S. marinus* combined) in round weight as by-catch per haul and on-board at any time when fishing for other species. Since 1 January 2005, the by-catch percentage has been reduced to 15% (both species combined).

MANAGEMENT AGREEMENTS: The *S. mentella* occurrences inside the Norwegian and Russian EEZs are currently managed by a joint Norwegian and Russian scientific advisory body. The fisheries are regulated according to bilateral agreements between Russia and Norway. NEAFC has set a TAC for the *S. mentella* in international waters in the Norwegian Sea in 2007 (15,500 t) and 2008 (14,500 t). The 2009-2011 TAC was agreed 10,500, 8,600 and 7,900 t, respectively. NEAFC by consensus adopted a TAC for 2012 of 7500 t. No specific management objectives are so far implemented.






SOURCE OF MANAGEMENT ADVICE: The advisory body is ICES. The assessment methodology was revised during the redfish stocks benchmark meeting in February 2012 (ICES, 2012b). The implementation of a new analytical assessment model in 2012 and the updated data for 2011 (landings and survey) have changed the perception of the stock.

ICES assessed the *S. mentella* stock based on catch-at-age statistics from the pelagic and demersal fleets, and numbers at age from three surveys in the Barents Sea. The Gadget and Schaefer biomass models were applied. Information on cod consumption on juveniles was included in natural mortality estimates. The new assessment model used and its outputs are considered to be an appropriate basis for advice by ICES since this year’s advice is based on the MSY approach.

ICES considers that national reporting of length distributions in the demersal and pelagic commercial catches needs to be increased. In order to assess the state of the stock, ICES points out it is necessary to survey the pelagic and the demersal components of *S. mentella* throughout its whole distribution area in Subareas I and II.

REFERENCE POINTS: At present, no fishing mortality or biomass reference points are defined for this stock. $F_{0.1} = 0.065$ is considered as a good candidate for F_{MSY} proxy, and used as a basis for advice.

STOCK STATUS:

F (Fishing Mortality)		
	2009–2011	
MSY (F_{MSY})		Appropriate
Precautionary approach (F_{pa}, F_{lim})		Unknown
SSB (Spawning-Stock Biomass)		
	2009–2011	
MSY ($B_{trigger}$)		Unknown
Precautionary approach (B_{pa}, B_{lim})		Unknown
Qualitative evaluation		

In contrast to the qualitative assessment last year, which concluded that the stock needed to be rebuilt, ICES estimates of biomass this year show that SSB has increased by more than 300% since 1992. The new assessment

further indicates an increase in the number of juveniles in recent years. In the absence of biomass reference points for this stock, ICES considers that this is sufficient to allow a fishery.

Due to poor year classes during the period 1998–2005, the spawning-stock biomass is expected to decline in the near future.

RECENT MANAGEMENT ADVICE:

ICES advises on the basis of the MSY approach that a commercial fishery can operate on *Sebastes mentella* in Subareas I and II, given that the total catch level, including bycatches and discards, does not exceed 47 000 t. Measures currently in place to protect juveniles have proven successful and should be maintained.

Other considerations

MSY approach

Following the ICES MSY approach implies a fishing mortality of 0.065, corresponding to landings of no more than 47 000 t in 2013. This is expected to keep SSB at the present level in 2020.

The current estimate of fishing mortality is far below the assumed natural mortality (0.05) and F_{MSY} proxy ($F_{0.1}$). Fishing at $F_{0.1}$, which is close to the assumed value of natural mortality is considered not to be detrimental to the stock. However, following several consecutive low recruitments (1998–2005) for this long-lived, late-maturing species, SSB is expected to decline in the near future, together with landings. Explorations of a multi-annual TAC advice would lead to predicted landings of 44,000 t for 2013–2015, or 40,000 t for 2013–2020.

STECF COMMENTS: STECF agrees with the ICES assessment of the state of the *S. mentella* stock and the advice for 2013. STECF agrees that it is important that management decisions taken at national and international levels are coordinated to ensure that the total catch in ICES Subareas I and II does not exceed the recommended level.

STECF notes that the implementation of a new assessment model in 2012 and the updated data for 2011 have led to a considerable change in the perception of the stock. STECF further notes that at present the European TACs are not set separately by redfish species but for *S. mentella* and *S. marinus* in Sub-areas I and II combined. Considering the ICES advice for 2013 that there should be no fishery on *S. marinus*, STECF advises that managers may wish to implement a more precautionary approach.

6.7. Redfish (*Sebastes marinus*) in Sub-areas I and II

FISHERIES: The fishery is mainly conducted by Norway, accounting for 80-90% of the historical total catch. *Sebastes marinus* is fished both in a directed gillnet and longline fishery and as bycatch in trawl fisheries targeting cod and saithe. The fish are also caught to a lesser extent by Danish seine, and handlines. Important fishing grounds are the Møre area (Svinøy), Halten Bank, outside Lofoten and Vesterålen, and at Sleppen outside Finnmark. Traditionally, *S. marinus* has been the most popular and highest priced redfish species. In the period 1984-90, landings of *S. marinus* were at a level of 23,000–30,000 t. In the period 1991-1999, the landings were around 17,000 t but since then have decreased, and from 2004 to 2007, annual landings were estimated to be about 7,000 t. The 2008 landings were 6,600 t. EU landings reached 388 t in 2007 and about 227 t in 2008. Landings in 2009 are estimated to have been about 6,000 and in 2010 about 8,000 t. Commercial landings in 2011 were 5,800 t, of which 37% are taken by trawl, 39% by gillnet, 22% by longline, and 2% by other gears.

All directed fishery except by handline is closed in the period 20 December-31 July and in September. Directed trawl fishery is not allowed. A minimum legal landing size of 32 cm has been set for all Norwegian fisheries and international fisheries in the Norwegian EEZ, with an allowance to have up to 10% undersized (i.e., less than 32 cm) specimens of *S. marinus* (in numbers) per haul. There are regulations on the percentage of allowed bycatch of *S. marinus* when fishing for other species. From January 2006, it is forbidden to use gillnets with mesh size less than 120 mm when fishing for redfish. The closed seasons enforced since 2004 seem to have reduced the gillnet catches by about 2,500 t, while the catches taken by other gears have not decreased, and in some cases increased, causing the total international catches to remain at the same level during the last 7 years.

SOURCE OF MANAGEMENT ADVICE: ICES is providing advice for management of this stock. The assessment methodology was evaluated and a benchmark assessment was conducted during the ICES redfish stocks benchmark meeting in February 2012. Gadget was accepted as the main analytical assessment model for

S. marinus in Subareas I and II. The model is a single-species, age-length structured model, split into mature and immature components. Data from two commercial fleets (a gillnet fleet and a combined trawl and other gears fleet), and two surveys was considered.

MANAGEMENT AGREEMENTS: The stock is currently managed by a joint Norwegian and Russian scientific advisory body and regulated according to bilateral agreements between Russia and Norway.

REFERENCE POINTS: No reference points have been established for this stock.

STOCK STATUS:

F (Fishing Mortality)		
	2009–2011	
MSY (F_{MSY})	?	Unknown
Precautionary approach (F_{pa}, F_{lim})	?	Unknown
SSB (Spawning-Stock Biomass)		
	2009–2011	
MSY ($B_{trigger}$)	?	Unknown
Precautionary approach (B_{pa}, B_{lim})	?	Unknown
Qualitative evaluation	⊗	SSB lowest in time series

SSB has been decreasing since the 1990s and is currently at the lowest level in the time-series. Fishing mortality has been increasing since 2005 and is currently at the highest level in the time-series. Recruitment is very low.

RECENT MANAGEMENT ADVICE:

The new assessment confirms the previous perception of the stock status. ICES advises on the basis of the precautionary approach that there should be no fishing on this stock. This is the same as the advice given since 2007 for this fishery: “*There should be no directed fishery on *Sebastes marinus* in Subareas I and II. Area closures should be maintained and bycatch limits should be as low as possible until a significant increase in the spawning-stock biomass (and a subsequent increase in the number of juveniles) has been verified*”.

Other considerations

PA Considerations

ICES advises that there should be no fishery, given the very low SSB (below any possible reference points) and poor recruitment. The annual natural mortality was revised to 0.05 (previously 0.1). The current fishing mortality is around 0.3 and very high compared to the natural mortality of 0.05.

STECF COMMENTS: STECF agrees with the ICES assessment that the state of the *S. marinus* stock is unknown and the ICES advice for 2013.

STECF however notes that European TACs are not set separately by species for redfish but for *S. mentella* and *S. marinus* combined. ICES advice for 2013 is to allow a fishery of up to 47 000 t total catch level on *S. mentella* in Subareas I and II. STECF advises that any fishery for redfish in subareas I and II is likely to impede the recovery of the stock of *S. marinus* in these areas.

6.8. Greenland halibut (*Reinhardtius hippoglossoides*) in area I and II

FISHERIES: The regulations enforced in 1992 reduced the total landings of Greenland halibut by trawlers from about 20,000 to 8,600 t. Since then annual trawler landings have varied between 9,000 and 20,000 t without any clear trend attributable to changes in allowable by-catch. In 2008 -2010, the landings were estimated to amount to 14,000 t, 12,000 t and 16,000 t respectively.

Since 1992, the fisheries have been regulated by allowing a directed fishery only by small coastal longline and gillnet vessels. By-catches of Greenland halibut in the trawl fisheries have been limited by permissible by-catch per haul and an allowable by-catch retention limit on board the vessel.






The 38th Session of the Joint Norwegian-Russian Fisheries Commission in 2009 decided to cancel the ban against targeted Greenland halibut fishery and established a TAC at 15 000 t for next three years (2010-2012). The TAC was allocated between Norway, Russia and other countries with shares of 51, 45 and 4% respectively. In 2011 the total landings were 16,300 t (58% trawl, 31% longline, 10% gillnet and 1% others). The 40th Session of JRNFC held in October 2011 raised the TAC for 2012 to 18 000 t.

SOURCE OF MANAGEMENT ADVICE: ICES is providing advice for the management of this stock. The fisheries are regulated according to bilateral agreements between Russia and Norway. A survey trends-based assessment based on two survey indices (Norwegian slope survey, Russian autumn survey) was carried out; discards and by-catch was not included. Discards were however considered to be minor. ICES noted that none of the current surveys cover the complete stock distribution, but most of the adult distribution area is covered. No analytical assessment could be presented for this stock. Biomass estimates from the surveys are not consistent. The benchmark for the Northeast Arctic (NEA) Greenland halibut stock is planned for 2013.

REFERENCE POINTS: No reference points are defined for this stock.

MANAGEMENT AGREEMENTS: There are no explicit management objectives for this stock but the fisheries are regulated according to bilateral agreements between Russia and Norway. There are signs that the regulations of the last two decades have improved the status of the stock, and measures should be taken to maintain the positive trends.

STOCK STATUS:

F (Fishing Mortality)	
	2008–2011
MSY (F_{MSY})	 Unknown
Precautionary approach (F_{pa}, F_{lim})	 Unknown
SSB (Spawning-Stock Biomass)	
	2009–2012
MSY ($B_{trigger}$)	 Unknown
Precautionary approach (B_{pa}, B_{lim})	 Unknown
Qualitative evaluation	 Increasing trend

Only landings and survey trends of biomass are available for this stock. Biomass estimates indicate a stable or increasing trend since 1992. There is no information on the exploitation rate of the stock.

RECENT MANAGEMENT ADVICE:

ICES advises on the basis of precautionary considerations that catches should not be allowed to increase above 15 000 t, the average catch for the last 10 years.

Other considerations

The ICES Workshop on Age Reading of Greenland Halibut (WKARGH) in 2011 (ICES, 2011b) addressed age-reading problems for this stock, and the Russian and Norwegian annual scientists' meeting in March 2012 recommended initiating annual or biannual exchange of otoliths and age-reading experts on these species in order to identify the differences in interpretation and to discuss possibilities for a common approach.

STECF COMMENTS: STECF agrees with the ICES assessment that the state of the stock is unknown and STECF has no objective means to advise on a suitable catch level.

STECF notes however that in 2011 the 40th Session of the Joint Norwegian-Russian Fisheries Commission raised the TAC from 15 000 t to 18 000 t for 2012.

6.9. Capelin (*Mallotus villosus*) in ICES subareas I and II, excluding Division IIa-west of 5°W (Barents Sea capelin)

The most recent advice for this stock was provided by ICES in 2011. Hence, the following text remains unchanged from the Consolidated STECF Review of Advice for 2012. Advice for 2013 will be provided in Part 3 of the STECF review of Advice for 2013 which will be available in November 2012.

FISHERIES: Norway and Russia are the two main countries which exploit the capelin stocks in these areas. No fishery took place between autumn 1993 and spring 1999. The fishery was re-opened in the winter of 1999. Since 1979 the fishery has been regulated by a bilateral agreement between Norway and Russia (formerly USSR) and since 1987, catches have been very close to the advice, varying between 100,000 t and 650,000 t. The fishery was closed from 2004-2008. In 2009 and 2010 landings amounted to 306 000 t and 323 000 t respectively. The landing over the winter period at the start of 2011 are 354 000 t.

SOURCE OF MANAGEMENT ADVICE: The main management advisory body is ICES. The assessment and stock history is based on joint Russia-Norwegian acoustic surveys during September each year. A model incorporating predation from cod has been used for predicting SSB and for estimating the historical time series of SSB (Report from the 2009 joint Russian-Norwegian meeting to assess the Barents Sea capelin stock, Kirkenes, October 3-4 2009. Report of the Arctic Fisheries Working Group, 21-27 April 2009. ICES CM 2009/ACOM: 02.).

REFERENCE POINTS:

	<i>Type</i>	<i>Value</i>	<i>Technical basis</i>
MSY	MSY B _{trigger}	Undefined	
Approach	F _{MSY}	Undefined	
Precautionary	B _{lim}	200 000 t	Above SSB ₁₉₈₉ , the lowest SSB that has produced a good year class.
	B _{pa}	Undefined	
Approach	F _{lim}	Undefined	
	F _{pa}	Undefined	

(unchanged since: 2010)

STOCK STATUS:

F (Fishing Mortality)			
	2008	2009	2010
MSY (F_{MSY})	-	-	- Not relevant
Precautionary approach (F_{pa}, F_{lim})	-	-	- Not relevant

SSB (Spawning-Stock Biomass)			
	2009	2010	2011
MSY ($B_{trigger}$)	?	?	? Undefined
Precautionary approach (B_{lim})	✓	✓	✓ Above limit reference point

The maturing component in autumn 2011 was estimated to be 2.1 million tonnes. The spawning stock in 2012 will consist of fish from the 2008 and 2009 year classes. The survey estimate of the 2010 year class is above the long-term average and 0-group observations during the joint Russian–Norwegian ecosystem survey in August–September 2011 also indicated that the 2011 year class also is above the long-term average.

MANAGEMENT OBJECTIVES: In 2002, the Joint Norwegian–Russian Fisheries Commission (JNRFC) agreed to adopt a management strategy in which the fishery is managed according to a target escapement strategy that takes the predation by cod into account. A basis for the management plan is that all catches are taken on pre-spawning capelin. The harvest control rule is designed to ensure that when the fishery is closed, the SSB remains above the proposed B_{lim} of 200 000 tonnes (with 95% probability). ICES considers the management plan to be consistent with the precautionary approach.

In 2010, the JNRFC decided that the management strategy should not be changed for the following 5 years.

RECENT MANAGEMENT ADVICE: ICES advises on the basis of the management plan agreed by the Joint Norwegian–Russian Fisheries Commission (JNRFC) that catches in 2012 should be no more than 320 000 tonnes.

FISHING OPPORTUNITIES FOR 2012 according to COM(2011) 298-Final.

STECF notes that with reference to COM(2011) 298-final this stock is classified under category 1. The rules for category 1 prescribe that for 2012, a TAC for Barents Sea Capelin in Sub-areas I and II excluding Division IIa west of 5°W of 320 000t should be proposed.

STECF COMMENTS: STECF agrees with the ICES assessment of the state of the stock and the advice for 2012.

6.10. Herring (*Clupea harengus*) in ICES subareas I & II (Norwegian Spring spawners)

The most recent advice for this stock was provided by ICES in 2011. Hence, the following text remains unchanged from the Consolidated STECF Review of Advice for 2012. Advice for 2013 will be provided in Part 3 of the STECF review of Advice for 2013 which will be available in November 2012.

FISHERIES: The total catches in 2010 were 1.457 million t., mainly taken by Norway (871 000 t), Russia (199 000 t), Iceland (206 000 t), EU (100 000 t), and Faroe Islands (80 000 t). The fishery in general follows the migration of the stock closely as it moves from the wintering and spawning grounds along the Norwegian coast to the summer feeding grounds in the Faroese, Icelandic, Jan Mayen, Svalbard, and international areas. Due to limitations for some countries to enter the EEZs of other countries in 2008, the fisheries do not necessarily depict the distribution of herring in the Norwegian Sea. A special feature of the summer fishery in 2005 and 2006 was the prolonged fishery in the Faroese and Icelandic zone. In 2007 and 2008 a clean herring fishery was

hampered by mixture of mackerel schools in the area. This was especially the case for the Faroese fleet, which usually targets mackerel later in the year (October–November).

Management regulations have restricted landings in recent years.

SOURCE OF MANAGEMENT ADVICE: The main management advisory body is ICES. The advice is based on an analytical assessment, which takes into consideration catch data, and eight surveys, three of which have not been continued in recent years, (acoustic surveys of adults and juveniles, larval survey, and 0-group survey). The present assessment is an updated assessment, using the models, configurations and procedures agreed at the benchmark assessment in 2008. From 2010 onwards, new maturity-at-age information was used for the whole time-series. This revision contributes to the change in perception of estimated SSB in the 2010 assessment.

REFERENCE POINTS:

	<i>Type</i>	<i>Value</i>	<i>Technical basis</i>
Management plan	SSB _{MP}	5.0 million t	Medium-term simulations conducted in 2001.
	F _{MP}	0.125	Medium-term simulations conducted in 2001.
MSY Approach	MSY B _{trigger}	5.0 million t	B _{pa}
	F _{MSY}	0.15	Stochastic equilibrium analysis using a Beverton & Holt S/R relationship with data from 1950 to 2009.
Precautionary Approach	B _{lim}	2.5 million t	MBAL (accepted in 1998).
	B _{pa}	5.0 million t	B _{lim} * exp(0.4*1.645).
	F _{lim}	not defined	-
	F _{pa}	0.15	Based on medium-term simulations.

(unchanged since: 2010)

STOCK STATUS:

	F (Fishing Mortality)			
	2008	2009	2010	
MSY (F_{MSY})	✓	✓	✓	At target
Precautionary approach (F_{pa})	✓	✓	✓	Harvested sustainably ¹⁾
Management plan (F_{MP})	✗	✗	✗	Above target

	SSB (Spawning-stock Biomass)			
	2009	2010	2011	
MSY (B_{trigger})	✓	✓	✓	Above trigger
Precautionary approach (B_{pa}, B_{lim})	✓	✓	✓	Full reproductive capacity

Management plan (SSB _{MP})	✓	✓	✓	Above trigger
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¹⁾ The nominal value for F_{2010} is slightly higher than F_{pa} but is considered to be not different.

SSB in 2011 is well above B_{pa} . The stock is composed of a number of good year classes: in the last 13 years, five large year classes have recruited into the stock (1998, 1999, 2002, 2003, and 2004). However, all cohorts from 2005 onward have been small. Fishing mortality during 2008–2010 has been at F_{pa} (= F_{MSY}).

RECENT MANAGEMENT ADVICE:

ICES advises on the basis of the EU, Faroe Islands, Iceland, Norway, and Russia management plan that landings in 2012 should be no more than 833 000 t.

Other considerations

Management plans

A long-term management plan was agreed by the EU, Faroe Islands, Iceland, Norway, and Russia in 1999. The management plan aims to constrain harvesting within safe biological limits and is designed to provide sustainable fisheries in the long term. ICES has evaluated the plan and concluded that it is consistent with the precautionary approach.

Following the long-term management plan agreed by the EU, Faroe Islands, Iceland, Norway, and Russia implies a TAC of 833 000 tonnes in 2012. This is expected to lead to an SSB in 2013 of 5.9 million tonnes.

MSY approach

Following the ICES MSY framework implies a fishing mortality of 0.15, resulting in landings of 989 000 tonnes in 2012. This will generate a small decline in SSB in 2013 to 5.7 million tonnes.

Fishing mortality in 2010 is at F_{MSY} , therefore the transition scheme towards the ICES MSY framework does not apply.

PA approach

Following the precautionary approach implies a fishing mortality in 2012 no higher than F_{pa} ($F = 0.15$), corresponding to landings of less than 989 000 tonnes in 2012. This is expected to maintain SSB above B_{pa} in 2013.

FISHING OPPORTUNITIES FOR 2012 according to COM(2011) 298-Final.

STECF notes that with reference to COM(2011) 298-final this stock is classified under category 1. The rules for category 1 prescribe that for 2012, a TAC for Herring in ICES subareas I & II (Norwegian Spring spawners) of 833 000t should be proposed.

STECF COMMENTS: STECF agrees with the ICES assessment of the state of the stock and the advice for 2012.

7. ECO-REGION 6: RESOURCES IN THE FAEROE PLATEAU ECOSYSTEM

7.1. Cod (*Gadus morhua*) in Vb1 (Faroe Plateau cod)

FISHERIES: Cod are mainly taken in a directed cod and haddock fishery with long lines, in a directed jigging fishery and as by-catch in the trawl fishery for saithe. Following the declaration of EEZs in the 1970s, the fishery became largely Faroese and fishing mortality declined briefly but it has increased since to former high levels. Landings have fluctuated between 6,000 and 40,000 t (1986–2007), almost entirely taken by non-EU fleets. In 2008 landings were 7,500 t, the lowest observed since 1993.t. Landings in 2009 and 2010 were 10,000 t and 12,700 t respectively. Total landings in 2011 were 10,000 t, where 62% was taken by the longlines, 7% by jigging, 31% by trawlers, and 0.1% by other gear types. There was no industrial bycatch or unaccounted removals.

An effort management system was implemented 1 June 1996. Fishing days are allocated to all fleets fishing in waters < 380 m depth for the period 1 September–31 August. In addition the majority of the waters < ca. 200 m depth are closed to trawlers, and are mainly utilized by longliners. The main spawning areas for cod are closed

for nearly all fishing gears during spawning time. In 2011, additional areas were closed in order to protect incoming year classes of cod.

The EU fishery on this stock has been managed together with cod in VI, Vb (EC waters), International waters of XII and XIV.

SOURCE OF MANAGEMENT ADVICE: The main management advisory body is ICES. The advice is based on an analytical method using survey and catch-at-age data. The technique was XSA calibrated by two research surveys (spring and summer surveys).

REFERENCE POINTS:

	<i>Type</i>	<i>Value</i>	<i>Technical basis</i>
MSY	MSY $B_{trigger}$	40 000 t	B_{pa} .
Approach	F_{MSY}	0.32	Provisional maximum sustainable yield, FLR stochastic simulations.
Precautionary	B_{lim}	21 000 t	Lowest observed SSB (1998 assessment).
	B_{pa}	40 000 t	$B_{lim}e^{1.645\sigma}$, assuming a σ of about 0.40 to account for the relatively large uncertainties in the assessment.
Approach	F_{lim}	0.68	$F_{pa}e^{1.645\sigma}$, assuming a σ of about 0.40 to account for the relatively large uncertainties in the assessment.
	F_{pa}	0.35	Close to F_{max} (0.34) and F_{med} (0.38) (1998 assessment).

STOCK STATUS:

F (Fishing Mortality)				
	2009	2010	2011	
MSY (F_{MSY})				Above target
Precautionary approach (F_{pa}, F_{lim})				Increased risk

SSB (Spawning-Stock Biomass)				
	2010	2011	2012	
MSY ($B_{trigger}$)				Below trigger
Precautionary approach (B_{pa}, B_{lim})				Increased risk

SSB has remained around B_{lim} since 2005. Fishing mortality has decreased since 2002 and is now between F_{lim} and F_{pa} , but still above F_{MSY} . The 2009 year class is estimated to be below average.

Comparing the 2010 estimates in last year's assessment (2011) with this year's assessment (2012) shows that recruitment has been revised downwards by 21%, the spawning-stock biomass revised downwards by 23%, and the fishing mortality revised upwards by 42%. The basis of the advice is the same as last year.

MANAGEMENT OBJECTIVES: A management system based on number of fishing days, closed areas, and other technical measures were introduced in 1996 to ensure sustainable demersal fisheries in Division Vb. This was before ICES introduced precautionary approach (PA) and MSY reference values, and at that time it was believed that the purpose was achieved if the total allowable number of fishing days was set such that on average 33% of the haddock exploitable stock in numbers would be harvested annually. This translates into an average F of 0.45, above the F_{pa} and F_{MSY} of 0.35 and 0.32 respectively. ICES considers this to be inconsistent with the PA and the MSY approaches. Work is ongoing in the Faroes to move away from the F_{target} of 0.45 to be consistent with the ICES advice.

A group representing the Ministry of Fisheries, the Faroese industry, the University of the Faroe Islands, and the Faroe Marine Research Institute has developed a management plan based on general maximum sustainable yield (MSY) principles developed by ICES. The plan has not yet been discussed by the political system. This new management plan should include a stepwise reduction of the fishing mortality to F_{MSY} in 2015 and a recovery plan if the SSB declines below the MSY $B_{trigger}$. The MSY $B_{trigger}$ has been defined at 40,000 t (the former B_{pa}) and F_{MSY} at 0.32. If the SSB declines below the MSY $B_{trigger}$, the fishing mortality will be reduced by the relationship $F_{MSY} * B_{act}/B_{trigger}$ until the SSB has increased again above the MSY $B_{trigger}$ and is thereafter kept at F_{MSY} .

RECENT MANAGEMENT ADVICE:

ICES advises on the basis of the MSY approach that effort should be reduced such that fishing mortality in 2013 will be no more than $F = 0.20$, corresponding to a 63% reduction in the present fishing mortality.

Other considerations

MSY approach

ICES advises on the basis of the MSY approach to reduce fishing mortality by 63% in 2013 to 0.20. This is 38% below F_{MSY} , because SSB in 2013 is 38% below MSY $B_{trigger}$. ICES advised that the present estimate of F_{MSY} should be regarded as provisional. Simulation studies that take the productivity of the ecosystem into account have been tried, but this model is still under development.

PA approach

The fishing mortality should be kept below an F_{pa} of 0.35. This translates into a reduction in fishing mortality by 30% as compared to the average of the last 3 years (0.51).

STECF COMMENTS: STECF agrees with the ICES assessment of the state of the stock and the advice for 2013.

STECF notes that this stock is managed by an effort management system and that no TAC is set. STECF also notes that a management plan based on MSY principles has been developed but not yet discussed by the political system. STECF notes that the proposed Faroese management plan is consistent with the ICES MSY approach.

7.2. Cod (*Gadus morhua*) in Vb2 (Faroe Bank cod)

FISHERIES: during the recent 10 years total catches for this stock have fluctuated between 4000 and 200 t. In the latest years EU landings have constituted 10-20% of the total. The EU fishery on this stock has been managed together with cod in VI, Vb (EC waters), International waters of XII and XIV.

Faroe Bank has been closed to fishing since 1 January 2009. However, in 2010 and 2011, respectively, a total of 61 and 100 fishing days were allowed to small longliners (<15 BRT) in the shallow waters of the Bank. Landings in 2010 and 2011 amounted to 105 t and 360 t respectively.

SOURCE OF MANAGEMENT ADVICE: The main management advisory body is ICES.

MANAGEMENT OBJECTIVES: There are no explicit management objectives for this stock.

REFERENCE POINTS: No reference points have been defined for this stock.

STOCK STATUS: There is no analytical assessment for this stock. Survey indices indicate that the stock is severely depleted.

RECENT MANAGEMENT ADVICE: New data on landings and indices from the two annual Faroese surveys (2011 summer, 2012 spring) do not change the perception of the stock since 2008 and do not give reason to change the advice from 2011. The advice for the fishery in 2013 is therefore the same as the advice given since 2008: “Because of the very low stock size ICES advises that the fishery should be closed. Reopening the fishery should not be considered until both survey indices indicate a biomass at or above the average of the period 1996–2002”.

STECF COMMENTS: STECF agrees with the ICES assessment of the state of the stock and the advice for 2013.

STECF notes that no TAC is set for this stock and that Faroe Bank has been closed to fishing since 1 January 2009. STECF notes that nevertheless 100 fishing days were allowed to small vessels in the shallow waters of the Bank in 2011 and agrees with ICES that the closure advice should apply to all fisheries.

7.3. Haddock (*Melanogrammus aeglefinus*) in area Vb (Faroe)

FISHERIES: Haddock are mainly caught in a directed longline fishery for cod and haddock and as by-catches in trawl fisheries for saithe. Normally, longline gears account for 80–90% of the catches. Landings are predominantly Faroese, with only low EU landings. Since 1993 total landings from Vb have increased from 4,000 t to 27,000 t in 2003 but have dropped to 5,197t in 2009. Total landings in 2010 were 5,198t and total landings in 2011 were 3,500 t (longliners accounted for 82% and trawlers for 18%).

An effort management system was implemented 1 June 1996. Fishing days are allocated to all fleets fishing in waters < 380 m depth for the period 1 September–31 August. In recent years only a fraction of the allocated number of fishing days has actually been utilized. In addition, the majority of the waters < ca. 200 m depth are closed to trawlers and are mainly utilized by longliners. The fishing law also prescribes fleet specific catch compositions of cod, haddock, saithe, and redfish.

SOURCE OF MANAGEMENT ADVICE: The management advisory body is ICES. The advice is based on an age-based assessment using commercial landings and age disaggregated data from two surveys. Discards were not included in the assessment but discarding is not considered to be a major problem in this fishery.

REFERENCE POINTS:

	<i>Type</i>	<i>Value</i>	<i>Technical basis</i>
MSY	MSY B_{trigger}	35 000	B_{pa}
Approach	F_{MSY}	0.25	Stochastic simulations.
Precautionary	B_{lim}	22 000 t	Lowest observed SSB.
	B_{pa}	35 000 t	$B_{\text{lim}} e^{1.645\sigma}$, with σ of 0.3.
Approach	F_{lim}	0.40	$F_{\text{pa}} e^{1.645\sigma}$, with σ of 0.3.
	F_{pa}	0.25	$F_{\text{med}}(1998) = 0.25$.

F_{MSY} and MSY B_{trigger} updated in 2012

MANAGEMENT AGREEMENTS: A management system based on number of fishing days, closed areas, and other technical measures were introduced in 1996 to ensure sustainable demersal fisheries in Division Vb. This was before ICES introduced precautionary approach (PA) and MSY reference values, and at that time it was believed that the purpose was achieved if the total allowable number of fishing days was set such that on average 33% of the haddock exploitable stock in numbers would be harvested annually. This translates into an average F of 0.45, above the F_{pa} and F_{MSY} of 0.25. ICES considers this to be inconsistent with the PA and the MSY approaches. Work is ongoing in the Faroes to move away from the F_{target} of 0.45 to be consistent with the ICES advice.

A group representing the Ministry of Fisheries, the Faroese industry, the University of the Faroe Islands, and the Faroe Marine Research Institute has developed a management plan based on general maximum sustainable yield (MSY) principles developed by ICES. The plan has not yet been discussed by the political system. This management plan includes a stepwise reduction of the fishing mortality to F_{MSY} in 2015 and a recovery plan if the SSB declines below the MSY $B_{trigger}$. The MSY $B_{trigger}$ has been defined at 35,000 t (the former B_{pa}) and F_{MSY} at 0.25. If the SSB declines below the MSY $B_{trigger}$, the fishing mortality will be reduced by the relationship $F_{MSY} * B_{act} / MSY B_{trigger}$ until the SSB has increased again above the MSY $B_{trigger}$ and is thereafter kept at F_{MSY} .

STOCK STATUS:

F (Fishing Mortality)				
	2009	2010	2011	
MSY (F_{MSY})	✓	✗	✗	Above target
Precautionary approach (F_{pa}, F_{lim})	✓	○	○	Increased risk

SSB (Spawning-Stock Biomass)				
	2010	2011	2012	
MSY ($B_{trigger}$)	✗	✗	✗	Below trigger
Precautionary approach (B_{pa}, B_{lim})	✗	✗	✗	Reduced reproductive capacity

SSB has decreased since 2003 and in 2012 it is estimated to be below B_{lim} . The fishing mortality has decreased from above F_{lim} in 2003 to just above F_{MSY} for the last 3 years. Year classes from 2003 onwards have all been well below the long-term average.

This year's assessment shows that the 2011 assessment overestimated the 2010 recruitment by around 30%, underestimated the fishing mortality in 2010 by 8%, and overestimated the 2010 total and spawning-stock biomasses by 15% and 12%, respectively.

RECENT MANAGEMENT ADVICE:

ICES advises that there should be no directed fishery on haddock in 2013. Measures should be put in place to minimize by-catches of haddock in other fisheries. A recovery plan should be developed and implemented as a prerequisite to reopening the directed fishery. This year's advice is based on the MSY approach.

Other considerations

MSY approach

Based on stochastic simulations MSY preliminary analyses suggested an $F_{MSY} = 0.25$. Work is still needed to confirm these analyses. Using this F_{MSY} value and given that SSB in 2013 is estimated below MSY $B_{trigger}$, fishing mortality should be reduced further. F in 2013 should be no more than $F_{MSY} * B_{2013} / MSY B_{trigger} = 0.15$.

PA approach

Given the recent poor recruitment and slow growth and the low SSB, the forecast indicates that even a zero fishing mortality in 2013 will not result in getting the stock above B_{lim} in 2014. There should therefore be no directed fishery on haddock. Measures should be put in place to minimize bycatches of haddock in other fisheries. A recovery plan should be developed and implemented as a prerequisite to reopening the directed fishery.

STECF COMMENTS: STECF agrees with the ICES assessment of the state of the stock and the advice for 2013.

STECF notes that the proposed Faroese management plan is consistent with the ICES MSY approach and if management is implemented in accordance with the proposed plan this would imply catches of 1,900 t in 2013.

7.4. Saithe (*Pollachius virens*) in Division Vb (Faroe saithe).

FISHERIES: Saithe are mainly caught in a directed trawl fishery (pair and single trawlers as well as jiggers), with bycatches of cod and haddock. Landings are predominantly Faroese (>95%), with only low EU landings. Landings have fluctuated between 20,000t and 60,000 t between 1965 and 2004. Since the record highest landings of 68,000 t in 2005, landings have dropped to 44,000 t in 2010. Total landings in 2011 were 29,000 t, of which 91% was taken by pair trawlers, 4.5% by single trawlers, and 3.6% by jiggers. Limited sampling in the blue whiting fishery in Faroese waters indicates that bycatches of saithe have been minor since the mandatory use of sorting grids was introduced from 15 April 2007 in the areas west and northwest of the Faroe Islands.

The management is by effort restrictions through individual transferable days introduced in 1996. The fishing law also prescribes area closures and fleet specific catch compositions of cod, haddock, saithe, and redfish.

SOURCE OF MANAGEMENT ADVICE: The management advisory body is ICES. The advice is based on an age-based assessment using commercial landings and age disaggregated data from pair trawlers series combined with survey data. There are no discards data, but discarding is not considered to be a major problem in this fishery.

REFERENCE POINTS:

	<i>Type</i>	<i>Value</i>	<i>Technical basis</i>
MSY	MSY B_{trigger}	55 000 t	Breakpoint in segmented regression.
Approach	F_{MSY}	0.28	Provisional stochastic simulations.
Precautionary	B_{lim}	Undefined	
	B_{pa}	55 000 t	B_{loss} in 2011.
Approach	F_{lim}	Undefined	
	F_{pa}	0.28	Consistent with 1999 estimate of F_{med} .

(Unchanged since 2011)

MANAGEMENT AGREEMENTS: A management system based on number of fishing days, closed areas, and other technical measures was introduced in 1996 to ensure sustainable demersal fisheries in Division Vb. This was before ICES introduced precautionary approach (PA) and MSY reference values, and at that time it was believed that the purpose was achieved if the total allowable number of fishing days was set such that on average 33% of the haddock exploitable stock in numbers would be harvested annually. This translates into an average F of 0.45, above the F_{pa} and F_{MSY} of 0.25. ICES considers this to be inconsistent with the PA and the MSY approaches.

Work is ongoing in the Faroes to move away from the F_{target} of 0.45 to be consistent with the ICES advice. A group representing the Ministry of Fisheries, the Faroe industry, the University of the Faroe Islands, and the Faroe Marine Research Institute has developed a management plan based on general maximum sustainable yield (MSY) principles developed by ICES. The plan has not yet been discussed by the political system. This management plan includes a stepwise reduction of the fishing mortality to F_{MSY} in 2015 and a recovery plan if the SSB declines below the MSY B_{trigger} . The MSY B_{trigger} has been defined at 55 kt (the former B_{pa}) and F_{MSY} at

0.28. If the SSB declines below the MSY $B_{trigger}$, the fishing mortality will be reduced by the relationship $F_{MSY} * B_{act}/B_{trigger}$ until the SSB has increased again above the MSY $B_{trigger}$ and is thereafter kept at F_{MSY} .

STOCK STATUS:

F (Fishing Mortality)				
	2009	2010	2011	
MSY (F_{MSY})	✗	✗	✗	Above target
Precautionary approach (F_{pa})	✗	✗	✗	Harvested unsustainably

SSB (Spawning-Stock Biomass)				
	2010	2011	2012	
MSY ($B_{trigger}$)	✓	✓	✓	Above trigger
Precautionary approach (B_{pa})	✓	✓	✓	Full reproductive capacity

SSB has decreased substantially since 2006 but remains above MSY $B_{trigger}$. Recruitment in 2011 was above average. Fishing mortality has decreased since 2009 and is above F_{MSY} .

SSB in 2010 and 2011 has been revised downwards by 35% and 40%, respectively, compared to last year's estimates. F in 2009 and 2010 has been revised upwards by 14% and 40%, respectively. The basis for the advice is the same as last year.

The potential for bias in commercial CPUE (for example hyper-stability) is a serious concern for shoaling species such as saithe. For this assessment, in addition to the pairtrawler CPUE, which is a measure of saithe density in its core area of distribution, the range of the spatial distribution of saithe was considered, using survey information, when constructing an abundance index for saithe. This approach is considered to reduce the bias. The assessment is very uncertain, with large revisions from year to year. Recruitment indices are only available from age 3 and this is a source of uncertainty in recent recruitment estimates and forecast.

RECENT MANAGEMENT ADVICE:

ICES advises on the basis of the MSY approach that effort should be reduced such that fishing mortality in 2013 will be no more than $F = 0.28$, corresponding to an 44% reduction in the present fishing mortality.

Other considerations

MSY approach

Following the ICES MSY framework implies that fishing mortality in 2013 should be no more than $F_{MSY} = 0.28$, resulting in a reduction of 44% in the present fishing mortality.

PA approach

Following the precautionary approach implies that fishing mortality in 2013 should be no more than $F_{pa} = 0.28$, resulting in a reduction of 44% in present fishing mortality.

STECF COMMENTS: STECF agrees with the ICES assessment of the state of the stock and the advice for 2013.

STECF notes that this stock is managed by an effort management system and that no TAC is set. STECF also notes that a management plan based on MSY principles has been developed but not yet discussed by the

political system. STECF notes that the proposed Faroese management plan is consistent with the ICES MSY approach.

8. WIDELY DISTRIBUTED AND ELASMOBRANCH RESOURCES

8.1. European eel (*Anguilla anguilla*)

The most recent advice for this stock was provided by ICES in 2011. Hence, the following text is based on that advice. Advice for 2013 will be provided in Part 3 of the STECF review of Advice for 2013 which will be available in November 2012.

FISHERIES: The European eel (*Anguilla anguilla* (L.)) is found and exploited in fresh, brackish and coastal waters in almost all of Europe, in northern Africa and in Mediterranean Asia. Eel fisheries are found throughout the distribution area. Fisheries are generally organised on a small scale (a few fishermen catching 1-5 tonnes per year) and involve a wide range of gears. The fisheries are managed on a national (or lower, regional or catchment) level. Landings peaked around 1965 at 40,000 tonnes, since when a gradual decline occurred to a level of 20,000 tonnes in the late 1990s, but throughout the decades, landing statistics cover only about half the true catches. Recent years show a rapid decline in reported catches, to below 10,000 tonnes. Recruitment remained high until 1980, but declined afterwards, to a level of only 2 % of former levels in 2001, and has remained low since. Aquaculture of wild-caught recruits (glass eel) has been expanding since 1980, in Europe as well as in eastern Asia (using European glass eel). Other anthropogenic factors (habitat loss, contamination and transfer of diseases) have had negative effects on the stock, most likely of a magnitude comparable to exploitation. In 2007, eel was included in CITES Appendix II that deals with species not necessarily threatened with extinction, but in which trade must be controlled in order to avoid utilization incompatible with their survival. The listing was due to become effective in March 2009.

SOURCE OF MANAGEMENT ADVICE: Management advice has been provided by ICES and FAO/EIFAC. The joint ICES/EIFAC working group is the main assessment body.

STOCK STATUS: The eel stock continues to decline in 2011. The glass eel recruitment trend has fallen to 5% of the 1960–1979 average in the Atlantic region and to less than 1% in the North Sea area, showing no sign of recovery.

Recruitment of young yellow eel has been declining continuously since the 1950s.

Stock indicators in the national eel management plans submitted in 2008 indicated that anthropogenic mortality was above the limit implied by EC Regulation No. 1100/2007 (EC, 2007). New data were not available, but it is anticipated that the 2012 reports to the EC will provide them.

Abundance of all stages of eel (glass eel, yellow eel, and silver eel) is at an historical minimum. The stock is in a critical state. In 2007, eel was included in CITES Appendix II that deals with species not necessarily threatened with extinction, but in which trade must be controlled to avoid utilization incompatible with the survival of the species (see <http://www.cites.org/eng/disc/how.shtml>). The listing was implemented in March 2009. Eel was listed in September 2008 as critically endangered in the IUCN Red List.

REFERENCE POINTS: Exploitation that leaves 30% of the virgin spawning-stock biomass is generally considered to be a reasonable target for escapement. Due to the uncertainties in eel management and biology, ICES proposed a limit reference point of 50% for the escapement of silver eels from the continent in comparison to pristine conditions (ICES, 2003). This is higher than the escapement of at least 40% “pristine” set by the EC Regulation for the escapement of silver eels. ICES has evaluated the conformity of country management plans with EC Regulation 1100/2007 (ICES Advice Reports 2009 and 2010, Technical Services), but it has not evaluated the consistency of the regulation itself with the precautionary approach. ICES will undertake such an evaluation based on country reports due in 2012 under EC Regulation 1100/2007.

MANAGEMENT OBJECTIVES: A management framework for eel was established in 2007 through an EC Regulation (EC No. 1100/2007; EC, 2007). The objective of this regulation is the protection, recovery, and sustainable use of the stock. To achieve the objective, Member States have developed eel management plans for their river basin districts, designed to reduce anthropogenic mortalities and increase silver eel biomass.

The objective of the national eel management plans is to provide, with high probability, a long-term 40% escapement to the sea of the biomass of silver eel, relative to the best estimate of the theoretical escapement in pristine conditions (i.e. if the stock had been completely free of anthropogenic influences). ICES has evaluated the conformity of the national management plans with EC Regulation No. 1100/2007 (ICES Advice Reports 2009 and 2010, Technical Services), but it has not evaluated the consistency of the regulation itself with the precautionary approach. ICES will undertake such an evaluation based on the national reports due in 2012 in accordance with EC Regulation No. 1100/2007 (EC, 2007).

A coordinated approach to planning, data workshops, and stock assessment is needed to take full advantage of the 2012 scheduled reporting by Member States on monitoring, effectiveness, and outcome of the national eel management plans. The subsequent statistical and scientific assessment will include an opinion by STECF as envisaged by the EU. Independent access to the raw data, biomass, and mortality estimates (see supporting information) provided by the Member States will be required to undertake the statistical and scientific assessments of the reliability and accuracy of the estimates.

RECENT MANAGEMENT ADVICE: The status of eel remains critical and urgent action is needed. ICES reiterates its previous advice that all anthropogenic mortality (e.g. recreational and commercial fishing, hydropower, pollution) affecting production and escapement of eels should be reduced to as close to zero as possible until there is clear evidence that both recruitment and the adult stock are increasing.

Given the current record-low abundance of glass eels, ICES reiterates its concern that glass eel stocking programmes are unlikely to contribute to the recovery of the European eel stock in a substantial manner. The overall burden of proof should be that stocking will generate net benefits, in terms of contributions to silver eel escapement and spawning potential. Prior to stocking, or for continuing existing stocking, a risk assessment should be conducted, taking into account fishing, holding, transport, post-stocking mortalities, and other factors such as disease and parasite transfers. To facilitate stock recovery all catches of glass eel should be used for stocking. Stocking should take place only where survival to the silver eel stage is expected to be high and escapement conditions are good. This means that stocking should not be used to continue fishing and stocking should only take place where all anthropogenic mortalities are low.

If suitable biomass and mortality data are reported by Member States in 2012 under the Council Regulation EC No. 1100/2007 (EC, 2007), ICES will use those to define and propose standard precautionary approach reference points.

STECF COMMENTS: STECF agrees with status of the stocks and the ICES advice.

8.2. Hake (*Merluccius merluccius*) in Division Vb (1), VI and VII, VIII and XII, XIV (Northern hake)

FISHERIES: Hake is caught in mixed fisheries together with megrim, anglerfish and *Nephrops*. Discards of juvenile hake can be substantial in some areas and fleets. An important increase in landings has occurred in the northern part of the distribution area (Division IIIa, and Subareas IV and VI) in recent years. Since the introduction of the high vertical opening trawls in the mid-1990s, no significant changes in fishing technology have been introduced. Landings have increased since 2006 and reached 73,100 t in 2010, the highest figure since 1973. There were insufficient data to update this information for 2011.

SOURCE OF MANAGEMENT ADVICE: The main management advisory body is ICES. The advice is based on a length-based assessment using commercial catch data and survey data. This stock was benchmarked in 2010. It was not possible to include Spanish commercial data for 2011 in the assessment. Therefore, the assessment model could not be updated this year. Projections for catch options and management advice for 2013 were based on the assessment conducted in 2011

REFERENCE POINTS:

	<i>Type</i>	<i>Value</i>	<i>Technical basis</i>
MSY	MSY B _{trigger}	Not defined	
Approach	F _{MSY}	0.24	F _{30%SPR}

Precautionary Approach	B_{lim}	Not defined	
	B_{pa}	Not defined	
	F_{lim}	Not defined	
	F_{pa}	Not defined	

MANAGEMENT AGREEMENT: A recovery plan was agreed by EU in 2004 (EC Reg. No. 811/2004). The aim of the plan was to increase the SSB to above 140 000 t with a fishing mortality (Fmgt) of 0.25, constrained by a year-to-year change in TAC of 15% when SSB is above 100,000 t. ICES have not evaluated the plan. At present (2011) the SSB is estimated to be above 140,000 t, but the reference points used as basis for that recovery plan are not considered valid anymore. The application of a new assessment method has, however, resulted in a change in the perception of the historical stock and the previous defined precautionary reference points, on which the recovery plan is based, are no longer appropriate.

A proposal for a long-term plan has been put forward by the EU in 2009 (COM(2009) 122 final). The aim of the proposal is to reach maximum sustainable yield.

STOCK STATUS:

F (Fishing Mortality)				
	2009	2010	2011	
MSY (F_{MSY})				Not available
Precautionary approach (F_{pa}, F_{lim})				Not available

SSB (Spawning-Stock Biomass)				
	2010	2011	2012	
MSY ($B_{trigger}$)				Not available
Precautionary approach (B_{pa}, B_{lim})				Not available
Qualitative evaluation				Above poss. reference points

No assessment has been carried out in 2012. The stock status is based on last year's assessment. The spawning-stock biomass has been increasing since 1998 and is estimated to be record high in 2011. Fishing mortality has been decreasing in recent years, but is still above FMSY. Recruitment fluctuations appear to be without substantial trend over the whole series. After several high recruitments in 2006 to 2008, the two most recent recruitments (2009 and 2010) are estimated to be low.

RECENT MANAGEMENT ADVICE:

ICES advises on the basis of the transition to the MSY approach that landings in 2013 should be no more than 45 400 t.

Other considerations

MSY approach

The stock is considered to be above any potential MSY Btrigger. Following the ICES MSY framework implies fishing mortality should be reduced to 0.24, resulting in landings of 37 200 tonnes in 2013. This is expected to lead to an SSB of 142 000 tonnes in 2014.

Following the transition scheme towards the ICES MSY framework implies fishing mortality should be reduced to 0.30, corresponding to landings of 45 400 tonnes. This is expected to lead to an SSB of 133 400 tonnes in 2014.

Management plan(s)

The current recovery plan (EC Reg. No. 811/2004) uses target values based on precautionary reference points that are no longer appropriate.

STECF COMMENTS: STECF agrees with the ICES assessment of the state of the stock and the advice for 2013. STECF also agrees with ICES that effective measures to reduce discarding are also needed, given the substantial discards of juvenile hake in some areas and fleets.

STECF notes that in the absence of Spanish commercial data for 2011 (account for about 60% of the international catches), the ICES advice is based on an assessment undertaken in 2011 and a projection based on assumptions on fishing mortality and recruitment for 2011 and 2012. As a result, there is a greater uncertainty on the predicted catches for 2013.

8.3. Boarfish (*Capros aper*) in the Northeast Atlantic

The most recent advice for this stock was provided by ICES in 2011. Hence, the following text remains unchanged from the Consolidated STECF Review of Advice for 2012. Advice for 2013 will be provided in Part 3 of the STECF review of Advice for 2013 which will be available in November 2012.


FISHERIES: Fisheries for boarfish are conducted with pelagic trawls, and the catches are used for reduction to fish meal and oil. Most landings (~88%) come from Division VIIj. The recent expansion of the fishery was enabled by developments in the pumping technology for boarfish catches. These changes made it easier to pump boarfish ashore. The number of vessels in the fishery has been increasing, although the recent introduction of a TAC is expected to limit further effort expansion.


SOURCE OF MANAGEMENT ADVICE: The main body for management advice is ICES.

REFERENCE POINTS: No reference points are defined for this stock.

MANAGEMENT AGREEMENT: There are no current management agreements.

STOCK STATUS:

F (Fishing Mortality)	
	2008–2010
Qualitative evaluation	 No overfishing

SSB (Spawning-stock Biomass)	
	2008–2010
Qualitative evaluation	 Insufficient information

No analytical assessment is currently possible. Preliminary analyses suggest that fishing mortality is less than natural mortality, and that the stock is relatively large and widely distributed. Survey data suggests that recruitment has increased since 2005.

RECENT MANAGEMENT ADVICE: This is the first time that ICES has provided advice for boarfish. Based on precautionary considerations, ICES advises that catches in 2012 should not be allowed to increase.

Other considerations

Precautionary considerations

Based on precautionary considerations, ICES advises that catches in 2012 should not be allowed to increase.

Management considerations

During the period 2008–2010 boarfish do not appear to have been overfished. However, landings have increased rapidly during these years, reaching almost 140 000 tonnes in 2010. As information on the exploitation of boarfish is preliminary, it would be cautious for catches not to increase above the average of landings (82 000 t) recorded during that period.

In 2010 an interim management plan, proposed by Ireland, included a number of measures to mitigate potential bycatch of other TAC species in the boarfish fishery. A closed season from 15 March to 31 August was proposed, as anecdotal evidence suggested that mackerel and boarfish are caught in mixed aggregations during this period. A closed season was proposed in Division VIIg from 1 September to 31 October to prevent catches of Celtic Sea herring, known to form feeding aggregations in this region at these times. If catches of a species other than boarfish but covered by TAC, totaled more than 5% of the total catch, by day and by ICES statistical rectangle, then fishing must cease in that rectangle.

The precautionary 2011 TAC of 33 000 t for boarfish covered ICES Subareas VI, VII, and VIII. Bottom trawl survey data suggests a continuity of distribution spanning ICES Subareas V, VI, VII, and VIII. Isolated small occurrences appear in the North Sea (ICES Subarea IV) in some years. An examination of Portuguese groundfish survey data indicated that boarfish are mostly distributed in the southwest of Portugal, with only rare occurrences in the northern parts. This suggests a potential discontinuity of the distribution of the species between ICES Division VIIIc and the southern part of Division IXa. Based on these results, a single stock is considered to exist in ICES Subareas IV, V, VI, VII, and VIII, a broader area than that covered by the current EU TAC.

Regulations and their effects

In 2010, the European Commission notified member states that the mesh sizes of less than 100 mm were illegal and that fisheries for boarfish should not be prosecuted with mesh sizes of less than 100 mm. However, in 2011, the European Parliament voted to change Regulation 850/1998 to allow fishing for boarfish using mesh sizes ranging from 32 to 54 mm.

FISHING OPPORTUNITIES FOR 2012 according to COM(2011) 298-Final.

STECF notes that with reference to COM(2011) 298-final this stock is classified under category 3.

STECF COMMENTS: STECF agrees with the ICES assessment of the state of the stock and notes that there is at present no objective means of determining an appropriate catch level. ICES has advised that catches should not be allowed to increase and in its management considerations has suggested that it would be cautious for catches not to increase above the average of landings (82,000 t) recorded during the period 2008-2010. STECF notes that because the TAC for 2011 (33,000 t) is below this proposed threshold a further reduction in the TAC in 2012 would seem to be unnecessary for a newly developed fishery showing no signs of impaired recruitment.

8.4. Spurdog (*Squalus acanthias*) in the North East Atlantic

The most recent advice for this stock was provided by ICES in 2011. Hence, the following text remains unchanged from the Consolidated STECF Review of Advice for 2012. Advice for 2013 will be provided in Part 3 of the STECF review of Advice for 2013 which will be available in November 2012.

FISHERIES: Spurdog is a relatively small (<120 cm TL), widely distributed species occurring throughout the ICES area, and also widespread in the NW Atlantic, SW Atlantic and parts of the Pacific (although there is evidence that populations in the NE Pacific are a separate species). Spurdog is one of the most important

commercial elasmobranchs, with catches in directed and by-catch fisheries. There have been directed longline and gillnet fisheries in IIa, IVa, VIa, VIIa and VIIb-k and there are by-catches from demersal otter trawl, gillnet and seine fisheries throughout the range of the stock.

The main fishing grounds for Spurdog are: Norwegian Sea (ICES Sub-area II); North Sea (ICES Sub-area IV); NW Scotland (ICES Sub-area VI) and the Celtic Sea (ICES Sub-area VII). Some landings are also from the Skagerrak and Kattegat (ICES Sub-area IIIa) and Iceland (ICES Sub-area V). Spurdog is also taken in small quantities in the Bay of Biscay (ICES Sub-area VIII) and off Greenland. These last areas are considered to be outside the main area of the North East Atlantic stock, which is considered to be separate from the North West Atlantic stock.

Currently, spurdog is caught primarily by trawlers, gillnetters and (seasonally) by inshore longliners. The larger autoliners that previously targeted spurdog no longer longline for spurdog. Most spurdog are now taken as by-catch in otter trawls, seines and gillnets targeting whitefish, although some inshore fisheries may have had small-scale, local and seasonal directed fisheries for this species prior to the zero TAC.

In the UK (E&W), just over 50% of spurdog landings were taken in line and net fisheries in 2006, with most landings coming from Sub-area VII and in particular from the Irish Sea. About 45% of the Scottish landings originate from demersal trawl fisheries and less than 30% of the Irish landings come from the gill nets and line fisheries.

Landings of this species remain difficult to quantify due to differences in the level to which they are identified in national landing statistics. Landings which are specifically identified as *S. acanthias* probably represent a minimum estimate, while a maximum estimate includes categories such as “Squalidae”, “dogfish” or “dogfish and hounds” which may include a number of other species (eg. deep-water squaloids, spotted dogfish, smooth-hounds and tope). The landings of spurdog, although not complete, show a marked decline since the mid-1980s. Up to 60,000t were landed annually in the early 1960s, landings averaged about 35,000t throughout the 1980s, then steadily declined to an average of about 15,000t by the late 1990s. The landings for 2005 were reported to be as low as 5600t and for 2006 at about 3000t, the lowest observed on record.

A TAC was introduced for the EU waters of Subarea IV and Division IIa in 1999. This TAC was reduced from 8870t in 2001 to 1051t in 2006. A by-catch quota of 841t was set in 2007 for IIa (EC) and IV, and at this time spurdog should not have comprised more than 5 % by live weight of the catch retained on board. A TAC (of 2828 t) for I, IIIa, V, VI, VII, VIII, XII and XIV was set for the first time in 2007, but this was subsequently altered to 2004 t covering only areas I, V, VI, VII, VIII, XII and XIV in 2008. In 2008 there was no TAC for Division IIIa. The TAC for 2010 was set at zero, but with an allowance for bycatches of up to 10% of the 2009 quotas to be landed, as long as the maximum landing length of 100 cm (total length) was respected, and that bycatch comprised less than 10% of the total weight of marine organisms on board the fishing vessel. The bycatch allowance was removed in 2011, and this has resulted in increased discarding of spurdog, of which an unknown proportion is dead.

Norway has a 70-cm minimum landing size, but this measure would not facilitate reducing the exploitation of mature females. In 2007 Norway also introduced a general ban on fishing and landing of spurdog in the Norwegian economic zone and in international waters in ICES areas I-XIV. However, boats less than 28m in length are allowed to fish for spurdog with traditional gears in inshore, territorial waters (within the 4 nm). Spurdog caught as by-catch in other fisheries have to be landed and the Norwegian Fiskeridirektoratet is allowed to stop the fishery when catches reach the last year’s level. In 2004, Germany proposed to the EU that spurdog should be listed under Appendix II of CITES (i.e. so that nations involved in the import/export trade would have to show that the harvesting and utilization was sustainable). Sweden recently added spurdog to their national Red List and since April 2011 landings of spurdog are not allowed for either the commercial or recreational fisheries.

SOURCE OF MANAGEMENT ADVICE: The main advisory body is ICES. Assessment is an age-length and sex structured model.

REFERENCE POINTS:

	Type	Value	Technical basis
MSY	MSY B _{trigger}	Not defined.	

Approach	MSY exploitation ratio	0.029	Catch as a proportion of the total biomass, assuming average selection over the last three years, reflecting a non-target selection pattern.
Precautionary Approach	B_{lim}	Not defined.	
	B_{pa}	Not defined.	
	F_{lim}	Not defined.	
	F_{pa}	Not defined.	

STOCK STATUS:

F (Fishing Mortality)			
	2008	2009	2010
MSY Exploitation Ratio			Below target
Precautionary approach (F_{pa}, F_{lim})			Undefined

SSB (Spawning-stock Biomass)			
	2009	2010	2011
MSY ($B_{trigger}$)			Undefined
Precautionary approach (B_{pa}, B_{lim})			Undefined
Qualitative evaluation			Below poss. reference points

The stock has suffered a historical high fishing mortality for more than four decades. The spawning biomass and recruitment have declined substantially over the past decades and are currently the lowest observed while exploitation is estimated to be below the MSY exploitation ratio.

RECENT MANAGEMENT ADVICE:

ICES advise on the basis of the precautionary approach that there should be no targeted fishery and that catches in mixed fisheries should be reduced to the lowest possible level. A rebuilding plan should be developed for this stock.

Additional considerations

Outlook for 2012

No short-term forecast is presented for this stock.

Management plans

No management plans are currently in place.

MSY considerations

Fishing mortality appears to have reduced below the MSY exploitation ratio in recent years. However, given the very low spawning biomass, recruitment, and productivity of the species it is not possible to identify any non-zero catch which would be compatible with the MSY approach.

PA considerations

Given that Spurdog spawning biomass and recruitment are currently the lowest observed and that Spurdog is a long-lived, slow-growing, and late-maturing species and therefore particularly vulnerable to fishing mortality, ICES advises on the basis of the precautionary approach that there should be no targeted fishery in 2012 and that catches in mixed fisheries should be reduced to the lowest possible level.

The stock currently appears stable at a low level, but the recent period of stability is short compared to the longevity of the species. Given this longevity, stock recovery will be slow.

Other considerations:

Historically Spurdog were subjected to large targeted fisheries but were also taken as a bycatch in mixed trawl fisheries. An EC TAC covering the entire stock range, was introduced in 2007 and was progressively reduced, and in 2011 TAC=0. Discarding of Spurdog has increased with increasingly restrictive TACs.

In 2009, a maximum landings length of 100 cm was introduced. There are no estimates of discard survival. However some individuals do survive although the proportion surviving varies considerably depending on a number of factors (e.g. size of catch, catching method, time on deck, etc.).

A rebuilding plan is needed for this stock. Rebuilding measures should incorporate biomass targets and rebuilding timelines.

Because of the number of assumptions made within the assessment model uncertainty is likely to be underestimated. Estimates of total landings of Northeast Atlantic Spurdog have been used, together with UK length-frequency distributions. However there are still concerns over the quality of the data as a consequence of (a) uncertainty in the historical level of catches because of misreporting and generic landing categories, (b) lack of commercial length-frequency information for countries other than the UK, and (c) lack of discard information. In addition survey data examined should be extended to cover the whole stock. Future assessments require updated and validated growth parameters (particularly for larger individuals) and better estimates of natural mortality.

FISHING OPPORTUNITIES FOR 2012 according to COM(2011) 298-Final:

STECF notes that with reference to COM(2011) 298-final this stock is classified under category 3.

STECF COMMENTS: STECF agrees with the ICES advice and notes that any rebuilding plan will require that there is no resumption of a target fishery, and that bycatch is restricted to close to zero for a number of years. Given the longevity and productivity of spurdog, any rebuilding plan will require several decades.

STECF further notes that setting a zero TAC will inevitably result in discards of incidental catches of spurdog, a proportion of which will be discarded dead. Nevertheless, STECF considers that a zero TAC is likely to deter any directed fishery for spurdog and is likely to reduce the exploitation rate on this species.

8.5. Basking shark (*Cetorhinus maximus*) in the North East Atlantic

The most recent advice for this stock was provided by ICES in 2011. Hence, the following text remains unchanged from the Consolidated STECF Review of Advice for 2012. Advice for 2013 will be provided in Part 3 of the STECF review of Advice for 2013 which will be available in November 2012.

FISHERIES: According to WGEF, a single stock of basking sharks *Cetorhinus maximus* exists in the ICES area. There is no information on transatlantic migrations. A genetics study underway in the UK aims to differentiate distinct stocks globally. They are known to congregate in areas with a high zooplankton biomass (e.g. fronts) and, therefore, may be locally important, but the locations of these areas are variable.

Biological data are limited, although all lamniform sharks have a very low fecundity and late age at maturity and they are likely to be sensitive to fishing mortality.

There have been directed fisheries for this species by Ireland, the UK, and Norway. The last directed fishery was that of Norway, and was prosecuted in II, IV, VI and VII. The Norwegian fleet has prosecuted local

fisheries from the Barents Sea to the Kattegat, as well as more distant fisheries ranging across the North Sea and as far as the south and west of Ireland, Iceland and Faeroe. The geographical and temporal distribution of the Norwegian domestic basking shark fishery changes markedly from year to year. Recent studies have highlighted the important role that oceanographic conditions can play in affecting basking shark distribution.

Since the mid-1940s, catches have varied considerably. In the late 1970s catches were about 10000t, in early 1980s about 4000t and in recent years a serious decline has been registered with catches ranging between 77t and 293t in the last eight years. Catches in 2005 were 221t and in 2006 16t (Norwegian by-catch) which was considerably less than in 2005. It is not known whether this decrease is related to marked price reductions, or that the release of live specimens has increased, or because actual abundance has declined.

Limited quantitative information exists on basking shark discarding in non-directed fisheries. However, anecdotal information is available indicating that this species is caught in gillnet and trawl fisheries in most parts of the ICES area. Most of this by-catch takes place in the summer months as the species moves inshore. The total extent of these catches is unknown. The requirement for EU fleets to discard all basking sharks caught as by-catch means that information cannot be obtained on these catches. A better protocol for recording and obtaining scientific data from by-catches is necessary for assessing the status of the stock.

Since 2006, there is no targeted fishery for basking sharks in Norway, UK or Ireland. Based on ICES advice, Norway banned all directed fisheries for basking shark in 2006, but dead or dying by-catch specimens can be landed and sold as before. The basking shark has been protected from killing, taking, disturbance, possession and sale in UK territorial waters since 1998. In Sweden it is forbidden to fish for or to land basking shark. Since 2002, there has a complete ban on the landings of basking shark from within the EU waters of ICES Sub-areas IV, VI and VII (Annex ID of Council Regulation (EC) 2555/2001). Since 2007, the EU has prohibited fishing for, retaining on board, transshipping or landing basking sharks by any vessel in EU waters or EU vessels fishing anywhere (Council regulation (EC) No 41/2006).

Basking shark was listed on Appendix II of the Convention on International Trade in Endangered Species (CITES) in 2002, on Appendices I and II of the Convention on the Conservation of Migratory Species (CMS) in 2005, on Annex I, Highly Migratory Species, of the UN Convention on the Law of the Sea (UNCLOS) and on the OSPAR (Convention on the protection of the marine environment of the north-east Atlantic) list of threatened and/or declining species in 2004.

SOURCE OF MANAGEMENT ADVICE: The main advisory body is ICES. There is no assessment of this stock. The evaluation is based on landings data and anecdotal information.

REFERENCE POINTS:

	<i>Type</i>	<i>Value</i>	<i>Technical basis</i>
MSY	MSY $B_{trigger}$	Not defined	
Approach	F_{MSY}	Not defined	
Precautionary	B_{lim}	Not defined	
	B_{pa}	Not defined	
Approach	F_{lim}	Not defined	
	F_{pa}	Not defined	

(unchanged since: 2010)

STOCK STATUS:

F (Fishing Mortality)

	2007	2008	2009
F_{msy}		?	
F_{pa} / F_{lim}		?	

SSB (Spawning Stock Biomass)			
	2008	2009	2010
$MSY B_{trigger}$?	
B_{pa} / B_{lim}		?	

No population estimate or fishery-independent survey information are available. Reference points cannot be defined.

Available landings and anecdotal information suggest that the stock is severely depleted.

RECENT MANAGEMENT ADVICE:

Management Objective (s)	Landings in 2011 and 2012
Transition to an MSY approach with caution at low stock size	TAC = 0. Retain on prohibited species list.
Cautiously avoid impaired recruitment (Precautionary Approach)	TAC = 0
Cautiously avoid impaired recruitment and achieve other objective(s) of a management plan (e.g., catch stability)	n/a

Outlook for 2011-2012

No reliable assessment can be presented for this stock. This is because of lack of data.

MSY approach

Given the international conservation status of this species, MSY is not considered to be a suitable target.

Policy paper

In the light of the EU policy paper on fisheries management (17 May 2010, [COM\(2010\) 241](#)) this stock is classified under category 10. The resulting TAC would be 0 t.

FISHING OPPORTUNITIES FOR 2012 according to COM(2011) 298-Final: STECF notes that with reference to COM(2011) 298-final this stock is classified under category 3.

STECF COMMENTS: STECF agrees with the ICES advice.

8.6. Tope (*Galeorhinus galeus*) in the North East Atlantic

The most recent advice for this stock was provided by ICES in 2011. Hence, the following text remains unchanged from the Consolidated STECF Review of Advice for 2012. Advice for 2013 will be provided in Part 3 of the STECF review of Advice for 2013 which will be available in November 2012.

FISHERIES: There are no currently no targeted commercial fisheries for tope in the North East Atlantic, though they are taken as a by-catch in trawl, gillnet and longline fisheries, including demersal and pelagic set gears. Though tope are discarded in some fisheries, due to their low market value, other fisheries land this species as by-catch. Tope is also an important target species in recreational sea angling and charter boat fishing in several areas, with most anglers and angling clubs following catch and release protocols. Landings data are

limited, as landings data are often included as “dogfishes and hounds” (DGH). Nevertheless, England and France have some species-specific landings data, and there are also limited data from Denmark, Ireland, Portugal and Spain in recent years. Many of the reported landings are from the English Channel, Celtic Sea and northern Bay of Biscay. Tope is also caught in Spanish fisheries in the western Cantabrian Sea (Galicia), where about 80% of the landings are from longline vessels, with the remainder from trawl and small gillnets. Tope is also reported in the catches off mainland Portugal, and are an important component of Azorean bottom long line fisheries. Tope are also caught in offshore long-line fisheries in this area. There were no major changes in the fishery noted since 2006. It has been suggested that there may be a greater retention of tope in some UK inshore fisheries operating in ICES Division IVc, as a result of by-catch limits on skates and rays, although no data are currently available to verify it.

Landings were increased since 1992 until 2002 (from 427t to 798t), then dropped to 372t in 2005. In 2006 landings were 497t. The degree of possible mis-reporting or under-reporting is not known. Landings indicate that France is one of the main nations landing tope. The United Kingdom also land tope, though species-specific data are not available prior to 1989. Since 2001, Ireland, Portugal and Spain have also declared species-specific landings, though recent data were not available for Spanish fisheries. Though some discards information is available from various nations, data are limited for most nations and fisheries. The available data (England and Wales) indicated that juvenile tope tend to be discarded in demersal trawl fisheries, though larger individuals are usually retained, with tope caught in drift and fixed net fisheries usually retained.

SOURCE OF MANAGEMENT ADVICE: The main recent source of information is ICES. However no species specific management advice is given.

REFERENCE POINTS: No precautionary reference points have been agreed for tope in the Northeast Atlantic.

STOCK STATUS: Stock structure is unknown. No assessment was undertaken, due to insufficient data. WGEF considers that there is a single stock of tope in the ICES area, with the centre of the distribution ranging from Scotland and southern Norway southwards to the coast of north-western Africa and Mediterranean Sea. Hence, the North East Atlantic tope stock covers the ICES Area (II–X), Mediterranean Sea (Subareas I–III) and northern part of the CECAF area, and any future assessment of the Northeast Atlantic tope stock may need to be undertaken in conjunction with the General Fisheries Commission for the Mediterranean (GFCM) and Fishery Committee for the Eastern Central Atlantic (CECAF). The stock unit identified by WGEF was based on published tagging studies which clearly indicate that tagged fish move widely throughout the North East Atlantic. Tope is listed in the UK Biodiversity priority list and is classified as Vulnerable in the IUCN Red data List.

RECENT MANAGEMENT ADVICE: There is no species specific management advice for Tope in the North East Atlantic. However ICES considers that tope is highly vulnerable to over-exploitation, as they have low population productivity, relatively low fecundity and protracted reproductive cycle. Unmanaged, targeted fisheries elsewhere in the world have resulted in stock collapse (e.g. off California and in South America).

FISHING OPPORTUNITIES FOR 2012 according to COM(2011) 298-Final.

STECF notes that with reference to COM(2011) 298-final this stock is classified under category 3.

STECF COMMENTS: STECF has no comment.

8.7. Porbeagle (*Lamna nasus*) in the North East Atlantic

The most recent advice for this stock was provided by ICES in 2011. Hence, the following text remains unchanged from the Consolidated STECF Review of Advice for 2012. Advice for 2013 will be provided in Part 3 of the STECF review of Advice for 2013 which will be available in November 2012.

FISHERIES: Porbeagle is a highly migratory and schooling species. Sporadic targeted fisheries develop on these schools. Porbeagle fisheries have been highly profitable. The main countries catching or having caught porbeagles are Spain and France. However in the past, important fisheries were prosecuted by Norway, Denmark and the Faeroe Islands.

The only regular, target fishery that still exists is the French fishery. Several countries have sporadic fisheries taking porbeagles (which also takes occasional tope and blue sharks), in the North Sea, west of Ireland and

Biscay, as they appear. These include Denmark, UK, and French vessels fishing to the south and west of England. There is a by-catch by demersal trawlers from many countries, including Ireland, UK, France and Spain.

SOURCE OF MANAGEMENT ADVICE: The main recent source of information and advice on porbeagle in the Northeast Atlantic is ICES. There is no fishery-independent information on this stock. Landings data for porbeagle may be reported as porbeagle, or as ‘various sharks nei’ in the official statistics. This means that the reported landings of porbeagle are likely to be an underestimation of the total landing of the species from the NE Atlantic. ICCAT is responsible for the management of this species in the tuna fisheries.

REFERENCE POINTS:

	<i>Type</i>	<i>Value</i>	<i>Technical basis</i>
MSY Approach	MSY $B_{trigger}$	Not defined	
	F_{MSY}	Not defined	
Precautionary Approach	B_{lim}	Not defined	
	B_{pa}	Not defined	
	F_{lim}	Not defined	
	F_{pa}	Not defined	

(unchanged since: 2010)

STOCK STATUS:

F (Fishing Mortality)			
	2007	2008	2009
F_{msy}	?	?	?
F_{pa} / F_{lim}		?	

SSB (Spawning Stock Biomass)			
	2008	2009	2010
MSY $B_{trigger}$?	
B_{pa} / B_{lim}		?	

The fisheries in the Northern part of the stock area have ceased and have not resumed. Before quotas were put in place, if porbeagle were present in sufficient numbers to support a fishery, a fishery would have developed. The fact that no fishery developed can be considered as a sign that the stock had not recovered from its previous low

numbers. However, in the absence of any quantitative data to demonstrate stock recovery, and in regard of this species' low reproductive capacity, the stock is probably still depleted.

Porbeagle is subject to the UN agreement on highly Migratory Stocks and the UK Biodiversity priority list. In IUCN, porbeagle is classified as Vulnerable for the depleted unmanaged population in the northeast Atlantic, and Lower Risk (conservation dependent) for the northwest Atlantic, in recognition of the introduction of the US and Canadian Fisheries Management Plans (IUCN 2000).

RECENT MANAGEMENT ADVICE:

Management Objective (s)	Landings in 2011 and 2012
Transition to an MSY approach with caution at low stock size	TAC = 0
Cautiously avoid impaired recruitment (Precautionary Approach)	TAC = 0
Cautiously avoid impaired recruitment and achieve other objective(s) of a management plan (e.g., catch stability)	n/a

Given the state of the stock, no targeted fishing for porbeagle should be permitted and by-catch should be limited. Landings of porbeagle should not be allowed.

Porbeagles are particularly vulnerable to fishing mortality, because the population productivity is low (long-lived, slow growing, high age-at-maturity, low fecundity, and a protracted gestation period) and they have an aggregating behaviour. In the light of this, risk of depletion of reproductive potential is high. It is recommended that exploitation of this species should only be allowed when indicators and reference points for stock status and future harvest have been identified and a management strategy, including appropriate monitoring requirements has been decided upon and is implemented.

Outlook for 2011-2012

Exploratory assessments conducted in 2009 and 2010 were not considered a basis for advice.

MSY approach

There is no assessment available to alter the perception of the depleted nature of the stock. Therefore there is no non-zero catch option that is compatible with the ICES MSY framework.

PA approach

ICES reiterates the precautionary advice it gave in 2008, for 2009 and for 2010 that “given the state of the stock, no targeted fishing for porbeagle should be permitted and bycatch should be limited and landings of porbeagle should not be allowed.”

Policy paper

In the light of the EU policy paper on fisheries management (17 May 2010, [COM\(2010\) 241](#)) this stock is classified under category 6. This implies a TAC=0 in 2011 and in 2012.

FISHING OPPORTUNITIES FOR 2012 according to COM(2011) 298-Final.

STECF notes that with reference to COM(2011) 298-final this stock is classified under category 3.

STECF COMMENTS: STECF agrees with the ICES advice.

STECF also agrees with ICES that it should be a requirement for all countries to document all incidental by-catches of this species.

STECF also notes that the data used by ICES and ICCAT are not identical and therefore may lead to slightly different perceptions of the stock status. STECF stresses that compiling the datasets for the various fisheries separately is essential to provide the best possible assessment of the state of the stock.

9. DEEPWATER RESOURCES

General comments and description of the fisheries for deepwater resources

The term ‘deep-water’ is defined by ICES to include waters of depths greater than 400 m. Deep water in the ICES area covers the deep parts of ICES Sub-areas I, II, III, V-X, XII, and XIV. However, some of the species included as deep-water species in the management advice by ICES are also distributed in more shallow waters, e.g. ling and tusk. Other species/stocks, which have similar depth distributions, e.g. anglerfish and Greenland halibut, are already assessed by ICES in area-specific assessment working groups.

Deep-water covers a huge area from the Arctic north to the sub-tropical south. It also covers ridges and underwater seamounts often with a quite unique biology. Productivity is very low in the deep-water. The diversity of deep-water life history strategies is considerable, but some species of fish targeted by fisheries are particularly vulnerable to disturbance because they grow slowly, mature late in life, and form aggregations easily accessible to fisheries. Recovery rates are much slower than in shallower waters. The knowledge of central biological characteristics such as stock identity, migration, recruitment, growth, feeding, maturation, and fecundity of most deep-water species still lags considerably behind that of commercially exploited shelf-based species. Such information is required to expand our understanding of the population dynamics of deep-water fishes, which in turn is required to underpin stock assessments.

Fisheries data including length and age compositions, discards, and cpue, are slowly increasing for deep-water stocks but time-series data are often short and are not available in sufficient spatial resolution for some stocks e.g. orange roughy and alfonosinos. VMS data are not readily available for most fleets.

In many cases, information on stock structure of deep-water species is lacking. However, in general assessment data are improving for several stocks/species. For instance this year (2012), ICES provides advice on tusk (*Brosme brosme*) in Va (Icelandic waters) and XIV based on an analytical assessment of the stock in Va. Also assessment data for Silver smelt and Roundnose Grenadier stocks seem to have improved. but for the majority of deep water species there is still no conclusive information on stock structure. In those cases “management units” have been used that have previously been suggested on the basis of distribution, life history and biological parameters, and bathymetrical considerations.

Fisheries on deep-water species have developed rapidly and the resources they exploit are generally especially vulnerable to over-fishing. Within the ICES area species/stocks have been depleted before appropriate management measures have been implemented e.g. orange roughy. It is also of concern that the landings statistics available may not reflect the true scale of the recent fishing activity, especially in waters outside national EEZs.

Following the classification of stock types suggested by ICES WKLIFE the overview table given below shows the most recent classification of the deep-sea stocks covered by ICES.

Code	Stock name	Category	Comment
lin-comb	Ling (<i>Molva molva</i>) in the Northeast Atlantic (I and II)	4	Norwegian cpue series. Nominal commercial cpue available (2000-2011) and reliable for trends . Age available for 2 years. Reliable catch data back to 1940s.
lin-comb	Ling (<i>Molva molva</i>) in the Northeast Atlantic (Va)	3	GADGET assessment has not previously been used as a basis for advice. The model has been further developed in 2012 and now estimates possible BRP. If these are accepted the stock could be considered in category 1. Previously, the stock has been assessed on survey trends (Icelandic Spring survey)
lin-comb	Ling (<i>Molva molva</i>) in the Northeast Atlantic (Vb)	4	Commercial standardised cpue series for Faroese longliners (1986-2011), Norwegian longliners (2000-2011), Faroese spring and summer surveys standardised cpue (1996-2011).
lin-comb	Ling (<i>Molva molva</i>) in the Northeast Atlantic (other areas)	4	Norwegian longline CPUE (2000-2011). Other series considered to be less informative due to low catches
bli-comb	Blue ling (<i>Molva dypterygia</i>) in the Northeast Atlantic (Vb, VI, VII and XIIb)	3	Production model (SRA) and age based model (MYCC) assessment has not previously been used as a basis for advice. The model has been further developed in 2012 and now estimates possible BRP. If these are accepted the stock could be considered in category 1. Previously, the stock has been assessed on trends (reliable series include Standardised French tally book lpue, logbook lpue, mean length in landings).
bli-comb	Blue ling (<i>Molva dypterygia</i>) in the Northeast Atlantic (Va, XIV))	3	GADGET assessment has not previously been used as a basis for advice. Previously, the stock has been assessed on survey trends (Icelandic Autumn survey).

Code	Stock name	Category	Comment
bli-comb	Blue ling (<i>Molva dypterygia</i>) in the Northeast Atlantic (other areas)	6	
usk-arct	Tusk in Subareas I and II (Arctic)	4	Norwegian cpue series. Nominal commercial cpue available (2000-2011) and reliable for trends. Reliable catch data back to 1940s.
usk-Ice	Tusk in Division Va	1	Gadget – benchmarked assessment using Iceland spring survey
usk-mar	Tusk in Division XIIb (Mid Atlantic Ridge)	7	Several years without catches, no CPUE, no survey, very small bycatch in mixed fishery (<300 tonnes in 20 years)
usk-rock	Tusk in Division VIb (Rockall)	4	Norwegian cpue series. Nominal commercial cpue available (2000-2011) and reliable for trends. Reliable catch data back to 1940s.
usk-oth	Tusk in Divisions IIIa, Iva, Vb, VI, VII, VIII, IX and XIIa (other areas)	4	Norwegian cpue series. Nominal commercial cpue available (2000-2011) and reliable for trends. Reliable catch data back to 1940s. Commercial standardised cpue series for Faroese longliners (1986-2011), Faroese spring and summer surveys standardised cpue (1996-2011).
arg-comb	Greater Silver Smelt (<i>Argentina Silus</i>) in the Northeast Atlantic (Va)	3	GADGET assessment has not previously been used as a basis for advice. Previously, the stock has been assessed on survey trends (Icelandic Autumn survey 2000-2010).
arg-comb	Greater Silver Smelt (<i>Argentina Silus</i>) in the Northeast Atlantic (all other areas)	4	Catch data from 1988. Spanish Porcupine survey (2001-2011), Faroese summer survey (1996-2011).
ory-comb	Orange Roughy (<i>Hoplostethus atlanticus</i>) in the Northeast Atlantic (VI)	6 and/or 7	Fishery is closed
	Orange Roughy (<i>Hoplostethus atlanticus</i>) in the Northeast Atlantic (VII)	6 and/or 7	Fishery is closed
	Orange Roughy (<i>Hoplostethus atlanticus</i>) in the Northeast Atlantic (other areas)	6	Landings data available
rng-comb	Roundnose grenadier (<i>Coryphaenoides rupestris</i>) in the Northeast Atlantic (Divisions Vb and XIIb Subareas VI and VII)	1 and/or 3	Production model (Bayesian surplus production) assessment has been benchmarked and used in assessments as indicative of trends. The model has been further developed in 2012 and now includes a short term forecast and estimates a proxy for Fmsy. If these are accepted the stock could be considered in category 1. Alternatively, this stock could be considered as category 3.
rng-comb	Roundnose grenadier (<i>Coryphaenoides rupestris</i>) in the Northeast Atlantic (III and IV)	7	There is no longer a target fishery on this stock. Low levels of bycatch from shrimp fisheries. Mostly discarded.
rng-comb	Roundnose grenadier (<i>Coryphaenoides rupestris</i>) in the Northeast Atlantic (Mid-Atlantic Ridge)	6	Catch data from 1973s to 2005 and 2011, very incomplete nominal cpue time series from Soviet/Russian fisheries until 2005
rng-comb	Roundnose grenadier (<i>Coryphaenoides rupestris</i>) in the Northeast Atlantic (other areas)	7	Landings data only.
bsf-comb	Black scabbard fish (<i>Aphanopus carbo</i>) in the Northeast Atlantic (Vb VI, VII)	4	Reliable series include standardised French tally book and logbook, Scottish deepwater Survey. Catch data available 1989 to 2011.
bsf-comb	Black scabbard fish (<i>Aphanopus carbo</i>) in the Northeast Atlantic (IXa)	3	Stage based Bayesian model indicative of trends and gives estimates of F. This has not previously been used as a basis for advice. Previous advice based on trends (Portuguese standardised commercial longline cpue)
bsf-comb	Black scabbard fish (<i>Aphanopus carbo</i>) in the Northeast Atlantic (other areas)	6	landings data only.
gfb-comb	Greater forkbeard (<i>Phycis blennoides</i>) in the Northeast Atlantic	4 and/or 7	Spanish IBTS in the Cantabrian sea (Division VIIIb), French western IBTS survey (EVHOE) in the Bay of Biscay (VIIIab and Celtic Sea (VIIf,g,h,j), Spanish survey on the Porcupine Bank, Irish bottom trawl survey and Scottish IBTS in VIa. However, available surveys don't cover the entire geographical range of the stock.

Code	Stock name	Category	Comment
alf-comb	Alfonsinos (<i>Beryx spp.</i>) in the Northeast Atlantic	4 and/or 6	For <i>B. Splendens</i> , Azorean longline survey cpue may be a suitable indicator of abundance. Some landings data in areas other than the Azores is for <i>Beryx</i> species combined. For <i>B. Decadactylus</i> the Azores longline survey is not suitable.
sbr-comb	Red (=blackspot) seabream (<i>Pagellus bogaraveo</i>) in the Northeast Atlantic VI, VII and VIII	6 and/or 7	Collapsed stock, now occurring at low level, i.e. not more than a few percent, of historical abundance. Long time series of landings data. YPR available.
sbr-comb	Red (=blackspot) seabream (<i>Pagellus bogaraveo</i>) in the Northeast Atlantic (IXa = Strait of Gibraltar)	6	Landings time series 29 years. Nominal cpue series available based on sales notes (29 years).
sbr-comb	Red (=blackspot) seabream (<i>Pagellus bogaraveo</i>) in the Northeast Atlantic (X Azores)	4	Longline survey data from 1996-2011, Fisheries cpue 1990-2011, length composition 1995-2011.

In ICES Division IVa there is a industrial by-catch of Greater silver smelt (*Argentina silus*), which also has been targeted occasionally for human Consumption. There are minor longline fisheries targeting tusk (*Bosme brosme*) and ling with forkbeard (*Phycis blennoides*) as by-catch. Some deepwater species are landed as by-catch in the trawl fisheries targeting *Pandalus*, anglerfish and Greenland halibut.

In ICES Division IIIa there was a targeted trawl fishery for roundnose grenadier (*Coryphaenoides rupestris*) until 2006, but since 2007 no fishery targeting this species has taken place. Greater silver smelt has been targeted in smaller amounts in Skagerrak. Several deep-water species are also taken as by-catch in, for instance, the trawl fisheries for northern shrimp.

In ICES Sub-area V there are trawl fisheries targeting blue ling, redfish species, argentine and orange roughy (*Hoplostethus atlanticus*), which have as by-catch a great number of other deep-water species. There are also traditional longline fisheries for ling and tusk, and trawl and gill net fisheries for Greenland halibut and anglerfish. In recent years a fishery in Faroese waters targeting Silversmelt has developed (15000 t in 2010).

In ICES Sub-areas VI and VII there are directed fisheries for blue ling, roundnose grenadier and black scabbardfish.

In Sub-area VIII there is a longline fishery, which mainly targets greater forkbeard, and trawl fisheries for hake, megrim, anglerfish and *Nephrops* which have a by-catch of deep-water species.

In ICES Sub-area IX some deep-water species are a by-catch of the trawl fisheries for crustaceans. Typical species are bluemouth (*Helicolenus dactylopterus*), greater forkbeard, conger eel (*Conger conger*), blackmouth dogfish (*Galeus melastomus*), kitefin shark (*Dalatias licha*), gulper shark (*Centrophorus granulosus*) and leafscale gulper shark (*Centrophorus squamosus*). There is a directed longline fishery for black scabbard fish (*Aphanopus carbo*) with a by-catch of the Portuguese dogfish (*Centroscymnus coelolepis*) and leafscale gulper shark (*Centrophorus squamosus*). There is also a longline (Voracera) fishery for red (blackspot) seabream *Pagellus bogaraveo*.

In ICES Sub-area X the main fisheries are by handline and longline near the Azores, and the main species landed are red (blackspot) seabream (*Pagellus bogaraveo*), wreckfish (*Polyprion americanus*), conger eel, bluemouth, golden eye perch (*Beryx splendens*) and alfonsino (*Beryx decadactylus*). At present the catches of kitefin shark are made by the longline and handline deepwater vessels and can be considered as accidental. There are no vessels at present catching this species using gillnets. Outside the Azorean EEZ there are trawl fisheries for golden eye perch, orange roughy, cardinal fish (*Epigonus telescopus*), black scabbard fish, and wreckfish.

In ICES Sub-area XII there are trawl fisheries on the mid-Atlantic Ridge for orange roughy, roundnose grenadier and black scabbard fish. There is a multispecies trawl and longline fishery on Hatton Bank, and some of this occurs in this sub-area, some in Sub-area VI. There is considerable fishing on the slopes of the Hatton Bank, and effort may be increasing. Smoothheads (*Alepocephalus spp.*) were previously usually discarded but now feature to a greater extent in the landings statistics.

In ICES Sub-area XIV there are trawl and longline fisheries for Greenland halibut (*Rheinhardtius hippoglossoides*) and redfish that have by-catches of roundnose grenadier, roughhead grenadier (*Macrourus berglax*) and tusk.

SOURCE OF MANAGEMENT ADVICE: The main management advisory body is ICES.

REFERENCE POINTS: Precautionary reference points have not been defined for most of these stocks.

STOCK STATUS: New stock assessments were made in 2012 for tusk in Icelandic waters (Vb). Also the stock Roundnose Grenadier in NE Atlantic has been analytically assessed. However, the information on stock status of many deep-water species is still insufficient for analytical assessments. In many cases the main source of information is catch rates from the commercial fisheries, although in some cases there is also information from research surveys. A number of research surveys have been initiated in recent years, and these are expected to aid the future knowledge on these species.

MANAGEMENT MEASURES Some fisheries are regulated by unilateral or internationally agreed TACs and these may have reduced exploitation/curbed expansion.

In the NEAFC regulatory area, NEAFC has in recent years introduced measures requiring that effort should be reduced by a total of 35% by 2008 and the EU introduced measures in 2006 that set effort for vessels holding deepwater licences to 80% of the 2003 level.

RECENT MANAGEMENT ADVICE: For a number of deep-water and elasmobranch stocks only landings information is available from which stock status cannot be derived. In those cases, ICES adopts a precautionary margin of -20% when the stock status relative to candidate reference points for stock size or exploitation is unknown. Exceptions where this margin is not applied have been made in cases where there is expert judgement that the stock is not reproductively impaired and there is evidence that the stock size is increasing or that exploitation has reduced significantly - for instance, on basis of survey indices or a reduction in fishing effort in the main fishery if the stock is taken as a by-catch species.

Deep-water stocks have previously been classified by ICES (ICES, 2005) on the basis of longevity and growth rate.

Only in very rare cases did ICES have information on indicators for exploitation pressure (e.g. fishing mortality). The approach to the ICES advice on deep-water species has been largely driven by the interpretation of the available abundance indicators (cpue or survey indicators) and the classification according to life history parameters:

- For species in cluster 1 (highly vulnerable)
 - When cpue information shows declines and life history information indicates that species are highly vulnerable, ICES generally recommends no catches of that species.
- For species in cluster 2 (less vulnerable)
 - When recent cpue is much lower than historical cpue, ICES generally recommends a reduction in catch or a low catch, maintaining that level until there is sufficient information that the species can sustain higher exploitation.
 - When cpue information shows no clear trend, ICES generally recommends recent average catches.
 - When surveys show a clear increase in abundance, ICES generally recommends no increase in current catches.

ICES reiterates that effort should be a driving management tool in these mixed deep-water fisheries. However, in the absence of pressure indicators, ICES has attempted to interpret the available landings and cpue data in a way that could be useful even when effort information is not available. The perceived tendency of the stock indicators (cpue, surveys) has been used to argue for the suggested changes to the landings. While acknowledging that a one-to-one relationship between catches and effort is unlikely ICES, in the absence of information, considers that the suggested reductions in landings would result in reductions of effort.

The ICES advice for deep-water species is provided every second year. The advice is applicable for 2013 and 2014.

These have been supplemented by new advice arising from recent requests to ICES made by NEAFC. New ICES advice on deep-water species will be provided in 2014.

STECF COMMENTS: STECF agrees with the ICES recommendation and considers the proposals as a constructive way forward in the light of uncertainties on the states of these stocks and the likely risks to them. STECF notes that appropriate sustainable exploitation rates for most deepwater species have not been

determined and the risks associated with current fishing effort are not quantified. Given the biology of many of these species, very low exploitation rates or zero fishing are likely to be advised in most cases.

STECF notes that in its advice for some species, ICES groups together stock components that are characterised by a shortage of data rather than on a biological basis. STECF suggests that in order to provide rational fisheries based advice, there is a need to define groupings, which have a spatial coherence that facilitates management. STECF further suggests that continued efforts should be made to define biological units based on, for example, genetic studies.

ICES has commented in 2006 on the precautionary reference points used for some stocks. Reference points that were previously suggested were: $U_{lim} = 0.2 * U_{max}$ and $U_{pa} = 0.5 * U_{max}$ (where U is the index of exploitable biomass). The ICES SGPA and NAFO proposed these reference points in 1997 for use in data poor situations. However, for most stocks ICES does not consider the available cpue series as suitable for defining U_{max} because the series are too short and U_{max} is not an index virgin biomass. STECF agrees that this is a valid point but in a data-poor situation and in the precautionary context, these reference points are likely to be the best available for these stocks, even though they may underestimate depletion/overestimate recovery in relation to actual U_{max} .

STECF notes that in any scheme to reduce existing fisheries in the short-term, attention would need to be paid to potential effort displacement into other neighbouring fisheries on the continental shelf. STECF further notes that several of these deep-water fisheries take place in international waters outside national or EU jurisdiction. Hitherto this has rendered it difficult to enforce management measures for these fisheries.

9.1. Alfonsinos/Golden eye perch (*Beryx* spp.)

FISHERIES: The section deals with two species, *Beryx splendens* and *B. decadactylus*.

Most of the landings of *Beryx* spp. are from hand-lines and long-lines within the Azorean EEZ of Sub-area X and by trawl outside the EEZ on the Mid-Atlantic Ridge. The trawl fishery landings refer to both species combined. The general absence of data on species composition of the catches and biological parameters are important limiting factors for the knowledge of these fish stocks. Underreporting of catches from international waters is suspected.

Alfonsinos aggregate in shoals, often associated with seamounts, and fisheries have, historically, had high catch rates once the shoals are located. As a consequence of this spatial distribution, their life-history and aggregation behaviour, these species can only sustain low rates of exploitation; localized sub-units of the population can be quickly depleted, even within a single season. To prevent depleting localised aggregations that have not yet been mapped and assessed, ICES has advised that the exploitation of new seamounts should not be allowed. Total landing (2011) is 0.38 kt.

SOURCE OF MANAGEMENT ADVICE: The main management advisory body is ICES.

STOCK STRUCTURE: For both species the stock structure is uncertain. They are distributed over a wide area, and may be composed of several populations.

REFERENCE POINTS: No precautionary reference points have been proposed for the stock(s) of Alfonsino/golden eye perch in the North East Atlantic, due to the lack of appropriate data.

STOCK STATUS:

F (Fishing Mortality)		
	2009–2011	
MSY (F_{MSY})	?	Unknown
Precautionary approach (F_{pa}, F_{lim})	?	Unknown

Qualitative evaluation	?	Unknown
SSB (Spawning-Stock Biomass)		
	2009–2011	
MSY ($B_{trigger}$)	?	Unknown
Precautionary approach (B_{pa}, B_{lim})	?	Unknown
Qualitative evaluation	?	Unknown

No reliable assessment are possible at present and fishing possibilities cannot be projected. The most recent data (2010 and 2011 landings) do not change the perception of the stock.

RECENT MANAGEMENT ADVICE:

Based on the ICES approach for data-limited stocks, ICES advises that catches should be no more than 280 tonnes.

This is the first year ICES is providing quantitative advice for data-limited stocks

Other considerations

ICES approach to data-limited stocks

For data-limited stocks without information on abundance or exploitation ICES considers that a precautionary reduction of catches should be implemented, unless there is ancillary information clearly indicating that the current exploitation is appropriate for the stock.

For this stock, ICES advises that catches should decrease by 20% in relation to the last three years' average catch, corresponding to catches of no more than 280 t in 2013. As three years is considered to be the minimum period required to see an effect of the precautionary buffer on the stock, no changes in the advice are expected before then unless the data clearly indicate otherwise.

STECF COMMENTS: The value of 280 t advised by ICES represents a reduction of 20 % on the average reported landings for 2009-2011. STECF therefore considers it more appropriate to express the advice for 2013 in terms of landings instead of catches. Adopting such an approach implies landings of alfonosinos of no more than 280 t in 2013 and 2014.

9.2. Ling (*Molva molva*)

FISHERIES: Ling is primarily fished in the depth range 200-500 m, though it is also found in shallower depths. This species does not have such extreme low productivity and high longevity as typical deep-water species, though specific data for many areas are lacking. The major fisheries are the longline and gillnet fisheries, but there are also by-catches in other gears, i.e. trawls and handline.

SOURCE OF MANAGEMENT ADVICE: The main management advisory body is ICES.

STOCK STRUCTURE: There is insufficient scientific information to establish the extent of putative stocks; however, ling may be sufficiently isolated at separate fishing grounds to be considered as individual management units. On this basis ICES advice is presented for the following management units:

- Divisions I and II (Arctic)
- Va (Iceland)

- Vb (Faroes)
- IIIa, IVa, VI, VII, VIII, IX, XII, and XIV (other areas).

9.2.1. Ling (*Molva molva*) in Divisions I and II (Arctic)

FISHERIES: Legislation enacted in 2000 to regulate the cod fishery has resulted in a continuous reduction in the number of longliners in the fishery for tusk, ling, and blue ling. By 2011 only 37 vessels in the fishery were larger than 21 m. However, it is not clear that there has been a reduction in effort targeting ling. Total landing in 2011 was 10.1 kt (50% longline, 45% gillnets, 4% trawl, and 1% other gear types).

REFERENCE POINTS: No reference points have been set for this assessment unit.

STOCK STATUS:

F (Fishing Mortality)		
	2009–2011	
MSY (F_{MSY})	?	Unknown
Precautionary approach (F_{pa}, F_{lim})	?	Unknown
Qualitative evaluation	→	Stable, but unknown in relation to poss. Ref. points

SSB (Spawning-Stock Biomass)		
	2009–2011	
MSY ($B_{trigger}$)	?	Unknown
Precautionary approach (B_{pa}, B_{lim})	?	Unknown
Qualitative evaluation	→	Stable

No analytical assessment is available for this stock. Therefore, detailed management options cannot be presented. The only information on the abundance of ling is from an index which may not be accurate (i.e. the index is unnot standardized and does not account for changes in fishing patterns), implying that cannot be considered to show precise changes in abundance over time. Discard data are not available. From the index trend it is inferred that increased catches since 2006 have not had a detrimental effect on the stock.

RECENT MANAGEMENT ADVICE:

Based on the ICES approach for data-limited stocks, ICES advises that there should be a 20% reduction in effort.

This is the first year ICES is providing quantitative advice for data-limited stocks

No analytical assessment is available for this stock. Therefore, detailed management options cannot be presented.

Other consideration

ICES approach to data-limited stocks

For data-limited stocks for which an abundance index is available, ICES uses as harvest control rule an index-adjusted *status quo* catch. The advice is based on a comparison of the two most recent index values with the three preceding values, combined with recent catch or landings data. Knowledge about the exploitation status also influences the advised catch.

The assessment of the stock is based on trends of an abundance index from commercial catches. There are no forecasts available. However, there is an indication of stable or increasing abundance in the fishable biomass from the commercial cpue index. If this is correct then the same effort may yield similar catches in 2013 and 2014 as in the period 2008–2011.

Additionally, considering that exploitation is unknown, ICES advises that effort should decrease by a further 20% as a precautionary buffer.

STECF COMMENTS: STECF agrees with the ICES assessment of the state of the stock and the advice for 2013 and 2014. However no effort data have been provided to quantify the effort reduction for the fishing fleets exploiting ling in Divisions I and II.

9.2.2. Ling (*Molva molva*) in Va (Iceland)

FISHERIES: Ling is primarily fished in the depth range 200–500 m, though it is also found at shallower depths. Ling in Division Va matures on average at a length of 75 cm, so a considerable proportion of catches consists of immature ling. Approximately 68% of the annual landings in Division Va are caught in a mixed fishery by longliners and the remainder as a bycatch, mainly by trawlers which are primarily targeting cod. Total landings (2011) are 9.6 kt (68% longline, 27% trawl, and 5% gillnet and Danish seine).

REFERENCE POINTS:

No reference points have been defined for this assessment unit.

STOCK STATUS:

F (Fishing Mortality)		
		2009–2011
MSY (F_{MSY})	?	Unknown
Precautionary approach (F_{pa}, F_{lim})	?	Unknown
Qualitative evaluation	→	Stable

SSB (Spawning-Stock Biomass)		
		2009–2011
MSY ($B_{trigger}$)	?	Unknown
Precautionary approach (B_{pa}, B_{lim})	?	Unknown
Qualitative evaluation	✓	Above poss. reference points

A ‘survey trends’ based assessment is conducted; this is based on trends in the Icelandic March groundfish survey. The juvenile index was high in 2004 to 2010 and has decreased since then, though it remains higher than in 1985–2003. The biomass index is at its highest level. Fishing mortalities have on average been lower since 2003 compared with those observed in the 1990s.

RECENT MANAGEMENT ADVICE:

Based on the ICES approach for data-limited stocks, ICES advises that catches should be no more than 12 000 tonnes.

This is the first year ICES is providing quantitative advice for data-limited stocks

No analytical assessment is available for this stock. Therefore, detailed management options cannot be presented.

Other considerations

ICES approach to data-limited stocks

For data-limited stocks with reliable abundance information from fisheries-independent data and a target F_{proxy} , where abundance is considered above $MSY B_{trigger}$, ICES uses a harvest control rule that requires calculation of catches to be based on the F_{proxy} target multiplied by the most recent survey biomass estimates.

For this stock the F_{proxy} of 1.5 is applied as a factor of the average of the most recent survey biomass estimates (average of 2011 and 2012), resulting in catch advice of no more than 12 000 t.

This catch advice is within 20% of the last three years’ catch and a 20% precautionary buffer is not applied because the stock has increased by more than 50% in the last two years compared with the three preceding years.

STECF COMMENTS: STECF agrees with the ICES assessment of the state of the stock. The value of 12000 t advised by ICES represents an increases of about 12% on the average reported landings for 2009-2011. STECF considers it more appropriate to express the advice for 2013 and 2014 in terms of landings instead of catches.





9.2.3. Ling (*Molva molva*) in Vb (Faroes)

FISHERIES: The major fishery are the Faroese and Norwegian longline fisheries, but there are also bycatches by other gears, including trawls, gillnet, and handline. In recent years Faroese landings have accounted for about 60 to 70% of the total landings, of these around 60% are taken by longline, partly in directed ling fisheries, and 40% as bycatch by trawlers in fisheries for other groundfish. The Norwegian longliners catches have been declining for the last 3 years and take about 30-40% of the total ling landings. Other nations catch ling as a bycatch in trawl fisheries, contributing about 1 to 2% of total landings. Faroese fleet caught nearly all landings in 2011 because of no bilateral and multilateral agreements between the Faroes and Norway/EU. Total catches (2011) were 4.784 kt, where 100% were landings (65% longliners, 30% trawlers, and 5% other gear types).

REFERENCE POINTS: No reference points have been proposed for this stock. However, as adult abundance as measured by surveys is above the average of the time-series, expert judgement considered it likely that SSB is above any candidate values for $MSY B_{trigger}$.

STOCK STATUS:

F (Fishing Mortality)		
		2009–2011
MSY (F_{MSY})	?	Unknown
Precautionary approach (F_{pa}, F_{lim})	?	Unknown

Qualitative evaluation		Stable
SSB (Spawning-Stock Biomass)		
		2009–2011
MSY ($B_{trigger}$)		Unknown
Precautionary approach (B_{pa}, B_{lim})		Unknown
Qualitative evaluation		Stable

Abundance indices suggest that ling in Division Vb is stable or increasing. Current catches are at about the long-term average (since the 1950s). There is some evidence of increased recruitment in recent years.

RECENT MANAGEMENT ADVICE:

Based on the ICES approach for data-limited stocks, ICES advises that there should be a 20% reduction in effort.

This is the first year ICES is providing quantitative advice for data-limited stocks

No analytical assessment is available for this stock. Therefore, detailed management options cannot be presented.

Other considerations

ICES approach to data-limited stocks

For data-limited stocks for which an abundance index is available, ICES uses as harvest control rule an index-adjusted *status quo* catch. The advice is based on a comparison of the two most recent index values with the three preceding values, combined with recent catch or landings data. Knowledge about the exploitation status also influences the advised catch.

The assessment of the stock is based on trends in indices of abundance from surveys and commercial cpue. No forecasts are available. However, there are some indications of increased recruitment and an increase in adult biomass. If these are correct then the same effort may yield an increase in catches in 2013 and 2014.

Additionally, considering that exploitation is unknown, ICES advises that effort should decrease by a further 20% as a precautionary buffer.

STECF COMMENTS: STECF agrees with the ICES advice that because the exploitation rate is unknown, effort in 2013 and 2014 should be decreased as a precautionary buffer. STECF is unable to advice on the amount of effort that corresponds to a 20% reduction since no effort data are reported in the ICES advice.

9.2.4. Ling (*Molva molva*) in IIIa, IVa, VI, VII, VIII, IX, XII, and XIV (Other areas)

FISHERIES: The major directed fishery for ling in Divisions IVa and Subarea VI is by Norwegian longline. The bulk of the landings from other countries are bycatches in trawl fisheries mainly directed at roundfish or deep-sea species. The landings from the central and southern North Sea (IVb,c) are bycatches in various other fisheries. In Subarea VII the main landings are generated by Norwegian and some Spanish longline fisheries. In Subareas VIII, IX, XII, and XIV all landings are bycatches in various fisheries. Total catches (2011) were 12.93 kt.

REFERENCE POINTS: No reference points are defined for this assessment unit. Adult abundance as measured by the commercial index is above the average of the time-series. However, the status of the stock

relative to historical levels is unknown and it may have been higher in the past. The level of the biomass relative to Btrigger is therefore unknown.

STOCK STATUS:

F (Fishing Mortality)		
		2009–2011
MSY (F_{MSY})	?	Unknown
Precautionary approach (F_{pa}, F_{lim})	?	Unknown
Qualitative evaluation	→	Stable

SSB (Spawning-Stock Biomass)		
		2007–2011
MSY ($B_{trigger}$)	?	Unknown
Precautionary approach (B_{pa}, B_{lim})	?	Unknown
Qualitative evaluation	→	Stable

While no reliable assessment is available for this assessment unit and fishing possibilities cannot be projected, the historic cpue data suggest that the stock was stable at the current volume of catch.

RECENT MANAGEMENT ADVICE:

Based on the ICES approach for data-limited stocks, ICES advises that catches should be no more than 10 800 tonnes.

This is the first year ICES is providing quantitative advice for data-limited stocks

No analytical assessment is available for this stock. Therefore, detailed management options cannot be presented.

Other considerations

ICES approach to data-limited stocks

For data-limited stocks for which an abundance index is available, ICES uses as harvest control rule an index-adjusted *status quo* catch. The advice is based on a comparison of the two most recent index values with the three preceding values, combined with recent catch or landings data. Knowledge about the exploitation status also influences the advised catch.

These cpue series cover the major fishing areas (Divisions VIa, IVa, and VIb) and are interpreted as being either stable or increasing, implying that abundance is at least stable at the current volume of catch.

Additionally, considering that exploitation is unknown, ICES advises that catches should decrease by a further 20% as a precautionary buffer. This results in catches of no more than 80% of the mean catch 2009–2011, i.e. 10 800 t in 2013.

STECF COMMENTS: STECF agrees with the ICES assessment of the state of the stock. The value of 10 800 t advised by ICES represents a reduction of 20 % on the average reported landings for 2009-2011. STECF

therefore considers it more appropriate to express the advice for 2013 in terms of landings instead of catches. This would imply landings in 2013 and 2014 of 10,800 t.

9.3. Blue Ling (*Molva dypterygia*).

FISHERIES: The majority of landings are from the Norwegian coast (II), Iceland (Va), Faroes (Vb), west of Scotland and Rockall Trough (VI) and the Mid-Atlantic Ridge and Hatton Bank (XII). Landings from the west of Ireland and Western Approaches (VII) and further south are very small. A major part of this fishery is on spawning aggregations. Landings from Division IIa are mainly catches in a gillnet fishery off mid-Norway, elsewhere this species is taken mainly as by-catch in trawl fisheries.

SOURCE OF MANAGEMENT ADVICE: The main management advisory body is ICES. No reliable analytical assessments are available.

STOCK STRUCTURE: There is insufficient scientific information to establish the extent of putative stocks; however, blue ling may be sufficiently isolated at separate fishing grounds to be considered as individual management units. On this basis advice is presented for the following management units:

- Subdivisions Va and XIV (Iceland and Reykjanes ridge);
- Subdivisions Vb, VI, and VII (Faroes Rockall and Celtic shelf); and
- Subdivisions I, II, IIIa, IVa, VIII, IX, and XII.

The latter grouping is a combination of isolated fishing grounds and thus these areas are grouped due to lack of data.

Blue ling is more vulnerable to over-exploitation than ling due to a slower growth rate and higher age at first maturity. It is particularly susceptible to rapid local depletion due to its highly aggregating behaviour during spawning. Ageing is a problem in this species, and thus age-structured analytical assessments are unlikely in the short-term.

9.3.1. Blue Ling (*Molva dypterygia*) in Va and XIV





FISHERIES: Blue ling, a gadoid species that grows faster than most deep-water species, is particularly vulnerable to exploitation (fisheries can target the spawning aggregations) and an opportunistic fishery on spawning aggregations account for pulses in landings in the early 1980s and in 1993. Closed areas to protect spawning aggregations in Division Va have been introduced since 2003. Blue ling have historically been taken as a bycatch in fisheries for cod, haddock, and saithe in Division Va. Since 2008 longliners have increased their targeting of blue ling in Division Va, and their landings now account for 70% of landings. The depth range of this fishery is 500 to 800 meters. The fishery is not regulated by TAC.

Total landings (2011) were 6.5 kt (73% longline, 24% trawl, and 3% other gear types).

REFERENCE POINTS: No reference points have been defined for this assessment unit. In the period 2002 to 2009 where no detrimental effect is observed in the stock dynamics, the mean value of F_{proxy} (total catch/survey biomass) is 1.7. This value can therefore be considered to be an appropriate and conservative advisory F_{proxy} upon which to base catch advice. It is likely that the current biomass is above MSY Btrigger.

STOCK STATUS:

F (Fishing Mortality)		
	2009–2011	
MSY (F_{MSY})	?	Unknown
Precautionary	?	Unknown

approach (F_{pa}, F_{lim})		
Qualitative evaluation		Increasing
SSB (Spawning-Stock Biomass)		
		2009–2011
MSY ($B_{trigger}$)		Unknown
Precautionary approach (B_{pa}, B_{lim})		Unknown
Qualitative evaluation		Above potential reference points

Autumn survey indices show an increase in biomass since 2001. There are indications that fishing mortality has been increasing in the last two years. Data from the spring survey imply that the biomass in shallower waters (< 500 m) has been declining in the last two years.

RECENT MANAGEMENT ADVICE:

Based on the ICES approach for data-limited stocks, ICES advises that catches should be no more than 3100 tonnes.

Area closures to protect spawning aggregations should be maintained and expanded as appropriate.

This is the first year ICES is providing quantitative advice for data-limited stocks

No analytical assessment is available for this stock. Therefore, detailed management options cannot be presented.

Other considerations

ICES approach to data-limited stocks

For data-limited stocks with reliable abundance information from fisheries-independent data and a target F_{proxy} , where abundance is considered above MSY $B_{trigger}$, ICES uses a harvest control rule that calculates catches based on the F_{proxy} target multiplied by the most recent survey biomass estimates.

For this stock the F_{proxy} of 1.7 is applied as a factor to the 2010 biomass estimate of 1824, resulting in catch advice of no more than 3100 t. ICES does not implement the uncertainty cap of 20% used for other data-limited stocks because recently the fishing mortality increased far above what is considered the F_{MSY} proxy.

The 20% precautionary buffer is therefore not applied because the stock is above possible reference points and an F_{MSY} proxy is used.

Blue ling is susceptible to sequential depletion of spawning aggregations and closed areas to protect spawning aggregations should therefore be maintained and expanded where appropriate

STECF COMMENTS: STECF agrees with the ICES advice. The value of 3100 t advised by ICES represents a reduction of about 50 % on the reported landings for 2010. STECF considers it more appropriate to express the advice in terms of landings instead of catches. Such an approach implies landings in 2013 and 2014 of 3,100 t.



9.3.2. Blue Ling (*Molva dypterygia*) in Vb, VI and VII




FISHERIES: The main fisheries are those by Faroese trawlers in Division Vb and French trawlers in Subarea VI and, to a lesser extent, Division Vb. Total international landings from Subarea VII are very small, as are bycatches in other fisheries. Landings by Faroese trawlers are mostly taken in the spawning season. Historically, this was also the case for French trawlers fishing in Division Vb and Subarea VI. However, in recent years blue ling has been taken mainly as a bycatch in French trawl fisheries for roundnose grenadier and black

scabbardfish. Total catches (2011) were 3 kt, where 99% were landings, <1% discards, 0% industrial bycatch, and 0% unaccounted removals.

REFERENCE POINTS: Preliminary investigations undertaken by ICES in 2012 indicate that for an assumed natural mortality of 0.18, an appropriate proxy for F_{MSY} lies within the range of 0.12–0.18.

STOCK STATUS:

F (Fishing Mortality)		
		2009–2011
MSY (F_{MSY})		Below target
Precautionary approach (F_{pa}, F_{lim})		Undefined

SSB (Spawning-Stock Biomass)		
		2009–2011
MSY ($B_{trigger}$)		Unknown, $B_{trigger}$ undefined
Precautionary approach (B_{pa}, B_{lim})		Undefined
Qualitative evaluation		Increasing

While no reliable assessment can be presented for this assessment unit, the cpue indices indicate that the current abundance of the stock is much lower than the initial level prior to the fishery. In the last 10 years there is no obvious response from the stock to the fishery.

Two independent assessments (stock reduction analysis:SRA and multi-year catch curve: MYCC) returned similar views that the stock was overexploited, with fishing mortality showing a peak in 2000 and then decreasing. These models indicate that stock abundance has been increasing since 2003 or 2004. The history of the exploitation is longer than most time-series of data, only landings time-series could be reconstructed back to 1966, i.e. early times of the fishery. The stock abundance has increased by a factor of 1.7 since 2002 according to SRA, and 2.8 since 2004 according to MYCC. However, the absolute level is estimated at about 25% of the unexploited level according to SRA.

The SRA (based on abundance indices and landings) and the multi-year catch curve (MYCC; based on age composition and landings) models both indicate decreasing fishing mortality since 2003–2004, below possible F_{MSY} proxies and increasing biomass. This is consistent with the observed increase of the mean size in landings.

RECENT MANAGEMENT ADVICE:

Based on the ICES approach for data-limited stocks, ICES advises that catches should be no higher than 3900 t in 2013. Existing management measures should be continued. Spatial management to prevent targeted fishing on spawning aggregations should be expanded to cover spawning areas in Division VIb.

This is the first year ICES is providing quantitative advice for data-limited stocks

Other considerations

No analytical assessment is available for this stock. Therefore, detailed management options cannot be presented.

ICES approach to data-limited stocks

Fishing mortality in the period 2008 to 2011 was well below all suggested F_{MSY} proxy values. However, current biomass in relation to $B_{trigger}$ is unknown and there is a possibility that the stock is below this point. It would therefore not be appropriate to allow F to increase to F_{MSY} until the biomass relative to $B_{trigger}$ can be assessed. Maintaining recent catches (average of landings 2008 to 2011) would be expected to result in increasing SSB. This would imply a catch of 3.9 kt in 2013.

Blue ling is susceptible to sequential depletion of spawning aggregations. High landings were caught at spawning time until the 2000s. Current spatial measures to protect spawning aggregations should therefore be maintained, and new spatial measures should be identified and implemented where appropriate, in particular in international waters in Divisions Vb and VIb.

STECF COMMENTS: STECF agrees with the ICES assessment of the state of the stock. The value of 3.9 kt advised by ICES represents the average reported landing for the period 2008-2011. STECF considers it more appropriate to express the advice for 2013 and 2014 in terms of landings instead of catches.

9.3.3. Blue ling (*Molva dypterygia*) in other areas (I, II, IIIa, IVa, VIII, IX, and XII)

FISHERIES: Blue ling is now taken as by-catch only from other fisheries in Subarea XII and Division IIa. Blue ling has been targeted in trawl fisheries on Hatton Bank (Division XIIb). There has also been a small bycatch in the longline fisheries in Division IIa. Recently Faroese and Norwegian vessels have caught blue ling in this area with longlines and nets. In other areas blue ling is taken in small quantities. Total catch (2011) was 0.534 kt.

REFERENCE POINTS: No reference points have been defined for this assessment unit.

STOCK STATUS:

F (Fishing Mortality)		
	2009–2011	
MSY (F_{MSY})	?	Unknown
Precautionary approach (F_{pa}, F_{lim})	?	Unknown
Qualitative evaluation	?	Unknown
SSB (Spawning-Stock Biomass)		
	2009–2011	
MSY ($B_{trigger}$)	?	Unknown
Precautionary approach (B_{pa}, B_{lim})	?	Unknown
Qualitative evaluation	✘	Below poss. reference points

No reliable assessment can be presented for this assessment unit and fishing possibilities cannot be projected.

Trends in landings suggest serious depletion in Subarea II. Landings have also declined strongly in Subarea XII from 2002 onwards. Landings in other areas are minor, but there is some evidence of a persistent decline in Subarea IV.

RECENT MANAGEMENT ADVICE: ICES advises that there should be no directed fisheries for blue ling, and a reduction in bycatches should be considered until the scientific information is sufficient to prove the fishery sustainable. Measures should be implemented to minimize the bycatch. Closed areas to protect spawning aggregations should be maintained and expanded where appropriate.

No reliable assessment can be presented for this assessment unit and fishing possibilities cannot be projected.

STECF COMMENTS: STECF agrees with the ICES assessment of the state of the stock and the advice for 2013 and 2014.

9.4. Tusk (*Brosme brosme*)

FISHERIES: Tusk is primarily fished in the depth range 200-500 m, though it is also found at shallower depths. Tusk is more vulnerable to overexploitation than ling due to a slower growth rate and higher age at first maturity. The majority of landings are from ICES sub-areas IIa, IIIa, from along the Norwegian coast of IVa, Va (around Iceland), and Vb (around Faroe Islands). This species is taken mainly in long line fisheries, and most of the catches are by-catches in ling fisheries. Tusk is also taken as by-catch in bottom trawl fisheries.

Before 2008, ICES advised for three management units proposed on the basis of apparent isolation of fishing grounds: Subareas I and II (Arctic), Division Va (Iceland), and Divisions IIIa, IVa, and Vb and Subareas VI, VII, VIII, IX, XII, and XIV (other areas).

SOURCE OF MANAGEMENT ADVICE: The main management advisory body is ICES.

STOCK STRUCTURE: The new perception of the stock structure is based on considerations of new genetic information in 2009 (Knutsen *et al.*, 2009). Studies using recently developed microsatellite primers detected highly significant genetic differentiation in tusk within its North Atlantic range. In particular, tusk around Rockall, the Mid-Atlantic Ridge, and off Canada, most likely represent different biological populations that clearly warrant separate management considerations.

As in 2011, ICES provided advice on separate stocks of tusk on the basis of new genetic evidence and advice is presented for the following revised management units:

- I and II (Arctic)
- Division Va and Subarea XIV
- The Mid-Atlantic Ridge (Division XII excluding XIIb)
- Subarea VIb (Rockall)
- IIIa, IV, Vb, VIa, VII, VIII, IX, XIIb, . (This latter grouping is a combination of isolated fishing grounds and these areas are grouped due to their mutual lack of data.)

9.4.1. Tusk (*Brosme brosme*) in Divisions I and II (Arctic)

FISHERIES: Tusk is taken in a mixed fisheries with ling and as a bycatch in fisheries for cod, mainly in longline fisheries. The exploitation is influenced by regulations aimed at other groundfish species, e.g. cod and haddock. Catches are primarily by Norwegian vessels and since 2003, EU vessels have been subject to a restricted TAC. The major fisheries are the Norwegian longline and gillnet fisheries, but there are also bycatches by other gears, i.e. trawls and handline. Other nations catch tusk as a bycatch in trawl fisheries.

Legislation enacted in 2000 to regulate the cod fishery has resulted in a continuous reduction in the number of longliners in the fishery for tusk, ling, and blue ling. By 2011 only 37 vessels above 21 m were in the fishery. Total catch (2011) was 11.7 kt, where 100% were landings (90% longlines, 9% gillnets, and 1% other gear types.)

REFERENCE POINTS: No reference points have been defined for this assessment unit. Adult abundance as measured by the commercial index is above the average of the time-series. However, the status of the stock relative to historical levels is unknown and it may have been higher in the past.

STOCK STATUS:

F (Fishing Mortality)		
	2009–2011	
Qualitative evaluation	?	Unknown

SSB (Spawning-Stock Biomass)		
	2009–2011	
Qualitative evaluation	?	Unknown

No reliable assessment can be presented for this assessment unit and fishing possibilities cannot be projected, however a reinterpretation of the historic cpue data suggest that recent catch levels (2006-2011) in Subareas I and II seem to have no detriment effect on the stock, however the level relative to historic level is unknown.

RECENT MANAGEMENT ADVICE:

Based on the ICES approach for data-limited stocks, ICES advises that catches should be no more than 9040 t.

This is the first year ICES is providing quantitative advice for data-limited stocks

Other considerations

No reliable assessment can be presented for this assessment unit and fishing possibilities cannot be projected.

ICES approach to data-limited stocks

For data-limited stocks without information on abundance or exploitation ICES considers that a precautionary reduction of catches should be implemented. The resulting limit should stay in place at least two years unless stock information shows a change that merits updating the advice.

For this stock, ICES advises that catches should decrease by 20% compared to the average catch of the last three years, corresponding to catches of no more than 9040 t in 2013 and subsequent years.

The major part of the fishery is managed through input controls. The available information show no negative affect on the stock from the current fishing effort. However, it is unknown if the current exploitation is appropriate in regard to MSY; ICES therefore advises no increase in effort.

STECF COMMENTS: STECF agrees with the ICES assessment of the state of the stock is unknown. The value of 9040 t advised by ICES represents a reduction of 20 % on the average reported landings for 2009-2011. STECF therefore considers it more appropriate to express the advice for 2013 and 2014 in terms of landings instead of catches.

9.4.2. Tusk (*Brosme brosme*) in Division Va and Subarea XIV

FISHERIES: Tusk is largely (98%) caught in a mixed fishery by longline fisheries in Division Va. Tusk is caught both in shelf areas and on the continental slope. In Subarea XIV tusk is caught as a bycatch species in small quantities. Total landings (2011) were 7.4 kt (98% longline).

REFERENCE POINTS:



	Type	Value	Technical basis
MSY	MSY B _{trigger}	Not defined.	




Approach	F_{MSY}	0.29	F_{max} as proxy for F_{MSY}
Precautionary	B_{lim}	Not defined.	
	B_{pa}	Not defined.	
Approach	F_{lim}	Not defined.	
	F_{pa}	Not defined.	

(unchanged since 2012)

F_{max} , derived from a yield-per-recruit curve estimated within the Gadget model is used as a proxy for F_{MSY} .

STOCK STATUS:

F (Fishing Mortality)		
	2011	
MSY (F_{MSY})		Close to target
Precautionary approach (F_{pa}, F_{lim})		Unknown

SSB (Spawning Stock Biomass)		
	2012	
MSY ($B_{trigger}$)		Unknown
Precautionary approach (B_{pa}, B_{lim})		Unknown
Qualitative evaluation		Above poss. reference points

Recruitment peaked in 2004 to 2006 but has declined since then to a low level in 2011. There are indications that fishing mortality may have declined in recent years and is close to the proxy for F_{MSY} . SSB has been increasing in recent years and is likely above candidate MSY $B_{trigger}$.

RECENT MANAGEMENT ADVICE:

ICES advises that based on MSY approach, landing should be no more than 6700 t.

Other considerations

MSY approach

A decrease in catches to 6700 t or less will result in a fishing mortality close to F_{max} in 2013 and a stable spawning-stock biomass.

However, the drop in recruitment since 2005–2006 will result in a decline in fishable biomass and sustainable catches in the coming years. Closures of known spawning areas and areas of high juvenile abundance should be maintained and expanded if needed.

STECF COMMENTS: STECF agrees with the ICES assessment of the state of the stock. STECF notes that the ICES advice is based on using F_{max} as the F_{MSY} proxy. However STECF considers that $F_{0.1}$ (0.16) is a more precautionary proxy of F_{MSY} than F_{max} (0.29) and given the continual decline in recruitment, basing advice for 2013 on $F_{0.1}$ would be more appropriate. Adopting the $F_{0.1}$ approach implies landings of tusk of no more than 3900 t in 2013.

9.4.3. Tusk (*Brosme brosme*) on the Mid-Atlantic Ridge (Division XII excluding XIIb)

FISHERIES: Tusk is a bycatch species in this area. There have been no reported catches during the last four years. Tusk has previously been a bycatch species in the gillnet and longline fisheries in Subdivisions XIIa₁ and XIVb₁. Russia reported catches of tusk in 2005, 2007, and 2009. In 1996–1997 Norway also had a fishery in this area.

NEAFC recommends that in 2009–2010 the effort in areas beyond national jurisdiction shall not exceed 65% of the highest level for deep-water fishing in previous years.

REFERENCE POINTS: No reference points have been defined for this assessment unit.

STOCK STATUS:

F (Fishing Mortality)	
2009–2011	
Qualitative evaluation	Unknown
	?

SSB (Spawning-Stock Biomass)	
2009–2011	
Qualitative evaluation	Unknown
	?

The only available information is landing statistics, with sporadic very low catches showing no trend. Catches from this area have been small and no catches have been reported for the last four years. No scientific analyses have been carried out.

RECENT MANAGEMENT ADVICE:

ICES advises on the basis of the approach for data-limited stocks that catches should not be increased unless there is evidence that this is sustainable. Measures should be taken to limit occasional high levels of bycatch.

This is the first year ICES is providing quantitative advice for data-limited stocks

Other considerations

No reliable assessment can be presented for this assessment unit and fishing possibilities cannot be projected.

ICES approach to data-limited stocks

For data-limited stocks without information on abundance or exploitation ICES considers that a precautionary reduction of catches should be implemented. The resulting limit should stay in place for at least two years unless stock information shows a change that merits updating the advice.

For this stock, since the current catches are around zero, ICES advises that catches should not increase unless there is evidence that this is sustainable. Occasional high bycatches should be avoided.

STECF COMMENTS: STECF agrees with the ICES advice for 2013 and 2014.

9.4.4. Tusk (*Brosme brosme*) in Subarea VIb (Rockall)

FISHERIES: Tusk is a bycatch species in the trawl, gillnet, and longline fisheries in Division VIb. Norway has traditionally landed the largest percentage of the total catch and in 2011 Norwegian longliners reported 96% of the total landings. Since 12 January 2007 parts of the Rockall bank have been closed to fishing with bottom trawls, gillnets, and longlines. The closed areas are areas traditionally fished by the Norwegian longline fleet. In 2004 Russia initiated a longline fishery of ling with a bycatch of tusk in international waters of the Rockall Bank. The maximum catch (137 t) was taken in 2005. In recent years the intensity of the Russian longline fishery has decreased. Small bycatches of tusk were also taken in the area by trawlers targeting haddock. Total catch (2011) was 0.45 kt, where 100% were landings (96% longline and 4% other gear types).

REFERENCE POINTS: No reference points have been defined for this assessment unit.

STOCK STATUS:

F (Fishing Mortality)		
	2009–2011	
MSY (F_{MSY})	?	Unknown
Precautionary approach (F_{pa}, F_{lim})	?	Unknown
SSB (Spawning-Stock Biomass)		
	2009–2011	
MSY ($B_{trigger}$)	?	Unknown
Precautionary approach (B_{pa}, B_{lim})	?	Unknown
Qualitative evaluation	↔	Stable

The only information on abundance of tusk is from an index that may not be accurate (i.e. the index is not standardized and does not take changes in fishing patterns into account), which implies that it should not be read as showing precise changes in abundance over time. The landings have been low since 2001, with a decreasing trend until 2008. The last three years the landings have remained stable at around 500 tonnes. The cpue also shows a decreasing trend until 2007; after this it has remained at a stable low level. The interpretation of these plots is that the abundance is stable at current catch levels. Discard information is not available.

RECENT MANAGEMENT ADVICE:

Based on the ICES approach for data-limited stocks, ICES advises catches of no more than 350 t.

This is the first year ICES is providing quantitative advice for data-limited stocks

The assessment of the stock is based on trends of an abundance index from commercial catches. There are no forecasts available.

Other considerations

ICES approach to data-limited stocks

For data-limited stocks for which an abundance index is available, ICES uses as harvest control rule an index-adjusted *status quo* catch. The advice is based on a comparison of the two most recent index values with the

three preceding values, combined with recent catch or landings data. Knowledge about the exploitation status also influences the advised catch.

There is an indication of stable abundance in the fishable biomass cpue from the commercial cpue index. This implies catches equal to the average catch of the last three years, corresponding to catches of no more than 440 t.

Additionally, considering that exploitation is unknown, ICES advises that catches should decrease by a further 20% as a precautionary buffer. This results in catches of no more than 350 t in 2013.

STECF COMMENTS: STECF agrees with the ICES assessment of the state. The value of 350 t advised by ICES represents a reduction of 20 % on the average reported landings for 2009-2011. STECF therefore considers it more appropriate to express the advice for 2013 and 2014 in terms of landings instead of catches.

9.4.5. Tusk (*Brosme brosme*) in IIIa, IV, Vb, VIa, VII, VIII, IX, XIIb (Other areas)

FISHERIES: Tusk is a bycatch species in longline, trawl, and gillnet fisheries for a range of species, including ling and other gadoids. Norway has traditionally landed a large share of the total international landings and in 2011 Norwegian landings for all areas except Division Vb constituted 86% of the total landings. Ca. 90% of the Norwegian landings are taken by longliners. The Faroese fleet caught nearly all landings in Division Vb in 2011 because of no bilateral or multilateral agreements between the Faroes and Norway/EU. Total catch (2011) was 6.4 kt, where 100% were landings (90% longliners, 5% trawlers, and 5% gillnets).

REFERENCE POINTS: No reference points have been defined for this assessment unit. However, as adult abundance as measured by Faroese surveys and all commercial indices is above the average of the time-series, SSB is considered to be likely above any candidate values for MSY $B_{trigger}$.

STOCK STATUS:

F (Fishing Mortality)		
	2009–2011	
MSY (F_{MSY})	?	Unknown
Precautionary approach (F_{pa}, F_{lim})	?	Unknown
SSB (Spawning-Stock Biomass)		
	2009–2011	
MSY ($B_{trigger}$)	?	Unknown
Precautionary approach (B_{pa}, B_{lim})	?	Unknown
Qualitative evaluation	✓	Above possible reference points

No reliable assessment can be presented for this assessment unit and fishing possibilities cannot be projected. Landings in all subareas have been stable since 2002. Both Faroese survey indices show an increasing trend since the early 2000s and cpue series both from the Faroes fishery in Division Vb and Norwegian longline fisheries in Divisions IVa, Vb, and VIa (not standardized) show similar trends. The average of the stock size indicator (the Faroese survey indices, number/hour) in the last two years (2010–2011) is substantially higher than the average of the three previous years (2007–2009).

RECENT MANAGEMENT ADVICE:

Based on the ICES approach for data-limited stocks, ICES advises that catches should be no more than 8500 tonnes.

This is the first year ICES is providing quantitative advice for data-limited stocks

Other considerations

No analytical assessment is available for this stock. Therefore, detailed management options cannot be presented.

ICES approach to data-limited stocks

For the data-limited stock with abundance information from fishery-independent data ICES uses as harvest control rule the abundance index-adjusted *status quo* catch, which provides advice based on a comparison of the last two years of abundance data compared to the previous three years, combined with the catch data available from previous years. Knowledge on the exploitation status influences the impact of the biomass changes on the advised catch.

For this stock the abundance is estimated to have increased by more than 20% in 2007–2009 (average of the three years) and 2010–2011 (average of the two years). This implies an increase of catches of at most 20% compared to the average catch of the last three years, corresponding to catches of no more than 8500 t.

As the exploitation is not detrimental to the stock (even though the exploitation status is unknown) and the biomass has increased more than 50%, no additional precautionary reduction is needed.

STECF COMMENTS: STECF notes that ICES assumes that the trends in the Faroese CPUE time series is representative of trends in the stock in geographically widespread areas, which may not be the case. The advice implies an increase in the average of the 2009–2011 landings of 20%. STECF considers that because of the uncertainty concerning the representativeness of the trends in the Faroese CPUE series for the stock as a whole, a more precautionary approach would be to restrict landings to the average level over the period 2009–2011. Adopting such an approach would imply landings in 2013 and 2014 of 7,110 t.

9.5. Greater silver smelt or argentine (*Argentina silus*)

FISHERIES: Argentine is primarily fished in the depth range 100 to 700 m. The majority of landings are from ICES sub-areas IIa, IIIa, IVa along the Norwegian coast, Va (around Iceland), and Vb (around Faroe Islands). This species is taken mainly in long line fisheries, and most of the catches are by-catches in ling fisheries. This species is also taken as by-catch in bottom trawl fisheries. The Norwegian fishery accounts for the more than 50% of total catches. The total landings from the whole area in 2011 were 46,073 tonnes.

SOURCE OF MANAGEMENT ADVICE: The main management advisory body is ICES. No reliable analytical assessment is available.

STOCK STRUCTURE: There is insufficient scientific information to establish the extent of putative stocks; however, argentine may be sufficiently isolated at separate fishing grounds to be considered as individual management units. On this basis advice is presented for the following management units:

- Sub-area Va (Iceland); and
- Sub-areas I, II, IIIa, IVa, Vb, VI, VII, VIII, IX, and XII (other areas).







The latter grouping is a combination of isolated fishing grounds and these areas are thus grouped due to their mutual lack of data.

9.5.1. Greater silver smelt (*Argentina silus*) in Va

FISHERIES: The fishery in Division Va for greater silver smelt is largely driven by market factors and has expanded rapidly since 2007 and subsequently the fishery has changed from a small-scale complementary fishery to the redfish fishery and on to a targeted fishery. More than 70% of the greater silver smelt caught in Division Va is taken in hauls where it composes 50% or more of the total catch of the haul, implying that this is a directed fishery. Total landings in 2011 were 10,000 t, where 100% were taken in trawl fisheries.

REFERENCE POINTS: There is no analytical basis on which to calculate biological reference points. During the period 2002 to 2007 where no detrimental effect is observed in the stock dynamics, the mean value of F_{proxy} (total catch/survey biomass) is 0.076. This value can therefore be considered to be an appropriate and conservative advisory F_{proxy} upon which to base catch advice. It is likely that the current biomass is above $B_{trigger}$.

STOCK STATUS:

F (Fishing Mortality)		
		2007–2011
MSY (F_{MSY})		Unknown
Precautionary approach (F_{pa}, F_{lim})		Unknown
Qualitative evaluation		Increasing
SSB (Spawning-Stock Biomass)		
		2007–2011
MSY ($B_{trigger}$)		Unknown
Precautionary approach (B_{pa}, B_{lim})		Unknown
Qualitative evaluation		Above possible ref points

Survey indices suggest a reduction in stock biomass in the last three years, and an increase in F_{proxy} indicates an increase in exploitation since 2007. Changes in mean age and length in catches indicate that the stock is at a reduced level.

RECENT MANAGEMENT ADVICE:

Based on the ICES approach for data-limited stocks, ICES advises that catches should be no more than 3700 tonnes.

This is the first year ICES is providing quantitative advice for data-limited stocks

Other consideration

No analytical assessment is available for this stock. Therefore, detailed management options cannot be presented.

ICES approach to data-limited stocks

For this stock the F_{proxy} of 0.076 is applied as a factor to the 2010 biomass estimate, resulting in catch advice of no more than 3,700 t. ICES does not implement the default rule as used for other data-limited stocks because the fishing mortality has increased significantly in the last two years.

STECF COMMENTS: STECF agrees with the ICES assessment that the state of the stock and the ICES advice that due to its low productivity, greater silver smelt can only sustain low rates of exploitation and that the

recently expanded (from 2008 to 2011) target fishery should be constrained, where 3,700 t for landings in 2013 can be considered a precautionary level of exploitation given the available information.

9.5.2. Greater silver smelt (*Argentina silus*) in other areas (I, II, IIIa, IV, Vb, VI, VII, VIII, IX, X, XII and XIV)

FISHERIES: There are presently three main areas where directed fisheries are conducted within the assessment unit area: around the Faroes (Division Vb), west of mid-Norway (Division IIa), and Subareas VI and VII. Landings in Division Vb doubled between 2005 and 2006 and have remained stable at this level since. Though landings from Division IIa have fluctuated, they have remained stable in the last four years. Landings in Subareas VI and VII declined significantly between 2002 and 2009 and increased in 2010 and 2011. Total landings in 2011 were 35,600 t.

REFERENCE POINTS: No reference points have been defined for this assessment unit.

STOCK STATUS:

F (Fishing Mortality)		
		2009–2011
MSY (F_{MSY})	?	Unknown
Precautionary approach (F_{pa}, F_{lim})	?	Unknown
Qualitative evaluation	?	Unknown
SSB (Spawning-Stock Biomass)		
		2009–2011
MSY ($B_{trigger}$)	?	Unknown
Precautionary approach (B_{pa}, B_{lim})	?	Unknown
Qualitative evaluation	?	Unknown

The state of the silver smelt resource in “other areas” is unknown. Catches increased considerably in recent years, but were reduced in 2003 in some areas, partly due to introduction of TAC management in EU waters. There is no evidence of a decline in biomass in Division Vb. Biomass in Subarea VII declined between 2001 and 2007 and has remained stable at about half the initial value since. Trends in abundance in Division IIa are unknown.

RECENT MANAGEMENT ADVICE:

Based on the ICES approach for data-limited stocks, ICES advises that catches should be no more than 31 300 tonnes.

This is the first year ICES is providing quantitative advice for data-limited stocks

Other considerations

No analytical assessment is available for this stock. Therefore, detailed management options cannot be presented.

ICES approach to data-limited stocks

For data-limited stocks for which an abundance index is available, ICES uses as harvest control rule an index-adjusted *status quo* catch. The advice is based on a comparison of the two most recent index values with the three preceding values, combined with recent catch or landings data. Knowledge about the exploitation status also influences the advised catch.

For this stock the abundance is estimated to have increased by 10% (a catch-weighted mean between the index for Division Vb and the one for Porcupine Bank) between 2007–2009 (average of the three years) and 2010–2011 (average of the two years). This implies an increase in catches of at most 10% in relation to last year's catch, corresponding to catches of no more than 39 115 t.

Additionally, considering that exploitation is unknown, ICES advises that catches should decrease by a further 20% as a precautionary buffer. This results in catches of no more than 31 292 t in 2013.

STECF COMMENTS: STECF notes that the 10% reduction is on the basis of a 10% increase with a 20% precautionary discount. Applying a 20% reduction in light of an SSB increase seems counter intuitive in principle, because over time such measures are cumulative and catches will be driven down on the basis of management measures. However in this case the evidence of an increase in biomass is very weak and biomass appears to be at significantly less than 50% of historic levels. For such a long-lived low productivity species this should suggest that F needs to be reduced more rapidly to be precautionary until a more significant response in biomass is observed.

STECF notes that an independent assessment of greater silver smelt in Division Vb has been undertaken by Faroese scientists but it is unclear whether the trends in the stock and exploitation rate are representative of the trends of the stock in other areas.

9.6. Black scabbardfish (*Aphanopus carbo*)

FISHERIES: Black scabbardfish is caught in two very different fisheries: (1) in waters off mainland Portugal (Division IXa) and (2) to the west of the British Isles. In the waters off Mainland of Portugal it is taken in a targeted artisanal longline fishery and CPUE data have been relatively stable over the years. To the west of the British Isles it is taken in a mixed species fishery, mainly in a French trawl fishery along with roundnose grenadier and sharks. The total landings from the whole area in 2011 were 5,989 tonnes.

SOURCE OF MANAGEMENT ADVICE: The main management advisory body is ICES.

STOCK STRUCTURE: The stock structure is uncertain. This section deals with a species distributed over a wide area which may be composed of several populations. Three management units are considered:

northern (Sub-areas V, VI, VII, and XIIb);

southern (Sub-areas VIII and IX).

Other areas (Sub-areas I, II, IIIa, IV, X, and XIV)

REFERENCE POINTS: No precautionary reference points have been established for the stock(s) of this species.

STOCK STATUS: The status of the species is unknown. In the northern area, indicators show a decline in abundance since 1990. In the southern area indicators have been relatively stable during the past decade. In the other areas only very small catches have been taken. Due to its low productivity, black scabbardfish can only sustain low rates of exploitation.

RECENT MANAGEMENT ADVICE: ICES recommends for 2013 and 2014 that catches in Subareas VI, VII, and Divisions Vb and XIIb should be constrained to 4,700 t (20% increase).

ICES recommends for 2013 and 2014 that catches in Subareas VIII and IX should not exceed 2,900 t, and the fishery in other areas should not be allowed to expand unless it can be shown that it is sustainable.

STECF COMMENTS: STECF agrees with this advice for in divisions Vb, XIIb and subareas VI and VII, but notes that ICES has used the 2010 value of catches as the basis of the 20% increase because of the uncertainty in the 2011 landings information. Using the more general ICES approach to uncertainty in the final year catch data (using the 3-year average) would imply catches of 4,500 t.

STECF agrees with this advice for 2013 and 2014 in ICES subareas VIII and IX, but notes that ICES has used the 2010 value of catches as the basis of the 20% increase because of the uncertainty in the 2011 landings information. Using the more general ICES approach to uncertainty in the final year catch data (using the 3-year average) would still imply catches of 3,700 t rounded to hundreds.

STECF agrees with the ICES assessment of the state of the stock and the advice for 2013 and 2014 in other areas, but further notes that for other data poor stocks with more available information ICES has advised reductions in catches on the basis of precautionary considerations.

9.6.1. Black scabbardfish (*Aphanopus carbo*) in divisions Vb, XIIb and subareas VI and VII

FISHERIES: In Subareas VI, VII, and XII, and Division Vb, black scabbardfish is mainly taken in mixed trawl fisheries along with roundnose grenadier and sharks, although some trawl fisheries can target specific species within the mixed fishery. Due to the mixed nature of the trawl fisheries in Subareas VI, VII, and XII, and Division Vb any measure taken to manage this species in these areas should take into account the advice given for other species taken in the same mixed fishery. The total landings in 2011 in Subareas VI, VII, and Divisions Vb and XIIb were 3 001 t.

REFERENCE POINTS: No reference points have been proposed for this stock. However, the biomass as measured by the standardized commercial cpue index is about half of the virgin biomass and thus likely above any candidate values for MSY Btrigger.

STOCK STATUS:

F (Fishing Mortality)		
		2009–2011
MSY (F_{MSY})	?	Unknown
Precautionary approach (F_{pa}, F_{lim})	?	Unknown
Qualitative evaluation	✓	Above poss ref points

SSB (Spawning-Stock Biomass)		
		2009–2011
MSY ($B_{trigger}$)	?	Unknown
Precautionary approach (B_{pa}, B_{lim})	?	Unknown
Qualitative evaluation	✓	Above poss ref points

Standardized cpue is at ca. 50% of its initial level which is considered to correspond to the start of the fishery. The tally-book index, which is considered to be a more reliable biomass index, shows an increasing trend since 2000.

RECENT MANAGEMENT ADVICE:

Based on the ICES approach for data-limited stocks, ICES advises that catches should be no more than 4,700 t.

This is the first year ICES is providing quantitative advice for data-limited stocks

Other considerations

No analytical assessment is available for this stock. Therefore, detailed management options cannot be presented.

ICES approach to data-limited stocks

This data-limited stock has reliable abundance information from standardized commercial cpue data. For harvest control rule ICES uses the abundance/biomass index-adjusted *status quo* catch, which provides advice based on a comparison of the last two years of abundance data compared to the previous three years, combined with the catch data available from previous years.

For this stock the abundance is estimated for both indices to have increased by 20% in 2007–2009 (average of the three years) and 2010–2011 (average of the two years). The catches from last year are assumed to be equal to the landings in 2010 rather than 2011 as these are preliminary and are probably lacking some Spanish catches. Because exploitation is not detrimental to the stock, no additional precautionary reduction is needed. ICES advises that catches should be no more than 4700 t in 2013.

STECF COMMENTS: STECF agrees with this advice, but notes that ICES has used the 2010 value of catches as the basis of the 20% increase because of the uncertainty in the 2011 landings information. Using the more general ICES approach to uncertainty in the final year catch data (using the 3-year average) would imply catches of 4,500 t. Moreover, the value advised by ICES represents an increase of 20% of reported landings. STECF therefore advises that it seems more appropriate to express the advice for 2013 in terms of landings instead of catches. Adopting such an approach implies landings of black scabbardfish of no more than 4,500 t in 2013 2014.

9.6.2. Black scabbardfish (*Aphanopus carbo*) in ICES subareas VIII and IX

FIHERIES: Black scabbardfish is taken in the waters off mainland Portugal in a targeted longline fishery that started in the late 1980s at restricted fishing grounds. Total catch in 2011 was 2,800 t, where 100% are landings (99% deep-water longline, 1% other gear types, and <1% discards).

REFERENCE POINTS: There are no reference points proposed for this stock. However, biomass as measured by the standardized commercial cpue index is currently at its highest level in the time-series (which is thought to represent the entire history of the fishery) and thus likely above any candidate values for MSY Btrigger.

STOCK STATUS:

(Fishing Mortality)		
	2009–2011	
MSY (F_{MSY})	?	Unknown
Precautionary approach (F_{pa}-F_{lim})	?	Unknown
Qualitative evaluation	?	Unknown

SSB (Spawning-Stock Biomass)		
	2010–2011	
MSY (B_{trigger})	?	Unknown
Precautionary approach ($B_{\text{pa}}, B_{\text{lim}}$)	?	Unknown
Qualitative evaluation	✓	Above poss. reference points

Cpue series of Division IXa suggest that the biomass has been increasing since 2000. No reliable assessment can be presented for this assessment unit and fishing possibilities cannot be projected, however cpue series of Division IXa suggest that the biomass has been relatively stable since 1995. (Madeira and Canary Islands are the only known spawning areas of this species in the Northeast Atlantic).

RECENT MANAGEMENT ADVICE:

Based on the ICES approach for data-limited stocks, ICES advises that catches should be no more than 3700 tonnes.

This is the first year ICES is providing quantitative advice for data-limited stocks

Other considerations

No analytical assessment is available for this stock. Therefore, detailed management options cannot be presented.

ICES approach to data-limited stocks

This data-limited stock has reliable abundance information from standardized commercial cpue data. For harvest control rule ICES uses the abundance/biomass index-adjusted *status quo* catch, which provides advice based on a comparison of the last two years of abundance data compared to the previous three years, combined with the catch data available from previous years.

For this stock the abundance is estimated to have increased by 5% in 2007–2009 (average of the three years) and 2010–2011 (average of the two years). The catches from the last year are assumed to be equal to the landings in 2011. Considering that exploitation does not seem to be detrimental to the stock, ICES advises that catches should be no more than 3700 t in 2013.

STECF COMMENTS: STECF agrees with this advice for 2013 and 2014, but notes that ICES has used the 2010 value of catches as the basis of the 5% increase because of the uncertainty in the 2011 landings information. Using the more general ICES approach to uncertainty in the final year catch data (using the 3-year average) would still imply catches of 3,700 t rounded to hundreds. The value of 3,700 t advised by ICES comes from the reported landings. STECF therefore advises that it seems more appropriate to express the advice for 2013 in terms of landings instead of catches. Adopting such an approach implies landings of black scabbardfish of no more than 3,700 t in 2013 and 2014.

9.6.3. Black scabbardfish (*Aphanopus carbo*) in other areas

FISHERIES: Despite the variability in the overall landings data through the years in other areas, the landings data available for the various ICES subareas identify Subarea X as the most important area in this assessment unit. Landings in ICES Subarea XIV may be area-misreporting. Total catches in 2011 are 200 t, where 100% are landings (73% deep-water longline).

REFERENCE POINTS: No reference points have been defined for this assessment unit.

STOCK STATUS:

F (Fishing Mortality)		
		2009–2011
MSY (F_{MSY})	?	Unknown
Precautionary approach (F_{pa}, F_{lim})	?	Unknown
Qualitative evaluation	?	Unknown
SSB (Spawning-Stock Biomass)		
		2009–2011
MSY ($B_{trigger}$)	?	Unknown
Precautionary approach (B_{pa}, B_{lim})	?	Unknown
Qualitative evaluation	?	Unknown

The state of black scabbardfish in other areas is unknown. The only available data on which to assess the stocks are landings data, which in some areas may be unreliable.

RECENT MANAGEMENT ADVICE: The ICES advice is that the fisheries should not be allowed to expand until there is sufficient information showing that the fishery is sustainable.

STECF COMMENTS: STECF agrees with the ICES assessment of the state of the stock and the advice for 2013 and 2014, but further notes that for other data poor stocks with more available information ICES has advised reductions in catches on the basis of precautionary considerations.

9.7. Greater forkbeard (*Phycis blennoides*)

FISHERIES: The landings of greater forkbeard are mainly bycatch from demersal trawl and longline fisheries targeting species such as hake, megrim, monkfish, ling, and blue ling. Since 1988, around 80% of landings came from Subareas VI and VII, and (12%), from Subareas VIII and IX (mainly from VIII). Fluctuations in landings are probably the result of changing effort on different target species and/or market prices and may not necessarily be linked with changes in forkbeard abundance.

TACs are set separately for a) ICES subareas I, II, III and IV, b) ICES subareas V, VI and VII, c) ICES subareas VIII and IX and d) ICES subareas X and XII.

Total landings in 2011 were 1.2 kt (Spanish fleet in Subareas VI, VII, VIII, and IX come from GNS (2%), LLS (18%), OTB (44%), and other gears (37%)). Discards of the Basque OTB Fleet in VI in 2011 is 14% and in VIII is 6% of total landings.

SOURCE OF MANAGEMENT ADVICE: The main management advisory body is ICES.

REFERENCE POINTS: No reference points have been established for the stock(s) of this species.

STOCK STATUS:

F (Fishing Mortality)		
		2009–2011
MSY (F_{MSY})	?	Unknown
Precautionary approach (F_{pa}, F_{lim})	?	Unknown
Qualitative evaluation	?	Unknown
SSB (Spawning-Stock Biomass)		
		2007–2011
MSY ($B_{trigger}$)	?	Unknown
Precautionary approach (B_{pa}, B_{lim})	?	Unknown
Qualitative evaluation	↔	Stable

Available indices for Subarea VII indicate a decline up to 2007. Since then the biomass appears to have been more stable. It is not clear if this is a response to a recruitment pulse passing through the fishery. Information on juveniles in surveys shows some indication of increased abundance in recent years.

RECENT MANAGEMENT ADVICE: Based on the ICES approach for data-limited stocks, ICES advises that catches should be no more than 1,000 t.

This is the first year ICES is providing quantitative advice for data-limited stocks

Other considerations

No analytical assessment is available for this stock. Therefore, detailed management options cannot be presented.

ICES approach to data-limited stocks

For data-limited stocks for which an abundance index is available, ICES uses as harvest control rule an index-adjusted *status quo* catch. The advice is based on a comparison of the two most recent index values with the three preceding values, combined with recent catch or landings data. Knowledge about the exploitation status also influences the advised catch.

The available surveys do not cover the entire distributional area of the stock. However, the surveys indicate stability in the last three years and so advice is based on the average catch over these years.

Additionally, considering that exploitation is unknown, ICES advises that catches should decrease by 20% as a precautionary buffer. This results in catches of no more than 1000 t in 2013.

STECF COMMENTS: STECF agrees with the ICES assessment that the state of the stock is unknown. The value of 1,000 t advised by ICES represents a reduction of 20% on the average reported landings over the period 2009-2011. STECF therefore advises that it seems more appropriate to express the advice for 2013 in terms of landings instead of catches. Adopting such an approach implies landings of greater forkbeard of no more than 1,000 t in 2013 and 2014.

9.8. Orange roughy (*Hoplostethus atlanticus*)

FISHERIES: The directed fishery for orange roughy aggregations west of Ireland in Sub-area VII has now ceased. The fishery in Sub-area VI has decreased dramatically since the depletion of the main aggregation on the Hebrides Terrace Seamount in the early 1990s and there has not been a major directed fishery since 2002. Faroese fisheries in Sub-areas VI, XII, and X have ceased and so has an Icelandic fishery in Division Va.

In Sub-area XII, the Faroes dominated the fishery throughout the 1990s, with small landings by France. In recent years, New Zealand and Ireland have targeted orange roughy in this area. There are many areas of the Mid-Atlantic Ridge where aggregations of this species occur, but the terrain is very difficult for trawlers.

Landings have declined to low levels in each management area (VI, VII, and other sub areas). Total catches in 2011 were 100 kt, where 100% were landings (demersal trawl).

SOURCE OF MANAGEMENT ADVICE: The main management advisory body is ICES.

STOCK STRUCTURE: It is not known if individual aggregations are reproductively distinct.

REFERENCE POINTS: Potential reference points for orange roughy in Subareas VI and VII have been evaluated and indicate that sustainable fishing levels would be very low (F_{MSY} proxies = 0.04–0.06).

STOCK STATUS:

F (Fishing Mortality)		
		2009–2011
MSY (F_{MSY})	?	Unknown
Precautionary approach (F_{pa}, F_{lim})	?	Unknown
Qualitative evaluation	?	Unknown
SSB (Spawning-Stock Biomass)		
		2009–2011
MSY ($B_{trigger}$)	?	Unknown
Precautionary approach (B_{pa}, B_{lim})	?	Unknown
Qualitative evaluation	?	Unknown

Orange roughy catches in Subarea VI increased rapidly and subsequently dropped. Orange roughy cpue in Subarea VI has shown a strong declining trend since early 1990s. It is presumed that the aggregations were fished out.

Orange roughy fisheries in Subarea VII have exhibited a similar pattern to that in VI. High catches have not been sustained by individual fleets and have dropped to low levels, suggesting sequential depletion. Orange roughy cpue in Subarea VII has shown a strong declining trend since the early 1990s. It is unclear if there are unfished aggregations remaining in Subarea VII.

Fisheries have been closed for all EC fisheries in these and other areas. There is insufficient information to evaluate the status of the stock in other areas. There is currently no internationally agreed TAC in the NEAFC regulatory area.

RECENT MANAGEMENT ADVICE:

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

Other considerations

No reliable assessment can be presented for this stock and fishing possibilities cannot be projected. The new survey data available do not change the perception of the stock.

A zero TAC without allowing a bycatch can potentially lead to discarding if existing fisheries overlap with the distribution of orange roughy. A preliminary examination of French observer data does not suggest that bycatch and discarding of orange roughy is currently significant. In order to protect the species, careful monitoring of the spatial overlap of existing fisheries with the distribution of orange roughy, coupled with the collection of fisheries dependant and independent data (observer programme and surveys) is required.

STECF COMMENTS: STECF agrees with the ICES assessment of the state of the stock and the advice for 2013 and 2014.

9.9. Roundnose grenadier (*Coryphaenoides rupestris*)

FISHERIES: The majority of international landings are from the Skagerrak (III), Faroes (Vb), west of Scotland and Rockall Trough (VI), west of Ireland and Western Approaches (VII) and the Mid-Atlantic ridge and western Hatton Bank (XII). In most areas, roundnose grenadier is the target species of mixed trawl fisheries. Total landings in 2011 were 6,638 t.

SOURCE OF MANAGEMENT ADVICE: The main management advisory body is ICES.

STOCK STRUCTURE: This section deals with a species distributed over a wide area, which may be composed of several populations. The scientific basis for stock identification is uncertain. The Wyville-Thomson Ridge and fjord sills, between Western Scotland and the edge of the North Sea slope, could be natural physical boundaries. It is therefore considered that the northern North Sea and the Norwegian Deep could represent a separate unit. The roundnose grenadier on the Mid-Atlantic Ridge and the Hatton Bank are separated by a major oceanic basin and may constitute separate units. This would indicate that the units could be split as:

- Divisions IIIa;
- Divisions Vb, VI, VII, and XIIb (Hatton bank);
- Mid-Atlantic ridge (Subdivisions Xb, XIIc, Va1, XIIa1, and XIVb1) ;
- All other areas (I, II, IV, Va2, VIII, IX, XIVa, XIVb2).

9.9.1. Roundnose grenadier (*Coryphaenoides rupestris*) in Division IIIa

FISHERIES: A total of only 2–3 vessels actively participated in the fishery during the period of peak catches in 2002–2005. Since 2007 there has been no directed fishery, and at present this species is taken only as bycatch and only in small amounts. Preliminary data account for 0 landings in 2011.

REFERENCE POINTS: No reference points have been established for the stock(s) of this species.

STOCK STATUS:

F (Fishing Mortality)	
	2009–2011
Qualitative evaluation	 Unknown

SSB (Spawning-Stock Biomass)		
	2009–2011	
Qualitative evaluation	?	Unknown

It has not been possible to assess the status of the stock. No directed fishery has taken place since 2007. A decrease in mean length in the catch from 1987 to 2004 and 2005 indicates heavy exploitation on this stock.

Catches appear to have been stable at about 1000 tonnes in the 1990s. Large increases in catches in the early 2000s are considered to have been unsustainable on the basis of the biology of the species and the small geographical extent of the fishery (in one ICES rectangle alone). Catches after 2006 are zero due to zero TAC in the Norwegian sector.

RECENT MANAGEMENT ADVICE:

ICES advises on the basis of the approach for data-limited stocks that a fishery on this stock should not be allowed unless there is evidence that this is sustainable.

This is the first year ICES is providing quantitative advice for data-limited stocks

Other considerations

No analytical assessment is available for this stock. Therefore, detailed management options cannot be presented.

ICES approach to data-limited stocks

For data-limited stocks without information on abundance or exploitation ICES considers that a precautionary reduction of catches should be implemented. The resulting limit should stay in place for three years unless stock information shows a change that merits updating the advice.

For this stock, since the current catches are around zero, ICES advises that a fishery on this stock should not be allowed unless there is evidence that this is sustainable.

STECF COMMENTS: STECF agrees with the ICES assessment that the state of the stock and the advice for 2013 and 2014.

9.9.2. Roundnose grenadier (*Coryphaenoides rupestris*) in Subareas VI and VII and in Divisions Vb and XIIb



FISHERIES: Roundnose grenadier is caught in a mixed fishery catching also black scabbardfish and blue ling. The period before the expansion of the fishery corresponds to the years 1990–1996. Landings in recent years have been below TACs both in Division Vb, Subareas VI, VII, and Division XIIb. Length distributions of French and Spanish landings decreased towards smaller fish. Discards accounted for about 30% of the catch in weight and 50% in number for the French fleets. Discards for the Spanish fleets are 10–18% of the landings in weight. In 2011, French discards have been reduced to 12% of the catch due to fishing activity in shallower waters and avoidance strategy. Spanish discards rate were uncertain but composed at least 5% of the catch. Total landings in 2011 (provisional) were 3,100 t (6,220 t in 2010), 100% deep-water trawl.



REFERENCE POINTS:

	Type	Value	Technical basis
MSY	MSY B_{trigger}	44 900 t	B_{loss} (2012 assessment).
Approach	B_{MSY}^*	69 100 t	Half of carrying capacity K , estimated from the surplus

			production model.
	H_{MSY}^*	0.08	Half of the intrinsic growth rate r , estimated from the surplus production model.
Precautionary Approach	B_{lim}	Not defined.	
	B_{pa}	Not defined.	
	F_{lim}	Not defined.	
	F_{pa}	Not defined.	

STOCK STATUS:

F_{proxy} (Harvest Rate)		
2009–2011		
MSY (H_{MSY})		Below target
Precautionary approach (F_{pa}, F_{lim})		Unknown

Stock Biomass		
2009–2011		
MSY ($B_{trigger}$)		Above target
Precautionary approach (B_{pa}, B_{lim})		Unknown

Total biomass for Division Vb and Subareas VI and VII is estimated to have been below B_{MSY} since 2002, decreasing until 2006. The stock is currently above MSY $B_{trigger}$. The harvest rate is below target (H_{MSY}).

RECENT MANAGEMENT ADVICE:

ICES advises that based on the MSY approach catches should be no more than 6,000 t (4,500 t for Division Vb and Subareas VI and VII, and 1,500 t (the 2011 catch) for Division XIIIb).

Other considerations

MSY approach

Following the ICES MSY framework implies fishing at a harvest rate of 0.08, resulting in landings of no more than 4500 tonnes in 2013 and 2014 for Division Vb and Subareas VI and VII.

Precautionary approach

Catches in Division XIIb have been declining in recent years. Following the precautionary approach ICES advises that catch should be no higher than that in 2011. This equates to a catch of no more than 1500 tonnes in 2013 and 2014 for Division XIIb.

STECF COMMENTS: STECF **recommends** that in order to reverse the observed decline in the stock of roundnose grenadier in Vb, VI, VII and XIIb, a significant reduction in fishing mortality is required. STECF notes the dramatic decline in the landings of roundnose grenadier from this area from a level of 25,000 t in 2001 to 3,000 in 2011.

To ensure a significant reduction in fishing mortality in order to allow the recovery of the stock STECF reiterates its previous advice that it may be necessary to ensure that catches are lower than the TAC advised by ICES.

Given that roundnose grenadier is taken in a deepwater mixed fishery, there is a need to harmonise management measures to account for the management requirements for other species taken.

9.9.3. Roundnose grenadier (*Coryphaenoides rupestris*) on the Mid-Atlantic ridge (Xb, XIIc, Va1, XIIa1, and XIVb1)

FISHERIES: The greatest annual catch (almost 30 000 t) in the area was taken by the Soviet Union in 1975 and in subsequent years the Soviet catch varied from 2800 to 22 800 t (Figure 9.4.15.3.1). In the last 15 years a sporadic fishery has taken place by vessels from Russia (annual catch estimated at 200–3200 t), Poland (500–6700 t), Latvia (700–4300 t), Spain (1600–3400 t), and Lithuania (data on catch are not available). Grenadier has also been taken as a bycatch in the Faroese orange roughy fishery and the Spanish blue ling fishery. The roundnose grenadier fisheries in Divisions Xb and XIIc, and Subdivisions Va1, XIIa1, and XIVb1 are managed by a TAC for European Community vessels. In international waters NEAFC regulations control efforts in the fisheries for deep-water species. Total catch in 2011 was 3.366 kt, where 100% was taken by mid-water trawl. No data for discards, industrial bycatch, or unaccounted removals.

REFERENCE POINTS: No reference points have been established for the stock(s) of this species.

STOCK STATUS:

F (Fishing Mortality)	
	2009–2011
Qualitative evaluation	? Insufficient information
SSB (Spawning-Stock Biomass)	
	2009–2011
Qualitative evaluation	? Insufficient information

RECENT MANAGEMENT ADVICE: Based on the ICES approach for data-limited stocks, ICES advises that catches should be no more than 1,350 t.

This is the first year ICES is providing quantitative advice for data-limited stocks

Other considerations

No analytical assessment is available for this stock. Therefore, detailed management options cannot be presented.

ICES approach to data-limited stocks

For data-limited stocks without information on abundance or exploitation ICES considers that a precautionary reduction of catches should be implemented.

For this stock, ICES advises that catches should decrease by 20% compared to the average catch of the last three years, corresponding to catches of no more than 1350 t in 2013 and subsequent years.

STECF COMMENTS: STECF agrees with the ICES assessment that the state of the stock is unknown. The value of 1,350 t advised by ICES represents a reduction of 20% on the average reported landings over the period 2009-2011. STECF therefore advises that it seems more appropriate to express the advice for 2013 in terms of landings instead of catches. Adopting such an approach implies landings of roundnose grenadier of no more than 1,350 t in 2013 and 2014.

9.9.4. Roundnose grenadier (*Coryphaenoides rupestris*) in all other areas. (I, II, IV, Va2, VIII, IX, XIVa, and XIVb2)

FISHERIES: There have been no directed fisheries, and roundnose grenadier were taken as bycatch in bottom trawls only in small amounts in a number of discrete areas. Total catch in 2011 was 0.129 kt, where 100% were landings taken with bottom trawl as bycatch. No data for discards and unaccounted removals.

SOURCE OF MANAGEMENT ADVICE: The main management advisory body is ICES.

The assessment is based on landings data and is indicative of trends. This assessment unit consists of a number of discrete areas in which only very small catches of roundnose grenadier occur.

REFERENCE POINTS: This is a bycatch fishery and advice on this stock should take advice for other stocks into account.

STOCK STATUS:

F (Fishing Mortality)		
		2009–2011
Qualitative evaluation	?	Unknown

SSB (Spawning-Stock Biomass)		
		2009–2011
Qualitative evaluation	?	Unknown

Catches across this assessment unit are minor and have declined to very low levels in recent years. This is a bycatch fishery so trends in landings may reflect changes in activity in other fisheries rather than stock abundance. Catches in early years may include an element of species misidentification.

RECENT MANAGEMENT ADVICE: Based on the ICES approach for data-limited stocks, ICES advises that fisheries should not be allowed to expand from 120 t until there is evidence that this is sustainable.

This is the first year ICES is providing quantitative advice for data-limited stocks

Other considerations

No analytical assessment is available for this stock. Therefore, detailed management options cannot be presented.

ICES approach to data-limited stocks

For data-limited stocks without information on abundance or exploitation ICES considers that a precautionary reduction of catches should be implemented. The resulting limit should stay in place for at least two years unless stock information shows a change that merits updating the advice.

For this stock, since catches are marginal and consist of bycatches, and there is no indication of high discard rates, ICES advises that catches should not exceed 120 t, the average catch from the last three years, unless there is evidence that this is sustainable.

STECF COMMENTS: STECF agrees with the ICES assessment that the state of the stock in these areas is unknown. STECF notes that the value of 120 t comes from the average of the last three landings without the precautionary 20% reduction. In order to be consistent with other data poor stocks, STECF suggests a reduction of 20% of the catches corresponding to 100 t. Moreover, the value of 120 t advised by ICES comes from landings data. STECF therefore advises that it seems more appropriate to express the advice for 2013 in terms of landings instead of catches. Adopting such an approach implies landings of roundnose grenadier of no more than 100 t in 2013 and 2014.

9.10. Red (blackspot) seabream (*Pagellus bogaraveo*) in ICES Subareas VI, VII, VIII, IX and X (Azores)

FISHERIES: There is a directed hand-line and longline fishery in Sub-areas IX and X. Red seabream have been caught in hook and line fisheries off the Azores since the 16th Century. There are now directed artisanal hand-line as well as longline fisheries in area Xa2. Historically, improvements in fishing technology have taken place in the directed hand-line and longline fisheries. These include the introduction of bottom longlines and bigger fishing vessels. The resulting improvement on fishing efficiency has not been quantified. Red seabream is caught by Spanish and Portuguese fleets in Sub-area IX. The Spanish artisanal longline fishery targeting red sea began in early 1980s. After 1997 there was a serious decline in landings. In Sub-areas VI, VII and VIII Red seabream appears as by-catch in the longline and trawl fisheries for hake, megrim, anglerfish, and *Nephrops*. In 2011 preliminary data show landing of 1,141 tonnes.

SOURCE OF MANAGEMENT ADVICE: The main management advisory body is ICES.

STOCKS STRUCTURE: The stock structure is uncertain. This section deals with a species distributed over a wide area, which may be composed of several populations. Three units are considered:

- Subareas VI, VII, and VIII;
- Subarea IX;
- Subarea X.

This management units division are supported by information on genetics and tagging.

REFERENCE POINTS: No precautionary reference points have been established for the stock(s) of this species.

STOCK STATUS (ALL STOCKS):

The state of the red seabream in Subareas VI, VII, and VIII is unknown. However catches are well below the historical levels of the 60's and 70's which could indicate that the assessment unit is depleted.

The state of the stock of Red seabream in Subarea IX is unknown.

The state of the stock of Red seabream in Subarea X is unknown.

RECENT MANAGEMENT ADVICE:

Subareas VI, VII and VIII

No directed fisheries, and measures should be put in place to reduce bycatch.

Subarea IX

Based on the ICES approach to data-limited stocks, ICES advises no increase in effort and that catches should be no more than 500 t.

Subarea X

Based on the ICES approach for data-limited stocks, ICES advises that catches should be no more than 400 t.

STECF COMMENTS:

STECF agrees with the ICES assessments that the states of these stocks are unknown.. The values advised by ICES for Subareas IX and X represents a reduction respectively of 20% and 40% on the average reported landings over the period 2009-2011. STECF therefore advises that it seems more appropriate to express the advice for 2013 in terms of landings instead of catches. Adopting such an approach implies landings in 2013 and 2014 of red (blackspot) seabream of no more than 500 t in Subarea IX and 400 t Subarea X.

9.11. Portuguese dogfish (*Centroscymnus coelolepis*) in the north-east Atlantic

The most recent advice for this stock was provided by ICES in 2010. Hence, the following text remains unchanged from the Consolidated STECF Review of Advice for 2011. Advice for 2013 will be provided in Part 3 of the STECF review of Advice for 2013 which will be available in November 2012.

FISHERIES: Portuguese dogfish are caught in virtually all deep-water fisheries in the NE Atlantic although catch data is patchy and incomplete. French trawlers, UK and German longliners and gillnetters in VI and VII are the fleets targeting this species. These fisheries began in 1991 and before that the species was not exploited. There are also directed longline fisheries in VIII and IX and some by-catches from XII. Landings of this species have been routinely grouped together with Leafscale gulper shark and reported as siki. Combined siki landings began in 1988 (although an unknown quantity is likely to have been discarded prior to this) and increased rapidly to over 8000 tonnes in 1997. Since 1997 landings have fluctuated with an overall upward trend, reaching a maximum of over 10,000 tonnes in 2003. Since 2003, reported landings have declined due to stock depletion and the introduction and gradual reduction in EU TACs and quotas in response to ICES advice, which in recent years has been for a zero TAC. However, deep-water sharks continue to be taken as a by-catch in a mixed deep-water trawl fishery in Vb, VI and VII and in a long-line fishery in Sub-area IX.

SOURCE OF MANAGEMENT ADVICE: The main advisory body is ICES. No analytical assessment was carried out in 2010. The assessment is based on commercial CPUE trends and survey trends. Landings data on these species remain very problematical and, in many cases, reliable data are only available for combined siki sharks. Many countries continue to report landings in amalgamated categories such as various sharks N.E.I. Retrospective splitting of the data into species categories and reconstruction of historic data from mixed categories is based on limited information and is problematic.

REFERENCE POINTS:

Reference points

	<i>Type</i>	<i>Value</i>	<i>Technical basis</i>
MSY	MSY B_{trigger}	Not defined	
Approach	F_{MSY}	Not defined	
Precautionary	B_{lim}	Not defined	
	B_{pa}	Not defined	
Approach	F_{lim}	Not defined	
	F_{pa}	Not defined	

In common with other deep-water species, U_{lim} has previously been proposed at 0.2* virgin biomass and U_{pa} at 0.5* virgin biomass (ICES, 1998) but in the absence of abundance indices that correspond to the start of the fishery, the reference points cannot be estimated.

STOCK STATUS:

F (Fishing Mortality)			
	2007	2008	2009
F_{msy}		?	
F_{pa} / F_{lim}		?	

SSB (Spawning Stock Biomass)			
	2008	2009	2010
$MSY B_{trigger}$?	
B_{pa} / B_{lim}		?	

Abundance indices from Scottish surveys (2000-2010) indicate a decline since 2000.

Historical commercial CPUE (2000-2006) in Subareas V, VI, and VII suggested this species was severely depleted.

There is insufficient information to separate the landings of Portuguese dogfish *Centroscymnus coelolepis* and leafscale gulper shark *Centrophorus squamosus*. Total international landings of the combined species have steadily increased to around 11 000 t in 2003 and have rapidly declined after 2003 to the lowest levels since the fishery started. Substantial declines in cpue series for the two species in Subareas V, VI, and VII suggest that both species are severely depleted and that they have been exploited at unsustainable levels. In Division IXa, lpue series are stable for leafscale gulper shark and declining for Portuguese dogfish.

RECENT MANAGEMENT ADVICE:

Management Objective (s)	Landings in 2011 and 2012
Transition to an MSY approach with caution at low stock size	TAC = 0
Cautiously avoid impaired recruitment (Precautionary Approach)	TAC = 0
Cautiously avoid impaired recruitment and achieve other objective(s) of a management plan (e.g., catch stability)	n/a

Due to its very low productivity, Portuguese dogfish and Leafscale gulper shark can only sustain very low rates of exploitation. The rates of exploitation and stock sizes of deepwater sharks cannot be quantified. However, based on the cpue information, Portuguese dogfish and Leafscale gulper shark are considered to be depleted. Given their very poor state, ICES recommends a zero catch of Portuguese dogfish and Leafscale gulper shark.

Outlook for 2011-2012

No reliable assessment can be presented for these stocks and fishing possibilities cannot be projected.

MSY transition scheme

An estimate of fishing mortality is not available. Portuguese dogfish are long-lived stocks, and no population estimates are available. Therefore a transition to F_{MSY} by 2015 is not currently possible.

Only survey data are available for the two most recent years. These data do not change the perception of these stocks and of the advice for the fishery given in 2008 “*Due to its very low productivity, Portuguese dogfish and Leafscale gulper shark can only sustain very low rates of exploitation. The rates of exploitation and stock sizes of deep-water sharks cannot be quantified. However, based on the cpue information, Portuguese dogfish and*

Leafscale gulper shark are considered to be depleted. Given their very poor state, ICES recommends a zero catch of Portuguese dogfish and Leafscale gulper shark.”

FISHING OPPORTUNITIES FOR 2012 according to COM(2011) 298-Final

STECF notes that with reference to COM(2011) 298-final this stock is classified under category 3.

STECF COMMENTS: STECF agrees with the ICES advice for Portuguese dogfish.

STECF notes that for 2012 a TAC of 0 t has already been agreed for deepwater sharks.

STECF **recommends** that EU fisheries exploiting deepwater sharks should not proceed until sustainable exploitation rates for deepwater sharks have been determined.

STECF further advises that in order to maximise protection of deep-water sharks, the gill netting ban introduced in 2006 (EC council regulation 51/2006Annex III) in waters deeper than 600m should be maintained. STECF supports the proposal to extend the gill net ban to other areas (Council regulation (EC) 40/2008, Annex III)

9.12. Leaf-scale gulper shark (*Centrophorus squamosus*) in the north-east Atlantic

The most recent advice for this stock was provided by ICES in 2010. Hence, the following text remains unchanged from the Consolidated STECF Review of Advice for 2011. Advice for 2013 will be provided in Part 3 of the STECF review of Advice for 2013 which will be available in November 2012.

FISHERIES: Leaf-scale gulper shark are caught in virtually all deep-water fisheries in the NE Atlantic. Catch data is patchy and incomplete. French trawlers in VI and VII target this species. Gill-net vessels registered in the UK (England and Wales), UK (Scotland) and Germany, target this and other deepwater species since the mid-1990s and takes place mainly west of the British Isles (Sub-areas VI and VII). There are also directed longline fisheries in VIII and IX and some by-catches from XII. Landings of this species have been routinely grouped together with Portuguese dogfish and reported as siki. Combined siki landings began in 1988 (although an unknown quantity is likely to have been discarded prior to this) and increased rapidly to over 8000 tonnes in 1997. Since 1997 landings have fluctuated with an overall upward trend, reaching a maximum of over 10 000 tonnes in 2003. Since 2003, reported landings have declined due to stock depletion and the introduction and gradual reduction in EU TACs and quotas in response to ICES advice, which in recent years has been for a zero TAC. However, deep-water sharks continue to be taken as a by-catch in a mixed deep-water trawl fishery in Vb, VI and VII and in a long-line fishery in Sub-area IX.

SOURCE OF MANAGEMENT ADVICE: The main advisory body is ICES. No analytical assessment was carried out in 2010. The assessment is based on commercial CPUE trends and survey trends. Landings data on these species remain very problematical and, in many cases, reliable data are only available for combined siki sharks. Many countries continue to report landings in amalgamated categories such as various sharks N.E.I. Retrospective splitting of the data into species categories and reconstruction of historic data from mixed categories is based on limited information and is problematic.

REFERENCE POINTS:

Reference points

	<i>Type</i>	<i>Value</i>	<i>Technical basis</i>
MSY	MSY B _{trigger}	Not defined	
Approach	F _{MSY}	Not defined	
Precautionary	B _{lim}	Not defined	
	B _{pa}	Not defined	
Approach	F _{lim}	Not defined	

	F_{pa}	Not defined	
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In common with other deep-water species, U_{lim} has previously been proposed at 0.2* virgin biomass and U_{pa} at 0.5* virgin biomass (ICES, 1998) but in the absence of abundance indices that correspond to the start of the fishery, the reference points cannot be estimated.

STOCK STATUS:

F (Fishing Mortality)				
		2007	2008	2009
F_{msy}			?	
F_{pa} / F_{lim}			?	

SSB (Spawning Stock Biomass)				
		2008	2009	2010
$MSY B_{trigger}$?	
B_{pa} / B_{lim}			?	

There is insufficient information to separate the landings of Portuguese dogfish *Centroscymnus coelolepis* and Leafscale gulper shark *Centrophorus squamosus*. Total international landings of the combined species have steadily increased to around 11 000 t in 2003 and have rapidly declined after 2003 to the lowest levels since the fishery started. Substantial declines in cpue series for the two species in Subareas V, VI, and VII suggest that both species are severely depleted and that they have been exploited at unsustainable levels. In Division IXa, lpue series are stable for Leafscale gulper shark and declining for Portuguese dogfish.

RECENT MANAGEMENT ADVICE:

Management Objective (s)	Landings in 2011 and 2012
Transition to an MSY approach with caution at low stock size	TAC = 0
Cautiously avoid impaired recruitment (Precautionary Approach)	TAC = 0
Cautiously avoid impaired recruitment and achieve other objective(s) of a management plan (e.g., catch stability)	n/a

Due to its very low productivity, Portuguese dogfish and Leafscale gulper shark can only sustain very low rates of exploitation. The rates of exploitation and stock sizes of deepwater sharks cannot be quantified. However, based on the cpue information, Portuguese dogfish and Leafscale gulper shark are considered to be depleted. Given their very poor state, ICES recommends a zero catch of Portuguese dogfish and Leafscale gulper shark.

Outlook for 2011-2012

No reliable assessment can be presented for these stocks and fishing possibilities cannot be projected.

MSY transition scheme

An estimate of fishing mortality is not available. Leafscale gulper sharks are long-lived stocks, and no population estimates are available. Therefore a transition to F_{MSY} by 2015 is not currently possible.

Only survey data are available for the two most recent years. These data do not change the perception of these stocks and of the advice for the fishery given in 2008 “Due to its very low productivity, Portuguese dogfish and Leafscale gulper shark can only sustain very low rates of exploitation. The rates of exploitation and stock sizes of deep-water sharks cannot be quantified. However, based on the cpue information, Portuguese dogfish and Leafscale gulper shark are considered to be depleted. Given their very poor state, ICES recommends a zero catch of Portuguese dogfish and Leafscale gulper shark.”

FISHING OPPORTUNITIES FOR 2012 according to COM(2011) 298-Final

STECF notes that with reference to COM(2011) 298-final this stock is classified under category 3.

STECF COMMENTS: STECF agrees with the ICES advice for Leafscale gulper shark.

STECF notes that for 2012 a TAC of 0 t has already been agreed for deepwater sharks.

STECF also **recommends** that EU fisheries exploiting deepwater sharks should not proceed until sustainable exploitation rates for deepwater sharks have been determined.

STECF further advises that in order to maximise protection of deep-water sharks, the gill netting ban introduced in 2006 (EC council regulation 51/2006Annex III) in waters deeper than 600m should be maintained. STECF supports the proposal to extend the gill net ban to other areas (Council regulation (EC) 40/2008, Annex III).

9.13. Kitefin shark (*Dalatias licha*) in the north-east Atlantic

The most recent advice for this stock was provided by ICES in 2010. Hence, the following text remains unchanged from the Consolidated STECF Review of Advice for 2011. Advice for 2013 will be provided in Part 3 of the STECF review of Advice for 2013 which will be available in November 2012.

FISHERIES Kitefin shark are caught in the deep-water fisheries in ICES Sub-areas VIII, IX and X and the Mediterranean but the main fishing is in Sub-area X (Azores). In this sub-area X (Azores) this species is a by-catch in demersal deepwater fisheries. At present, there are no directed fisheries for this species. There is the risk that sporadic small-scale target fisheries may develop in the Azores, as a function of the markets. Excluding ICES Subarea X (Azores) where species-specific landings are available, landings of this species are incomplete and have mostly been reported with other species as Squalidae.

SOURCE OF MANAGEMENT ADVICE: The main recent source of information and advice on kitefin shark in the Northeast Atlantic is ICES. An update assessment was carried out in 2010.

REFERENCE POINTS

	<i>Type</i>	<i>Value</i>	<i>Technical basis</i>
MSY	MSY B _{trigger}	Not defined	
Approach	F _{MSY}	Not defined	
Precautionary	B _{lim}	Not defined	
	B _{pa}	Not defined	
Approach	F _{lim}	Not defined	
	F _{pa}	Not defined	

In common with other deep-water species, U_{lim} has previously been proposed at 0.2* virgin biomass and U_{pa} at 0.5* virgin biomass (ICES, 1998) but in the absence of abundance indices that correspond to the start of the fishery, the reference points cannot be estimated.

STOCK STATUS:

F (Fishing Mortality)				
		2007	2008	2009
F_{msy}			?	
F_{pa} / F_{lim}			?	

SSB (Spawning Stock Biomass)				
		2008	2009	2010
$MSY B_{trigger}$?	
B_{pa} / B_{lim}			?	

Kitefin is a demersal elasmobranch considered as a long-lived stock.

Advice is provided based on an examination of the stock status of each of the stock in the divisions within the ecoregion.

Reference points cannot be defined.

RECENT MANAGEMENT ADVICE:

Management Objective (s)	Landings in 2011 and 2012
Transition to an MSY approach with caution at low stock size	TAC = 0
Cautiously avoid impaired recruitment (Precautionary Approach)	TAC = 0
Cautiously avoid impaired recruitment and achieve other objective(s) of a management plan (e.g., catch stability)	n/a

Outlook for 2011-2012

No reliable assessment can be presented, or expected on the next years, for this stock. The main reason is the lack of information from fisheries or surveys. There are no target fisheries and discards are expected to increase due to regulation effects.

MSY transition scheme

An estimate of fishing mortality is not available. Demersal elasmobranchs are long-lived stocks, and no population estimates are available. Therefore a transition to F_{MSY} by 2015 is not currently possible.

FISHING OPPORTUNITIES FOR 2012 according to COM(2011) 298-Final

STECF notes that with reference to COM(2011) 298-final this stock is classified under category 3.

STECF COMMENTS: STECF agrees with the ICES advice for kitefin shark.

STECF notes that for 2012 a TAC of 0 t has already been agreed for deepwater sharks.

STECF also **recommends** that EU fisheries exploiting deepwater sharks should not proceed until sustainable exploitation rates for deepwater sharks have been determined.

STECF further advises that in order to maximise protection of deep-water sharks, the gill netting ban introduced in 2006 (EC council regulation 51/2006Annex III) in waters deeper than 600m should be maintained. STECF supports the proposal to extend the gill net ban to other areas (Council regulation (EC) 40/2008, Annex III)

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11. LIST OF BACKGROUND DOCUMENTS

Background documents are published on the meeting's web site on:
<http://stecf.jrc.ec.europa.eu/web/stecf/ewg09>

List of background documents:

1. EWG-12-09 – Doc 1 - Declarations of invited and JRC experts.

European Commission

EUR 25413 EN – Joint Research Centre – Institute for the Protection and Security of the Citizen

Title: Scientific, Technical and Economic Committee for Fisheries. Review of scientific advice for 2013 - part 2 (STECF-12-08).

STECF members: Casey, J., Abella, J. A., Andersen, J., Bailey, N., Bertignac, M., Cardinale, M., Curtis, H., Daskalov, G., Delaney, A., Döring, R., Garcia Rodriguez, M., Gascuel, D., Graham, N., Gustavsson, T., Jennings, S., Kenny, A., Kirkegaard, E., Kraak, S., Kuikka, S., Malvarosa, L., Martin, P., Motova, A., Murua, H., Nord, J., Nowakowski, P., Prellezo, R., Sala, A., Scarcella, G., Simmonds, J., Somarakis, S., Stransky, C., Theret, F., Ulrich, C., Vanhee, W. & Van Oostenbrugge, H.

EWG-12-09 members: Casey, J., Vanhee, W., Druon, J.-N., Bertignac, M., Colloca, F., Keatinge, M., Kirkegaard, E., Knittweiss, L., Kupschus, S., Munch-Petersen, S., Nimmegeers, S., O’Hea, B., Raid, T., Scarcella, G.

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Abstract

STECF EWG-12-09 was held on 2 -6 July 2012 in Copenhagen (Denmark). The meeting produced the 2nd report in 2012 focussing on the review of stocks of EU interest. STECF adopted the report during its plenary meeting on 9-13 July 2012.

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Key policy areas include: environment and climate change; energy and transport; agriculture and food security; health and consumer protection; information society and digital agenda; safety and security including nuclear; all supported through a cross-cutting and multi-disciplinary approach.

The Scientific, Technical and Economic Committee for Fisheries (STECF) has been established by the European Commission. The STECF is being consulted at regular intervals on matters pertaining to the conservation and management of living aquatic resources, including biological, economic, environmental, social and technical considerations.



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