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# Scientific, Technical and Economic Committee for Fisheries (STECF)

## REVIEW OF SCIENTIFIC ADVICE FOR 2014

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## PART 2 (STECF-13-11)

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**SCIENTIFIC, TECHNICAL AND ECONOMIC COMMITTEE FOR FISHERIES (STECF)**

**REVIEW OF SCIENTIFIC ADVICE FOR 2014 - PART 2 (STECF-13-11)**

# SCIENTIFIC, TECHNICAL AND ECONOMIC COMMITTEE FOR FISHERIES (STECF)

## REVIEW OF SCIENTIFIC ADVICE FOR 2014 –Advice on Fish Stocks of Interest to the European Union (STECF-13-11)

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# REVIEW OF SCIENTIFIC ADVICE FOR 2014 PART 2

## Introduction to the STECF Review of Advice for 2014

### Background

This report represents the STECF review of advice for stocks of interest to the European Union in The North Sea, Skagerrak, Kattegat and eastern English Channel, the Celtic Seas and west of Scotland, the Bay of Biscay and Iberian waters, waters surrounding Iceland and Greenland, the Barents and Norwegian Seas and some widely distributed and migratory stocks and deepwater resources in the northeast Atlantic ocean.

In undertaking the review, STECF has consulted the most recent reports on stock assessments and advice from appropriate scientific advisory bodies or other readily available literature, and has attempted to summarise it in a common format. For some stocks the review remains unchanged from the Consolidated Review of advice for 2013 (STECF 12-22), since no new information on the status of or advice for such stocks was available at the time the present review took place.

STECF notes that the ICES approach for data limited stocks has remained largely unchanged from that used to provide advice for 2013; the exception being for some species classified as long-lived. While the principle of the approach has not changed, for some long-lived stocks assessed using trends only, the criterion for assessing whether the proportional change in the recent period (most recent 2 years) compared to an earlier period (preceding 3 years) has been modified to compare the average of the most recent 3 years with the average for the preceding 5 years. The reasons for this approach for only a sub-set of stocks that would classify as long-lived are not specified in the ICES advice sheets.

### 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. For stocks assessed by ICES, the stock status is summarised in a "traffic light" table utilising various 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.

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

### Terms of Reference

The STECF is requested to review and comment on the scientific advice released so far in 2013 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 results of its assessment 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 2014 (COM(2013) 319 final – see supporting documentation).

ICES has been asked to provide, for some stocks, a complementary advice option considering there will be no more discards for the relevant fisheries. STECF is requested, when reviewing this advice, to also comment on this complementary advice option.

Similarly, for data-limited stocks, ICES has been requested to use the available data, together with basic principles, information from comparable cases and expert knowledge in order to provide the best possible advice on the level of landings, or catches when possible, corresponding to MSY, using quantitative, semi-quantitative or qualitative methods as appropriate. Most of this advice is not expected to change in comparison with last year. As last year, STECF is requested to review this advice on data-limited stocks, in particular those which were re-examined or re-opened by ICES.

#### ✓ **Eco-Region 1: North Sea**

- **DG Mare focal person:** Peter Hopkins, Unit E2
- 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 Gurnard 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
  - Mergim 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 Gurnard 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**

- **DG Mare focal persons:** Laurent Markovic, Unit C2
- 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)
  - Mergims (*Lepidorhombus whiffiagonis* & *L. boschii*) in ICES Divisions VIIb, VIIIc, VIIe-k, VIIIa, VIIIb & VIId
  - Mergims (*Lepidorhombus whiffiagonis* & *L. boschii*) in ICES Subarea VI
  - *Nephrops norvegicus* in ICES Divisions VIIb, VIIc VIIj & VIII

- *Nephrops norvegicus* in ICES Divisions VIIIf, 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 VIId & VIIe
- Whiting in ICES Division VIIa
- Whiting in ICES Divisions VIIe-k
- Whiting in ICES Division VIa
- Whiting in ICES Division VIb
- Whiting in ICES Division VIII
- Rays and Skates in ICES Subareas VI & VII
- *Other demersal elasmobranchs West of Scotland*

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

- DG Mare focal person: Rodrigo Ataide Dias, Unit C2
- Stocks of
  - Anchovy in ICES Subarea VIII
  - Anchovy in ICES Division IXa
  - Anglerfish (*Lophius piscatorius* & *L. budegassa*) in ICES Divisions VIIIf & 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 VIIIf & IXa
  - Norway lobster in ICES division VIIIf
  - Norway lobster in ICES divisions VIIIf, 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 VIIIf & 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 VIIIa & VIIIb
- 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 elasmobranchs in the Bay of Biscay and Iberian Waters*

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

- **DG Mare focal person:** Frederik Schutyser, Unit C2
- 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**

- **DG Mare focal person:** Frederik Schutyser, Unit C2
- 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**

- **DG Mare focal person:** Frederik Schutyser, Unit C2
- 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**

- **DG Mare focal persons:** Fernando Nieto Conde, Unit C2
- 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

## Participants

This report was prepared in draft by the STECF Expert Working Group 13-08 at its meeting in Copenhagen from 1-5 July 2013. STECF acknowledges the significant contribution from the following participants:

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## 1 Resources of the North Sea

### 1.1 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 km<sup>2</sup>, Mean weight: 25.6 grams, Discards: 25% in number

		Range of potential density ( <i>Nephrops</i> per m <sup>2</sup> )								
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.

### **Mixed-fisheries advice**

All the *Nephrops* fisheries in the North Sea area can be considered as mixed fisheries where cod is a major (by-) catch component. Cod is also the main 'limiting' species for the North Sea demersal fisheries regarding current TAC and effort constraints in 2014.

In the ICES mixed fisheries advice for the North Sea there is no single recommendation but rather a range of example scenarios, assuming that fishing patterns and catchability in 2013 and 2014 are unchanged from those in 2012.

The 'minimum' and 'cod' scenarios of the mixed-fisheries analyses are both consistent with the single-species advice for cod. The current single-stock *Nephrops* advice for each of the functional units (with the exception of FU 6) leads to catches of cod which are potentially higher than allowed by the cod management plan, i.e. if the cod management plan is strictly enforced catches of *Nephrops* would be lower than allowed in the single-stock advice.

**STECF comments on mixed fisheries advice for the North Sea:** STECF notes that apart from the 'Maximum' scenario, all mixed fisheries advices for the Functional Units are lower than the single advice by FU.

*Nephrops* in Subarea IV: Landings of *Nephrops* according to single-stock advice and under different mixed-fisheries scenarios. Landings in tonnes

	Moray Firth	Noup	Fladen Ground	Nor- wegian Deeps	Farn Deeps	Firth of Forth	Botney Gut – Silver Pit	Off Horn's Reef	Devils Hole	Other rec- tangles 2)
FU	9	10	7	32	6	8	5	33	34	
Single-stock Advice*	739	50	8959	800	1173	1417	1000	1100	600	608
Mixed-fisheries scenarios										
Maximum	1731	80	9223	1116	4847	4187	1594	1754	957	969
Minimum	425	19	2164	269	1190	1039	384	423	231	234
Cod MP	434	20	2211	275	1216	1062	393	432	236	239
SQ effort	867	39	4417	549	2430	2121	785	863	471	477
Effort	266	13	1322	176	842	725	252	277	151	153

### 1.1.1 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 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. Since then landings have decreased. In 2011 landings were 3986 t and in 2012 4429 t. It is noticed that total discards in 2012 were estimated to around 4700 t.

**SOURCE OF MANAGEMENT ADVICE:** The main management advisory body is ICES. The assessment in 2012 is based on combined Danish and Swedish UWTV survey data for 2011 and 2012.

#### REFERENCE POINTS:

	Type	Value	Technical basis
MSY Approach	MSY B <sub>trigger</sub>	Undefined.	
	F <sub>MSY</sub> = F <sub>max</sub>	Harvest ratio 7.9%.	Equivalent to F <sub>max</sub> combined sex.
Precautionary Approach	Not defined.		

*Harvest ratios as proxy for F<sub>MSY</sub> for Division IIIa from length cohort analysis 2011 (2008–2010):*

	Male	Female	Combined
F <sub>max</sub>	6.8 %	10.0 %	7.9 %
F <sub>0.1</sub>	4.9 %	7.6 %	5.6 %
F <sub>35%SPR</sub>	8.1 %	12.9 %	10.5 %

#### STOCK STATUS:

F (Fishing Mortality)			
	2010	2011	2012
MSY (F <sub>MSY</sub> )	?	✓	✓ Appropriate
Precautionary approach (F <sub>pa</sub> , F <sub>lim</sub> )	?	?	? Undefined
SSB (Spawning-Stock Biomass)			
	2011	2012	2013
Qualitative evaluation	→	↘	↗ Increasing

Estimates of absolute abundance, available for 2011 and 2012 from an underwater TV (UWTV) survey for the whole area, indicates a 30% decrease from 2011 to 2012 in stock abundance. However, the landings per unit effort suggest an increase in biomass over the full time-series. Furthermore, the estimated harvest ratios of 5.0% (2011)



and 8.2% (2012) from these UWTV surveys together with the fishery indices (effort and lpue) suggest that the stock is exploited sustainably.

#### RECENT MANAGEMENT ADVICE:

ICES advises on the basis of the MSY approach that landings in 2014 should be no more than 5019 tonnes in 2014. If total discard rates do not change from the average of the last three years (2010–2012), this implies total catches of no more than 8895 tonnes. This figure includes discards expected to survive the discarding process – assumed to be 25% of the total number discarded for this stock.

If a discard ban is implemented, ICES advises on the basis of the MSY approach that catches should be no more than 7578 tonnes.

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

STECF notes that the ICES advice for 2014 imply a 4% decrease of the status quo (2012) harvest ratio (and a 13% increase 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.

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

The stock status and advice for this stock for 2014 remains unchanged from that given for 2013. The text below therefore remains largely unchanged from the Consolidated STECF review of advice for 2013 (STECF-12-22).

**FISHERIES:** Landings from Botney Gut were 1240 t in 2012, an 18% increase from 2011 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 <sub>trigger</sub>		No reference points are defined
Approach	F <sub>msy</sub>		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 m<sup>2</sup>. 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.

### 1.1.3 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 and 2012. In 2012 landings were 2460 t. The UK fleet has accounted for virtually all landings from the Farn Deep. Estimated discarding during has fluctuated around 27% by weight in recent years.

**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
MSY	MSY B <sub>trigger</sub>	858 million	UWTV survey index at start of current decline (2007) as measured by a geostatistical method.
Approach	F <sub>MSY</sub>	Harvest rate 8.1%.	Equivalent to F <sub>35%SPR</sub> males in 2011.
Precautionary	F <sub>0.1</sub>	Not agreed.	
Approach	F <sub>max</sub>	Not agreed.	

#### Harvest rate reference points, 2013

	Male	Female	Combined
F <sub>max</sub>	11.6 %	21.6 %	15.3 %
F <sub>0.1</sub>	7.1 %	14.0 %	8.7 %
F <sub>35%SPR</sub>	8.1 %	15.2 %	11.1 %

For this functional unit (FU), the exploitation rate on males is usually considerably higher than on females and there is evidence of sperm-limitation following harvest rates in the region of 20%. There is evidence to suggest that in both 2006 and 2010 mature females have not been able to successfully mate and therefore a larger male spawning potential is desirable. To this effect the harvest rate equivalent to fishing at F<sub>35%SPR</sub> for males is suggested as a proxy for F<sub>MSY</sub> (F<sub>35%SPR</sub>, males = 8.1%).

#### STOCK STATUS:

F (Fishing Mortality)			
	2010	2011	2012
MSY (F <sub>MSY</sub> )	✗	✗	✗ Above
Precautionary approach (F <sub>pa</sub> , F <sub>lim</sub> )	?	?	? Undefined
SSB (Spawning-Stock Biomass)			

	2010	2011	2012
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 fluctuating near MSY  $B_{trigger}$  since 2007. 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 2014 should be no more than 1173 tonnes. If total discard rates do not change from the average of the last 3 years (2010–2012), this implies total catches of no more than 1329 tonnes. Note that this figure includes discards expected to survive the discarding process – assumed to be 15% of the total number discarded for this stock.

In order to ensure the stock in this FU is exploited sustainably, management should be implemented at the functional unit level.

#### Other considerations

##### MSY approach

Following the ICES MSY approach implies a harvest rate of 7.2% (below FMSY because biomass is below MSY  $B_{trigger}$ ), resulting in landings of 1091 t in 2014.

Following the transition scheme towards the ICES MSY approach implies fishing mortality to be reduced to  $(0.2 \cdot F_{2010} + 0.8 \cdot (F_{MSY} \cdot (SSB_{2014} / MSY B_{trigger}))) = 7.6\%$  (biomass is just below MSY  $B_{trigger}$ , so no additional reductions are considered relevant), corresponding to landings of no more than 1173 t in 2014. If discards rates do not change from the average of the last 3 years (2010–2012, assuming 15% discard survival), this implies total catches of no more than 1329 t.

**STECF COMMENTS:** STECF agrees with the ICES assessment of the state of the stock and the advice for 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 the landings corresponding to ICES advice for 2014 imply a 41% decrease on the status quo harvest ratio and a 55% decrease in landings from this functional unit compared to 2012.

#### 1.1.4 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 2012 total landings decreased to 4369 t, a more than 40% decrease from 2011 and only around 33% of peak landings in 2009. U.K (Scotland) accounted for 98 %, the remaining part being Danish. Discarding rates seem to have decreased in recent years to around 2% by number.

**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:

	Type	Value	Technical basis
MSY	MSY $B_{trigger}$	2767 million individuals.	Lowest observed UWTV survey estimate of abundance (1992–2011).
Approach	$F_{MSY}$	Harvest rate 10.3%.	Equivalent to $F_{0.1}$ combined sex in 2011. $F_{MSY}$ proxy based on

			<i>length-based Y/R.</i>
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)				
	2010	2011	2012	
MSY ( $F_{\text{MSY}}$ )	✓	✓	✓	Below target
Precautionary approach ( $F_{\text{pa}}, F_{\text{lim}}$ )	?	?	?	Undefined
SSB (Spawning-Stock Biomass)				
	2010	2011	2012	
MSY ( $B_{\text{trigger}}$ )	✓	✓	✗	Below trigger
Precautionary approach ( $B_{\text{pa}}, B_{\text{lim}}$ )	?	?	?	Undefined

The stock has declined from the highest observed value in 2008 and is now just below the MSY Btrigger. The harvest rate has fluctuated in recent years, and fell to approximately 4% in 2012 which is below FMSY.

### RECENT MANAGEMENT ADVICE:

ICES advises on the basis of the MSY approach that landings in 2014 should be no more than 8959 tonnes. If total discard rates do not change from the average of the last 3 years (2010–2012), this implies total catches of no more than 9059 tonnes. Note that this figure includes discards expected to survive the discarding process – assumed to be 25% of the total number discarded for this stock.

In order to ensure the stock in this FU is exploited sustainably, management should be implemented at the functional unit level. Should the catch in this FU be lower than advised, the difference should not be transferred to other FUs.

#### Other considerations

#### MSY approach

Following the ICES MSY approach implies a harvest rate of 10.0%, (lower than the FMSY because SSB is below MSY Btrigger), resulting in landings of less than 8959 t in 2014. If discards rates do not change from the average of the last 3 years (2010–2012, assuming 25 % discard survival), this implies total catches of no more than 9059 t.

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

STECF notes that the landings corresponding to ICES advice for 2014 implies a 45% increase on the status quo harvest ratio and a 105% increase in landings from this functional unit compared to 2012.

#### 1.1.5 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 around 1900 t in 2010 and 2011. In 2012 they were around 2100 t

**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:**

	<i>Type</i>	<i>Value</i>	<i>Technical basis</i>
MSY Approach	MSY B <sub>trigger</sub>	292 million individuals.	Bias-adjusted lowest observed UWTV survey estimate of abundance (1993-2010).
	F <sub>MSY</sub>	Harvest rate 16.3%.	Equivalent to F <sub>max</sub> combined sex in 2011. F <sub>msy</sub> proxy based on length-based Y/R
Precautionary Approach	Not defined.		

**Harvest rate reference points, 2011**

	Male	Female	Combined
F <sub>max</sub>	12.7 %	26.7 %	16.3 %
F <sub>0.1</sub>	7.7 %	15.2 %	9.4 %
F <sub>35%</sub>	9.4 %	18.3 %	12.7 %

**STOCK STATUS:**

F (Fishing Mortality)			
	2010	2011	2012
MSY (F <sub>MSY</sub> )	✗	✗	✗ Above target
Precautionary approach (F <sub>pa</sub> , F <sub>lim</sub> )	?	?	? Undefined
SSB (Spawning-Stock Biomass)			
	2010	2011	2012
MSY (B <sub>trigger</sub> )	✓	✓	✓ Above trigger
Precautionary approach (B <sub>pa</sub> , B <sub>lim</sub> )	?	?	? Undefined

The stock remains above MSY B<sub>trigger</sub> but has declined over the last three years. The harvest rate remains above FMSY.

**RECENT MANAGEMENT ADVICE:**

ICES advises on the basis of the transition to the MSY approach that landings in 2013 should be no more than 1417 tonnes. If total discard rates do not change from the average of the last 3 years (2010–2012), this implies total catches of no more than 1646 tonnes. Note that this figure includes discards expected to survive the discarding process – assumed to be 25% of the total number discarded for this stock.

In order to ensure the stock in this FU is exploited sustainably, 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 1381 t in 2014.

To follow the transition scheme towards the ICES MSY – approach, the harvest rate should be reduced to 16.7% (0.2\* F<sub>2010</sub>+ 0.8\* F<sub>MSY</sub>), corresponding to landings of no more than 1417 t in 2013 (where F<sub>2010</sub> is the observed harvest rate in 2010 (18.4%)). If discards rates do not change from the ratio in 2012, assuming 25% discard survival), this implies total catches of no more than 1646 t.

**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 2014 imply a 23% decrease on the status quo harvest ratio and a 32% decrease in landings from this functional unit compared to 2012.

### 1.1.6 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 2012 were 860 t, a decrease of 38% compared to 2011 landings.

Discarding rates averaged over the period 2006–2012 for this stock were about 10% by number. This represents a reduction in discarding rate compared to the average for the period 2000–2005. This may arise from the increasing use of larger mesh sizes in the northern North Sea, although reduction in recruitment may also account for this change.

**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:

	Type	Value	Technical basis
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. $F_{MSY}$ proxy based on length-based Y/R
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)				
	2010	2011	2012	
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 is declining but remains just above MSY Btrigger. The harvest rate was above FMSY in 2011 and decreased in 2012, although it is still above Fmsy.

#### RECENT MANAGEMENT ADVICE:

ICES advises on the basis of the MSY approach that landings in 2014 should be no more than 739 tonnes. If total discard rates do not change from the average of the last 3 years (2010–2012), this implies total catches of no more than 796 tonnes. Note that this figure includes discards expected to survive the discarding process – assumed to be 25% of the total number discarded for this stock.

In order to ensure the stock in this FU is exploited sustainably, management should be implemented at the functional unit level.

#### Other considerations

##### MSY approach

Following the ICES MSY approach implies the harvest rate should be less than 11.8%, resulting in landings of less than 739 t in 2014. If discards rates do not change from the average of the last 3 years (2010–2012, assuming 25% discard survival), this implies total catches of no more than 796 t.

**STECF COMMENTS:** STECF agrees with the ICES assessment of the state of the stock and the advice for 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 the landings corresponding to ICES advice for 2014 imply a 19% decrease on the status quo harvest ratio and a 14% decreases in landings from this functional unit compared to 2012.

#### 1.1.7 Norway lobster (*Nephrops norvegicus*) in the Noup (FU 10)

The stock status and advice for this stock for 2014 remains unchanged from that given for 2013. The text below therefore remains largely unchanged from the Consolidated STECF review of advice for 2013 (STECF-12-22).

**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. For 2012 only 13 t were reported.

**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 <sub>trigger</sub>		No reference points are defined
Approach	F <sub>msy</sub>		No reference points are defined
Precautionary Approach	Not defined		

#### 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 m<sup>2</sup>. 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.

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

The stock status and advice for this stock for 2014 remains unchanged from that given for 2013. The text below therefore remains largely unchanged from the Consolidated STECF review of advice for 2013 (STECF-12-22).

**FISHERIES:** Landings from this area have declined steadily since 2005. In 2005 landings were 1089 t, in 2011 landings were only 310 t. Peak landings of around 1200 t were recorded in 2002. Until 2008 more than 80% of the landings from this FU were taken by Denmark, but since 2009 this percentage has decreased. The decline in total 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:

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

#### STOCK STATUS:

F (Fishing Mortality)		
	2009–2011	
MSY (F <sub>MSY</sub> )	?	Unknown
Precautionary approach (F <sub>pa</sub> , F <sub>lim</sub> )	?	Unknown
Qualitative evaluation	✓	below poss repoints



SSB (Spawning-Stock Biomass)		
	2009–2011	
MSY ( $B_{trigger}$ )	?	Unknown
Precautionary approach ( $B_{pa}, B_{lim}$ )	?	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 m<sup>2</sup>. 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.

#### 1.1.9 Norway lobster (*Nephrops norvegicus*) in Horns Reef (FU 33)

The stock status and advice for this stock for 2014 remains unchanged from that given for 2013. The text below therefore remains largely unchanged from the Consolidated STECF review of advice for 2013 (STECF-12-22).

**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:

	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	
MSY ( $F_{MSY}$ )	?	Unknown

Precautionary approach ( $F_{pa}, F_{lim}$ )	?	Unknown
<b>SSB (Spawning-Stock Biomass)</b>		
<b>2009–2011</b>		
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 m<sup>2</sup>, 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.

#### 1.1.10 Norway lobster (*Nephrops norvegicus*) Devil's Hole (FU 34)

Advice for this stock for the years 2013 and 2014 was given in 2012 and the text below remains largely unchanged from the Consolidated STECF review of advice for 2013 (STECF-12-22).


**FISHERIES:** Peak landings of 1305 t from this functional unit were recorded in 2009. Since then they have declined substantially. In 2012 total landings amounted to 597 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:

	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	
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 m<sup>2</sup>. 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.

## 1.2 Northern shrimp (*Pandalus borealis*) on Fladen Ground (Division IVa)

The results from the most recent assessment and advice for this stock were released in 2012. The text below remains unchanged from the Consolidated STECF review of advice for 2013 (STECF-12-22).

**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 2006-2011. 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)		
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. 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. ICES advises on the basis of the approach for data limited stocks that catches should not increase, unless there is evidence that this will be sustainable. This corresponds to zero catches.

This is the first year ICES is providing quantitative advice for data-limited stocks (see Quality considerations).

**Other considerations**

The available information is inadequate to evaluate stock trends. The state of the stock is therefore unknown 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, unless there is ancillary information clearly indicating that the current level of exploitation is appropriate for the stock.

For this stock, since the current landings are around zero, ICES advises that catches should not increase, unless there is evidence that this will be sustainable. This corresponds to zero catches.

**Additional 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.

**STECF COMMENTS:** STECF agrees with the ICES advice.

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

The results from the most recent assessment and advice for this stock were released in 2012. The text below remains unchanged from the Consolidated STECF review of advice for 2013 (STECF-12-22).

**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, landings increased to 8,300 t in 2011 while estimated catches (including discards) were around 9,000 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, Swedish and Norwegian lpue data, and Norwegian survey biomass and recruitment indices (1 group abundance index) from 2006 onwards.

**REFERENCE POINTS:** No reference points have yet been defined for this stock.

**STOCK STATUS:**

F (Fishing Mortality)		
		2009–2011
Qualitative evaluation	?	Insufficient information
SSB (Spawning-Stock Biomass)		
		2008–2012
Qualitative evaluation	↓	Decrease

The state of the stock is unknown. Landings per unit effort (lpue) indices, which fluctuated without trend from the mid-1990s through the mid-2000s, have declined after 2007. Survey biomass indices have also declined since 2007. The average biomass index in the last two years (2011–2012) is 50% lower than the average of the three previous years (2008–2010). The recruitment index decreased from 2007 to 2010, but increased in 2011 and further in 2012.

**RECENT MANAGEMENT ADVICE:** Based on ICES approach to data-limited stocks, ICES advises that landings should be no more than 5800 tonnes. Additionally, measures should be taken to address discarding.

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 decreased by more than 20% between 2008 and 2010 (average of 14 830 t) and 2011–2012 (average of 7435 t). This implies a decrease of 20% in relation to the average of the last three years' landings, corresponding to landings of no more than 7200 t.

Additionally, considering that exploitation is unknown, ICES advises that landings should decrease by a further 20% as a precautionary buffer. This results in landings of no more than 5800 t in 2013.

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 a restrictive quota. In 2011, estimated discards amounted to 10% of the total catch (862 t). All vessels, including Norwegian vessels < 15 m that are not currently using electronic logbooks, should be required to provide logbooks. Additionally, sorting grids should be mandatory in all areas to minimize bycatch.

**STECF COMMENTS:** STECF agrees with ICES that the state of the stock is uncertain and that survey indices indicate a decline in 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 biomass indices from 2007 to 2011 and a further decline in the biomass index in 2012, give reason for caution. In relation to precautionary considerations STECF therefore agrees with ICES that catches from this stock should be reduced.

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 too 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.

## 1.4 Cod (*Gadus morhua*) in the Kattegat

The stock status and advice for this stock for 2014 remains unchanged from that given for 2013. The text below therefore remains largely unchanged from the Consolidated STECF review of advice for 2013 (STECF-12-22).

**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 93 t in 2012. 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:

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

(unchanged since: 2011)

### STOCK STATUS:

F (Fishing Mortality)				
	2009	2010	2011	
MSY (F <sub>MSY</sub> )	?	?	?	Unknown
Precautionary approach (F <sub>pa</sub> , F <sub>lim</sub> )	?	?	?	Unknown
SSB (Spawning Stock Biomass)				
	2010	2011	2012	
MSY (B <sub>trigger</sub> )	?	?	?	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:

New data available for this stock do not change the perception of the stock. Therefore, the advice for this fishery in 2014 is the same as the advice for 2013 (see ICES, 2012): “*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.

In 2013, the cod quota is assumed to be restricted to a bycatch quota. The quota has not been limiting the fisheries in recent years. There are now considerations that the low current quota could be reached before the end of the year and hence increase the discard rate of cod.

#### 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 2014, 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) implying that the TAC for 2014 should be set at 75 t.

## 1.5 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 2010, 2011 and 2012 were about 37 200t, 32 900t and 32 000t respectively. The assessment area for this stock includes ICES Divisions IIIa (Skagerrak), VIIId 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 VIIId, 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 $> B_{pa}$ .

(unchanged since: 2011)

**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. The 18<sup>th</sup> of January 2013, the Parties agree to restrict their fishing on the basis of TACs consistent with a fishing mortality rate that maximises long-term yield and maintains spawning stock biomass above  $B_{pa}$ . The transitional arrangement and long-term management are as follows:

#### Transitional arrangement:

F will be reduced as follows: 75 % of  $F_{2008}$  for the TACs in 2009, 65 % of  $F_{2008}$  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.

#### Long-term management:

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.

This plan entered into force on 1 January 2013.

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 evaluated the EC management plan (EC 1342/2008) and the EU–Norway long-term management plan in March 2009 (Annex 6.4.3) and concluded that these management plans are in accordance with the precautionary approach only if implemented and enforced (ICES, 2011a). A joint ICES–STECF group met during 2011 to conduct a historical evaluation of the effectiveness of these plans (ICES, 2011c; Kraak et al., 2012). The group concluded at that time that although there has been a gradual reduction in  $F$  and discards in recent years, the plans for North Sea cod had not controlled  $F$  as envisaged. Reductions in  $F$  observed since 2011 seem to be more pronounced than predicted in this evaluation.

#### STOCK STATUS:

F (Fishing Mortality)				
	2010	2011	2012	
MSY ( $F_{MSY}$ )	✗	✗	✗	Above target
Precautionary approach ( $F_{pa}, F_{lim}$ )	✓	✓	✓	Harvested sustainably
Management plan ( $F_{MP}$ )	✗	✗	✓	Below target

SSB (Spawning-Stock Biomass)				
	2011	2012	2013	
MSY ( $B_{trigger}$ )	✗	✗	✗	Below trigger
Precautionary approach ( $B_{pa}, B_{lim}$ )	✗	✗	○	Increased risk
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, and is now in the vicinity of  $B_{lim}$ . Fishing mortality declined from 2000 and is now estimated to be around 0.4, between  $F_{pa}$  and the  $F_{MSY}$  proxy. Recruitment since 2000 has been poor.

#### RECENT MANAGEMENT ADVICE:

ICES advises on the basis of the EU–Norway management plan that landings in 2014 should be no more than 28 809 t. If discards rates do not change from those in 2012, this implies catches of no more than 37 496 t.

#### Other considerations

##### Management plan

The EU–Norway 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 6.4.3).

The EU has adopted a long-term plan for this stock with the same aims (Council Regulation (EC) 1342/2008; Annex 6.4.3). 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 Bpa. In 2013, there has been no reduction in effort ceilings compared to the preceding year.

In the recovery phase of 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 2014 equal to 25% of F2008 ( $F_{2014} = 0.16$ ). This would lead to a TAC reduction of more than 20%, necessitating the application of the interannual TAC constraint (leading to  $F_{2014} = 0.18$ ).

The long-term phase of the management is reached when the TAC derived from the long-term phase exceeds the TAC derived from the recovery phase. Application of the long-term phase calculates the target  $F$  as  $0.4 - (0.2 \times (Bpa - SSB_{2013}) / (Bpa - Blim))$  which implies  $F_{2014} = 0.21$ , and hence leads to a TAC greater than that derived from the recovery phase, implying the management plan now switches to the long-term phase.

Following the management plan long-term phase, landings should be no more than 28 809 t in total for Subarea IV and Divisions IIIa West and VIId in 2014. If discard rates do not change from those in 2012, this implies catches in 2014 of no more than 37 496 t. Because of annual changes in fishing pattern the assumption on discard ratio is based on the most recent estimate.

### **MSY approach**

Following the ICES MSY approach requires fishing mortality to be reduced to 0.11 (lower than FMSY because  $SSB_{2014} < MSY$  Btrigger), resulting in catches of less than 21 014 t in 2014. This is expected to lead to an SSB of 141 150 t in 2015.

To follow the transition scheme towards the ICES MSY framework the fishing mortality must be reduced to  $(0.2 \times 0.56) + (0.8 \times 0.11) = 0.20$ , which is lower than Fpa. This implies catches of less than 36 507 t in 2014, which is expected to lead to an SSB of 128 251 t in 2015. If discards rates do not change from those in 2012, this implies landings in 2014 of no more than 28 057 t.

### **PA approach**

A 87% reduction in  $F$  is needed to increase SSB to around Bpa in 2015. This corresponds to catches of no more than 10 063 t in 2014. If discard rates do not change from those in 2012, this implies landings in 2014 of no more than 7781 t.

### **Mixed fisheries**

In contrast to single-species advice there is no single recommendation for mixed fisheries (ICES, 2013b), but rather a range of example scenarios, assuming fishing patterns and catchability in 2013 and 2014 are unchanged from those in 2012. Major differences between the outcomes of the various scenarios indicate potential undershoot or overshoot of the advised landings 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 2014. The “minimum” and “cod” scenarios of the mixed-fisheries analyses are both consistent with the single-species advice for cod. It is noted that in the “max” scenario, the implied  $F$  would exceed Fpa which is not considered precautionary.

<b>Rationale</b>	<b>Catch (2014)</b>	<b>Landings (2014)</b>	<b>Discards (2014)</b>	<b>Basis</b>	<b>F<sub>total</sub> (2014)</b>	<b>F<sub>land</sub> (2014)</b>	<b>F<sub>disc</sub> (2014)</b>	<b>SSB (2015)</b>	<b>%SSB<sup>1)</sup> Change</b>	<b>%TAC<sup>2)</sup> Change</b>
Management plan	37.496	28.809	8.687	Long-term phase	0.21	0.15	0.06	127.392	+45%	–9%
<i>Mixed fisheries options – minor differences with calculation above can occur due to different methodology used</i>										
Maximum	96.751	78.729	18.022	A	0.75	-	-	65.054	–26%	+247%
Minimum	33.126	27.332	5.794	B	0.20	-	-	116.680	+33%	–14%
Cod MP	33.413	27.567	5.846	C	0.20	-	-	116.438	+33%	–13%
SQ effort	60.828	49.924	10.903	D	0.41	-	-	93.639	+7%	+57%
Effort_Mgt	29.314	29.314	6.229	E	0.22	-	-	114.641	+31%	–8%

Weights in thousand tonnes.

<sup>1)</sup> SSB 2015 relative to SSB 2014.

<sup>2)</sup> Landings 2014 relative to TACs 2013 (North Sea 26 475 + Skagerrak 3783 + Eastern English Channel 1543 = 31 801 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.

It is assumed that there is no change in fishing mortality in 2013 relative to 2012. This is based on the fact that there is no reduction in effort ceilings for 2013 compared to 2012, leading to an assumed overshoot of the TACs in 2013, higher than the additional 12% added to the North Sea TAC for Fully Documented Fisheries purposes.

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

STECF notes that the management plan on which the advice is based on, switched from the recovery phase to the long-term phase.

STECF notes that the provision in the long-term management plan for cod (Council Regulation (EC) 1342/2008; Annex 6.4.3) which prescribes a target fishing mortality rate of  $F=0.4$  when the stock is above  $B_{pa}$  (=  $B_{MSY}=150,000$  t) is not consistent with the objective of achieving  $F_{MSY}$  ( $F_{MSY}=0.19$ ).

With regards to the introduction of a landing obligation in Skagerrak, STECF has estimated the following:

TAC in Skagerrak represents a fixed share of 12% of the total TAC, and assuming that the TAC is set in accordance with ICES advice on landings, the TAC in Skagerrak for 2014 would be 3 457 t. Meanwhile, according to data provided to ICES and used in the assessment, the discard rate in the Skagerrak (32%) is higher than the discard rate in the North Sea (22%) and discards in the Skagerrak represented 21% of total discards. This is attributable to the lower mesh size (90 mm) used in Skagerrak for the main demersal fisheries. 21% of the 8 687 t total discards estimated for cod in IIIa, IV and VIId for 2014 equates to 1 824 t. Assuming the proportion of total cod discarded in the Skagerrak remains the same as in 2012, the estimated total catch of cod in Skagerrak in 2014 is 5 281 t.

STECF notes that many vessels previously belonging to the TR 2 gear group will switch to using TR1 gears as a result of the adoption of proposed technical measures for the Skagerrak. Such a switch is likely to result in a lower proportion of the catch of cod being discarded but STECF has no objective means to estimate the magnitude of such an effect.

## **1.6 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 2012 (37 600 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:

	Type	Value	Technical basis
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)				
	2010	2011	2012	
MSY ( $F_{MSY}$ )	✓	✗	✓	Appropriate
Precautionary approach ( $F_{pa}, F_{lim}$ )	✓	✓	✓	Harvested sustainably
Management plan ( $F_{MP}$ )	✓	✗	✓	Below target

SSB (Spawning-Stock Biomass)				
	2011	2012	2013	
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 the  $F_{MSY}$  proxy 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 the TAC (Human Consumption landings) should be no more than 40 639 t in 2014. If rates of discards and industrial bycatch do not change from the average of the last 3 years (2010–2012), this implies catches of no more than 45 318 t.

### Other considerations

The uptake of Scottish haddock quota in 2012 was very close to 100%, which contrasts with historical under-utilisation of the quota and supports the hypothesis of increased targeting in combination with a quota that was predicted to be restrictive.

### 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 agreed management plan implies fishing at the target rate of 0.3, which results in a TAC (Human Consumption landings) reduction of more than 15%. Therefore, the maximum TAC reduction of 15% is applied, resulting in human consumption landings of no more than 40 639 t in 2014. If rates of discards and industrial bycatch do not change from the average of the last 3 years (2010–2012), this implies catches of no more than 45 318 t.

This advice implies a reduction in TAC (15%) and increase in F (71%) which is due to the absence of young fish recruiting to the population, and hence a predicted decline in spawning-stock biomass. The possibility of extended periods of low recruitment was accounted for in the 2008 evaluation of the management plan that was deemed to be sustainable.

### **MSY approach**

Following the ICES MSY approach implies fishing mortality to be increased to 0.3, resulting in a TAC (Human Consumption landings) of no more than 37 146 t in 2014. If rates of discards and industrial bycatch do not change from the average of the last 3 years (2010–2012), this implies catches of no more than 41 418 t. This is expected to lead to an SSB of 204 000 t in 2015.

### **PA approach**

The fishing mortality in 2014 should be no more than  $F_{pa}$ , corresponding to human consumption landings of 85 775 t in 2014. If rates of discards and industrial bycatch do not change from the average of the last 3 years (2010–2012), this implies catches of no more than 95 538 t. This is expected to keep SSB just above  $B_{pa}$  in 2015.

### **Mixed fisheries**

In contrast to single-species advice there is no single recommendation for mixed fisheries (ICES, 2013b), but rather a range of example scenarios, assuming fishing patterns and catchability in 2013 and 2014 are unchanged from those in 2012. Major differences between the outcomes of the various scenarios indicate potential undershoot or overshoot of the advised landings 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 2014. In all scenarios except the ‘max’, the haddock management plan catch options could not be fully utilized.

<b>Rationale</b>	<b>Total Catch 2014</b>	<b>Human consumption Landings 2014</b>	<b>Discards 2014</b>	<b>IBC 2014</b>	<b>Basis</b>	<b>Total F 2014</b>	<b>F(Landings) 2014</b>	<b>F (Disc) 2014</b>	<b>F (IBC) 2014</b>	<b>SSB 2015</b>	<b>%SSB<sup>1)</sup> Change</b>	<b>%TAC<sup>2)</sup> Change</b>
Management Plan	45.318	40.639	4.581	0.098	15% TAC decrease ( $F_{2013}^* 1.71$ )	0.332	0.226	0.106	0.0003	200	-22%	-15%
<i>Mixed fisheries options – minor differences with calculation above can occur due to different methodology used</i>												
Maximum	54.133	49.366	4.768	-	A	0.42	-	-	-	185.550	-24%	+3%
Minimum	14.634	13.390	1.244	-	B	0.1	-	-	-	227.893	-6%	-72%
Cod MP	14.891	13.625	1.266	-	C	0.1	-	-	-	227.615	-6%	-72%
SQ effort	28.730	26.258	2.472	-	D	0.2	-	-	-	212.663	-12%	-45%
Effort_Mgt	10.648	9.746	0.902	-	E	0.07	-	-	-	232.223	-4%	-80%

Weights in thousand tonnes.

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

<sup>1)</sup> SSB 2015 relative to SSB 2014.

<sup>2)</sup> Human Consumption 2014 relative to TACs 2013 (TAC for IV + IIIa = 47 810 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.

It is assumed that there is no change in fishing mortality in 2013 relative to 2012. This is based on the fact that there is no reduction in effort ceilings for 2013 compared to 2012.

#### **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  $F_{msy}$ .

With regards to the introduction of a landing obligation in Skagerrak, STECF has estimated the following:

TAC in Skagerrak represents a fixed share of 6% of the total TAC, and assuming that the TAC is set in accordance with ICES advice on landings, the TAC in Skagerrak for 2014 would be 2 355 t. Meanwhile, according to data provided to ICES and used in the assessment, the discard rate in the Skagerrak (22%) is higher than the discard rate in the North Sea (11%) and discards in the Skagerrak represented 16% of total discards. This is attributable to the lower mesh size (90 mm) used in Skagerrak for the main demersal fisheries. 16% of the 4 581 t total discards estimated for haddock in IIIa and IV for 2014 equates to 733 t. Assuming the proportion of total haddock discarded in the Skagerrak remains the same as in 2012, the estimated total catch of haddock in Skagerrak in 2014 is 3 088 t.

STECF notes that many vessels previously belonging to the TR 2 gear group have switched to using TR1 gears as a result of the adoption of proposed technical measures for the Skagerrak. Such a switch is likely to result in a lower proportion of the catch of haddock being discarded but STECF has no objective means to estimate the magnitude of such an effect.

### **1.7 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 2011 and 2012 the landings were 97 104t and 77 717t 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 (Blim).*

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  $0.30 - 0.20 \times (200,000 - \text{SSB}) / 94,000$ .
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 Plan	SSB <sub>MP</sub>	200 000 t	B <sub>pa</sub>
	F <sub>MP</sub>	0.3	Or lower depending on SSB in relation to SSB target.
MSY Approach	MSY B <sub>trigger</sub>	200 000 t	Default value B <sub>pa</sub>
	F <sub>MSY</sub>	0.3	Stochastic simulation using hockey-stick stock–recruitment.
Precautionary approach	B <sub>lim</sub>	106 000 t	B <sub>loss</sub> = 106 000 t (estimated in 1998).
	B <sub>pa</sub>	200 000 t	Affords a high probability of maintaining SSB above B <sub>lim</sub> .
	F <sub>lim</sub>	0.6	F <sub>loss</sub> the fishing mortality estimated to lead to stock falling below B <sub>lim</sub> in the long term.
	F <sub>pa</sub>	0.4	Implies that B <sub>eq</sub> > B <sub>pa</sub> and P(SSB <sub>MT</sub> < B <sub>pa</sub> ) < 10%.

#### STOCK STATUS:

F (Fishing Mortality)				
	2010	2011	2012	
MSY (F <sub>MSY</sub> )	✓	✓	✓	Appropriate
Precautionary approach (F <sub>pa</sub> , F <sub>lim</sub> )	✓	✓	✓	Harvested sustainably
Management plan (F <sub>MP</sub> )	✓	✓	✓	At limit
SSB (Spawning-Stock Biomass)				
	2011	2012	2013	
MSY (B <sub>trigger</sub> )	✓	✗	✗	Just below trigger
Precautionary approach (B <sub>pa</sub> , B <sub>lim</sub> )	✓	○	○	Increased risk
Management plan (SSB <sub>MP</sub> )	✓	✗	✗	Just below trigger

SSB increased above Bpa in 1997, but has declined since 2005. The latest SSB estimate is close to Bpa. Fishing mortality has fluctuated around FMSY since 1997. Recruitment has been below average since 2006 and shows a declining trend in recent years.

## RECENT MANAGEMENT ADVICE:

ICES advises on the basis of the EU–Norway management plan that landings in 2014 should be no more than 85 581 t for the whole assessment area. Discards are known to take place but cannot be quantified, therefore total catches cannot be calculated.

### *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 (2013).

Since SSB at the beginning of 2013 is below Bpa, paragraph 3 of the harvest control rule applies, resulting in a F of 0.29 and a TAC (landings) reduction of more than 15%. Therefore, the maximum TAC reduction of 15% is applied (paragraph 5), resulting in landings of no more than 85 581 t in 2014. This is expected to lead to an SSB of 176 099 t in 2015 which is below Bpa. Discards are known to take place but cannot be quantified, therefore total catches cannot be calculated.

#### *MSY approach*

Following the ICES MSY framework implies a fishing mortality of 0.29 (below FMSY because SSB is below MSY Btrigger). This would result in landings of no more than 82 600 t in 2014. This is expected to lead to an SSB in 2015 of 178 400 t. Discards are known to take place but cannot be quantified, therefore total catches cannot be calculated.

#### *PA approach*

An 49% reduction in F is needed to maintain SSB at Bpa in 2015. This corresponds to landings of no more than 56 181 t in 2014. Discards are known to take place but cannot be quantified, therefore total catches cannot be calculated.

#### *Mixed fisheries*

In contrast to single-species advice there is no single recommendation for mixed fisheries (ICES, 2013b), but rather a range of plausible scenarios, assuming fishing patterns and catchability in 2013 and 2014 are unchanged from those in 2012. Major differences between the outcomes of the various scenarios indicate potential undershoot or overshoot of the advised landings corresponding to the single-species advice. As a result, fleet dynamics may change, but cannot be determined.

Cod is the main limiting species for the North Sea demersal fisheries in 2014. Following the ‘cod’ scenario (full implementation of the cod management plan), and also the effort management scenario, the saithe management plan catch options could not be fully utilized. It is also noted that for the ‘max’ scenario the implied F would exceed Fpa which is not considered precautionary.

<b>Rationale</b>	<b>landings 2014</b>	<b>landings IIIa&amp;IV 2014<sup>1)</sup></b>	<b>landings VI 2014<sup>1)</sup></b>	<b>Basis</b>	<b>F 2014</b>	<b>SSB 2015</b>	<b>% SSB change 2)</b>	<b>% TAC change 3)</b>
Management plan	85.581	77.536	8.045	15% TAC constraint	0.31	176.056	8.5%	-15%
<i>Mixed fisheries options – minor differences with calculation above can occur due to different methodology used</i>								
Maximum	143.439	129.956	13.483	A	0.54	143.575	-11%	+42%
Minimum	48.050	43.533	4.517	B	0.15	221.170	+36%	-52%
Cod_MP	48.359	43.813	4.546	C	0.15	220.911	+36%	-52%
SQ Effort	89.630	81.205	8.425	D	0.3	186.756	+15%	-11%
Effor_Mgt	68.305	61.884	6.421	E	0.22	204.306	+26%	-32%

Weights in thousand tonnes.

<sup>1)</sup> 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.



<sup>2)</sup> SSB 2015 relative to SSB 2014.

<sup>3)</sup> Landings 2014 relative to TAC 2013.

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.

It is assumed that there is no change in fishing mortality in 2013 relative to 2012. This is based on the fact that there is no reduction in effort ceilings for 2013 compared to 2012.

#### STECF COMMENTS:

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

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 2014 should be reduced to the lowest possible level).

With regards to the introduction of a landing obligation 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 the STECF (Commission data call: Ref. ARES(2013)222443-20/02/2013), landings in Skagerrak represented 6% of the combined (IIIa and IV) landings in 2012. Assuming that the TAC is set in accordance with ICES advice on landings and the distribution of landings in 2014 is the same as in 2012, the landings in Skagerrak for 2014 would be 4 652 t. The average discard rate in the Skagerrak in 2010 to 2012 is 9%. Assuming a discard rate of 9%, the estimated total catch of saithe in Skagerrak in 2014 is 5 112 t.

STECF notes that many vessels previously belonging to the TR 2 gear group have switched to using TR1 gears as a result of the adoption of proposed technical measures for the Skagerrak. Such a switch is likely to result in a lower proportion of the catch of saithe being discarded but STECF has no objective means to estimate the magnitude of such an effect.

## 1.8 Whiting (*Merlangius merlangus*), Skagerrak & Kattegat (IIIa)

Advice for this stock for the years 2013 and 2014 was given in 2012 and the text below remains largely unchanged from the Consolidated STECF review of advice for 2013 (STECF-12-22).

**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 2012 were 63 t. ICES estimates of discards are 291 t in 2012 which is three times lower 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	?	Insufficient information
SSB (Spawning Stock Biomass)		
	1980 - 2011	
Qualitative evaluation	?	Insufficient information

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:

The 2012 advice for this stock is biennial and valid for 2013 and 2014 (see ICES, 2012): *Based on the ICES approach for data limited stocks, ICES advises that catches should be no more than 500 tonnes.*

#### 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.

## 1.9 Whiting (*Merlangius merlangus*) in Subarea IV (North Sea) and Division VIIId (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 2012, the Working Group estimated that about 25 407 t were caught. The human consumption landings in the North Sea were 12 929 t with a TAC for 2013 of 18 932 t. The landings in the Eastern Channel amounted to 4 103 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 33% in 2012. Because of the restrictive TACs, discard rates increased in 2010 and 2011, although they are estimated to have decreased again in 2012. More selective gears were introduced in the Nephrops (TR2) fleet in 2012 which may also have contributed to a decline in discard rates.

**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. However, based on a considerable revision of the natural mortality rate in 2012, the target  $F$  of 0.3 is no longer considered applicable. ICES has been requested to re-evaluate the EU-Norway management plan with the new stock assessment results in 2013.

#### 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)			
	2010	2011	2012
MSY ( $F_{MSY}$ )	?	?	Undefined
Precautionary approach ( $F_{pa}, F_{lim}$ )	?	?	Undefined

SSB (Spawning-Stock Biomass)			
	2011	2012	2013
MSY ( $B_{trigger}$ )	?	?	Undefined
Precautionary approach ( $B_{pa}, B_{lim}$ )	?	?	Undefined
Qualitative evaluation	→	→	At recent average

SSB has been below average since 2002, while fishing mortality has been declining over the whole time series. Recruitment has been well below average since 2003.

**RECENT MANAGEMENT ADVICE:** ICES advises on the basis of precautionary considerations that total catches should be no more than 36 992 t. If rates of discards and industrial bycatch do not change from the average of the last 3 years (2010-2012), this implies human consumption landings of no more than 24 389 t (18 514 t in the North Sea and 5 875 t in Division VIIId). 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” (ICES, 2010). Consequently the EU and Norway have agreed to management of whiting at this level of total fishing mortality, conditional on a  $\pm 15\%$  TAC constraint.

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 the 2012 assessment, caused by new estimates of natural mortality, the target F is no longer considered applicable and the management target needs re-evaluation.

Following the agreed management plan implies fishing at the target rate of 0.3, which results in a TAC increase for Human Consumption landings in IV of more than 15%. Therefore, the maximum TAC increase of 15% is applied, resulting in human consumption landings for the total area of no more than 28 680 t in 2014. If rates of discards and industrial bycatch do not change from the average of the last 3 years (2010-2012), this implies catches of no more than 43 391 t.

#### *MSY approach*

There are no reference points to enable MSY advice.

#### *PA considerations*

As an interim measure, the target F in the plan (0.3) has been scaled 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 2012/2013 assessments, which would generate a target F of 0.225 ( $0.75 * 0.3$ ).

Following this approach in 2014 with a target fishing mortality of 0.225 would lead to total catches of no more than 36 992 t. If rates of discards and industrial bycatch do not change from the average of the last 3 years (2010-2012), this implies human consumption landings of no more than 24 389 t (18 514 t in the North Sea and 5875 t in Division VIIId).

#### *Mixed fisheries*

In contrast to single-species advice there is no single recommendation for mixed fisheries (ICES, 2013b), but rather a range of example scenarios, assuming fishing patterns and catchability in 2013 and 2014 are unchanged from those in 2012. Major differences between the outcomes of the various scenarios indicate potential undershoot or overshoot of the advised landings corresponding to the single-species advice. As a result, fleet dynamics may change, but cannot be determined.

Cod is the main limiting species for the North Sea demersal fisheries in 2014.. In all scenarios except the ‘max’, the catch options resulting from the whiting single-species advice could not be fully utilized.

<b>Rationale</b>	<b>Total Catch 2014</b>	<b>Total Landings IV+VIId 2014</b>	<b>Total Discards 2014</b>	<b>Total IBC 2014</b>	<b>Landings IV 2014</b>	<b>Landings VIId 2014</b>	<b>Basis</b>
Precautionary considerations	36.992	24.389	11.600	1.004	18.514	5.875	MP F rescaled (0.75 x 0.3)
<i>Mixed fisheries options – minor differences with calculation above can occur due to different methodology used</i>							
<i>Maximum</i>	48.212	31.983	16.229	-	24.307	7.676	A
<i>Minimum</i>	13.540	9.067	4.472	-	6.891	2.176	B
<i>Cod MP</i>	13.731	9.195	4.536	-	6.988	2.207	C
<i>SQ effort</i>	26.608	17.758	8.849	-	13.496	4.262	D
<i>Effort_Mgt</i>	11.283	7.560	3.723	-	5.746	1.814	E

<b>Rationale</b>	<b>Total F 2014</b>	<b>F(Landings) 2014</b>	<b>F(Discards) 2014</b>	<b>F(IBC) 2014</b>	<b>SSB 2015</b>	<b>% SSB change <sup>2)</sup></b>	<b>% TAC change <sup>3)</sup></b>
Precautionary considerations	0.225	0.143	0.079	0.004	311.434	+15%	-2%
<i>Mixed fisheries options – minor differences with calculation above can occur due to different methodology used</i>							
<i>Maximum</i>	0.31	-	-	-	301.300	+11%	+28%
<i>Minimum</i>	0.08	-	-	-	330.336	+22%	-64%
<i>Cod MP</i>	0.08	-	-	-	330.174	+22%	-63%
<i>SQ effort</i>	0.16	-	-	-	319.332	+18%	-29%
<i>Effort_Mgt</i>	0.07	-	-	-	332.243	+23%	-70%

Weights in thousand tonnes.

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

<sup>1)</sup> SSB 2015 relative to SSB 2014.

<sup>2)</sup> Human consumption for Subarea IV in 2014 relative to TAC for Subarea IV and Division IIa in 2013 (18932 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 catch split between Subarea IV and Division VIId in 2013 is assumed to be the same as the proportion as estimated in 2012: 76% landings from Subarea IV and 24% landings from Division VIId. This assumes separate management for Division VIId from Subarea VII.

It is assumed that there is no change in fishing mortality in 2013 relative to 2012. This is based on the fact that there is no reduction in effort ceilings for 2013 compared to 2012.

#### STECF COMMENTS:

STECF agrees with the ICES assessment of the state of the stock and the advice for 2014 that total catches should be no more than 36 992 t. This implies human consumption landings of no more than 24 389 t (18 514 t in the North Sea and 5 875 t in Division VIId) in 2014.

STECF notes that the use of updated natural mortality estimates resulted in a 25% downward revision of the mortality estimates for whiting ( $0.75 \times 0.3$ ) and therefore the target F of the current management plan (0.3) is no longer considered applicable.

While the existing management plan prescribes that the TAC in 2014 should be set in accordance with a fishing mortality in 2014 of  $F = 0.3$ , this value is no longer considered an appropriate target fishing mortality rate. Nevertheless, the provisions of the existing management plan prescribe that human consumption landings in

2014 should be no greater than 21,772 t for the North Sea (Subarea IV). This value is derived by applying a 15% TAC constraint as prescribed in the management plan. The corresponding value for landings in VIId in 2014 should be no greater than 6,909 t.

## 1.10 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.

## 1.11 Brill (*Scophthalmus 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 in area IV have fluctuated between 1000 t and 1500 t for most of the available time series (1973–2008). In the period 1991–1994 landings between 1700 t and 2400 t have been recorded. In 2011 and 2012 the landings were 1 495t and 1 515t respectively.

A precautionary TAC (including turbot) in areas IIa and IV for 2012 and 2013 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. An EU TAC is set for EU waters of ICES Division IIa and Subarea IV together with turbot (ICES, 2013a).


### REFERENCE POINTS:

No reference points have been defined.

### STOCK STATUS:

F (Fishing Mortality)		
2010–2012		
Qualitative evaluation		Insufficient information

SSB (Spawning-Stock Biomass)		
2005–2012		
Qualitative evaluation		Stable to increasing

Landings have been relatively stable and above historical values since 1998 and considered a reliable approximation of catches as only little discarding of brill

occurs. The stock size indicator (Ipue) in the last three years (2010–2012) is 56% higher (North Sea) or 2 % lower (Kattegat) than the average of the five previous years (2005–2009). The survey is noisy and landings and Ipue may be also influenced by the turbot uptake of the TAC

### RECENT MANAGEMENT ADVICE:

The advice for this stock is biennial and valid for 2014 and 2015. ICES advises on the basis of the ICES approach to data limited stocks that catches should be no more than 2 727 t. All catches are assumed to be landed.

### Other considerations

No analytical assessment can be presented. The main cause of this is lack of biological data. 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 three most recent index values with the five preceding values, combined with recent landings data. Knowledge about the exploitation status also influences the advised catch.

The stock size indicator (Ipue) in the last three years (2010–2012) is 56% higher (North Sea) or 2% lower (Kattegat) than the average of the five previous years (2005–2009). Given that the North Sea is the main distribution area, and that the Kattegat survey is noisy but, nevertheless, shows a clear increasing trend in the

last fifteen years, this implies an increase of catches of at most 20 % in relation to the last three years average catches, corresponding to catches of no more than 2727 t.

The exploitation status is unknown but effort for the main fleet with brill bycatches (beam trawls) in the North Sea and Skagerrak has declined almost 50% between 2002 and 2012. Therefore, no additional precautionary reduction of catches is needed.

All catches are assumed to be landed.

**STECF COMMENTS:** STECF agrees with the ICES assessment that the state of the stock is unknown and with the advice for 2014 and 2015.

STECF notes that this is the first time the ICES data-limited approach is implemented for this stock. The value of 2 727 t advised by ICES represents an increase of 20% on the average reported catches over the period 2010-2012.

STECF considers that while the advice is given for brill in Subarea IV and Divisions IIIa and VIId,e., because around 60% of the brill is caught in the North Sea, the advice is appropriate for the North Sea.

STECF considers that since advice for both brill and turbot in the North Sea is now available from ICES it may be appropriate to adopt separate management measures to regulate exploitation of these stocks.

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.

## 1.12 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 in area IV 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. In 2011 and 2012 the landings were 6 808t and 6 019t respectively.

A precautionary TAC (including flounder) in areas IIa and IV for 2012 and 2013 was set to 18 434 t.



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

**MANAGEMENT AGREEMENT:** No specific management objectives are known to ICES. An EU TAC is set for EU waters of area IIa and IV together with flounder (ICES, 2013a).

### REFERENCE POINTS:

No reference points have been defined.

### STOCK STATUS:

F (Fishing Mortality)		
2010 – 2012		
Qualitative evaluation		Insufficient information
TSB (Total Stock Biomass)		
2005 – 2012		
Qualitative evaluation		Stable in the main area

Landing data are not complete and are not indicative for catches since discard rates are high. Survey indices show a stable abundance in the last decades in Subarea IV which is the main part of the distribution area and an increasing abundance for Division IIIa. The stock size indicator (number/hour) in the last three years (2010–2012) is 7% higher (North Sea) or 16% higher (Skagerrak–Kattegat) than the average of the five previous years (2005–2009).

### RECENT MANAGEMENT ADVICE:

The advice for this stock is biennial and valid for 2014 and 2015. Based on the ICES approach for data limited stocks, ICES advises that landings should be no more than 7 795 t. Discards are known to take place, but the data are insufficient to estimate a discard proportion that could be applied to give catch advice; therefore total catches cannot be calculated.

#### ***Other considerations***

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

#### ***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 three most recent index values with the five preceding values, combined with recent landings data. Knowledge about the exploitation status also influences the advised catch.

The stock size indicator (number/hour) in the last three years (2010–2012) is 7 % higher (North Sea) or 16% higher (Skagerrak–Kattegat) than the average of the five previous years (2005–2009). Given that the North Sea is the main distribution area, and that both surveys show an increase, this implies an increase of landings of at most 7% in relation to the last three years average landings, corresponding to landings of no more than 7795 t.

Even though exploitation status is unknown, the effort of the main fleet with dab bycatches (beam trawls) in the North Sea and Skagerrak has declined almost 50% between 2002 and 2012. Therefore, no additional precautionary reduction of catches is needed.

Discards are known to take place, but the data are insufficient to estimate a discard proportion that could be applied to give catch advice; therefore total catches cannot be calculated.

**STECF COMMENTS:** STECF agrees with the ICES assessment that the state of the stock is unknown and with the advice for 2014 and 2015.

STECF notes that this is the first time the ICES data-limited approach is implemented for this stock. The value of 7 795 t advised by ICES represents an increase of 7% on the average reported landings over the period 2010–2012.

STECF considers that while the advice is given for dab in IIIa and North Sea, because around 90% of the dab is caught in the North Sea, the advice is appropriate for the North Sea.

STECF considers that since advice for both dab and flounder in the North Sea is now available from ICES it may be appropriate to adopt separate management measures to regulate exploitation of these stocks.

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.

### **1.13 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 in area IV 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. In 2011 and 2012 the landings were 3 046t and 2 187t respectively.

A precautionary TAC (including dab) in areas IIa and IV for 2012 and 2013 was set to 18 434 t.

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

**MANAGEMENT AGREEMENT:** No specific management objectives are known to ICES. An EU TAC is set for EU waters of area IIa and IV together with dab (ICES, 2013a).



#### **REFERENCE POINTS:**

No reference points have been defined.

#### **STOCK STATUS:**

**F (Fishing Mortality)**



	<b>2010 - 2012</b>	
<b>Qualitative evaluation</b>		Insufficient information
<b>TSB (Total Stock Biomass)</b>		
	<b>2005 – 2012</b>	
<b>Qualitative evaluation</b>		Increase in the main area

The available survey information indicates stable stock abundance since the mid nineties. Landings are declining, with the lowest landings for IIIa in 2012. Landing data are not indicative for catches since discard rates are variable. The stock size indicator (number/hour) for the whole area in the last three years (2010–2012) is 7% higher than the average of the five previous years (2005–2009).

#### **RECENT MANAGEMENT ADVICE:**

The advice for this stock is biennial and valid for 2014 and 2015. Based on the ICES approach for data limited stocks, ICES advises that landings should be no more than 3 160 t. Discards are known to take place, but the data are insufficient to estimate a discard proportion that could be applied to give catch advice; therefore total catches cannot be calculated.

#### ***Other considerations***

No analytic 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.

#### ***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 three most recent index values with the five preceding values, combined with recent landings data. Knowledge about the exploitation status also influences the advised catch.

The stock size indicator (number/hour, based on the Q1 survey of the whole area) in the last three years (2010–2012) is 7 % higher than the average of the five previous years (2005–2009). This implies an increase of landings of at most 7 % in relation to the last three years average landings, corresponding to landings of no more than 3 160 t.

Even though exploitation status is unknown, the effort of the main fleet with flounder bycatches (beam trawls) in the North Sea and Skagerrak has declined almost 50% between 2002 and 2012. Therefore no additional precautionary reduction of catches is needed.

Discards are known to take place, but the data are insufficient to estimate a discard proportion that could be applied to give catch advice; therefore total catches cannot be calculated.

**STECF COMMENTS:** STECF agrees with the ICES assessment that the state of the stock is unknown and with the advice for 2014 and 2015.

STECF notes that this is the first time the ICES data-limited approach is implemented for this stock. The value of 3 160t advised by ICES represents an increase of 7% on the average reported landings over the period 2010-2012.

STECF considers that while the advice is given for flounder in IIIa and North Sea, because around 90% of the flounder is caught in the North Sea, the advice is appropriate for the North Sea.

STECF considers that since advice for both flounder and dab in the North Sea is now available from ICES it may be appropriate to adopt separate management measures to regulate exploitation of these stocks.

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.

## **1.14 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 in area IV have fluctuated between 5 000 t and 8 000t in the

period 1973–2001. Since then, landings have been stable just below 4 000t. In 2011 and 2012 the landings were 3 365t and 3 084t respectively.

A precautionary TAC (including witch) in areas IIa and IV for 2012 and 2013 was set to 6 391 t.



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

**MANAGEMENT AGREEMENT:** No specific management objectives are known to ICES. An EU TAC is set for EU waters of ICES Division IIa and Subarea IV together with witch (ICES, 2013a).

#### REFERENCE POINTS:

No reference points have been defined.

#### STOCK STATUS:

F (Fishing Mortality)		
2010–2012		
Qualitative evaluation		Insufficient information
TSB (Total Stock Biomass)		
2005–2012		
Qualitative evaluation		Increasing

Landing data show a declining long-term trend. The available survey information indicates mature biomass is variable and has been at a high level for the last 20 years. The stock size indicator (gr/hour) in the last three years (2010–2012) is 16% higher than the average of the five previous years (2005–2009).

#### RECENT MANAGEMENT ADVICE:

The advice for this stock is biennial and valid for 2014 and 2015. Based on the ICES approach for data limited stocks, ICES advises that landings should be no more than 4 350 t. Discards are known to take place, but the data are insufficient to estimate a discard proportion that could be applied to give catch advice; therefore total catches cannot be calculated.

#### Other considerations

No analytic 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.

#### 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. In this case, the advice is based on a comparison of the three most recent index values with the five preceding values, combined with recent landings data. Knowledge about the exploitation status also influences the advised catch.

The stock size indicator (number/hour, based on the Q1 survey of the whole area) in the last three years (2010–2012) is 16% higher than the average of the five previous years (2005–2009). This implies an increase of landings of at most 16% in relation to the last three years average landings, corresponding to landings of no more than 4350 t.

Even though exploitation status is unknown, the effort of the main fleet with lemon sole bycatches (otter trawls) in the North Sea and Skagerrak has declined by 14% (TR1) and 45% (TR2) between 2004 and 2012. Therefore no additional precautionary reduction of catches is needed.

Discards are known to take place, but the data are insufficient to estimate a discard proportion that could be applied to give catch advice; therefore total catches cannot be calculated.

**STECF COMMENTS:** STECF agrees with the ICES assessment that the state of the stock is unknown and with the advice for 2014 and 2015.

STECF notes that this is the first time the ICES data-limited approach is implemented for this stock. The value of 4 350t advised by ICES represents an increase of 16% on the average reported landings over the period 2010–2012.

STECF considers that since advice for both lemon sole and witch in the North Sea 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 VIIId. There is no TAC set for lemon sole in IIIa and VIIId. As around 90% of the lemon sole is caught in the North Sea, STECF consider the advice is appropriate for the North Sea.

### 1.15 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.

### 1.16 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 Part 1 of the STECF review of advice for 2014 (STECF 13-10).

#### 1.16.1 Plaice (*Pleuronectes platessa*) 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 2010, 2011 and 2012 are estimated to be 9 200 t, 8 300 t and 7 600 t 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)		
2010–2012		
Qualitative evaluation		Insufficient information
SSB (Spawning-Stock Biomass)		
2008–2013		
Qualitative evaluation	West 	West: stable/increasing
	East 	East: decreasing and low

Plaice in Skagerrak is considered to have two components: Eastern and Western, the latter of which is mixed with the North Sea stock. A combined assessment of the Skagerrak with the North Sea stock shows a consistent upward scaling of the total spawning stock biomass. A biomass index suggests that, in recent years, the Western component is higher than the historical average, and conversely the eastern component is lower (despite the notable increase observed in 2013). Fishing mortality is unknown, but effort has been reduced.

**RECENT MANAGEMENT ADVICE:** 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 landings should be no more than 8 972 t. In the Eastern Skagerrak, no directed

fisheries should occur and bycatch and discards should be minimized. If the discard rate does not change from the rate of the last year (2012), this implies catches of no more than 10 196 t.

If a discard ban is implemented, ICES advises on the basis of the ICES approach for data-limited stocks that catches should be no more than 10 196 t.

### ***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. This year advice is based on an estimation of the most recent trends in survey index values, combined with recent catch or landings data. Knowledge about the exploitation status also influences the advised catch.

For the Western component (where nearly all catches take place) the biomass in the last three years (2011–2013) is 7% higher than the average of the five previous years (2006–2010). This implies an increase of landings of at most 7% in relation to the last three years average landings, corresponding to landings of no more than 8972 t.

Even though exploitation status is unknown, the effort of the main fleets with plaice catches has declined substantially (–41% between 2003 and 2012). For trawling and Danish seines (all mesh sizes) a reduction in 40% effort was recorded. Therefore no additional precautionary reduction of catches is needed.

If discards rates do not change from the rate of the last year (2012), this implies catches of no more than 10 196 t. Discard mortality is assumed to be 100%.

Conversely, in the Eastern component, the biomass is considered depleted. The biomass in the last three years (2011–2013) is 19% lower than the average of the five previous years (2006–2010). Catches in the Eastern area are very low (under 1% of the Skagerrak catches in 2012), but the actual exploitation rate is uncertain due to the reduced stock status. Therefore, no directed fisheries should occur and bycatch and discards should be minimized.

### ***Alternative options for potential interim management plans***

In 2013, EU and Norway and the North Sea RAC are considering further options for an interim management plan for plaice in Skagerrak, on the basis of the links between this stock and North Sea Plaice. This work is based on ICES feedback on an EU-Norway request on this topic (ICES, 2012a). ICES concluded that such a strategy could potentially form the basis of an interim harvest control rule until the biological knowledge on the stocks structure is consolidated.

In 2012 ICES considered that a pragmatic harvest control rule could be used indexing the Skagerrak TAC to either;

- a) Changes in the North Sea TAC or
- b) Changes in SSB of the combined assessment.

These options could potentially form the basis of an interim management plan, with provisions explicitly linked to a monitoring of the dynamics in local components within Skagerrak (ICES, 2012a and Appendix 6.4.17.4).

The SSB estimated from the combined assessment increased by 10% between 2011 and 2012 and is well above MSY Btrigger for the North Sea stock. The West Skagerrak survey index also shows a slightly increasing trend.

- a) A change in the TAC in Skagerrak based on the changes in TAC in the North Sea (+15%) would imply catches in 2014 to be no more than 11 880 t ( $\text{TAC 2013} = 9142 \text{ t landings} \times 1.15 = 10\,513 \text{ t landings}$ , with 12% discard ratio to catches = 11 880 t catches).
- b) A change in the TAC in Skagerrak based on the changes in the combined assessment SSB would imply catches in 2014 to be no more than 11 364 t ( $\text{TAC 2013} = 9142 \text{ t landings} \times 1.1 = 10\,056 \text{ t landings}$ , with 12% discard rate = 11 364 t catches)

This interim harvest control rule should be reconsidered after the next benchmark of the assessment.

### **STECF COMMENTS:**

STECF agrees with the ICES assessment of the state of the stock and the advice for 2014. STECF interprets the advice for in the Eastern Skagerrak, that no directed fisheries should occur and bycatch and discards should be minimized, to mean that in 2014, catches of plaice from the Eastern Skagerrak should be reduced to the lowest possible level.

The value of 8972 t advised by ICES for Skagerrak represents an increase of 7% on the average reported landings over the period 2010-2012.

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 landing obligation in the Skagerrak STECF notes that a landing obligation for plaice will first enter into force in 2015.

### 1.16.2 Plaice (*Pleuronectes platessa*) in the Kattegat

The derivation of the advised landings of plaice in 2014 for Kattegat and subdivisions 22 and 23 (2 224 t) is given in Part 1 of the STECF review of advice for 2014 (STECF 13-10).

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 15% of the landings in 2014 to be taken in the Kattegat will give a predicted landing of plaice in 2014 in the Kattegat of 334 t.

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%
2012	226	1627	12%	88%

## 1.17 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 2012 landings are 73 800 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.

The increased use of new gears such as “SumWing” and electric “pulse trawls” will increasingly affect catchability and selectivity of plaice and sole. ICES considered that pulse trawls experienced lower catch rates (kg hr<sup>-1</sup>) of undersized sole and higher catch rates of marketable sole, compared to standard beam trawls (ICES, 2006). Plaice catch rates decreased for all size classes. In 2011, approximately 30 derogation licenses for pulse trawls were operational in the Netherlands, increasing to 42 in 2012. Debate is ongoing in the EU about extensions of an additional 42 derogation licenses as well as possible amendments to EU regulations that would permanently legalize the use of pulse gears for the whole fleet. The introduction of innovative gears may lead to changes in how the ecosystem is impacted by the plaice and sole targeting fleet. Because of the lighter gear and lower towing speed, pulse vessels generate a lower swept-area per hour and reduced bycatch of benthic organisms. The new gears may change fishing patterns as well.

**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  $F = 0.3$ .

In 2012, ICES evaluated a proposal by the Netherlands for an amended management plan, which could serve as the “stage 2” plan (Coers et al., 2012). The amendments included changing the target  $F$  for sole to 0.25 and to cease reductions of effort. ICES concluded that the plan – subject to those amendments – is consistent with the precautionary approach and the principle of maximum sustainable yield (ICES, 2012a). However, implementation of stage two of the plan is not yet defined. The amendments evaluated do not affect the current TAC advice for plaice as the changes were in relation to (1) the target  $F$  for sole, and (2) ceasing reductions in effort limitations.

In 2013, the effects of interannual quota flexibility in the management plan for plaice and sole were evaluated (ICES, 2013c). ICES concluded that the multiannual management plan is robust to inclusion of interannual quota flexibility in terms of the probability of the stock biomass falling below  $B_{lim}$ , and average yield. This conclusion is conditional on the interannual quota flexibility being suspended when the stock is estimated to be outside safe biological limits.

#### 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	$MSY$ $B_{trigger}$	230 000 t	Default to value of $B_{pa}$ .
Approach	$F_{MSY}$	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)				
	2010	2011	2012	
MSY ( $F_{MSY}$ )	✓	✓	✓	Appropriate
Precautionary approach ( $F_{pa}, F_{lim}$ )	✓	✓	✓	Harvested sustainably
Management plan ( $F_{MP}$ )	✓	✓	✓	Below target
SSB (Spawning-Stock Biomass)				
	2011	2012	2013	
MSY ( $B_{trigger}$ )	✓	✓	✓	Above trigger
Precautionary approach ( $B_{pa}, B_{lim}$ )	✓	✓	✓	Full reproductive capacity
Management plan ( $SSB_{MP}$ )	✓	✓	✓	Above target

The stock is well within precautionary limits, has increased in the past ten years, and has reached a record-high level in 2013. Recruitment has been around the long-term average from 2007 onwards. In recent years, fishing mortality has been estimated below FMSY.

**RECENT MANAGEMENT ADVICE:**

ICES advises on the basis of stage one of the EU management plan (Council Regulation No. 676/2007) that landings should be no more than 111 631 t in 2014. If discard rates do not change from the average of the last three years (2010–2012), this implies catches of no more than 159 584 t.

**Other considerations****Management plan**

The North Sea plaice and sole stocks have both 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).

Following the EU multiannual plan stage 1 (as rules relating to the setting of F for stage 2 are not yet defined) would imply fishing at the target rate of 0.3, which results in a TAC (landings) increase of more than 15%. Therefore, the maximum TAC increase of 15% is applied, resulting in landings of no more than 111 631 t in 2014. If discard rates do not change from the average of the last three years (2010–2012), this implies catches of no more than 159 584 t. This is expected to lead to an SSB of 737 017 t in 2015.

**MSY approach**

Following the ICES MSY approach implies an increase in fishing mortality to 0.25, resulting in catches of 153 069 t in 2014. If discard rates do not change from the average of the last three years (2010–2012), this implies landings of no more than 106 226 t. This is expected to lead to an SSB of 743 656 t in 2015.

Given that the current (2012) estimate of fishing mortality is slightly below FMSY, there is no need to follow a transition scheme towards this reference value.

### Precautionary approach

The fishing mortality in 2014 should be no more than  $F_{pa}$  (0.6), corresponding to catches of no more than 317 395 t in 2014. If discard rates do not change from the average of the last three years (2010–2012), this implies landings of no more than 222 529 t. This is expected to keep SSB above  $B_{pa}$  in 2015.

### Mixed fisheries

In contrast to single-species advice there is no single recommendation for mixed fisheries (ICES, 2013b), but rather a range of example scenarios, assuming fishing patterns and catchability in 2013 and 2014 are unchanged from those in 2012. Major differences between the outcomes of the various scenarios indicate potential undershoot or overshoot of the advised landings corresponding to the single-species advice. As a result, fleet dynamics may change, but cannot be determined.

Cod is the main limiting species for the North Sea demersal fisheries in 2014. In all scenarios except the “Maximum”, the Plaice IV management plan catch options could not be fully utilized.

Rationale	Catch (2014)	Landings (2014) <sup>3</sup>	Basis	F(2–6) Total (2014)	F(2–6) HC (2014)	F(2–3) Disc (2014)	Disc. (2014)	SSB (2015)	% SSB change <sup>1</sup>	%TAC change <sup>2</sup>
Management plan	159.584	111.631	TAC + 15%	0.26	0.14	0.23	48.242	737.017	0%	+15%
<i>Mixed fisheries options – minor differences with calculation above can occur due to different methodology used</i>										
Maximum	233.968	163.655	A	0.41			70.312	650.750	–12%	+69%
Minimum	78.931	54.880	B	0.12			24.051	808.471	+10%	–43%
Cod_MP	79.249	55.102	C	0.12			24.147	808.146	+10%	–43%
SQ effort	149.936	104.520	D	0.25			45.416	736.068	+0%	+8%
Effort_Mgt	118.995	82.855	E	0.19			36.140	767.586	+4%	–15%

Weights in '000 t.

<sup>1</sup>) SSB 2015 relative to SSB 2014.

<sup>2</sup>) Landings 2014 relative to TAC 2013.

<sup>3</sup>) Landings of plaice in Subarea IV, calculated as the projected total stock landings less the stock landings that occur in Division VIId. The subtracted value (676 t) is estimated based on the plaice catch advice for Division VIId for 2013, using the recent 3-year average (2009–2011) proportion of the Subarea IV plaice stock in the annual plaice landings in Division VIId. TAC change restrictions of 15% are applied after subtracting the Division VIId catches.

Mixed Fisheries assumptions:

Maximum scenario: Fleets stop fishing when last quota exhausted

Minimum scenario: Fleets stop fishing when first quota exhausted

Cod management plan scenario: Fleets stop fishing when cod quota exhausted

SQ effort scenario: Effort in 2012 and 2013 as in 2011

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

It is assumed that there is no change in fishing mortality in 2013 relative to 2012. This is based on the fact that there is no reduction in effort ceilings for 2013 compared to 2012.

### STECF COMMENTS:

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

STECF notes that in the assessment of plaice in the North Sea, ICES has taken into account information on migration of plaice between the North Sea and VIId. Similar information relating to movement of plaice between the North Sea and the Skagerrak has not been taken into account.

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.



## 1.18 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 3 600 t in 2012.

**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:

	Type	Value	Technical basis
MSY Approach	MSY B <sub>trigger</sub>	Undefined.	
	F <sub>MSY</sub>	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)		
2010-2012		
Qualitative evaluation		Among the lowest in time series

SSB (Spawning-Stock Biomass)		
2009-2013		
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.

### RECENT MANAGEMENT ADVICE:

Based on the ICES approach for data limited stocks, ICES advises that landings of plaice in Division VIIId should be no more than 3 925 t, and discarding should be reduced. Discards are known to be high but cannot be quantified; therefore total catches cannot be calculated.

#### Other considerations

#### ICES approach to data limited stocks

For data-limited stocks with analytical assessment and forecast that are only treated qualitatively, ICES uses a short-term forecast using the FMSY proxy (or lower, if stock biomass is estimated to be below MSY B<sub>trigger</sub>) as a target to be reached by 2015. A change limit of  $\pm 20\%$  is applied to the advice.

For this stock, no MSY B<sub>trigger</sub> has been defined, and the method has been applied based on reaching the FMSY proxy in 2015. This implies fishing mortality should be reduced to 0.28, based on

$(F_{2010} \cdot 0.2) + (F_{MSY} \cdot 0.8)$  ( $= (0.48 \cdot 0.2) + (0.23 \cdot 0.8)$ ), resulting in landings of no more than 3925 t in 2014 (including plaice originating from the North Sea and Western English channel). This is expected to lead to an SSB increase of 18% in 2015.

Discards are known to be high but cannot be quantified therefore total catches cannot be calculated.

### **Mixed fisheries**

This is the first year this stock is included in the mixed fisheries assessment for the North Sea. In contrast to single-species advice there is no single recommendation for mixed fisheries (ICES, 2013b), but rather a range of example scenarios, assuming fishing patterns and catchability in 2013 and 2014 are unchanged from those in 2012. Major differences between the outcomes of the various scenarios indicate potential undershoot or overshoot of the advised landings corresponding to the single-species advice. As a result, fleet dynamics may change, but cannot be determined.

Cod is the main limiting species for the North Sea and eastern channel demersal fisheries in 2014. In all scenarios except the 'max', the plaice VIId catch option could not be fully utilized.

<b>Rationale</b>	<b>Landings plaice in VIId (2014) <sup>2)</sup></b>	<b>Landings VIId plaice (2014)</b>	<b>Basis</b>	<b>F landings (2014)</b>	<b>%SSB index change 2014-2015</b>
MSY transition	3925	3016	$(F_{2010} \cdot 0.2) + (F_{MSY} \cdot 0.8)$	0.28	+ 18%
<i>Mixed fisheries options – minor differences with calculation above can occur due to different methodology used (ICES, 2013b)</i>					
<i>Maximum</i>	5996	4608	A	0.33	-3%
<i>Minimum</i>	2208	1697	B	0.11	+28%
<i>Cod_MP</i>	2213	1701	C	0.11	+28%
<i>SQ effort</i>	4127	3171	D	0.21	+12
<i>Effort_Mgt</i>	3390	2605	E	0.17	+18

Weights in tonnes.

<sup>1)</sup> Based on the recent average proportion of the TAC for VIId,e landed in VIId (72%, last 2 years average).

<sup>2)</sup> Landings of all plaice in VIId including plaice originating from the North Sea and Western English Channel.

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

### **STECF COMMENTS:**

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

STECF notes that the stock is advised for ICES Division VIId but is managed for ICES Divisions VIId and VIIe combined. The combined advice for plaice in VIId and VIIe is for landings no greater than 5322 t, which represents a 5% increase on the estimated average landings of plaice from these areas over the last 3 years and less than a 1% decrease compared to the agreed TAC for 2013 for VIId and VIIe.

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.

## **1.19 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 2010, 2011 and 2012 landings were 538 t, 552 t and 358 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 $B_{\text{trigger}}$	2000 t	lowest observed SSB excluding 1984–1985 low SSB's (ICES, 2010).
Approach	$F_{\text{MSY}}$	0.30	Provisional value based on $F_{\text{pa}}$ .
Precautionary Approach	$B_{\text{lim}}$	Undefined.	
	$B_{\text{pa}}$	Undefined.	
	$F_{\text{lim}}$	0.47	$F_{\text{med}}$ 98 excluding the abnormal years around 1990.
	$F_{\text{pa}}$	0.30	Consistent with $F_{\text{lim}}$ .

**STOCK STATUS:**

F (Fishing Mortality)				
	2010	2011	2012	
MSY ( $F_{\text{MSY}}$ )	✗	✗	✗	At target
Precautionary approach ( $F_{\text{pa}}, F_{\text{lim}}$ )	○	○	○	Increased risk

SSB (Spawning-Stock Biomass)				
	2010	2012	2013	
MSY ( $B_{\text{trigger}}$ )	✗	✗	✗	Below trigger
Precautionary approach ( $B_{\text{pa}}, B_{\text{lim}}$ )	?	?	?	Undefined

SSB has decreased since 2006 and has been below MSY  $B_{\text{trigger}}$  since 2007. Fishing mortality has been around 0.36 since 2005. The last strong year class was the 2000 year class; since then recruitment has decreased to a historical low recruitment in 2012.

**RECENT MANAGEMENT ADVICE:**

ICES advises on the basis of the transition to the MSY approach that catches in 2014 should be no more than 353 tonnes. Discards are considering low, and therefore all catches are assumed to be landed.

**Other considerations**

**MSY approach**

Because SSB in the beginning of 2014 is below MSY  $B_{\text{trigger}}$ , the ICES MSY approach implies a fishing mortality of  $F_{\text{MSY}} \times \text{SSB}_{2014} / \text{MSY } B_{\text{trigger}}$  of 0.23. This results in catches of no more than 314 tonnes in 2014. This is expected to lead to an SSB of 1860 t in 2015. All catches are assumed to be landed.

Following the transition to the MSY approach implies a fishing mortality of  $0.2 \times F_{2010} + 0.8 \times (F_{\text{MSY}} \times \text{SSB}_{2014} / \text{MSY } B_{\text{trigger}})$  of 0.26. This results in catches of no more than 353 tonnes in 2014. This is expected to lead to an SSB of 1820 tonnes in 2015. All catches are assumed to be landed.

**Precautionary approach**

The fishing mortality in 2014 should be no more than  $F_{\text{pa}}$ , corresponding to landings in 2014 of no more than 396 tonnes. This is expected to lead to an SSB of 1780 tonnes in 2015.

### ***Additional considerations***

Between 2010 and 2012 the advice was based on an  $F_{MSY}$  of 0.38. This reference point was based on several standard stochastic simulations. Nevertheless, the input data are quite variable and uncertain for this stock, and not least the growth parameters, leading to high  $F_{MSY}$  compared to other neighbouring sole stocks. Furthermore, the ICES MSY approach as outlined in “General context of ICES advice” states that  $F_{MSY}$  cannot be higher than  $F_{pa}$ . Therefore ICES decided to provisionally apply a  $F_{MSY}$  equal to the formerly estimated  $F_{pa}$  of 0.30 pending a future revision of reference points.

### **STECF COMMENTS:**

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

With regards to the introduction of a landing obligation in the Skagerrak STECF notes that a landing obligation for sole will first enter into force in 2015.

## **1.20 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 2010, 2011 and 2012 are around 12 600 t, 11 500 t and 11 600 t.

The increased use of “SumWing” and electric “Pulse trawls” will increasingly affect catchability and selectivity of North Sea sole. In 2011, approximately 30 derogation licenses for Pulse trawls were taken into operation, which increased to 42 in 2012. Debate is ongoing in the EU about extensions of an additional 42 derogation licenses as well as possible amendments to EU regulations which would permanently legalize the use of pulse gears. ICES concluded that pulse trawls experienced reduced catch rates (kg/hr) of undersized sole, compared to standard beam trawls (ICES, 2006). Catch rates of sole above the minimum landings size from research vessel trials were higher but the commercial feasibility study suggested lower catch rates. The introduction of innovative gears may lead to changes in how the ecosystem is impacted by the plaice and sole targeting fleet. Because of the lighter gear and lower towing speed, pulse vessels generate a lower swept-area per hour and reduced bycatch of benthic organisms. The new gears may change fishing patterns as well.

**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 Plan	SSB <sub>MP</sub>	35 000 t	Stage one: Article 2.
	F <sub>MP</sub>	0.4 0.2	Stage one: Article 2; Stage two: Article 4.
MSY Approach	MSY B <sub>trigger</sub>	35 000 t	Default to value of B <sub>pa</sub> .
	F <sub>MSY</sub>	0.22	Median of stochastic MSY analysis assuming Ricker Stock-Recruit relationship (range of 0.2-0.25).
Precautionary Approach	B <sub>lim</sub>	25 000 t	B <sub>loss</sub>
	B <sub>pa</sub>	35 000 t	B <sub>pa</sub> 1.4*B <sub>lim</sub>
	F <sub>lim</sub>	Not defined.	
	F <sub>pa</sub>	0.4	F <sub>pa</sub> = 0.4 implies B <sub>eq</sub> > B <sub>pa</sub> and P(SSB<B <sub>pa</sub> ) < 10%

**MANAGEMENT AGREEMENTS:** A multiannual plan for plaice and sole in the North Sea was adopted by the EU Council in 2007 (EC regulation 676/2007) which describes two stages: a recovery plan during its first stage and a management plan during its second stage. Objectives are defined for these two stages, rebuilding the

stocks to within safe biological limits in the first and exploiting the stocks at MSY in the second. Stage 1 is deemed to be completed when both stocks have been within safe biological limits for two consecutive years. TAC-setting procedures are provided to accommodate stage 1 as well as a transitional period during which an impact assessment and evaluation should take place to reconsider long-term objectives. The plaice stock has been within safe biological limits as defined by the plan since 2005. The sole stock has been within safe biological limits in terms of fishing mortality since 2008. The 2012 and 2013 estimates are well above  $B_{pa}$  (43 kt and 39 kt). Consequently, ICES concludes that the objectives of stage 1 are currently met and provides advice based on the plan's TAC-setting procedure, acknowledging the stock to be in a transitional stage at present.

The current plan prescribes effort limitations (kW-days per metier) to be adjusted in line with changes in fishing mortality. The current advice implies a reduction of 10% in effort (following a 10% reduction in  $F$  to 0.21 for sole) as well as an increase in fishing mortality for plaice.

In 2012, ICES evaluated a proposal by the Netherlands for an amended management plan, which could serve as the 'stage 2' plan (Coers *et al.* 2012). The amendments included changing the target  $F$  for sole to 0.25 and to cease reductions of effort. ICES concluded that the plan – subject to those amendments – is consistent with the precautionary approach and the principle of maximum sustainable yield (ICES, 2012b). However, implementation of stage two of the plan is not yet defined.

## STOCK STATUS:

F (Fishing Mortality)				
	2010	2011	2012	
MSY ( $F_{MSY}$ )	✗	✗	✗	Above target
Precautionary approach ( $F_{pa}, F_{lim}$ )	✓	✓	✓	Harvested sustainably
Management plan ( $F_{MP}$ )	✓	✓	✓	Below target

SSB (Spawning-Stock Biomass)				
	2011	2012	2013	
MSY ( $B_{trigger}$ )	✗	✓	✓	Above trigger
Precautionary approach ( $B_{pa}, B_{lim}$ )	⦿	✓	✓	Full reproductive capacity
Management plan ( $SSB_{MP}$ )	✗	✓	✓	Above target

SSB has fluctuated around the precautionary reference points for the last decade and is estimated to be well above  $B_{pa}$  in 2013. Fishing mortality has shown a declining trend since 1995 and is estimated to be close to  $F_{msy}$  in 2012.

## RECENT MANAGEMENT ADVICE:

ICES advises on the basis of stage one the EU management plan (Council Regulation No. 676/2007) that landings in 2014 should be no more than 11 900 tonnes. Discards are known to take place but cannot be quantified; therefore total catches cannot be calculated.

### Other considerations

#### Management plan

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).

Following the EU multiannual plan stage 1 rules (as rules relating to the setting of  $F$  for stage 2 are not yet defined) would imply a 10% reduction of  $F$  to 0.21, which results in a TAC (landings) reduction of more than 15%. Therefore, the maximum TAC reduction of 15% is applied, resulting in landings of no more than 11 900 t

in 2014. This is expected to lead to an SSB of 46 070 t in 2015. Discards are known to take place but cannot be quantified; therefore total catches cannot be calculated.

### ***MSY approach***

Following the ICES MSY approach implies fishing mortality to be reduced to 0.22 ( $F_{MSY}$ , as  $SSB_{2012} > MSY B_{trigger}$ ), resulting in landings of 11 194 t in 2014. Discards are known to take place but cannot be quantified, therefore total catches cannot be calculated. This is expected to lead to an SSB of 46 916 t in 2015.

Given that the current (2012) estimate of fishing mortality is close to  $F_{MSY}$  there is no need to follow a transition scheme towards this reference value.

### ***Precautionary approach***

The  $F_{pa}$  for North Sea sole is 0.4. This would lead to landings of 18 540 t in 2014 and an SSB of 39 175 t in 2015. Discards are known to take place but cannot be quantified, therefore total catches cannot be calculated.

### ***Mixed fisheries***

In contrast to single-species advice there is no single recommendation for mixed fisheries (ICES, 2013b), but rather a range of example scenarios, assuming fishing patterns and catchability in 2013 and 2014 are unchanged from those in 2012. Major differences between the outcomes of the various scenarios indicate potential undershoot or overshoot of the advised landings 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 and eastern channel demersal fisheries in 2014. Following the 'cod' scenario (full implementation of the cod management plan), the sole management plan catch options could not be fully utilised.

<b>Rationale</b>	<b>Landings (2014)</b>	<b>Basis</b>	<b>F landings (2014)</b>	<b>SSB (2015)</b>	<b>%SSB change<sup>1)</sup></b>	<b>%TAC change<sup>2)</sup></b>
Management plan	11.900	15% TAC reduction	0.24	46.070	-4%	-15%
Mixed fisheries options – minor differences with calculation above can occur due to different methodology used (ICES, 2013b)						
<i>Maximum</i>	17.576	A	0.38	40.002	-17%	+26%
<i>Minimum</i>	6.420	B	0.12	51.775	+8%	-54%
<i>Cod_MP</i>	6.424	C	0.12	51.772	+8%	-54%
<i>SQ effort</i>	12.040	D	0.24	45.835	-5%	-14%
<i>Effort_Mgt</i>	11.869	E	0.24	46.015	-4%	-15%

Weights in thousand tonnes.

<sup>1)</sup> SSB 2015 relative to SSB 2014.

<sup>2)</sup> Human Consumption landings 2014 relative to TAC 2013.

Mixed fisheries assumptions

F. Maximum scenario: Fleets stop fishing when last quota exhausted

G. Minimum scenario: Fleets stop fishing when first quota exhausted

H. Cod management plan scenario: Fleets stop fishing when cod quota exhausted

I. SQ effort scenario: Effort in 2013 and 2014 as in 2012

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

It is assumed that there is no change in fishing mortality in 2013 relative to 2012. This is based on the fact that there is no reduction in effort ceilings for 2013 compared to 2012.

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

## **1.21 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 2013 were 4,047 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 Approach	MSY $B_{trigger}$	8000 t	$B_{pa}$
	$F_{MSY}$	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 $1.4 F_{pa} = 0.55$ . 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 $F_{loss}$ ; $SSB > B_{pa}$ and probability ( $SSB_{mt} < B_{pa}$ ), 10%: 0.4.

**STOCK STATUS:**

F (Fishing Mortality)			
	2010	2011	2012
MSY ( $F_{MSY}$ )	✗	✗	✗ Above target
Precautionary approach ( $F_{pa}, F_{lim}$ )	○	○	○ Increased risk

SSB (Spawning-Stock Biomass)			
	2011	2012	2013
MSY ( $B_{trigger}$ )	✓	✓	✓ Above trigger
Precautionary approach ( $B_{pa}, B_{lim}$ )	✓	✓	✓ Full reproductive capacity

The spawning-stock biomass has fluctuated without trend and is above MSY  $B_{trigger}$  since 2002. Fishing mortality has always been above  $F_{MSY}$ , and has been above  $F_{pa}$  since 2005. Recruitment has been fluctuating without trend.

**RECENT MANAGEMENT ADVICE:**

ICES advises on the basis of the transition to the MSY approach that catches in 2014 should be no more than 3251 tonnes. All catches are assumed to be landed.

*Other considerations*

**MSY approach**

Following the ICES MSY approach implies fishing mortality to be reduced to 0.29 resulting in catches of less than 2894 t in 2014. This is expected to lead to an SSB of 11 319 t in 2015.

Following the transition scheme towards the ICES MSY approach implies that  $(F_{2010} * 0.2) + (0.8 * F_{MSY})$  is 0.32, resulting in catches of less than 3251 t in 2014. This is expected to lead to an SSB of 11 054 t in 2015. Discards are not taken into account, but are considered to be small and all catches are assumed to be landed.

**PA approach**

The fishing mortality in 2014 should be no more than  $F_{pa}$ , corresponding to catches of less than 3803 t in 2014. This is expected to keep SSB well above  $B_{pa}$  in 2015. All catches are assumed to be landed.

### Mixed fisheries

This is the first year this stock is included in the mixed fisheries assessment for the North Sea. In contrast to single-species advice there is no single recommendation for mixed fisheries (ICES, 2013b), but rather a range of example scenarios, assuming fishing patterns and catchability in 2013 and 2014 are unchanged from those in 2012. Major differences between the outcomes of the various scenarios indicate potential undershoot or overshoot of the advised landings corresponding to the single-species advice. As a result, fleet dynamics may change, but cannot be determined.

Cod is the main limiting species for the North Sea and eastern channel demersal fisheries in 2014. Following the 'cod' scenario (full implementation of the cod management plan), the sole VIId catch option could not be fully utilized. It is also noted that for the 'max', 'SQeffort' and 'Effort\_Mgt' scenario the implied  $F$  would exceed  $F_{pa}$  which is not considered precautionary.

Rationale	Catches (2014)	Basis	F(2014)	SSB(2015)	%SSB change <sup>1)</sup>	%TAC Change <sup>2)</sup>
MSY transition	3251	$(F_{2010} \cdot 0.2) + (F_{MSY} \cdot 0.8)$	0.33	10 951	+8%	-45%
<i>Mixed fisheries options – minor differences with calculation above can occur due to different methodology used (ICES, 2013b)</i>						
Maximum	5858	A	0.70	8271	-19%	-1%
Minimum	2359	B	0.23	11 852	+ 16%	-60%
Cod_ MP	2365	C	0.23	11 845	+ 16%	-60%
SQ effort	4266	D	0.46	9897	+ 3%	-28%
Effort_Mgt	3873	E	0.41	10 299	+ 1%	-34%

Weights in thousand tonnes.

<sup>1)</sup> SSB 2015 relative to SSB 2014.

<sup>2)</sup> Human Consumption landings 2014 relative to TAC 2013.

Mixed fisheries assumptions

K. Maximum scenario: Fleets stop fishing when last quota exhausted

L. Minimum scenario: Fleets stop fishing when first quota exhausted

M. Cod management plan scenario: Fleets stop fishing when cod quota exhausted

N. SQ effort scenario: Effort in 2013 and 2014 as in 2012

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

It is assumed that there is no change in fishing mortality in 2013 relative to 2012. This is based on the fact that there is no reduction in effort ceilings for 2013 compared to 2012.

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

## 1.22 Turbot (*Psetta maxima*) in Division IIIa

**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. In IIIa a target fisheries for turbot probably only occurred before 1960s when the stock was large, while today turbot is only caught as by-catch in the trawl and gillnet fisheries. ICES estimate of landings in 2012 is 189 tonnes which is almost two times higher than the 2011 estimate. Discards are considered negligible.

### REFERENCE POINTS:

No reference points have been defined.

### STOCK STATUS:

F (Fishing Mortality)		
2010 - 2012		
Qualitative evaluation	?	Insufficient information
TSB (Total Stock Biomass)		
2005 – 2012		



Qualitative evaluation		Stable
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Landings decreased over the last decade but have increased again in 2012. Survey abundance indices are highly variable without trend over the last decades. Recent analysis has shown that that biomass declined by about 80% since the 1920s and the maximum body size has decreased by about 30%. The stock size indicators (number/hour) show opposing trends comparing the last three years (2010–2012) with the average of the five previous years (2005–2009), either 10% lower (based on the Q1 survey) or 48% higher (Q4 survey), suggesting no predominant trend in the data.

#### **RECENT MANAGEMENT ADVICE:**

Based on the ICES approach for data-limited stocks, ICES advises that catches should be no more than 102 tonnes in 2014. All catches are assumed to be landed.

#### ***Other considerations***

##### ***ICES approach to data limited stocks***

For data limited stocks for which an abundance or 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 three most recent index values with the five preceding values, combined with recent landings data. Knowledge about the exploitation status also influences the advised catch.

The stock size indicator (number/hour) in the last three years (2010–2012) is 10% lower (based on the Q1 survey) and 48% higher (Q4 survey) than the average of the five previous years (2005–2009). This suggests no significant trend in the data and no changes in relation to the last three years average catches, corresponding to catches of no more than 128 t.

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 102 t in 2014.

All catches are assumed to be landed.

**STECF COMMENTS:** STECF agrees with the ICES assessment of the state of the stock and the advice for 2014. STECF notes that this advice also applies to 2015. The value of 102 t advised by ICES represents a reduction of 20% on the average reported landings over the period 2010-2012.

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.

## **1.23 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 and 12.

#### **REFERENCE POINTS:**

No reference points have been defined.

#### **STOCK STATUS:**

F (Fishing Mortality)			
	2010	2011	2012
Qualitative evaluation			Declining

SSB (Spawning-Stock Biomass)			
	2010	2011	2012
Qualitative evaluation			Increasing from low level

A trends-based assessment for turbot in the North Sea is presented for the first time. Landings of turbot have been stable since 1995. Recruitment is variable around the long-term average. The sudden increase in F is because of a reduction of the minimum landing size in 2001. Since then fishing mortality has declined. Spawning-stock biomass is at a low level, but has been gradually increasing in recent years.

#### RECENT MANAGEMENT ADVICE:

Based on ICES approach to data limited stocks, ICES advises that catches of turbot in Subarea IV should be no more than 2978 t. All catches are assumed to be landed.

#### Other considerations

##### ICES approach to data-limited stocks

For data-limited stocks with analytical assessment and forecast that are only treated qualitatively, ICES uses a short-term forecast applying the  $F_{MSY}$  proxy (or lower, if the stock biomass is estimated to be below  $MSY B_{trigger}$ ) as a target to be reached by 2015. A change limit of  $\pm 20\%$  is applied to the advice.

For this stock, no  $MSY B_{trigger}$  has been defined, and the method has been applied based on maintaining fishing mortality at the  $F_{MSY}$  proxy. This implies fishing mortality should be kept at 0.34, resulting in landings of no more than 2978 t in 2014. This is expected to lead to an increase in SSB of 12% from 2014 to 2015. All catches are assumed to be landed.

**STECF COMMENTS:** STECF agrees with the ICES assessment of the state of the stock and the advice for 2014. The value of 2978 t advised by ICES represents an increase of 6% on the average reported landings over the period 2010-2012.

STECF considers that since advice for both turbot and brill in the North Sea is now available from ICES it may be appropriate to adopt separate management measures to regulate exploitation of these stocks.

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.

## 1.24 Witch (*Glyptocephalus cynoglossus*) in the North Sea

**FISHERIES:** Witch is an important bycatch in some *Nephrops* fisheries. There is an occasional directed fishery in the Skagerrak. In the North Sea it is mainly taken as by-catch. A few Danish seine fisheries have been targeting this species in IIa. There is no Minimum Landing Size (MLS) specified in EU waters. However, on a local level a minimum landing size of 28 cm is enforced in Germany, Denmark, Scotland, Sweden and in some coastal areas of England. Discard rates are unknown but are potentially important to the assessment. In 2012 recorded landings were around 1896 t.

A precautionary TAC (including lemon sole) in areas IIa and IV for 2012 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). No analytical assessment can be presented, mainly due to a lack of sufficiently long datasets. Therefore, fishing possibilities cannot be projected.

#### REFERENCE POINTS:

No reference points have been defined.

#### STOCK STATUS:

F (Fishing Mortality)	
	2012

Qualitative evaluation		Above possible reference points
<b>TSB (Total Stock Biomass)</b>		
<b>2006 - 2013</b>		
Qualitative evaluation		Increase

Landings have declined in the last decade, but the 2012 landings in IIIa show an increase. Abundance indices show a declining trend since the peak observed in 2000 and an increase in recent years. The stock size indicator (number/hour) in the last three years (2011–2013) is more than 20% higher than the average of the five previous years (2006–2010) for both surveys. Exploratory estimates suggest that fishing mortality is above potential  $F_{MSY}$  proxies.

#### **RECENT MANAGEMENT ADVICE:**

Based on the ICES approach for data limited stocks, ICES advises that landings should be no more than 1574 tonnes. Discards are known to take place, but the data are insufficient to estimate a discard proportion that could be applied to give catch advice; therefore total catches cannot be calculated.

#### ***Other considerations***

#### ***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. Knowledge about the exploitation status also influences the advised catch.

The stock size indicator (number/hour) in the last three years (2011–2013) compared to the average of the five previous years (2006–2010) is 73% and 24% higher for the Quarter 1 and Quarter 3 survey respectively. This implies an increase of landings of at most 20 % in relation to the last three years average landings to 1968 t.

The effort of the main fleet with witch bycatches (otter trawls) in the North Sea and Skagerrak has declined by 14% (TR1) and 45% (TR2) between 2004 and 2012. In the Skagerrak, a similar decrease was seen for TR2 which is the main fleet in this area. At the same time, there is indication from a preliminary assessment that the stock may be overexploited. Concluding, there is uncertainty on the exploitation rate on witch, therefore ICES advises that landings should decrease by 20% as a precautionary buffer. This results in landings of no more than the last three years average landings of 1574 t in 2014.

Discards are known to take place, but the data are insufficient to estimate a discard proportion that could be applied to give catch advice; therefore total catches cannot be calculated.

**STECF COMMENTS:** STECF agrees with the ICES assessment of the state of the stock and the advice for 2014. STECF notes that this advice also applies to 2015.

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

STECF further notes that the advice is for the combined area IIa-IV, IIIa and VIId. Assuming the same proportional distribution of landings as in 2012 will imply landings of witch from subarea IV (North Sea) in 2014 and 2015 of 919 t. This represents an increase of 13% on the average landings from Subarea IV over the period 2010-2012.

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.

## **1.25 Norway pout (*Trisopterus esmarki*) in IIa, IIIa and the North Sea**

The results from the most recent assessment and advice for this stock were released in 2012. The text below remains unchanged from the Consolidated STECF review of advice for 2013 (STECF-12-22).

**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. Norway pout itself has been a by-catch in the fisheries for shrimp on the North Sea.

**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.

Norway pout is a short-lived species and most likely a one-time spawner. The population dynamics of Norway pout are very dependent on changes caused by recruitment variation and variation in predation (or other natural) mortality, and less by the fishery. Recruitment is highly variable and influences SSB and TSB rapidly because of the short life span of the species. 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 following 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	MSY $B_{\text{escapement}}$	150 000 t	$= B_{\text{pa}}$
Approach	$F_{\text{msy}}$	Undefined	None advised
Precautionary approach	$B_{\text{lim}}$	90 000 t	$B_{\text{lim}} = B_{\text{loss}}$ , the lowest observed biomass in the 1980s
	$B_{\text{pa}}$	150 000 t	$= B_{\text{lim}} e^{0.3*1.65}$
	$F_{\text{lim}}$	Undefined	None advised
	$F_{\text{pa}}$	Undefined	None advised

#### STOCK STATUS:

F (Fishing Mortality)			
	2009	2010	2011
MSY ( $F_{\text{MSY}}$ )	?	?	?
Precautionary approach ( $F_{\text{pa}}, F_{\text{lim}}$ )	?	?	?
Qualitative evaluation	↗	↗	↘

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

The stock size decreased significantly in 2011 due to very low recruitment in 2010 and 2011. However, 2012 recruitment has been very high and stock size is estimated to be above above MSY<sub>Bescapement</sub> in September 2012. This is expected to maintain SSB above MSY<sub>Bescapement</sub> in 2013. 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  $F$  (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 according to the escapement strategy that catches of Norway pout in 2012 should not exceed 101 000 t. With this catch in 2012, catches in 2013 should not exceed 393 000 t. If no catch is taken in 2012, then catches in 2013 should not exceed 458 000 t.

#### *Other considerations*

#### *Management plans*

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).

Long term management strategies for the stock were evaluated by ICES in September 2012 based on a joint EU-Norway request, and considered to be consistent with the precautionary approach under certain constraints (ICES 2012b).

#### *Advice for 2012 (in-year):*

##### *MSY approach*

To maintain the spawning-stock biomass above MSY  $B_{\text{escapement}}$  by January 1 2013, catches of no more than 101 000 t can be taken in 2012. This corresponds to  $F=0.67$  in 2012.

##### *PA approach*

The precautionary approach corresponds to maintaining SSB above  $B_{\text{pa}} = \text{MSY } B_{\text{escapement}}$  on January 1, 2013. Therefore, it is similar to the MSY approach for this species.

#### *Advice for 2013:*

##### *MSY approach*

Two catch options are provided for 2013, depending on the assumed catch for 2012.

If Catch(2012)=0: To maintain the spawning-stock biomass above MSY  $B_{\text{escapement}}$  by January 1 2014, catches of no more than 458 000 t can be taken in 2013. This corresponds to  $F=1.82$  in 2013.

If Catch(2012)=101 kt: To maintain the spawning-stock biomass above MSY  $B_{\text{escapement}}$  by January 1 2014, catches of no more than 393 000 t can be taken in 2013. This corresponds to  $F=1.70$  in 2013.

##### *PA approach*

The precautionary approach corresponds to maintaining SSB above  $B_{\text{pa}} = \text{MSY } B_{\text{escapement}}$  on January 1, 2014. Therefore, it is similar to the MSY approach for this species.

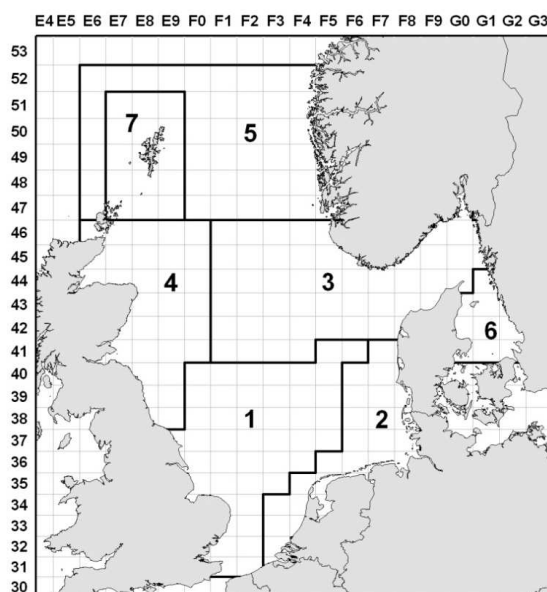
**STECF COMMENTS:** STECF agrees with the ICES assessment of the state of the stock and the revised advice for 2012 and advice for 2013.

## **1.26 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
3.25.1	1	Dogger Bank area	31-34 E9-F2; 35 E9-F3; 36 E9-F4; 37 E9-F5; 38-40 F0-F5; 41 F5-F6
3.25.2	2	South Eastern North Sea	31-34 F3-F4; 35 F4-F6; 36 F5-F8; 37-40 F6-F8; 41 F7-F8
3.25.3	3	Central Eastern North Sea	41 F1-F4; 42-43 F1-F9; 44 F1-G0; 45-46

F1-G1; 47 G0			
3.25.4	4	Central Western North Sea	38-40 E7-E9; 41-46 E6-F0
3.25.5	5	Viking and Bergen Bank area	47-51 E6 + F0-F5; 52 E6-F5
3.25.6	6	Division IIIa East (Kattegat)	41-43 G0-G3; 44 G1
3.25.7	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 101,256 t in 2012.

Dredge survey information for December has been available since 2010 and is 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. ICES advice for SAs 4–7 is based on the approach to data-limited stocks.

Catch possibilities are largely dependent on the size of the recruiting year-class.

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

**MANAGEMENT OBJECTIVES:** No management objectives have been set for these stocks 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 not been based on ICES advice.

#### **RECENT MANAGEMENT ADVICE:**

ICES provides advice separately for the 7 areas. The table below gives an overview of the ICES advice by sandeel area.

Year	Sandeel Area 1	Sandeel Area 2	Sandeel Area 3	Sandeel Area 4	Sandeel Area 5	Sandeel Area 6	Sandeel Area 7	EC zone TAC	NOR zone TAC	ICES landings
2005 <sup>1</sup>	-	-	-	-	-	No advice	No advice	661	10 <sup>2</sup>	177
2006 <sup>1</sup>	-	-	-	-	-	No advice	No advice	300	0	293
2007 <sup>1</sup>	-	-	-	-	-	No advice	No advice	173	51	230
2008 <sup>1</sup>	-	-	-	-	-	No advice	No advice	375	128	348
2009 <sup>1</sup>	-	-	-	-	-	No advice	No advice	377	0	353
2010	-	-	-	-	-	No advice	No advice	377	50	414
2011	< 320	< 34	0	5–10	No increase in effort unless there is evidence that this is sustainable.			354	90	438
2012	< 23	< 5	< 5	< 5	No increase in catches unless there is evidence that this is sustainable.			61	42	101 <sup>3</sup>
2013	< 224.544	< 17.544	< 78.331	< 2.041	0	< 0.219	0	0 <sup>3</sup>	20	

Weights in thousand tonnes.

<sup>1</sup> Advice for Subarea IV excluding the Shetland area.

<sup>2</sup> TAC set for EC fisheries 10 kt, seasonal effort limitations set for Norwegian fisheries.

<sup>3</sup> Preliminary.

For SAs 1–3 the advice is based on ICES MSY approach to short-lived species as it was last year. For SAs 4–7 the advice this year is based on ICES approach to data-limited stocks, whereas last year the advice was based on precautionary considerations.

For short-lived species such as sandeel, ICES interpretation of the MSY concept uses B<sub>pa</sub> estimates as the default value for MSY Bescapement. ICES advice is based on the sandeel stock being at or above MSY Bescapement in the year after the fishery has taken place. This escapement strategy should retain a stock that is sufficient for successful recruitment and which can also provide an adequate resource for predators of sandeel (ICES, 2010).

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 agrees with ICES advice.

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.

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

**FISHERIES:** The landings in 2012 were 44,594 t, the lowest observed in the time series. Average landings in the period 1983 to 2012 are 321,022 t.

#### REFERENCE POINTS:

	Type	Value	Technical basis
<b>MSY Approach</b>	MSY B <sub>escapement</sub>	215 000 t	= B <sub>pa</sub>
	F <sub>MSY</sub>	Not defined.	
<b>Precautionary Approach</b>	B <sub>lim</sub>	160 000 t	Median SSB in the years (2000–2006) of lowest SSB and no impaired recruitment (ICES, 2010).
	B <sub>pa</sub>	215 000 t	B <sub>pa</sub> = B <sub>lim</sub> * exp <sup>(σ*1.645)</sup> , with σ = 0.18 estimated from assessment uncertainty in the terminal year (ICES, 2010).
	F <sub>lim</sub>	Not defined.	
	F <sub>pa</sub>	Not defined.	

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

#### STOCK STATUS:



F (Fishing Mortality)			
	2010	2011	2012
MSY ( $F_{MSY}$ )	?	?	? Undefined
Precautionary approach ( $F_{pa}$ , $F_{lim}$ )	?	?	? Undefined
SSB (Spawning-Stock Biomass)			
	2011	2012	2013
MSY ( $B_{escapement}$ )	✓	✓	✗ Below escapement trigger
Precautionary approach ( $B_{pa}$ , $B_{lim}$ )	✓	✓	⚠ Increased risk

The stock at the start of 2013 is expected to be just above  $B_{lim}$ , which is the result of the very low recruitments in both 2010 and 2011. The 2010 and 2011 year classes were the lowest of any two consecutive years in the time-series. It is therefore mainly the amount of young fish, represented as a medium recruitment in 2012, which drives the advised catch for 2013.  $F$  has fluctuated around 0.5 since 2005, except in 2012 when  $F$  was the lowest observed.

#### RECENT MANAGEMENT ADVICE: `

ICES advises on the basis of the MSY approach that the catch in 2013 should be no more than 224,544 t to maintain SSB in 2014 above MSY  $B_{escapement}$ . All catches are assumed to be landed. The advised catch is mainly driven by the medium recruitment in 2012 (in contrast to the historically low recruitments in 2010 and 2011).

**STECF COMMENTS:** STECF agrees with the ICES advice.

#### 1.26.2 Sandeel (*Ammodytidae*) in Area-2 (South Eastern North Sea)

**FISHERIES:** The landings in 2012 were 8,048 t, the lowest observed in the time series. Average landings in the period 1983 to 2012 are 59,705 t.

#### REFERENCE POINTS:

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

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

#### STOCK STATUS:

F (Fishing Mortality)			
	2010	2011	2012
MSY ( $F_{MSY}$ )	?	?	? Undefined
Precautionary approach ( $F_{pa}$ , $F_{lim}$ )	?	?	? Undefined
SSB (Spawning-Stock Biomass)			
	2011	2012	2013
MSY ( $B_{escapement}$ )	✓	✓	✗ Below escapement trigger
Precautionary approach ( $B_{pa}$ , $B_{lim}$ )	✓	✓	⚠ Increased risk

Despite a very low  $F$  in 2012, SSB in 2013 has dropped below  $B_{pa}$  due to the very low recruitments in both 2010 and 2011. Recruitment in 2012 is estimated to be medium and this leads to a predicted increase in SSB in 2014.

**RECENT MANAGEMENT ADVICE:** ICES advises on the basis of the MSY approach that the catch in 2013 should be no more than 17,544 t to maintain SSB in 2014 above MSY  $B_{escapement}$ . All catches are assumed to be landed. The advised catch is mainly driven by the medium recruitment in 2012 (in contrast to the historically low recruitments in 2010 and 2011).



**STECF COMMENTS:** STECF agrees with the ICES advice.

### 1.26.3 Sandeel (*Ammodytidae*) in Area-3 (Central Eastern North Sea)

**FISHERIES:** The landings in 2012 were 45,732 t. Average landings in the period 1983 to 2012 are 220,536 t.

#### REFERENCE POINTS:

	Type	Value	Technical basis
<b>MSY Approach</b>	MSY $B_{\text{escapement}}$	195 000 t	$= B_{\text{pa}}$
	$F_{\text{MSY}}$	Not defined.	
<b>Precautionary Approach</b>	$B_{\text{lim}}$	100 000 t	The highest SSB (in 2001) in the period (2001–2007) with the lowest SSB and low recruitment (ICES, 2010).
	$B_{\text{pa}}$	195 000 t	$B_{\text{pa}} = B_{\text{lim}} * \exp^{(\sigma * 1.645)}$ , with $\sigma = 0.40$ estimated from assessment uncertainty in the terminal year (ICES, 2010).
	$F_{\text{lim}}$	Not defined.	
	$F_{\text{pa}}$	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)				
	2010	2011	2012	
MSY ( $F_{\text{MSY}}$ )	?	?	?	Undefined
Precautionary approach ( $F_{\text{pa}}, F_{\text{lim}}$ )	?	?	?	Undefined
SSB (Spawning Stock Biomass)				
	2011	2012	2013	
MSY ( $B_{\text{escapement}}$ )	✓	✗	✗	Below escapement trigger
Precautionary approach ( $B_{\text{pa}}, B_{\text{lim}}$ )	✓	○	✗	Below Blim

Since 2005, F has been variable between years and below the long-term mean. The stock has increased from a record low SSB in 2004 (at half of  $B_{\text{lim}}$ ) to above  $B_{\text{pa}}$  in 2010, but SSB has since declined, being below  $B_{\text{pa}}$  in 2012 and just below  $B_{\text{lim}}$  in 2013. The low SSB is the result of the historically low recruitments in 2010 and 2011. The advised catch for 2013 is mainly driven by young fish represented by a relatively strong recruitment in 2012.

#### RECENT MANAGEMENT ADVICE:

ICES advises on the basis of the MSY approach that the catch in 2013 should be no more than 78 331 t to maintain SSB in 2014 above MSY  $B_{\text{escapement}}$ . All catches are assumed to be landed. The advised catch is mainly driven by the medium recruitment in 2012 (in contrast to the historically low recruitments in 2010 and 2011).

#### Other considerations

Based on the Norwegian national management plan, a TAC for the Norwegian EEZ of SA 3 was set at 20,000 t 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.

**STECF COMMENTS:** STECF agrees with the ICES advice.

### 1.26.4 Sandeel (*Ammodytidae*) in Area-4 (Central Western North Sea)

**FISHERIES:** The landings in 2012 were 2,500 t.

**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)			
	2010	2011	2012
MSY ( $F_{MSY}$ )	?	?	Unknown
Precautionary approach ( $F_{pa}$ , $F_{lim}$ )	?	?	Unknown
Qualitative evaluation	→	→	→ Very low
SSB (Spawning-Stock Biomass)			
	2011	2012	2013
MSY ( $B_{escapement}$ )	?	?	Unknown
Precautionary approach ( $B_{pa}$ , $B_{lim}$ )	?	?	Unknown
Qualitative evaluation	↗	→	↘ Declining

Survey data indicate that the strong 2009 year class has been followed by lower recruitments in 2010, 2011, and 2012. The very limited effort applied in the area suggests a very low fishing mortality.

#### RECENT MANAGEMENT ADVICE:

ICES advises on the basis of the approach to data-limited stocks that catches should not exceed 2,041 t. in 2013.

For this stock, the available survey series is short and difficult to interpret numerically at this time. It shows high recruitment in 2009 followed by much lower recruitment. The recent catches have been very low with some increase in 2012; therefore, catches in 2013 should remain low. Following ICES approach to data-limited stocks, catches in 2013 should decrease by a precautionary buffer of 20% in relation to the 2012 catch, leading to catches of no more than 2,041 t.

#### 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 advice.

#### 1.26.5 Sandeel (*Ammodytidae*) in Area-5 (Viking and Bergen Bank area)

**FISHERIES:** The landings in 2012 were 8,048 t, the lowest observed in the time series. Average landings in the period 1983 to 2012 are 59,705 t.

**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)	
	2010–2012
Qualitative evaluation	→ Very low
SSB (Spawning-Stock Biomass)	
	2011–2013
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 the approach to data-limited stocks that catches should not increase unless there is evidence that this will be sustainable. This corresponds to zero catch.

For this stock, current catches are zero. ICES advises that catches in 2013 should remain at zero unless there is evidence that an increase would be sustainable.

**STECF COMMENTS:** STECF agrees with ICES advice.

### 1.26.6 Sandeel (*Ammodytidae*) in Area-6 (Division IIIa East (Kattegat))

**FISHERIES:** The landings in 2012 were 210 t.

**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)	
	2010–2012
Qualitative evaluation	? Insufficient information
SSB (Spawning-Stock Biomass)	
	2011–2013
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 the approach to data-limited stocks that catches should be no more than 219 tonnes.

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 219 t. This advice is expected to remain unchanged for several years unless information on stock status becomes available.

**STECF COMMENTS:** STECF agrees with the ICES advice.

### 1.26.7 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)	
	2010–2012
Qualitative evaluation	→ Very low
SSB (Spawning-Stock Biomass)	
	2010–2013
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 the approach to data-limited stocks that no increase in the fisheries should take place unless there is evidence that this will be sustainable. This corresponds to zero catch.

For this stock, because the current catches are zero, ICES advises that catches in 2013 should be remain at zero unless there is evidence that an increase would be sustainable.

**STECF COMMENTS:** STECF agrees with the ICES advice.

## 1.27 Rays and skates in the North Sea

Advice for this stock for the years 2013 and 2014 was given in 2012 and the text below remains unchanged from the Consolidated STECF review of advice for 2013 (STECF-12-22).

**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

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.

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.

At present ray and skate fisheries are managed by means of a generic, multi-species TAC, along with prohibitions for severely depleted species.

Skates and rays fisheries are currently managed under a common TAC, although this complex comprises species that may have different vulnerabilities to exploitation. TAC advice is based on the status of the main commercial species, with species-specific advice also provided on an individual basis.

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 about 2,500 t in 2011.

**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, based on surveys and landings.

Three commercial skate species (thornback ray, spotted ray, and cuckoo ray) show increasing trends in relative abundance in fishery-independent trawl surveys. There is evidence of a long-term decline to depleted levels in the distribution and relative abundance of one commercial species (*Dipturus batis* complex). Trends in the relative abundance of two other commercial species (blonde ray, undulate ray) are unclear. Starry ray is an abundant non-commercial species and is almost exclusively discarded, and stock trends are decreasing. Discard survivorship is not known.

The advice is based on the stock status of the main commercial species in the ecoregion, with species-specific advice provided below. Landings of skates and rays in the North Sea have generally declined, and this is associated with changes in species composition and relative abundance.

**RECENT MANAGEMENT ADVICE:** The most recent advice for this stock was provided by ICES in 2012 and covers 2013 and 2014.

The previous advice was given for 2011 and 2012. The basis of this advice was the precautionary approach. This year, individual advice is given for each of the main species, on the basis of ICES approach to data-limited stocks.

ICES provides advice on the overall exploitation (landings and discards) of the ray and skates species assemblage, and also on individual species. ICES does not advise that individual TACs be established for each species, at present. This is because the catch statistics for individual species are not reliable. ICES considers the generic TAC, at best, as an ineffective measure, regulating overall outtake from the assemblage. ICES advises that a suite of species- and fishery-specific measures be developed to manage the fisheries on commercial species and achieve recovery of the depleted species. Such measures should be developed by managers involving all stakeholders; ICES is willing to assist in the process.

ICES does not advise a precautionary decrease in TAC, because it is considered that this would lead to increased regulatory discarding and further reduce the quality of the catch data. ICES does not view the TAC as the main means to manage the fishery, but rather as an upper boundary on the outtake. Therefore, further reductions to the TAC are not considered to be the best approach to allow recovery of depleted species at present.

Management measures should be framed in a mixed-fisheries context, considering the overall behaviour of demersal fleets, and the drivers for such behaviour. Because these species are mainly caught in mixed fisheries, when the TAC is exhausted, catches continue to take place, but are discarded. In order to achieve optimal harvesting of the commercial species, and to assist recovery of the depleted species, a suite of measures should be put in place.

Closure to fishing of spawning and/or nursery grounds, and measures to protect the spawning component of the population (e.g. maximum landing size) are powerful tools to protect rays and skates. In some cases, single-species TACs may be appropriate, especially for easily identified species, and/or discrete stocks in limited distribution areas.

Given that the European Community intends to introduce a ban on discards, minimum or maximum landing sizes should be carefully considered before they are introduced, because they could lead to increased discards. Size limits may best be applied if discard (escapee) survival can be shown to be high.

Resume of ICES advice for 2013 and 2014 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) IV, VIIId, IIIa	Depleted	Zero catch. Retain on prohibited species list
Thornback ray <i>Raja clavata</i>	IV, VIIId, IIIa	increasing	+ 20%
Spotted ray <i>Raja montagui</i>	IV, VIIId, IIIa	Stable/increasing	+ 20%
Starry ray <i>Amblyraja radiata</i>	IV, VIIId, IIIa	Decreasing	- 36%
Cuckoo ray <i>Leucoraja naevus</i>	IV, VIIId, IIIa	Increase	+ 20%
Blonde ray <i>Raja brachyuran</i>	VIIId	Uncertain	- 20%
Undulate ray <i>Raja undulate</i>	VIIId, VIIe	Low and highly variable	No target fishery
Other species	IV, VIIId, IIIa	Uncertain	- 20%

### 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. Rays and skates offer a unique opportunity to institute spatial, seasonal, and technical measures that can be used to improve stock status and regulate fishing mortality. This is because they have defined spatially discrete life history stages, and because stock–recruitment relationships are believed to be very strong.

### PA approach

The previous advice was given for 2011 and 2012. The basis of this advice was ICES precautionary approach. This year, individual advice is given for each of the main stocks, on the basis of ICES approach to data-limited stocks. An overall TAC advice is also provided using ICES approach to data-limited stocks.

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

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

## 1.28 Spurdog (*Squalus acanthias*) in the North Sea

Advice for this stock for the years 2013 and 2014 was given in 2012 and the text below remains unchanged from the Consolidated STECF review of advice for 2013 (STECF-12-22).

Spurdog in the North Sea is assessed as part of the spurdog stock in the North East Atlantic and the stock summary and advice is given in Section 8.8.

## 1.29 *Scyliorhinus canicula* and *Scyliorhinus stellaris* in Subareas IIa, IV and VIIId

Advice for these stocks for the years 2013 and 2014 was given in 2012 and the text below remains unchanged from the Consolidated STECF review of advice for 2013 (STECF-12-22).

This is the first advice for this stock provided by ICES. The advice is valid for 2013 and 2014. Assessment was conducted separately for IIa, IV and VIIId based on Survey- and landings trends from UK (BTS-Q3; Divisions IVc and VIIId) and IBTS-Q1 North Sea.

**FISHERIES:** Lesser-spotted dogfish *Scyliorhinus canicula* are mainly bycaught in mixed demersal fisheries. They are generally of low commercial value and discard rates are high. Discard survivorship is considered to be high. Fisheries for lesser-spotted dogfish may take place for use as bait in pot fisheries, but this is unquantified.

In the North Sea waters landings of *Scyliorhinus canicula* are available for division IIa IV and VIIId, landings have increased since 2000 from 1758t to 2546t in 2011.

Lesser-spotted dogfish is a small, productive, egg-laying shark. It is one of the most common small sharks in this ecoregion. It has a high discard survival rate.

Some demersal sharks, including lesser-spotted dogfish, may benefit from scavenging on trawl-damaged organisms and discards.

**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 <sub>trigger</sub>	Not defined	
Approach	F <sub>MSY</sub>	Not defined	
Precautionary Approach	B <sub>lim</sub>	Not defined	
	B <sub>pa</sub>	Not defined	
	F <sub>lim</sub>	Not defined	
	F <sub>pa</sub>	Not defined	

### STOCK STATUS:

F (Fishing Mortality)		
	2009–2011	
MSY (F <sub>MSY</sub> )	?	Unknown
Precautionary approach (F <sub>pa</sub> , F <sub>lim</sub> )	?	Unknown
Qualitative evaluation	↘	Decreasing
SSB (Spawning-Stock Biomass)		
	2005–2011	



<b>MSY</b> ( $B_{trigger}$ )		Unknown
<b>Precautionary approach</b> ( $B_{pa}, B_{lim}$ )		Unknown
<b>Qualitative evaluation</b>		Increasing

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 assessment:

Species	Area	State of stock
<i>Scyliorhinus canicula</i> (lesser spotted dogfish)	Ila, IV VIIId	Increasing

The stock is estimated to be increasing. Survey catch rates are increasing throughout the ecoregion. The average of beam trawl survey (BTS-Q3), assumed as stock size indicator, in the last two years (2010-2011) is 35% higher than the average of the five previous years (2005-2009). The average of the international bottom trawl surveys in the North Sea (IBTS-Q1), assumed as a stock size indicator, in the last two years (2010-2011) is 26% higher than the average of the five previous years (2005-2009). Catches are stable or increasing, though data are not complete. Given the increase in abundance, and stable/increasing catches, it can be inferred that exploitation (fishing mortality) is stable or decreasing.

#### RECENT MANAGEMENT ADVICE:

*Scyliorhinus canicula* (Lesser-spotted dogfish)

Management Objective (s)	Landings in 2011 and 2012
Transition to an <b>MSY approach</b> with caution at low stock size	
Cautiously avoid impaired recruitment ( <b>Precautionary Approach</b> )	
Cautiously avoid impaired recruitment and achieve other objective(s) of a <b>management plan</b> (e.g., catch stability)	n/a

There is no TAC in place for *Scyliorhinus canicula*.

#### Advice for 2013-2014 by individual stocks

Species	Area	Advice
<i>Scyliorhinus canicula</i> (lesser spotted dogfish)	IIIa, IV and VIIId	Maximum catches increase of 20% No individual TAC

Based on ICES approach to data-limited stocks, ICES advises that catches could be increased by a maximum of 20%. Because the data for catches of lesser-spotted dogfish are not fully documented, ICES is not in a position to quantify the result. ICES does not advise that an individual TAC be set for this stock, at present.

Given that there is a consistent increase in stock size over an extended period of time, no additional precautionary buffer is needed.

#### Outlook for 2013 and 2014

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 2013 and 2014. The rate of exploitation of these stocks relative to  $F_{MSY}$  is not currently known.

#### **Additional information**

As there is no obligation to report lesser-spotted dogfish at the species level, they are often included in generic categories such as “dogfish and hounds”. Therefore, landings data are not considered reliable. High levels of discarding take place.

Fishery-independent trawl surveys provide the longest time-series of species-specific information.

The methods applied to derive quantitative advice for data-limited stocks are expected to evolve as they are further developed and validated. The harvest control rules are expected to stabilize stock size, but they may not be suitable if the stock size is low and/or overfished.

**STECF COMMENTS:** STECF agrees with the ICES advice.

### **1.30 Other Demersal elasmobranchs in the North Sea, Skagerrak and Eastern channel**

Advice for this stock for the years 2013 and 2014 was given in 2012 and the text below remains unchanged from the Consolidated STECF review of advice for 2013 (STECF-12-22).

Angel sharks and South Hounds in the North Sea are assessed as part of their stocks in the North East Atlantic and the stock summary and advice for 2013 is given in Sections 8.17 and 8.18.

### **1.31 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, larval 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 the coastal area of the eastern North Sea.

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

Although the three main North Sea herring stocks include summer, autumn and winter spawners they are 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 the 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 Kattegat area, 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 total catch estimate for the North Sea and eastern Channel in 2012 by ICES amounts to 401,515 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 VIId 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)			
	2010	2011	2012
MSY ( $F_{MSY}$ )	✓	✓	✓ Appropriate
Precautionary approach ( $F_{pa}$ )	?	?	? Undefined
Management plan ( $F_{MP}$ )	✓	✓	✓ Below limit
SSB (Spawning-Stock Biomass)*			
* at spawning time in autumn.	2010	2011	2013
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.

Since 2007 SSB has been increasing and it is currently well above  $B_{pa}$ . Fishing mortality has been low for the past five years, and while it has increased recently it is still below  $F_{MSY}$ . The year classes from 2002 onwards are estimated to be among the weakest since the late 1970s. The recruits per spawner in the last decade are the lowest observed. Thus, 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 (Blim).*
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) for 2 ringers and older,  
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.*

ICES has evaluated this management plan and concluded that the plan is consistent with the precautionary approach and the MSY approach. ICES has evaluated the current and new options of

the management plan in 2012. ICES concludes that all management plans tested included precautionary options (see ICES Advice 2012, Section 6.3.3.6.).

#### **RECENT MANAGEMENT ADVICE:**

ICES advises on the basis of the agreed EU–Norway management plan that catches in 2014 should be no more than 482 477 t, including 470 037 t for the A-fleet. All catches are assumed to be landed. ICES advises that activities that have a negative impact on the spawning habitat of herring, such as extraction of marine aggregates and construction on the spawning grounds, should not occur.

#### **Management plan**

Following the agreed management plan between EU and Norway ( $F = 0.25$ ) implies a decrease in TAC of 2% which results in a TAC of 470 037 t for the A-fleet in 2014 (Scenario 2), which would lead to an SSB of around 1.8 million tonnes at spawning time in 2014. The agreed management plan (

Annex 6.4.9) between EU and Norway has been evaluated (ICES, 2011a) 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 (ICES,

2012b) has revised the perception of the stock. ICES has evaluated the current and new options of the management plan in 2012. ICES concludes that all management plans tested included precautionary options (see ICES Advice 2012, Section 6.3.3.6)

### **MSY approach**

As no MSY  $B_{trigger}$  has been identified for this stock, the ICES MSY approach has been applied without considering SSB in relation to MSY  $B_{trigger}$ . Following the ICES MSY approach implies an increase in fishing mortality to 0.27, resulting in catches of less than 503 399 t in 2014 (Scenario 6). This is expected to lead to an SSB of around 1.8 million tonnes in 2014

### **Precautionary approach**

The SSB is expected to remain above  $B_{pa}$  in 2013.

Under the revised reference points,  $F_{pa}$  is no longer considered an operational reference point for the fisheries management of the North Sea herring stock.

**STECF COMMENTS:** STECF agrees with the ICES assessment of the state of the stock and the advice for 2014 for which, according to the existing EU Management plan, catches should be no more than 482 477 t, including 470 037 t allocated to the A-fleet.

## **1.32 Herring (*Clupea harengus*) in Divisions IVc and VIIId (Downs spawning herring)**

**FISHERIES:** The Downs herring constitutes one of the three main stock units forming the North Sea herring stock and it is included in Section 2.31 on Herring (*Clupea harengus*) in the North Sea (Sub-area IV) including components of this stock in Div. 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 2.31 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 advice.

## **1.33 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 10,400 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 might have prevented the full utilisation of the occasional strong year-classes, which, in general, emerge and disappear very quickly in the sprat stocks.

**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)		
		2010–2012
Qualitative evaluation	?	Insufficient information
SSB (Spawning Stock Biomass)		
		2011–2013
Qualitative evaluation	?	Insufficient information

The combined survey index indicates lower abundance in the four most recent years. The exploitation status of the stock is unknown.

**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 6787 tonnes. The value of 6787 t advised by ICES represents a precautionary reduction of 36% on the average reported landings over the period 2010–2012.

**STECF COMMENTS:** STECF agrees with the ICES assessment of the state of the stock and the advice for 2014 catches, which should be no more than 144 000 t. ICES assumes that all catches are landed.

### 1.34 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 2011 and 2012 were around 111,000 t and 107,000 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:

##### Reference points

	Type	Value	Technical basis
<b>MSY Approach</b>	MSY B <sub>trigger</sub>	Not defined.	
	F <sub>MSY</sub>	1.3	Provisional F <sub>MSY</sub> proxy based on M (where M is estimated based on a multispecies assessment and varies over time; 1.3 is the value in 2013).
<b>Precautionary Approach</b>	B <sub>lim</sub>	90 000 t	B <sub>lim</sub> was set to ensure that years of very good recruitment mainly occurred when the stock was above B <sub>lim</sub> and years of very low recruitment only occurred when the stock was below B <sub>lim</sub> (ICES, 2013).
	B <sub>pa</sub>	142 000 t	$B_{pa} = B_{lim} \times \exp(\sigma \times 1.645)$ , with $\sigma = 0.28$ estimated from assessment uncertainty in the terminal year (ICES, 2013).
	F <sub>lim</sub>	Not defined.	
	F <sub>pa</sub>	Not defined.	

F (Fishing Mortality)			
	2010	2011	2012
MSY ( $F_{MSY}$ )	?	?	? Undefined
Precautionary approach ( $F_{pa}, F_{lim}$ )	?	?	? Undefined
Qualitative evaluation	✓	✓	✓ Below provisional $F_{MSY}$ proxy

SSB (Spawning Stock Biomass)			
	2011	2012	2013
MSY ( $B_{trigger}$ )	?	?	? Undefined
Precautionary approach ( $B_{pa}, B_{lim}$ )	✓	✓	✓ Full reproductive capacity

**STOCK STATUS:** The spawning stock has been above  $B_{pa}$  since 2005, with the exception of 2007, where SSB was approximately at  $B_{pa}$ . Fishing mortality shows an overall decreasing trend since 2004. Recruitment appears more stable than is often the case for short-lived species, with recruitment in 2012 estimated to be below average.

**RECENT MANAGEMENT ADVICE:** ICES advises on the basis of the MSY approach that catches of sprat from July 2013 to June 2014 should be no more than 144 000 t. All catches are assumed to be landed.

#### MSY approach

The ICES MSY approach for a short-lived species is typically an escapement strategy. Although some preliminary work towards the establishment of an MSY  $B_{escapement}$  has been done, the associated uncertainties have not been sufficiently examined to be able to advise according to an escapement strategy at this stage. The value of MSY  $B_{escapement}$  should take into account the uncertainties in the final assessment year as well as in the incoming recruitment. To ensure precautionary exploitation and until an evaluation has been conducted, ICES considers that advice for this stock should be based on a  $F_{MSY}$  proxy. For short-lived species, natural mortality is considered as a potential  $F$  setting an  $F_{MSY}$  proxy (ICES, 2013b), although reference point would also require evaluation. For this sprat stock fishing at  $F = M = 1.3$  (where  $M$  has been derived from a multispecies assessment) corresponds to a catch of no more than 144 000 t from July 2013 to June 2014.

**STECF COMMENTS:** STECF agrees with the ICES assessment of the state of the stock and the advice for 2014 catches, which should be no more than 144 000 t. ICES assumes that all catches are landed.

STECF agrees with ICES that the MSY approach for short-lived species including North Sea sprat should typically be an escapement strategy but at present, the uncertainties associated with MSY  $B_{escapement}$  have not yet been sufficiently examined to provide the basis for advice on future fishing opportunities. In such circumstances, STECF considers that a precautionary approach is appropriate. However, STECF considers that a comprehensive assessment to determine the suitability of an escapement strategy versus the currently accepted proxy for  $F_{MSY}$  as the basis for advice, be undertaken at the earliest opportunity. STECF suggests that it would be appropriate for the Commission to request ICES to undertake such an assessment.

### 1.35 Pollack (*Pollachius pollachius*) in the North Sea (ICES Sub-area IV and Division IIIa)

Advice for this stock for the years 2013 and 2014 was given in 2012 and the text below remains largely unchanged from the Consolidated STECF review of advice for 2013 (STECF-12-22).




**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 the Norwegian fisheries where about 75% of the catches are in coastal areas. Total landings in 2012 were 1500 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	 Insufficient information
SSB (Spawning-Stock Biomass)	
2009-2011	
Qualitative evaluation	IV -  IV: Insufficient information
	IIIa -  IIIa: Below possible reference points

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** The 2012 advice for this stock is biennial and valid for 2013 and 2014: *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.*

### *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 that catches should be no more than 1300 t in IV and there should be no directed fisheries and bycatch and discards should be minimised in Division IIIa..

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

The results from the most recent assessment and advice for this stock were released in 2012. The text below remains unchanged from the Consolidated STECF review of advice for 2013 (STECF-12-22).

**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 2011 was 29,344 tonnes, which represents a 32% increase compared to 2010. 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)	
2009-2011	



Qualitative evaluation	?	Insufficient information
SSB (Spawning-stock Biomass)		
	2010–2012	
Qualitative evaluation	?	Insufficient information

The available information, while broadly informative, is insufficient to evaluate recent stock trends and exploitation status. Therefore, the state of the horse mackerel in the North Sea is unknown. The IBTS index for adult horse mackerel suggests that the stock has been declining since the early 2000s and has remained at low abundance since 2005.

**MANAGEMENT AGREEMENTS:** Since 2010, the EU TAC for the North Sea area has included Divisions IVb,c and VIIId. In the past, Division VIIId 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, VIIId, 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:** Based on ICES approach to data-limited stocks, ICES advises that catches of horse mackerel in Divisions IIIa, IVb,c, and VIIId (North Sea stock) should be no more than 25 500 t.

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. As there is no accepted indication of the value of  $F$  relative to proxies of  $F_{MSY}$  and no marked positive trends in stock indicators, the advice is set as the previous catch, with a precautionary buffer applied.

The previous catch for this stock can be defined as the average of the last three years, as there is no clear trend in the catch. The average for the period 2009–2011 is 31 940 t. A precautionary buffer of 20% is applied to this, leading to an advised maximum catch of 25 500 t.

As the precautionary buffer is applied in the catch advice, this advice should apply for at least three years (i.e. 2013–2015) unless new information or analyses indicate a new situation (e.g. a clearly marked increase in stock indicators).

##### *Precautionary considerations*

Since 1998 catches have been substantially higher than in earlier years, but the sustainability of these catches cannot be assessed. The IBTS index for adult horse mackerel suggests that the stock has been fluctuating at low abundance since the early 2000s. Given that the exploitation status is unknown and taking into account the trends shown by the IBTS index, the advice for 2013 is to reduce catch.

**STECF COMMENTS:** STECF agrees with the ICES advice for 2013.

## **1.37 Mackerel (*Scomber scombrus*) - North Sea spawning component**

The results from the most recent assessment and advice for this stock were released in 2012. The text below remains unchanged from the Consolidated STECF review of advice for 2013 (STECF-12-22).

The stock summary and advice for mackerel in the North Sea is given in Section 8.5 (Combined Southern, Western and North Sea spawning components).

### 1.38 Red mullet (*Mullus surmelutus*) in the North Sea



**FISHERIES:** Historically, most catches have been taken by bottom trawls in a target fisheries in Division VIIId. Since 2009 landings have been shared by two main fisheries, bottom trawlers and flyshooters. Discards are considered negligible.

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

**MANAGEMENT AGREEMENT:** There are no specific management agreements for striped red mullet in the North Sea.

**REFERENCE POINTS:** No biological reference points have been proposed for striped red mullet in the North Sea.

**STOCK STATUS:** Stock status

F (Fishing Mortality)		
2010–2012		
Qualitative evaluation		Insufficient information
SSB (Spawning-Stock Biomass)		
2005–2012		
Qualitative evaluation		Decreasing

The stock is mainly fished in the eastern English Channel (Division VIIId) and southern North Sea. Biomass estimates from Division VIIId show high variability and indicate a considerable decrease in the last three years. Abundance in the North Sea has also been low in recent years. The average of the stock size indicator (relative biomass) in the last two years (2011–2012) is 69% lower than the average of the three previous years (2008–2010). The landings follow a similar pattern over this period and have reduced since 2009.

**RECENT MANAGEMENT ADVICE:** Based on ICES approach to data-limited stocks, ICES advises that catches should be no more than 460 tonnes. All catches are assumed to be landed.

#### *ICES approach to data limited stocks*

For data-limited stocks for which a biomass/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 biomass is estimated to have decreased by more than 20% between the periods 2007–2009 (average of the three years) and 2010–2011 (average of the two years). This implies an decrease of catches of at most 20% in relation to the catches in the last year (ICES estimates for 2012), corresponding to catches in 2014 of no more than 575 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 460 t in 2014.

All catches are assumed to be landed.

**STECF COMMENTS:** STECF agrees with the ICES assessment of the state of the stock and the advice for 2014 that catches should be no more than 460 t.

### 1.39 Red gurnard (*Aspitrigla cuculus*) in the North Sea

STECF did not have access to any recent stock assessment information on red gurnard in the North Sea. Advice on red gurnard is given at the NE Atlantic regional level in Section 8.6 of this report.

### 1.40 Grey gurnard (*Eutrigla gurnardus*) in the North Sea

Advice for this stock for the years 2013 and 2014 was given in 2012 and the text below remains largely unchanged from the Consolidated STECF review of advice for 2013 (STECF-12-22).



**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 2011 and 2012 were 449 t and around 600 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 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:**

The 2012 advice for this stock is biennial and valid for 2013 and 2014: *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.*

**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.

**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.

**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.

## 1.41 Sea bass (*Dicentrarchus labrax*) in the North Sea

STECF did not have access to any recent stock assessment information on sea bass in the North Sea.

## 2 Resources of the Celtic Sea and West of Scotland

### 2.1 Norway lobster (*Nephrops norvegicus*) in ICES Div. Vb and Sub-area VI, (West of Scotland) and waters west of Ireland

#### 2.1.1 Norway lobster (*Nephrops norvegicus*) in North Minch (FU 11)

The results from the most recent assessment and advice for this stock were released in 2012. The text below remains unchanged from the Consolidated STECF review of advice for 2013 (STECF-12-22).

**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 ( $\sim 0.59$  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:

	Type	Value	Technical basis
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 FMSY 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.

### 2.1.2 Norway lobster (*Nephrops norvegicus*) in South Minch (FU 12)

The results from the most recent assessment and advice for this stock were released in 2012. The text below remains unchanged from the Consolidated STECF review of advice for 2013 (STECF-12-22).

**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<sup>-2</sup>). 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 F35%SPR. F35%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 FMSY.

**REFERENCE POINTS:**

	<i>Type</i>	<i>Value</i>	<i>Technical basis</i>
MSY	MSY $B_{\text{trigger}}$	1016 million individuals	Bias-adjusted lowest observed UWTV survey estimate of abundance
Approach	$F_{\text{msy}}$	12.3% harvest rate	Equivalent to $F_{35\% \text{SPR}}$ combined sex. $F_{\text{MSY}}$ proxy based on length-based yield-per-recruit analysis.
Precautionary Approach	Not agreed		

*Harvest ratio reference points (2011):*

	Male	Female	Combined
$F_{\text{max}}$	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 ( $F_{\text{MSY}}$ )	✗	✓	✓ Below target
Precautionary approach ( $F_{\text{pa}}, F_{\text{lim}}$ )	?	?	? Not defined

SSB (Spawning-Stock Biomass)			
	2009	2010	2011
MSY ( $B_{\text{trigger}}$ )	✓	✓	✓ Above trigger
Precautionary approach ( $B_{\text{pa}}, B_{\text{lim}}$ )	?	?	? Not defined

The stock has been above MSY  $B_{\text{trigger}}$  the full time-series. The harvest ratio (removals/UWTV abundance) has decreased since 2007 and is now below  $F_{\text{MSY}}$  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.

### 2.1.3 Norway lobster (*Nephrops norvegicus*) in Firth of Clyde (FU 13), including Sound of Jura.

The results from the most recent assessment and advice for this stock were released in 2012. The text below remains unchanged from the Consolidated STECF review of advice for 2013 (STECF-12-22).

**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

	Type	Value	Technical basis
MSY	MSY B <sub>trigger</sub>	579 millions	Lowest observed abundance estimate
Approach	F <sub>msy</sub>	16.4% harvest rate	Equivalent to F <sub>max</sub> combined sex. F <sub>MSY</sub> proxy based on length-based yield-per-recruit analysis.
Precautionary Approach	Not agreed	Not defined	

##### Reference points – Sound of Jura

	Type	Value	Technical basis
MSY	MSY B <sub>trigger</sub>	Not defined	
Approach	F <sub>msy</sub>	14.5% harvest rate	Equivalent to F <sub>35%SpR</sub> combined sex
Precautionary Approach	Not agreed	Not defined	

#### Harvest ratio reference points (2011):

	Male	Female	Combined
F <sub>max</sub>	13.6	34.0	16.4
F <sub>0.1</sub>	8.7	21.1	9.7
F <sub>35%</sub>	10.7	25.7	14.5

#### STOCK STATUS:

##### Firth of Clyde

F (Fishing Mortality)			
	2009	2010	2011
MSY ( $F_{MSY}$ )	✗	✗	✗ Above target
Precautionary approach ( $F_{pa}, F_{lim}$ )	?	?	? Not defined

SSB (Spawning-Stock Biomass)			
	2009	2010	2011
MSY ( $B_{trigger}$ )	✓	✓	✓ Above trigger
Precautionary approach ( $B_{pa}, B_{lim}$ )	?	?	? Not defined

## Sound of Jura

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 ( $B_{trigger}$ )	?	?	? Not defined
Precautionary approach ( $B_{pa}, B_{lim}$ )	?	?	? Not defined

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)..

#### 2.1.4 Norway lobster (*Nephrops norvegicus*) in FU 16, Porcupine Bank, Divisions VIIb,c,j,k

The results from the most recent assessment and advice for this stock were released in 2012. The text below remains unchanged from the Consolidated STECF review of advice for 2013 (STECF-12-22).

**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 assessment is based on indicators similar to last year's, with the addition of catch advice based on a 2012 UWTV survey. The basis for this year's advice is the ICES MSY approach.

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

#### STOCK STATUS:

F (Fishing Mortality)		
	2011	
MSY ( $F_{MSY}$ )	?	Unknown
Precautionary approach ( $F_{pa}, F_{lim}$ )	?	Undefined
Qualitative evaluation	✓	Below possible reference points

SSB (Spawning-Stock Biomass)		
	2011	
MSY ( $B_{trigger}$ )	?	Undefined
Precautionary approach ( $B_{pa}, B_{lim}$ )	?	Undefined
Qualitative evaluation	↗	Increasing, from low abundance

The exploitation proxy indicates that the exploitation rates increased during the 2000s but declined significantly in 2011. Survey and commercial lpue and cpue show declining trends up to the late 2000s. Survey cpue increased significantly in 2010 and this has been linked to a stronger recruitment first observed in the survey in 2009. The first UWTV survey for FU 16 was carried out in June 2012; this provides an abundance estimate for this stock for the first time.

**RECENT MANAGEMENT ADVICE:** ICES advises on the basis of the MSY approach that landings in 2013 should be no more than 1800 tonnes.

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

**Other considerations:**

**MSY approach**

No MSY  $B_{\text{trigger}}$  has been defined for this FU. The recent stock size is known to be relatively high compared to that in the late 2000s. Hence the ICES MSY approach has been applied only in relation to  $F_{\text{MSY}}$ . This implies a harvest ratio of 5.0%, resulting in landings of 1800 t in 2013.

**Additional considerations**

The advice has been updated in November 2012 to take into account a new UWTV survey. It has been possible to use the results of this survey and the assessment and catch advice framework previously developed by ICES for use with UWTV surveys for the first time in this FU. The catch advice issued in June (1100 t) was based on the ICES approach to data-limited stocks.

A seasonal closed area (1 May–31 July) has been in place since 2010. The closure has been respected by the fleet and has therefore afforded some protection to the majority of the stock area (~75%). For this part of the stock area fishing effort and mortality has been reduced at a time of peak female emergence and typically high lpue and landings. The closure will also have inadvertently concentrated effort and fishing mortality in ~25% of the stock area not currently covered by the closure. Survey information indicates that abundance was 2.5 times higher inside the closed area than outside.

Discarding by the *Nephrops* trawl fishery is around 50% of the total catch by weight. The main species that are discarded by weight are blue-mouth redfish, blue whiting, and argentines. Discarding of *Nephrops* in the fishery has been negligible up to 2011.

**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.

**2.1.5 Norway lobster (*Nephrops norvegicus*) in FU 17, Aran Grounds (Division VIIb)**

The results from the most recent assessment and advice for this stock were released in 2012. The text below remains unchanged from the Consolidated STECF review of advice for 2013 (STECF-12-22).

**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  $F_{\text{MSY}}$  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  $F_{\text{MSY}}$  proxies are likely to be uncertain.

**REFERENCE POINTS:**

	Type	Value	Technical basis
MSY	MSY $B_{\text{trigger}}$	Not defined	
Approach	$F_{\text{msy}}$	HR 10.5%	Equivalent to $F_{35\% \text{ SPR}}$ for combined sex in 2010



Precautionary Approach			No reference points are defined
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*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
Qualitative evaluation	↗	↘	↘ Lowest in the time series

The UWTV surveys conducted since 2002 give estimates of abundance that have fluctuated widely. The 2012 abundance estimate is the lowest in the eleven year time series. . 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 590 tonnes.

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 approach has been applied only in relation to  $F_{MSY}$ . This implies harvest ratio of 10.5 %, resulting in landings of 590 t in 2013.

**Additional considerations:**

The advice has been updated in November 2012 to take into account the most recent UWTV survey results which show a significant decline in stock abundance. The landings advice issued in June (890 t) was also based on the MSY approach, but used the results from the survey in 2011.

Discarding by the *Nephrops* trawl fleet is around 47% of the total catch by weight. The main discards are small *Nephrops*. The main fish species discarded are dogfish, haddock, whiting and megrim.

**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.

## 2.2 Norway lobster (*Nephrops norvegicus*) in Celtic and Irish Seas

The results from the most recent assessment and advice for these stocks were released in 2012. The text below remains unchanged from the Consolidated STECF review of advice for 2013 (STECF-12-22).

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	> $F_{max}$	$F_{35\%}$	$F_{max}$	$F_{max}$
	$F_{max}-F_{0.1}$	$F_{0.1}$	$F_{35\%}$	$F_{max}$
	< $F_{0.1}$	$F_{0.1}$	$F_{0.1}$	$F_{35\%}$
	Unknown	$F_{0.1}$	$F_{35}$	$F_{35\%}$

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%

The lowest observed UWTV abundance has been proposed as a preliminary MSY  $B_{\text{trigger}}$  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  $B_{\text{trigger}}$  (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 km<sup>2</sup>, Mean weight: 34 g, Discards: 25% in number

Basis	Landings	Range of potential densities ( <i>Nephrops</i> per m <sup>2</sup> )						
		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%
<b>average (10yr)</b>	<b>2464</b>	<b>12.4%</b>	<b>9.9%</b>	<b>8.3%</b>	<b>7.1%</b>	<b>6.2%</b>	<b>5.5%</b>	<b>5.0%</b>
maximum	3145	15.8%	12.6%	10.5%	9.0%	7.9%	7.0%	6.3%
<b>Minimum</b>	1152	5.8%	4.6%	3.9%	3.3%	2.9%	2.6%	2.3%

Shaded areas indicate harvest rates > 7.5 % (lowest  $F_{\text{MSY}}$  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).

### 2.2.1 Norway lobster (*Nephrops norvegicus*) in FU 14, Irish Sea East (Division VIIa)

The results from the most recent assessment and advice for this stock were released in 2012. The text below remains unchanged from the Consolidated STECF review of advice for 2013 (STECF-12-22).

**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:

	Type	Value	Technical basis
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 ( $F_{pa}, F_{lim}$ )	?	?	?	Undefined

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

**2.2.2 Norway lobster (*Nephrops norvegicus*) in FU 15, Irish Sea West (Division VIIa)**

The results from the most recent assessment and advice for this stock were released in 2012. The text below remains unchanged from the Consolidated STECF review of advice for 2013 (STECF-12-22).

**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:**

	Type	Value	Technical basis
MSY	MSY B <sub>trigger</sub>	3 billion individuals	Minimum abundance observed based in a scaled trawl survey
Approach	F <sub>msy</sub>	HR 17.1%	Equivalent to F <sub>max</sub> for combined sexes in 2010.
Precautionary Approach	Not defined		

*Harvest ratio reference points (2010):*

	Male	Female	Combined
F <sub>max</sub>	17.1%	17.1%	17.1%
F <sub>0.1</sub>	11.0%	10.2%	10.6%
F <sub>35%SpR</sub>	14.1%	12.7%	13.4%

**STOCK STATUS:**

	F (Fishing Mortality)		
	2009	2010	2011
MSY (F <sub>MSY</sub> )	✗	✓	✗ Above target

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 ( $B_{pa}, B_{lim}$ )	?	?	?	Undefined

The stock abundance is stable and is above MSY  $B_{trigger}$ . 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.

### 2.2.3 Norway lobster (*Nephrops norvegicus*) in FU19, SW and SE Ireland (Divisions VII g, j)

The results from the most recent assessment and advice for this stock were released in 2012. The text below remains unchanged from the Consolidated STECF review of advice for 2013 (STECF-12-22).

**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 $B_{trigger}$	Not defined	
Approach	FMSY	HR 7.5%	Equivalent to F0.1 for combined sex in 2011
Precautionary	Not defined		

Approach			
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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.

#### 2.2.4 Norway lobster (*Nephrops norvegicus*) in FU 20-22, Celtic Sea (Divisions VIIIf, g, h)

The results from the most recent assessment and advice for this stock were released in 2012. The text below remains unchanged from the Consolidated STECF review of advice for 2013 (STECF-12-22).

**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:**

	Type	Value	Technical basis
MSY	MSY $B_{trigger}$	Not defined	
Approach	$F_{MSY}$ (whole FU20-22) harvest rate	Not defined	
	$F_{MSY}$ (FU22) harvest rate	10.9%	2.2.4.1.1.1.1 MSY under SCA model
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)			
	2010	2011	2012
Qualitative evaluation			 Increasing

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 3100 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 m<sup>2</sup>. 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 3100 t in 2013.

### ***Additional considerations***

The advice has been updated in November 2012 to take into account the most recent UWTV survey results which show a significant increase in stock abundance. The landings advice issued in June (2600 t) was also based on the MSY approach, but used the results from the survey in 2011.

**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 107% more in landings) from the functional unit 22.

## **2.3 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 traditionally included French vessels targeting saithe and Scottish whitefish trawlers with smaller catches by vessels from Ireland and Norway. Landings were sustained at about 21,000 t until the late 1980s but have since declined markedly to a level of about 220 t in 2009.

Currently the >100 mm otter trawl gear vessels targeting finfish (TR1) take roughly 90–95% of the cod catch and the 70–99 mm Nephrops fleet (TR2) takes 5–10% of the catch. Part of the landings comes from vessels using TR1 gear, fishing west of the line defined in the cod long-term management plan. Discards reported to ICES (all fleets combined) are 2.6 times greater than landings.

Landings restrictions in the first half of the 1990s led to considerable misreporting, however, legislation introduced in Britain and Ireland in 2006 has since reduced misreporting. Observer data show an increase in discards starting in 2006 and, whereas landings have remained at or below 500 tonnes since 2004, the total catch actually *increased* after 2004 as discarding rose from an historic level of 6% (1982 – 2000) to 65% or more in recent years.

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:**

	Type	Value	Technical basis
MSY	MSY	22 000 t	$B_{pa}$
Approach	$B_{trigger}$		
	$F_{MSY}$	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)			
	2010	2011	2012
MSY ( $F_{MSY}$ )	✗	✗	✗ Above target
Precautionary approach ( $F_{pa}, F_{lim}$ )	✗	✗	✗ Harvest unsustainable

SSB (Spawning-Stock Biomass)			
	2011	2012	2013
MSY ( $B_{trigger}$ )	✗	✗	✗ Below trigger
Precautionary approach ( $B_{pa}, B_{lim}$ )	✗	✗	✗ Reduced reproductive capacity

Fishing mortality is high. The spawning-stock biomass has been below  $B_{lim}$  since 1997 and has remained very low, well below  $B_{lim}$  since 2006. Recruitment has been estimated to be low over the last decade and is considered impaired.

**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).

Cod in Division VIa is subject to the EU cod long-term management plan ([EC 1342/2008](#)). ICES has not evaluated whether the management plan is in accordance with the precautionary approach. However, management measures taken so far have not constrained catches and no increase in stock biomass has occurred.

### **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 2014.

#### ***Other Considerations***

##### ***MSY approach:***

Following the ICES MSY framework implies fishing mortality to be reduced to 0.01 (lower than  $F_{MSY}$  because SSB in 2014 is 92% below MSY  $B_{trigger}$ ), resulting in catches of no more than 10 tonnes in 2014. If discard rates do not change from the average of the last three years, this implies landings in 2014 of no more than 3 tonnes. This is expected to lead to an SSB of 3440 tonnes in 2015.

Following the transition scheme towards the ICES MSY framework implies fishing mortality to be reduced to 0.19, based on  $(F_{2010} * 0.2) + ((F_{MSY} * (SSB_{2014} / MSY B_{trigger})) * 0.8)$ , resulting in catches of no more than 330 t in 2013. This is expected to lead to an SSB of 3010 tonnes in 2014. If discard rates do not change from the average of the last three years, this implies landings in 2014 of no more than 110 tonnes.

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:***

The fisheries on this stock are managed under the cod long-term management plan (EC 1342/2008). Until the 2012 assessment benchmark ICES did not consider it possible to assess unaccounted mortality accurately. As a consequence ICES has not yet evaluated whether the management plan is in accordance with the precautionary approach. However, management measures taken so far have not constrained catches and no increase in stock biomass has occurred.

There was no effort reduction in 2013 compared to 2012.

Following the agreed management plan implies  $F(2014) = 0.75 F(2013)$ . This results in a TAC of 310 t in 2014. If discard rates do not change from the average of the last three years, this corresponds to catches in 2014 of 980 tonnes.

#### ***Additional Considerations***

Management measures taken thus far have neither constrained catches nor recovered the stock.

The stock is suffering impaired recruitment.

The zero TAC for this area and 1.5% bycatch by live weight limit implemented in 2012 applies to the retained part of the catches and therefore does not constrain discards.

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. Data on seal predation are insufficient for reliable estimation of predation mortality.

### **STECF COMMENTS:**

STECF agrees with the ICES advice that there should be no directed fisheries and that bycatch and discards should be minimized in 2014. STECF advises that this should be interpreted to mean that in 2014, catches of cod from Division VIa should be reduced to the lowest possible level.

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, and 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 2013 is 0 t implying that the TAC for 2014 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.

## 2.4 Cod (*Gadus morhua*) in Division VIb (Rockall)

Advice for this stock for the years 2013 and 2014 was given in 2012 and the text below remains largely unchanged from the Consolidated STECF review of advice for 2013 (STECF-12-22).

**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 in 2005 - 2006. Over the period 2007 - 2012 landings fluctuated between 30t 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:

Advice for 2014 and 2015: The 2012 advice for this stock is biennial and valid for 2013 and 2014: Based on the ICES approach for data-limited stocks, ICES advises that catches should be no more than 70 tonnes”.

### 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. However, because the precautionary buffer (20% reduction in catch) was applied in the advice issued in 2012, and catches are marginal, the same catch advice (70 t) is considered valid.

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.

## 2.5 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 – 2011). 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.

The total catch for haddock in 2011 was estimated to be 3227 tonnes of which 46% were discarded. Splitting discards by fleet shows that Nephrops vessels (TR2) are responsible for ~80% of all discards while landing only 80 tonnes, less than 5% of the total landings (1742 tonnes). Total landings in 2012 are estimated to be 5,100 tonnes; a three-fold increase on 2011. In 2012, the TR2 gear group was responsible for 76% of all discards and landings were 554 t, 11% of total landings of haddock from VIa.

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 >480 million in 2000 (the largest on record) to an estimated recruitment of approximately 8 million in 2008. Recent recruitment (2010 and 2011) are estimated to be around 50 million.

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. In 2010 fishery landings and catch-at-age data from 2006 onwards were re-introduced in the assessment, based on the perception of improved accuracy of landings statistics.

### REFERENCE POINTS:

	Type	Value	Technical basis
MSY	MSY $B_{\text{trigger}}$	30 000 t	$B_{\text{pa}}$
Approach	$F_{\text{MSY}}$	0.3	Provisional proxy by analogy with North Sea haddock. Fishing mortalities in the range of 0.19–0.41 are consistent with $F_{\text{MSY}}$ .
Precautionary	$B_{\text{lim}}$	22 000 t	$B_{\text{lim}} = B_{\text{loss}}$ , the lowest observed spawning stock estimated since the reference point was established in 1998.
	$B_{\text{pa}}$	30 000 t	$B_{\text{pa}} = B_{\text{lim}} * 1.4$ . This is considered to be the minimum SSB required to obtain a high probability of maintaining SSB above

Approach			$B_{lim}$ , taking into account the uncertainty of assessments.
	$F_{lim}$	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)				
	2010	2011	2012	
MSY ( $F_{MSY}$ )	✓	✓	✓	Appropriate
Precautionary approach ( $F_{pa}, F_{lim}$ )	✓	✓	✓	Harvested sustainably
SSB (Spawning-Stock Biomass)				
	2011	2012	2013	
MSY ( $B_{trigger}$ )	✗	✓	✓	Above trigger
Precautionary approach ( $B_{pa}, B_{lim}$ )	○	✓	✓	Fully reproductive capacity

The 2009 year class is above the average in the recent period, but is below the long-term average. Nevertheless, this year class is the main contributor to the increase of the SSB in 2012 to above  $B_{pa}$ .  $F$  has been above  $F_{pa}$  in most years since 1987 but has been declining since 1999.  $F$  has been below the  $F_{MSY}$  proxy since 2009.

**RECENT MANAGEMENT ADVICE:** ICES advises on the basis of the MSY approach that catches should be no more than 6432 t. If discarding rates do not change from the average of the last three years, this corresponds to landings of no more than 3988 t.

Effective technical measures should be implemented to reduce 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. Whereas ICES evaluated the plan and considered it to be precautionary it has not been formally agreed.

Following the plan would result in a 23% TAC decrease. This would result in catches of 5223 tonnes and landings of 3,238 tonnes in 2014. This is expected to lead to an SSB of 28,743 tonnes in 2015.

### MSY approach

Following the ICES MSY approach implies fishing mortality at 0.26 (lower than the  $F_{MSY}$  proxy because SSB in 2014 is 12% below MSY  $B_{trigger}$ ), resulting in catches in 2014 of no more than 6,432 t. If discarding rates do not change from the average of the last three years, this corresponds to landings of no more than 3,988 t. This is expected to lead to an SSB of 27,270 tonnes in 2015. Since  $F$  is below  $F_{MSY}$  in 2012, the transition to MSY option is not relevant.

### PA approach

A fishing mortality of 0.16 will lead to an SSB in 2015 around 30 000 tonnes ( $B_{pa}$ ), resulting in catches in 2014 of no more than 4,158t. If discarding rates do not change from the average of the last three years, this corresponds to landings of no more than 2,578 t.

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

Applying the harvest rules in the management plan proposed for this stock would imply that the TAC for 2014 should be set at 3,238t corresponding to a 23% decrease in the TAC compared to 2013.

STECF notes that observed discarding rates declined from 46% by weight in 2011 to 9% by weight in 2012. Predicted discard rates from the assessment model also decreased from 51% in 2011 to 31% in 2012. The advised landings in 2013 are based on a discard rate in 2013 of 38% (average predicted rate over the period 2010-2012).

In 2012, vessels targeting Nephrops (TR2) were responsible for 76% of all discards while landings amounted to 11 % of the total landings of haddock from VIa.

A large variety of measures and regulations have been implemented as part of the long-term plan for cod stocks and emergency measures introduced under EC regulation 43/2009 (Annex III). They include *inter alia* TAC regulation, area closures, technical measures, and effort restrictions. However, they do not appear to have had a significant impact on the overall proportion of discards of haddock from VIa fisheries attributed to the TR2 fleet. It is likely that the high proportion of discards attributed to the TR2 fleet which primarily targets Nephrops, is due to quota limitations for haddock.

## 2.6 Haddock (*Melanogrammus aeglefinus*) in Division VIb (Rockall)

The results from the most recent assessment and advice for this stock were released in 2012. The text below remains unchanged from the Consolidated STECF review of advice for 2013 (STECF-12-22).

**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 VIb. 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 <sub>trigger</sub>	9000 t	B <sub>pa</sub>
Approach	F <sub>MSY</sub>	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.

## **2.7 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.

## **2.8 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 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 2012 was 1039 t, of which 30% were landings (313 t) and 70% discards; approximately 80% 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..

#### **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	$B_{lim}$ = Bloss (1998), the lowest observed spawning stock estimated in previous assessments.
	$B_{pa}$	22 000 t	$B_{pa}$ = $B_{lim}$ * 1.4. This is considered to be the minimum SSB required to have a high probability of maintaining SSB above $B_{lim}$ , taking into account the uncertainty of assessments.
Approach	$F_{lim}$	1.0	$F_{lim}$ is the fishing mortality above which stock decline has been observed.
	$F_{pa}$	0.6	$F_{pa}$ = 0.6 * $F_{lim}$ . This F is considered to have a high probability

			of avoiding Flim.
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(unchanged since: 1998)

#### STOCK STATUS:

##### F (Fishing Mortality)

	2010	2011	2012
MSY ( $F_{MSY}$ )	?	?	? Unknown
Precautionary approach ( $F_{pa}, F_{lim}$ )	✓	✓	✓ Harvested sustainably

##### SSB (Spawning Stock Biomass)

	2011	2012	2013
MSY ( $B_{trigger}$ )	?	?	? Unknown
Precautionary approach ( $B_{pa}, B_{lim}$ )	✗	✗	✗ Reduced reproductive capacity

The spawning-stock biomass 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 and, to a lesser degree, 2011 year classes are estimated to be above the recent average.

#### RECENT MANAGEMENT ADVICE:

ICES advises on the basis of the precautionary approach that catches in 2014 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

##### 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 2014.

## 2.9 Whiting (*Merlangius merlangus*) in Division VIb (Rockall)

The results from the most recent assessment and advice for this stock were released in 2012. The text below remains largely unchanged from the Consolidated STECF review of advice for 2013 (STECF-12-22).

**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:** The 2012 advice for this stock is biennial and valid for 2013 and 2014: “Based on the ICES approach for data limited stocks, ICES advises that catches should be no more than 11 tonnes”. ICES advises that the same catch advice is still applicable to 2015.

#### *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.

Because the precautionary buffer (20% reduction in catch) was applied in the advice issued in 2012, and catches are marginal, the same catch advice (11 t) is also considered valid for 2015.

**STECF COMMENTS:** STECF agrees with the ICES assessment of the state of the stock and the advice for 2014 and 2015.

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).

## **2.10 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 round fish 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 round fish and *Nephrops* and to a lesser extent in small meshed *Pandalus* fisheries.

The directed fishery takes place in deep water on the continental shelves in areas where cold-water corals (*Lophelia spp.*) occur, particularly at Rockall. However, demersal trawling is prohibited in several large areas at Rockall, and near the Wyville–Thomson ridge, which affords protection for corals in those areas.

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. Total landings in 2012 were 11,493 t (7,351 t in Division IIIa and Subarea IV; 4,142 t in Subarea VI). Discards from the Scottish, Irish, and Danish fleets were minimal in 2012 (64 t).

**SOURCE OF MANAGEMENT ADVICE:** The management advisory body is ICES. The assessment area (Divisions IIa 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:**

No reference points have been defined for these two stocks. Because of identified problems with growth estimates and uncertainties in ageing, previous reference points are not considered to be valid.

#### **STOCK STATUS:**

	F (Fishing Mortality)	
	2010–2012	
Qualitative	?	Insufficient information

evaluation		
	<b>SSB (Spawning-Stock Biomass)</b>	
	2008–2012	
<b>Qualitative evaluation</b>		Decreasing

Recent dedicated anglerfish surveys, the Scottish and Irish anglerfish and megrim industry/science surveys for the Northern shelf (SCO-IV-VI-AMISS-Q2) in Division IVa and Subarea VI, indicate a decline in biomass since 2008. The average biomass over this area in the last two years (2011–2012) is 22% lower than the average biomass of the three previous years (2008–2010).

**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:**

No analytical assessment can be presented for this stock. Because of uncertainties concerning catch-at-age data as well as limited knowledge about population dynamics, a forecast cannot be presented.

Based on ICES approach to data-limited stocks, ICES advises that catches should be no more than 10 231 t in 2014. All catches are assumed to be landed.

ICES advise 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 more than 20% between the periods 2008–2010 (average of the three years) and 2011–2012 (average of the two years). This implies a decrease in catches of at least 20% in relation to the average catches of the last three years, corresponding to catches in 2014 of no more than 10 231 t. All catches are assumed to be landed.

Though the exploitation status is unknown, the effort in the main fisheries has decreased until 2011 and an increase in 2012 is not anticipated; therefore, no additional precautionary reduction is needed.

**STECF COMMENTS:** STECF agrees with the ICES assessment of the state of the stock and the advice that catches should be no more than 10,231 t in 2014. Given that the stock is distributed over 2 separate TAC management areas (VI; EU and international waters of Vb; international waters of XII and XIV and EU waters of IIa and IV), STECF notes that advised catch of 10,231 t should equate to the fishing opportunities for both TAC management areas combined. However, the issue of how such fishing opportunities would best be allocated remains to be resolved.

STECF considers that from a scientific perspective, it would be appropriate to allocate fishing opportunities according to the relative distribution of anglerfish biomass in the separate management areas. The trawl survey data presented in the ICES advice indicate an average total survey biomass estimate of anglerfish for the period 2010–2012 of 36,325 t, of which 17,333 t (46%) was distributed in subarea IV and 19,952t (54%) was distributed in Sub-area VI. Using the relative survey biomass estimates as a means of allocating the advised fishing opportunities, implies that in 2014 catches no greater than 5,475 t in EU waters of IIa and IV and no greater than 4,756 t in VI; EU and international waters of Vb; international waters of XII and XIV.

STECF notes that if fishing opportunities for anglerfish in 2014 were to be allocated according to the procedure outlined above, compared to the agreed TACs for 2013, they would represent a 45% decrease in fishing opportunities in EU waters of IIa and IV and an 11% increase in EU and international waters of Vb; international waters of XII and XIV.

STECF notes that landings from subarea XII and division Vb are not included in the ICES assessment.

## 2.11 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.

## 2.12 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 2012 nominal catches of Megrim in Division VIa, VIb and subarea IV as officially reported to ICES have ranged from 1,920 t in 2005 to 6,150 in 1996. Combined landings have been fluctuating around 3,000t since 2008 with a combined (Divisions IVa, VIa and VIb) nominal catch of 2,815 t for 2012.

It is unclear if the trends in landings reflects trends in abundance or are a consequence of the changes in trawl effort observed over the period.

Area misreporting had 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:

	Type	Value	Technical basis
MSY Approach	MSY $B_{trigger}$	9740 t	50% $B_{MSY}$
	$F_{MSY}$	0.33	Estimated directly from the model. Fishing mortality values expressed relative to $F_{MSY}$ .
Precautionary Approach	$B_{lim}$	5844 t	30% $B_{MSY}$
	$B_{pa}$	Not defined.	
	$F_{lim}$	Not defined.	
	$F_{pa}$	Not defined.	

### STOCK STATUS:

#### Divisions IVa and VIa:

F (Fishing Mortality)				
	2010	2011	2012	
MSY ( $F_{MSY}$ )	✓	✓	✓	Appropriate
Precautionary approach ( $F_{pa}, F_{lim}$ )	?	?	?	Undefined

Biomass			
	2011	2012	2013
MSY ( $B_{trigger}$ )	✓	✓	✓ Above trigger
Precautionary approach ( $B_{pa}, B_{lim}$ )	✓	✓	✓ Full reproductive capacity

Fishing mortality has been below  $F_{MSY}$  for almost the full time-series and the biomass well above MSY  $B_{trigger}$ .

### Division VIb (Rockall)

F (Fishing Mortality)		
	2010–2012	
Qualitative evaluation	✓	Below poss. reference points
SSB (Spawning-Stock Biomass)		
	2008–2012	
Qualitative evaluation	↗	Increasing

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 2012 survey data shows a substantive increase in biomass. The average of the stock size indicator, biomass from the survey, in the last two years (2011–2012) is 52% higher than the average of the three previous years (2008–2010). 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 catches should be no more than 7000 t in 2014 and 2015. If discard rates do not change from the average of the last three years, this implies landings of no more than 5,950 t.

**Division VIb (Rockall):** Based on ICES approach to data-limited stocks, ICES advises that landings should be no more than 207 t in 2014. Discards are known to take place but cannot be quantified; therefore total catches cannot be calculated. ICES advises that the management area should be the same as the assessment area.

### STECF COMMENTS:

STECF agrees with the ICES assessment of the state of the stock and the advice that catches should be no more than 7,207t in 2014. Given that the stock is distributed over 2 separate TAC management areas ((i) *EU waters of IIa and IV* and (ii) *EU and international waters of Vb; VI; international waters of XII and XIV*), STECF notes that advised catch should equate to the fishing opportunities for both TAC management areas combined. STECF notes that ICES (2013) the management and assessment units should be appropriately aligned and they should encompass the full spatial structure of the stock. ICES recommends that the management unit should match the assessment unit. Currently, there is a process to resolve how such fishing opportunities would best be allocated, but this process has not been finalised.

STECF considers that from a scientific perspective, if there is desire to maintain the current TAC area arrangements, it would be appropriate to allocate fishing opportunities according to the relative distribution of megrim biomass in the separate management areas. According to the SAMISS/IAMISS survey data, the average biomass distribution of megrim for the period 2010-2012 indicates that 56% is distributed in subarea IV and 44% is distributed in Division VIa. Using these relative survey biomass estimates as a means of allocating the advised fishing opportunities, implies that in 2014 landings no greater than 3,332 t in *EU waters of IIa and IV* and no greater than 2825 t in *EU and international waters of Vb; VI; international waters of XII and XIV*.

STECF notes that if fishing opportunities for megrim in 2014 were to be allocated according to the procedure outlined above, compared to the agreed TACs for 2013, they would represent a 72% increase in fishing opportunities in *EU waters of IIa and IV* and an 17% decrease in *EU and international waters of Vb; VI; international waters of XII and XIV*.



## 2.13 Plaice (*Pleuronectes platessa*) - Vb (EU zone), VI, XII, XIV

STECF did not have access to any stock assessment information on plaice in these areas.

## 2.14 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 2013 were 233t .

Catches in Division VIIk are negligible while sole in Division VIIj are mainly caught by Irish vessels on sandy grounds off the southwest of Ireland.

The stock area includes Division VIIh. However, the landings in Divisions VIIj,k are taken in the northeastern part of Division VIIj, which is about 250 km away from the northern part of Division VIIh where most of the landings from Division VIIh are taken. It is likely that sole in Division VIIh is part of the Division VIIe or Division VIIf stocks. This needs to be further evaluated. In the lack of firm conclusions, ICES prefers to keep the current stock area.

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



### REFERENCE POINTS:

No reference points are defined for this stock. Previous defined reference points (show below) were provisional.

	Type	Value	Technical basis
MSY	MSY B <sub>trigger</sub>	Not defined	
Approach	F <sub>msy</sub>	0.31	Provisional proxy based on WGCSE 2010 estimate of F <sub>max</sub>
Precautionary Approach	B <sub>lim</sub>	Not defined	
	B <sub>pa</sub>	Not defined	
	F <sub>lim</sub>	Not defined	
	F <sub>pa</sub>	Not defined	

(unchanged since 2010)

### STOCK STATUS:

F (Fishing Mortality)	
2010–2012	
Qualitative evaluation	 Below possible reference points
SSB (Spawning-Stock Biomass)	
2009–2012	
Qualitative evaluation	 Increasing

Fishing mortality had a substantial decrease over the period 2003–2006, and has since then remained around one third of the 1993–2003 average. SSB has been increasing since 2005. The average SSB in the last two years (2011–2012) is 11% higher than the average of the three previous years (2008–2010).

### RECENT MANAGEMENT ADVICE:

Based on ICES approach to data-limited stocks, ICES advises that that catches should be no more than 252 t in 2014. All catches are assumed to be landed.

#### Other consideration

#### 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 is estimated to have increased by 11% between the periods 2008–2010 (average of the three years) and 2011–2012 (average of the two years). This implies an increase of catches of at most 11% in relation to average official landings of the last three years, corresponding to catches in 2014 of no more than 252 tonnes. All catches are assumed to be landed. Considering that fishing mortality has reduced significantly, no additional precautionary reduction is needed.

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

STECF notes that the advice for 2014 that catches should not exceed 252 t implies a 37% decrease compared to the agreed TAC for 2013.

## 2.15 Sole (*Solea solea*) - VIIbc

Advice for this stock for the years 2013 and 2014 was given in 2012 and the text below remains largely unchanged from the Consolidated STECF review of advice for 2013 (STECF-12-22).

**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 44 t in 2012 and have been close to the TAC.

**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:

Because the precautionary buffer (20% reduction in catch) was applied in the advice issued in 2012, and catches are marginal, the same catch advice (30 t) is also considered valid for 2015.

#### *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.

Because a precautionary buffer (20% reduction in catch) was applied in the advice issued in 2012, and catches are marginal, the same catch advice (30 t) is also considered valid for 2015.

**STECF COMMENTS:** STECF agrees with the ICES assessment of the state of the stock and the advice for 2014 and 2015.

STECF notes that following the ICES approach to data-limited stocks, the advised catches for this stock for 2014 and 2015 would have been greater than 30 t, if all Member States had fully-utilised their quota entitlements over the years 2009-2011.



## 2.16 Sole (*Solea solea*) – Vb, VI, XII and XIV

STECF did not have access to any stock assessment information on plaice in these areas.

## 2.17 Sandeel (*Ammodytes spp.* & *Gymammodytes spp.*) in Division VIa

Advice for this stock for the years 2013 and 2014 was given in 2012 and the text below remains largely unchanged from the Consolidated STECF review of advice for 2013 (STECF-12-22).

**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)	
	2010–2012
Qualitative evaluation	? Insufficient information

SSB (Spawning Stock Biomass)	
	2010–2013
Qualitative evaluation	? Insufficient information

The available information is inadequate to evaluate stock status or trends. The state of the stock is therefore unknown.

**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.

## 2.18 Norway pout (*Trisopterus esmarki*) in Division VIa (West of Scotland)

The results from the most recent assessment and advice for this stock were released in 2012. The text below remains unchanged from the Consolidated STECF review of advice for 2013 (STECF-12-22).

**FISHERIES** A directed industrial fishery existed in the past but at present there are no directed fisheries for Norway Pout in Division VIa. Total landings for the years 1971 – 2009 varied considerably, 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. If industrial fisheries resumes in this area they may take a bycatch of juvenile herring and other species.

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

**REFERENCE POINTS:** No fishing mortality or biomass reference points are defined for this stock.

**STOCK STATUS:** The available information is inadequate to evaluate stock trends relative to risk, so the state of the stock is unknown. The only data available are official landings statistics which have been very low and do not provide an adequate basis for scientific advice.

**RECENT MANAGEMENT ADVICE:** There is insufficient information to evaluate the status of this stock. Therefore, based on the ICES approach to data limited stocks, and taking into account the absence of landings in

recent years, ICES advises for 2013 and 2014 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 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.

## 2.19 Rays and skates in ICES Subareas VI and VII

Advice for this stock for the years 2013 and 2014 was given in 2012 and the text below remains unchanged from the Consolidated STECF review of advice for 2013 (STECF-12-22).

**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.

Fisheries on skates are currently managed under a common TAC, although this complex comprises species that may have different vulnerabilities to exploitation. TAC advice is based on the status of the main commercial species, with species-specific advice for other species also provided where relevant.

Demersal elasmobranchs in this region are caught in mixed target and non-target fisheries. TACs alone may not adequately protect these species as restrictive TACs may lead to high discarding.

At present fisheries on rays and skates are managed by means of a generic, multi-species TAC, along with prohibitions for severely depleted species.

Management measures such as closed areas/seasons or effort restrictions may better protect demersal elasmobranchs. In particular, measures to protect spawning/nursery grounds would be beneficial. ICES could provide advice on such measures.

**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 <sub>trigger</sub>	Not defined	
Approach	F <sub>MSY</sub>	Not defined	
Precautionary Approach	B <sub>lim</sub>	Not defined	
	B <sub>pa</sub>	Not defined	
	F <sub>lim</sub>	Not defined	
	F <sub>pa</sub>	Not defined	

F<sub>MSY</sub> 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:** Of the six main commercial skate species, two species (*Raja clavata* and *R. montagui*) show increasing trends in relative abundance. There is evidence of declining abundance of *Leucoraja naevus*, and a slight decreasing trend in recent years for *R. microocellata*. The stock status of two species (*L. fullonica* and *R. brachyura*) are unclear. There is not enough information to assess the status of any species in the Rockall area.

$F_{MSY}$  is not currently defined for these species and may be of limited use until further information is available, including a better assessment of the species composition of the landings. Biomass reference points have not been set at the present time, but could be developed for survey indices.

Landings of skates and rays in the Celtic Sea ecoregion have generally declined, and this is associated with changes in species composition and relative abundance. Species-specific landings are available from 2011.

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.
	VIIbc,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.
	VIIbc,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:** ICES provides advice on the overall exploitation (landings and discards) of the ray and skates species assemblage, and also individual species (Table 5.4.43.1). ICES does not advise that species-specific TACs be established, at present. This is because a TAC is not considered the most effective means to regulate fishing mortality in these, mostly bycatch, species.

ICES advises that a suite of species- and fishery-specific measures be developed to manage the fisheries on the commercial species and achieve recovery of the depleted species. Such measures should be developed by management authorities involving all stakeholders; ICES could assist in this process.

Management measures should be framed in a mixed-fisheries context, considering the overall behaviour of demersal fleets, and the drivers for such behaviour. These species are mainly caught in mixed fisheries. When the TAC is exhausted, catches continue to take place, but are discarded. In order to achieve optimal harvesting of the commercial species, and to assist recovery of the depleted species, a suite of measures should be put in place.

Closure to fishing of spawning and/or nursery grounds, and measures to protect the spawning component of the population (e.g. maximum landing size) are powerful tools to protect rays and skates. In some cases, single-species TACs may be appropriate, but their effects should be carefully evaluated for each specific case before implementation.

Given that the European Community intends to introduce a ban on discards, minimum or maximum landing sizes should be carefully considered before they are introduced, because they could lead to increased discards.

ICES advises that white skate (*Rostroraja alba*) remains on the Prohibited Species List, as it appears to be depleted in the Celtic Sea ecoregion

### Advice for 2013 and 2014 by individual stocks

Species	Area	Stock Status	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	Depleted	Depleted stock, no targeted fishery, minimize bycatch
	VII a-c, e-j	Depleted	Depleted stock, no targeted fishery, minimize bycatch
<i>R.. clavata</i> (thornback ray)	VI	Increasing	+20%
	VIIa,f,g	Increasing	+20%
	VIIe	Stock to be determine (should refer to North Sea Divisions)	
<i>R.. montagui</i> (spotted ray).	VI	Decreasing	-23%
	VIIa,f,g	Increasing	+20%
	VHe		
<i>L. naevus</i> (cuckoo ray)	VI	Decreasing	-36%
	VIIa-c, e-j	Decreasing	-36%
<i>R. brachyura</i> (blonde ray)	VIa	Uncertain	- 20%
	VIIafg	Uncertain	- 20%
	VHe	Stock to be determine (should refer to North Sea Divisions)	No advice
	VIII		No advice
<i>R.. undulata</i> (undulate ray)	VIIj	Depleted	No targeted fishery, minimize bycatch
	VIIj		
	VIIId,e		No advice
<i>R. microocellata</i> (small-eyed ray)	VIIIfg	Decreasing	- 36%
<i>L. circularis</i> (sandy ray)	VI, VII	Uncertain	-20%
	VIIb,e,h-k		No advice
<i>R. fullonica</i> (shagreen ray)	VI, VII	Uncertain	-20%
	VIIb,e,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

ICES provides advice on the overall exploitation (landings and discards) of the ray and skates species assemblage, and also individual species. ICES does not advise that species-specific TACs be established, at present. This is because a TAC is not considered the most effective means to regulate fishing mortality in these, mostly bycatch, species.

ICES advises that a suite of species- and fishery-specific measures be developed to manage the fisheries on the commercial species and achieve recovery of the depleted species. Such measures should be developed by management authorities involving all stakeholders; ICES could assist in this process.

Management measures should be framed in a mixed-fisheries context, considering the overall behaviour of demersal fleets, and the drivers for such behaviour. These species are mainly caught in mixed fisheries. When the TAC is exhausted, catches continue to take place, but are discarded. In order to achieve optimal harvesting of the commercial species, and to assist recovery of the depleted species, a suite of measures should be put in place.

Closure to fishing of spawning and/or nursery grounds, and measures to protect the spawning component of the population (e.g. maximum landing size) are powerful tools to protect rays and skates. In some cases, single-species TACs may be appropriate, but their effects should be carefully evaluated for each specific case before implementation.

Given that the European Community intends to introduce a ban on discards, minimum or maximum landing sizes should be carefully considered before they are introduced, because they could lead to increased discards.

ICES advises that white skate (*Rostroraja alba*) remains on the Prohibited Species List, as it appears to be depleted in the Celtic Sea ecoregion

### 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 2013 and 2014. 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.

**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*).

## 2.20 *Scyliorhinus canicula* and *Scyliorhinus stellaris* in Subareas VI and VII

Advice for these stocks for the years 2013 and 2014 was given in 2012 and the text below remains unchanged from the Consolidated STECF review of advice for 2013 (STECF-12-22).

### 2.20.1 Lesser-spotted dogfish (*Scyliorhinus canicula*) in Subarea VI and Divisions VIIa–c, e–j (Celtic Sea and west of Scotland)

Advice for this stock for the years 2013 and 2014 was given in 2012 and the text below remains unchanged from the Consolidated STECF review of advice for 2013 (STECF-12-22).

**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

Some demersal sharks, including lesser-spotted dogfish, may benefit from scavenging on trawl-damaged organisms and discards.

Lesser-spotted dogfish is a small, productive, oviparous shark. It is one of the most common small sharks in this ecoregion. It has a high discard survival rate.

**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 $B_{\text{trigger}}$	Not defined	
Approach	$F_{\text{MSY}}$	Not defined	
Precautionary Approach	$B_{\text{lim}}$	Not defined	
	$B_{\text{pa}}$	Not defined	
	$F_{\text{lim}}$	Not defined	
	$F_{\text{pa}}$	Not defined	

$F_{\text{MSY}}$  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)		
	2009–2011	
MSY ( $F_{\text{MSY}}$ )	?	Unknown
Precautionary approach ( $F_{\text{pa}}, F_{\text{lim}}$ )	?	Unknown
Qualitative evaluation	↘	Decreasing
SSB (Spawning-Stock Biomass)		
	2005–2011	
MSY ( $B_{\text{trigger}}$ )	?	Unknown
Precautionary approach ( $B_{\text{pa}}, B_{\text{lim}}$ )	?	Unknown
Qualitative evaluation	↗	Increasing

The stock is estimated to be increasing. Survey catch rates are increasing throughout the ecoregion. The average of beam trawl survey (BTS-Q3), assumed as stock size indicator, in the last two years (2010-2011) is 35% higher than the average of the five previous years (2005-2009). The average of the international bottom trawl surveys in the North Sea (IBTS-Q1), assumed as a stock size indicator, in the last two years (2010-2011) is 26% higher than the average of the five previous years (2005-2009). Catches are stable or increasing, though data are not complete. Given the increase in abundance, and stable/increasing catches, it can be inferred that exploitation (fishing mortality) is stable or decreasing.

Species	Area	State of stock
<i>S. canicula</i> (lesser spotted dogfish)	VI and VII a-c, e-j	increasing in all areas.

**RECENT MANAGEMENT ADVICE:***Scyliorhinus canicula* (Lesser-spotted dogfish)

Management Objective (s)	Landings in 2011 and 2012
Transition to an <b>MSY approach</b> 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 <b>management plan</b> (e.g., catch stability)	n/a

There is no TAC in place for *Scyliorhinus canicula*.

**Advice for 2013 and 2014 by individual stocks**

Species	Area	Advice
<i>S. canicula</i> (lesser spotted dogfish)	VI and VII	Maximum catch increase of 20%

**Outlook for 2013-2014**

No reliable quantitative assessment can be presented for this stock. Therefore, no catch projections are available.

**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 2013 and 2014.

**Other consideration**

Landings are not considered to be reliable as this species can be landed using generic categories such as “dogfish and hounds”. High levels of discarding take place. As there is no TAC for lesser-spotted dogfish, there is no obligation to report these at species level.

Fishery-independent trawl surveys provide the longest time-series of species-specific information.

The methods applied to derive quantitative advice for data-limited stocks are expected to evolve as they are further developed and validated

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

**2.20.2 Greater-spotted dogfish (*Scyliorhinus stellaris*) in Subarea VI and VII**

Advice for this stock for the years 2013 and 2014 was given in 2012 and the text below remains unchanged from the Consolidated STECF review of advice for 2013 (STECF-12-22).

**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:**

	Type	Value	Technical basis
MSY	MSY $B_{\text{trigger}}$	Not defined	
Approach	$F_{\text{MSY}}$	Not defined	
	$B_{\text{lim}}$	Not defined	

Precautionary	$B_{pa}$	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. 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:

##### Advice for 2011 and 2012 by individual stocks

Species	Area	Advice
<i>S. stellaris</i> (greater spotted dogfish)	VIIa,e,f	No advice

#### Outlook for 2012-2013

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.

#### Additional information

The UK (England and Wales) westerly IBTS survey also had stations along the west coast of Wales. Although they are captured regularly in this survey, catches comprised few individuals. These UK surveys have tagged and released a number of greater-spotted dogfish in recent years, which will hopefully provide further information to aid in stock identification.

**STECF COMMENTS:** STECF agrees with the ICES advice.



## 2.21 Tope (*Galleorhinus galeus*) in ICES Subareas VI and VII

Previous stock summaries and advice for tope has been provided at the NE Atlantic regional level and at present, STECF is unable to provide additional information and advice for subareas VI and VII separately. The advice for tope at the NE Atlantic regional level is given in Section 8.10 of this report.

## 2.22 Other Demersal elasmobranchs in western waters

Advice from ICES for Angel sharks (*Squatina squatina*) and Smooth Hounds (*Mustellus spp*) is provided at the NE Atlantic regional level and is given in Sections 8.17 and 8.18 of this report.

## 2.23 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 3<sup>rd</sup> quarter. Catches in 2012 were 18,500t.

**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 plan	SSB <sub>MGT</sub>	Not defined.	
	F <sub>MGT</sub>	F <sub>3-6</sub> = 0.25	If SSB in TAC year $\geq 75\ 000$ t ( <a href="#">(EC) 1300/2008</a> , Art. 3).
		F <sub>3-6</sub> = 0.20	If SSB in TAC year $<75\ 000$ t and $\geq 50\ 000$ t ( <a href="#">(EC) 1300/2008</a> , Art. 3).
		F <sub>3-6</sub> = 0.00	If SSB in TAC year $<50\ 000$ t ( <a href="#">(EC) 1300/2008</a> , Art. 3).
MSY	MSY B <sub>trigger</sub>	Not defined.	
Approach	F <sub>MSY</sub>	0.25	Simulations under different productivity regimes
Precautionary approach	B <sub>lim</sub>	50 000 t	Lowest reliable estimate of SSB.
	B <sub>pa</sub>	Not defined.	
	F <sub>lim</sub>	Not defined.	

	$F_{pa}$	Not defined.	
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(unchanged since: 2010)

**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.

#### STOCK STATUS:

F (Fishing Mortality)				
	2010	2011	2012	
MSY ( $F_{MSY}$ )	✓	✓	✓	Appropriate
Precautionary approach ( $F_{pa}, F_{lim}$ )	?	?	?	Undefined
Management plan ( $F_{MGT}$ )	✓	✓	✓	Below target
SSB (Spawning-Stock Biomass)				
	2011	2012	2013	
MSY ( $B_{trigger}$ )	?	?	?	Undefined
Precautionary approach ( $B_{pa}, B_{lim}$ )	?	?	?	Undefined

ICES considers, since 1977, the stock has been fluctuating at a considerable lower biomass than in the previous 20 years. Fishing mortality has fluctuated around  $F_{MSY}$  in recent years, and recruitment is lower than in the historical

period.

## RECENT MANAGEMENT ADVICE

ICES advises on the basis of the agreed West of Scotland herring management plan that landings should be no more than 28 067 t in 2014. Discards are considered to be low and all catches are therefore assumed to be landed.

ICES advises that activities that have a negative impact on the spawning habitat of herring, such as extraction of marine aggregates and marine construction on the spawning grounds, should not occur.

### *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 28 067 t in 2014 which is equivalent to a TAC increase of 2%. SSB in 2014 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 approach implies a fishing mortality at  $F_{MSY} = 0.25$ , resulting in catches of no more than 28 067 t in 2014. This is expected to lead to an SSB of 100 984 t in 2014. As no MSY  $B_{trigger}$  has been identified for this stock, the ICES MSY approach has been applied with  $F_{MSY}$  without consideration of SSB in relation to MSY  $B_{trigger}$ . Discards are considered to be low and all catches are therefore assumed to be landed.

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

## 2.24 Herring (*Clupea harengus*) in the Clyde (Division VIa)

The most recent advice for this stock was provided by ICES in 2005.

**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 300 t in 2012.

**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.

In 2011 under the provisions of the TAC and Quota Regulations (57/2011), the European Commission delegated the function of setting the TAC for certain stocks which are only fished by one Member State, to that Member State. This provision currently applies to herring in the Firth of Clyde with TAC setting responsibility delegated to UK. Since 1998 the agreed TAC for Clyde herring has never been reached.

**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.

**STECF COMMENTS:** STECF agrees with the ICES advice. STECF did not have access to any additional stock assessment information on herring in the Clyde (Division VIa).

## 2.25 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 6,500t in 2012.

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 (2008–2012) and has been used in an 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 from the Malin shelf acoustic survey that is known to contain herring from a mixture of stocks is not an optimal tuning index for this stock. However, if it is possible to disaggregate the index according to stock component, then it could provide a basis for an assessment. Efforts to split the Malin Shelf acoustic survey according to stock component are underway and should continue.

### REFERENCE POINTS:

	Type	Value	Technical basis
MSY Approach	MSY $B_{\text{trigger}}$	Undefined.	Under development.
	$F_{\text{MSY}}$	0.25	Stochastic simulations on segmented regression stock recruit relationship, under different productivity regimes.
Precautionary approach	$B_{\text{lim}}$	81 000 t	Lowest reliable estimate.
	$B_{\text{pa}}$	110 000 t	$1.4 B_{\text{lim}}$
	$F_{\text{lim}}$	0.33	$F_{\text{loss}}$
	$F_{\text{pa}}$	Undefined.	

### STOCK STATUS:

F (Fishing Mortality)				
	2010	2011	2012	
MSY ( $F_{\text{MSY}}$ )	✗	✗	?	Unknown
Precautionary approach ( $F_{\text{pa}}, F_{\text{lim}}$ )	✗	✗	?	Unknown
SSB (Spawning-Stock Biomass)				
	2011	2012	2013	
MSY ( $B_{\text{trigger}}$ )	?	?	?	Undefined
Precautionary approach ( $B_{\text{pa}}, B_{\text{lim}}$ )	✗	✗	✗	Reduced reproductive capacity

An exploratory assessment (ICA, including survey data from the Malin shelf acoustic survey) shows that SSB is increasing but is likely to be low, whereas F has declined since the high in 1998. Although there is little information on recruitment available and it is very uncertain, it does not appear to be above average, according to this assessment. Another exploratory assessment (SVPA) shows different trends in recent years, but also estimates very low SSB. The last recruitment estimate of the SVPA assessment is uncertain and has been replaced by an average recruitment (1957-2011).

### RECENT MANAGEMENT ADVICE

ICES advises on the basis of precautionary considerations that there should be no catches of this stock unless a rebuilding plan is implemented. Discards are considered to be low and all catches are therefore assumed to be landed.

ICES advises that activities that have a negative impact on the spawning habitat of herring, such as extraction of marine aggregates and marine construction on the spawning grounds, should not occur.

#### ***Other considerations***

#### ***Management plans***

There is no explicit management plan for this stock. A revised rebuilding plan was proposed by the Pelagic RAC in 2012. STECF evaluated this plan in 2012–2013, but further evaluation is needed. To date ICES has not been requested to evaluate this plan.

**STECF COMMENTS:** STECF agrees with the ICES assessment of the state of the stock and the advice for 2014 that there should be no catches from this stock unless a rebuilding plan is put in place.

A proposed revised rebuilding plan was used for setting the TAC in 2013. STECF recommended further evaluation of the plan and suggested modifications to the plan. It is expected that the RAC will consider the modifications to the plan and submit a revised draft in 2013. Management strategy evaluation (MSE) of this plan will be conducted by the Irish Marine Institute, and the results given to STECF. STECF will be requested to evaluate these results at its November 2013 meeting, and advise on whether the plan is precautionary and in conformity with MSY.

## **2.26 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.

## **2.27 Pollack (*Pollachius pollachius*) in western waters**

Advice for this stock for the years 2013 and 2014 was given in 2012 and the text below remains largely unchanged from the Consolidated STECF review of advice for 2013 (STECF-12-22).

**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 2012 were almost 4,500t.

**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	?	Insufficient information

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

The available information is insufficient to evaluate the exploitation and the trends of pollack in the Celtic Sea ecoregion.

#### **RECENT MANAGEMENT ADVICE**

The 2012 advice for this stock is biennial and valid for 2013 and 2014 (see [ICES, 2012](#)): “Based on the ICES approach for data limited stocks, ICES advises that catches should be no more than 4200 tonnes”. The new data available for this stock do not change the perception of the stock.

#### ***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 2014.

STECF notes that the landings corresponding to ICES advice for 2013 and 2014 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 and 2014 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.

## 2.28 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.

## 2.29 Grey Gurnard (*Eutrigla gurnardus*) in western waters

Advice for this stock for the years 2013 and 2014 was given in 2012 and the text below remains largely unchanged from the Consolidated STECF review of advice for 2013 (STECF-12-22).

**FISHERIES:** Currently, grey gurnard is a bycatch species in demersal fisheries, mainly by trawlers. Catches are largely discarded. Official landings for 2011 were 82t. Preliminary landings in 2012 were 280t. 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)	
2009–2011	
Qualitative evaluation	? 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:** The 2012 advice for this stock is biennial and valid for 2013 and 2014. The advice is based 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.

The advice for 2014 is the same catch advised for 2013 (even though the value cannot be quantified), not that a further 20% reduction in catch be implemented.

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 2014.

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.

## **2.30 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 from ICES on red gurnard is provided at the NE Atlantic regional level and is given in Section 8.6 of this report.

## **2.31 Red mullet (*Mullus barbartus* and *Mullus surmelutuss*) in western waters (Subareas and Divisions VI, VIIa-c, e-k, VIII, and IXa)**

Advice for this stock for the years 2013 and 2014 was given in 2012 and the text below remains largely unchanged from the Consolidated STECF review of advice for 2013 (STECF-12-22).

**FISHERIES:** In 2010, 60% of the landings originated from Subarea VIII. Most of the catch is taken by the French and Spanish bottom trawler fleets. In the Bay of Biscay a fly-shooting fisheries has developed recently. Observer information indicates that there is very little discarding (no minimum landing size has been determined).



**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	?	Insufficient information

SSB (Spawning-Stock Biomass)		
2009–2011		
Qualitative evaluation		Insufficient information

There is limited information to evaluate stock trends. The landings have shown an increase since the mid-1990s and they are now stable and above average (essentially in Subarea VIII). Recruitment indices fluctuate without trend although there is some indication of several large year classes in the early 2000s.

**RECENT MANAGEMENT ADVICE:** ICES advises on the basis of the approach to data-limited stocks that catches should be no more than 2000 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 average catch of the last three years (2008–2010), corresponding to catches of no more than 2000 t in 2013.

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

## 2.32 Sea bass (*Dicentrarchus labrax*) in Divisions VIa, VIIb, and VIIj (West of Scotland and Ireland)

**FISHERIES:** Sea bass is an important recreational fishery targeted around the coast of Ireland. A moratorium on commercial fishing for this species by Irish vessels has been in place since 1990; as a result, unavoidable catches of Irish commercial vessels are discarded. The very small commercial catches are made predominantly by French vessels. Official landings 2012 are less than 1 tonne, but the available value is still preliminary. No discards information is available, but discarding is known to occur.

**SOURCE OF MANAGEMENT ADVICE:** The main management advisory body is ICES. The only available information is official landings.

**REFERENCE POINTS:**

No reference points have been defined for this stock.

**STOCK STATUS:**

F (Fishing Mortality)		
2010–2012		
Qualitative evaluation	?	Insufficient information

SSB (Spawning-Stock Biomass)		
2011–2013		
Qualitative evaluation	?	Insufficient information



Official reported landings are higher than one tonne after 2000 (except in 2012, but the landings estimate is still preliminary). Sea bass official landings have been around 10 tonnes after 2007, with the exception of 2011, when higher catch values were recorded. Most of the catches are taken from Division VIIj.

#### RECENT MANAGEMENT ADVICE:

Based on ICES approach to data-limited stocks, ICES advises commercial landings of no more than 18 tonnes in 2014. No information on discards is available, therefore it is not possible to provide commercial catch advice. Also, recreational catches cannot be quantified. Therefore total catches cannot be calculated.

Currently there is no TAC for this species in this area, and it is not clear whether this should constitute a separate management unit. ICES does not necessarily advocate the introduction of a TAC for sea bass in this area.

#### Other considerations

##### ICES approach to data-limited stocks

For data-limited stocks without information on biomass or 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 landings should decrease by 20% in relation to the average of the last three years with official landings information (2009–2011), corresponding to commercial landings of no more than 18 tonnes in 2014. No information on discards is available therefore it is not possible to provide commercial catch advice.

#### STECF COMMENTS:

Given the complete absence of information on recreational catches of sea bass from these areas, STECF is unable to judge whether the ICES advice to restrict commercial catches to less than 18 tons in 2014 is likely to be an effective management measure.

## 2.33 Cod (*Gadus morhua*) in area VIIa (Irish Sea Cod)

Advice for this stock for the years 2013 and 2014 was given in 2012 and the text below remains largely unchanged from the Consolidated STECF review of advice for 2013 (STECF-12-22).

**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 200 t in 2012. 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 (2012) are unknown. Landings are estimated at 200 t, but official landings were 65% higher (330 t) due to the reallocation of catches from the Irish Sea into the Celtic Sea as they represent a combination of inaccurate area reporting and catches of cod considered by ICES to be part of the Celtic Sea stock. 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 <sub>trigger</sub>	10 000 t	B <sub>pa</sub>
Approach	F <sub>MSY</sub>	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:

The 2012 advice for this stock is biennial and valid for 2013 and 2014. 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 the agreed Management Plan would imply a TAC of 214 t and a further 25% reduction in effort in 2014.

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.

## **2.34 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 6,000t and 13,000t until 2003. From 2004 to 2010 landings have been between 3,000t and 5,000t. Landings have increased in 2011 and 2012 to 7,200t and 8,600t respectively. All landings are taken by EU fleets

*Cod is caught in a range of fisheries, including otter trawl fisheries targeting gadoids, Nephrops, or mixed demersal fish, beam trawl fisheries, and gillnet fisheries. Landings are made throughout the year, but tend to be higher during the first half of the year. The TACs have constrained catches since 2003 and the impact of the Trevoze Head closure applied since 2005 has resulted in landings being spread throughout the year.*

*Highgrading occurred during the first part of 2011 before the TAC was revised. In 2012, the TAC was not fully caught, mainly due to restricted TACs on haddock for France. The level and length composition of the discards in 2012 is similar to the situation observed in the time-series before 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.

### **REFERENCE POINTS:**

	<b><i>Type</i></b>	<b><i>Value</i></b>	<b><i>Technical basis</i></b>
MSY	MSY B <sub>trigger</sub>	10 300t	Provisionally set at B <sub>pa</sub> .
Approach	F <sub>MSY</sub>	0.40	Provisional proxy based on F <sub>max</sub> (ICES, 2011).
Precautionary	B <sub>lim</sub>	7 300 t	B <sub>lim</sub> = B <sub>loss</sub> (B76), the lowest observed spawning-stock biomass.
	B <sub>pa</sub>	10 300 t	B <sub>pa</sub> = B <sub>lim</sub> * 1.4. Biomass above this value affords a high probability of maintaining SSB above B <sub>lim</sub> , taking into account the variability in the stock dynamics and the uncertainty in

Approach			assessments.
	$F_{lim}$	Undefined.	
	$F_{pa}$	Undefined.	

(unchanged since: 2011)

#### STOCK STATUS:

F (Fishing Mortality)				
	2010	2011	2012	
MSY ( $F_{MSY}$ )	✗	✓	✗	At target
Precautionary approach ( $F_{pa}, F_{lim}$ )	?	?	?	Undefined
SSB (Spawning-Stock Biomass)				
	2011	2012	2013	
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 (e.g. 1987 and 2010). Fishing mortality shows a declining trend since 2005 and is now around the  $F_{MSY}$  proxy.

**RECENT MANAGEMENT ADVICE:** ICES advises on the basis of the MSY approach that landings in 2014 should be no more than 6848 tonnes. Discards are known to take place but cannot be quantified; therefore total catches cannot be calculated.

#### Other considerations

##### MSY approach

Following the ICES MSY approach implies fishing mortality to be reduced to 0.4, resulting in the landings of no more than 6848 t in 2014. This is expected to lead to an SSB of 15 290 t in 2015. Discards have been estimated for 2011 and 2012, but this is not considered sufficient to estimate a discard proportion that could be applied to give catch advice; therefore total catches cannot be calculated.

No transition to the MSY approach is needed since current fishing mortality is estimated to be at the  $F_{MSY}$  proxy.

##### Precautionary considerations

This stock is currently exploited around the  $F_{MSY}$  proxy and SSB is above  $B_{pa}$  and  $MSY B_{trigger}$ .

There is no  $F_{pa}$  reference point for application of the precautionary approach.

**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 considers that  $F_{0.1}$  ( $F=0.20$ ) is a more appropriate proxy for  $F_{MSY}$  and should be used. However, given that the landings corresponding to fishing at  $F=0.4$  in 2014 are predicted to be lower than those observed over a period coincident with declining fishing mortality, fishing at  $F=0.4$  in the short term is predicted to maintain SSB well above  $MSY B_{TRIGGER}$ .

STECF notes that TAC for cod relates for Divisions VIIb,c,e-k, Subareas VIII, IX, X, and CECF 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.

## 2.35 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 variable and estimates are large in some years.

Total catch (2012) was 1061 t (32% landings and 68% discards).

**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:

	Type	Value	Technical basis
MSY	MSY $B_{\text{trigger}}$	Not defined.	
Approach	$F_{\text{MSY}}$	Not defined.	
Precautionary Approach	$B_{\text{lim}}$	Not defined.	
	$B_{\text{pa}}$	Not defined.	
	$F_{\text{lim}}$	Not defined.	
	$F_{\text{pa}}$	0.5	ICES proposed that $F_{\text{pa}}$ be set at 0.5 by association with other haddock stocks.

(unchanged since: 1998)

### STOCK STATUS:

F (Fishing Mortality)		
		2010–2012
MSY ( $F_{\text{MSY}}$ )	?	Unknown
Precautionary approach ( $F_{\text{pa}}$ , $F_{\text{lim}}$ )	?	Unknown
SSB (Spawning-Stock Biomass)		
		2009–2013
Qualitative evaluation	↗	Increasing

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 (2012–2013) is 17% higher than the average of the three previous years (2009–2011). SSB trends are fluctuating due to the dependence of incoming year classes.

### Management plans

There is currently no explicit management plan for this stock.

### RECENT MANAGEMENT ADVICE:

Based on ICES approach to data-limited stocks, ICES advises that catches should be no more than 1120 tonnes in 2014. If discard rates do not change from the average of the last three years, this implies landings of no more than 572 tonnes. 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 increased by 17% between the periods 2009–2011 (average of the three years) and 2012–2013 (average of the two years). This implies a 17% increase in catches compared to the average catches of the last three years, corresponding to catches in 2014 of no more than 1120 tonnes. If discard rates do not change from the average of the last three years, this implies landings of no more than 572 tonnes. Considering that the effort in the main fisheries has decreased, no additional precautionary reduction is needed

### **Precautionary considerations**

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 2014.

STECF notes that the landings corresponding to ICES advice for 2014 imply a 17% increase on the average reported landings over the years 2010-2012.

## **2.36 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 2012, total ICES estimated (preliminary) catches amounted to 28,700 t of which 64% are landings (all fleets combined) and 36% discards.

**SOURCE OF MANAGEMENT ADVICE:** The management advisory body is ICES. The advice is based on an assessment carried out in ASAP (Age-Structured Assessment Programme; NOAA toolbox which uses catch data with two survey indices and one commercial tuning index.

### **REFERENCE POINTS:**

	<i>Type</i>	<i>Value</i>	<i>Technical basis</i>
MSY	MSY $B_{\text{trigger}}$	7500 t	$B_{\text{loss}}$
Approach	$F_{\text{MSY}}$	0.33	$F_{\text{max}}(\text{landings: } 0.28 + \text{discards: } 0.05)$
Precautionary Approach	$B_{\text{lim}}$	Undefined.	
	$B_{\text{pa}}$	Undefined.	
	$F_{\text{lim}}$	Undefined.	
	$F_{\text{pa}}$	Undefined.	

(unchanged since 2012)

### **STOCK STATUS:**

<b>F (Fishing Mortality)</b>				
	2010	2011	2012	
MSY ( $F_{\text{MSY}}$ )	✗	✗	✗	Above target
Precautionary approach ( $F_{\text{pa}}, F_{\text{lim}}$ )	?	?	?	Undefined

<b>SSB (Spawning-Stock Biomass)</b>				
	2011	2012	2013	
MSY ( $B_{\text{trigger}}$ )	✓	✓	✓	Above trigger
Precautionary approach ( $B_{\text{pa}}, B_{\text{lim}}$ )	?	?	?	Undefined

SSB shows a slowly increasing trend over the time-series and a sharp increase in 2011 with the maturing of the strong 2009 cohort; SSB is now declining as this cohort is reduced. Fishing mortality remains above the  $F_{MSY}$  proxy and appears to have increased in 2012. Recruitment in 2009 was exceptionally good, but has been below average since then. Recruitment in 2012 was the lowest in the time-series.

### Management plans

There is currently no explicit management plan for this stock.

### RECENT MANAGEMENT ADVICE:

ICES advises on the basis of MSY transition that catches should be no more than 5281 t in 2014. If discard rates do not change from the average of the last three years, this implies landings of no more than 3602 t.

### Other considerations

#### MSY approach

Following the ICES MSY approach implies fishing mortality to be reduced to 0.33, resulting in catches of no more than 4521 t. If discard rates do not change from the average of the last three years, this implies landings in 2014 of no more than 3098 t. This is expected to lead to an SSB of 20 218 t in 2015, assuming an average recruitment in 2013.

Following the transition scheme towards the ICES MSY approach implies fishing mortality to be reduced to 0.39 based on  $(F_{2010} \times 0.2) + (F_{MSY} \times 0.8)$  (higher than the  $F_{MSY}$  proxy), resulting in catches of no more than 5281 t. Advice relates to catches. If discard rates do not change from the average of the last three years, this implies landings in 2014 of no more than 3602 t and discards of 1679 t in 2013. This is expected to lead to an SSB of 19 398 t in 2015, assuming an average recruitment in 2013.

### STECF COMMENTS:

STECF agrees with the ICES assessment of stock status and the advice for 2014.

However, the management measures introduced following the large 2009 yearclass have not effected a reduction in fishing mortality. If the TAC for 2014 is set in line with advised landings and fishing mortality in 2014 is not reduced, the catches will be in the region of 7,907 t and discards will be in the region of 4305 t. This represents a 2.5 fold increase in discards (2626 t) compared to fishing at  $F=0.39$ .

STECF notes technical measures have been introduced to reduce discards of undersize gadoids in this area. The effectiveness of these measures in reducing discards and the impact on commercial catches should be monitored and evaluated.

## 2.37 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.

## 2.38 Whiting (*Merlangius merlangus*) in VIIa (Irish Sea)

Advice for this stock for the years 2013 and 2014 was given in 2012 and the text below remains largely unchanged from the Consolidated STECF review of advice for 2013 (STECF-12-22).

**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 (2012): 1.45 kt, total landings: 0.05 kt; estimated discards: 1.40 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 $B_{\text{trigger}}$	Undefined	
Approach	$F_{\text{MSY}}$	Undefined	
Precautionary	$B_{\text{lim}}$	5 000 t	<b>Bloss</b> (1998); the lowest observed SSB as estimated in previous assessment. There is no clear evidence of reduced recruitment at the lowest observed SSBs.
	$B_{\text{pa}}$	7 000 t	<b>Bloss</b> * 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	$F_{\text{lim}}$	0.95	The fishing mortality above which stock decline has been observed.
	$F_{\text{pa}}$	0.65	This $F$ is considered to have a high probability of avoiding $F_{\text{lim}}$ . It implies an equilibrium SSB of 10.6 kt, and a relatively low probability of $SSB < B_{\text{pa}}$ (= 7 kt), and is within the range of historic $F$ s.

(unchanged since: 1998)

## STOCK STATUS

### F (Fishing Mortality)

	2009–2011	
MSY ( $F_{\text{MSY}}$ )	?	Unknown
Precautionary approach ( $F_{\text{pa}}, F_{\text{lim}}$ )	?	Unknown
Qualitative evaluation	✗	Above poss. reference points

### SSB (Spawning Stock Biomass)

	2009–2011	
MSY ( $B_{\text{trigger}}$ )	?	Unknown
Precautionary approach ( $B_{\text{pa}}, B_{\text{lim}}$ )	?	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  $B_{\text{lim}}$ . 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:



The 2012 advice for this stock is biennial and valid for 2013 and 2014 (see [ICES, 2012](#)): “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 2014.

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.

## 2.39 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 22,000 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 in 2012 were 9,976 t with substantial discards which could not be quantified.

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:

	Type	Value	Technical basis
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)				
	2010	2011	2012	
MSY ( $F_{MSY}$ )	✗	✓	✓	Appropriate
Precautionary approach ( $F_{pa}, F_{lim}$ )	?	?	?	Undefined

SSB (Spawning-Stock Biomass)				
	2011	2012	2013	
MSY ( $B_{trigger}$ )	✓	✓	✓	Above trigger
Precautionary approach ( $B_{pa}, B_{lim}$ )	✓	✓	✓	Full reproductive capacity

Spawning-stock biomass has been increasing since 2008 and is well above MSY  $B_{trigger}$ . Fishing mortality has shown a declining trend since 2007 and has been below the  $F_{MSY}$  proxy since 2011. Two recruitments have been above average, 2008 and 2009; they have now entered the fishery and are contributing to the spawning stock. The 2011 and 2012 year class are estimated to be the lowest of the time-series.

### Management plans

No specific management objectives are known to ICES.

## RECENT MANAGEMENT ADVICE:

ICES advises based on the MSY approach that landings in 2014 should be no more than 15 562 tonnes. Discards are known to take place but cannot be quantified; therefore, total catches cannot be calculated.

### Other considerations

#### MSY approach

Following the ICES MSY framework implies fishing mortality at the  $F_{MSY}$  proxy (= 0.36), resulting in landings of no more than 15 562 tonnes in 2014. This is expected to lead to an SSB of 45 329 tonnes in 2015. Discards are known to occur, but cannot be quantified.

#### Precautionary approach

No precautionary fishing mortality reference points are defined. SSB is expected to remain far above  $B_{pa}$ , in the short term.

### Additional considerations

During the 2011 December EU Fisheries Council meeting, Ireland, UK, and France agreed to introduce additional technical measures to reduce the high levels of haddock and whiting discards observed in the Celtic Seas in 2010. In consultation with national governments and the NWWAC it was agreed to introduce the mandatory use of a 110 mm square mesh panel in *Nephrops* trawls and a 100 mm panel in gadoid fisheries. While the regulation was not introduced until 14 August 2012 (EC Regulation 737/2012), it is understood that for both French and Irish fleets, the technical measures were in practice introduced much earlier in the year by the national administrations. Following the outcome of the 2012 December Fisheries Council, EU Member States committed to an evaluation of the effectiveness of the technical measures and to introduce additional measures if required (see STECF, 2013). The EC is in the process of collating information from Member States to allow STECF to undertake an evaluation of the technical measures at the 2013 winter plenary meeting.

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

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 VIIb,c is not included in any assessment.

## 2.40 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 (29 000 t). In 2012, preliminary landings estimates were 26,800 t, the third highest value in the time series. Landings of *L. budegassa* have fluctuated all over the studied period between 5 700 t to 9 600 t. The preliminary total estimated landings for 2012 are 9,600 t.

**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)		
	2010–2012	
Qualitative evaluation	?	Insufficient information

SSB (Spawning-Stock Biomass)		
	2008–2012	
Qualitative evaluation	↗	Increasing

#### *Lophius budegassa*

F (Fishing Mortality)		
	2010–2012	
Qualitative evaluation	?	Insufficient information

SSB (Spawning-Stock Biomass)		
	2008–2012	
Qualitative evaluation	↗	Increasing

The long-term trend in biomass is stable for *L. budegassa* and increasing for *L. piscatorius*. For *L. piscatorius* the average of the stock biomass indicator in the last two years (2011–2012) is 55% higher than the average of the three previous years (2008–2010). For *L. budegassa* the average of the stock biomass indicator in the last two years (2011–2012) is 25% higher than the average of the three previous years (2008–2010). For *L. piscatorius* there is evidence of medium recruitments in the period 2008 to 2012, whereas strong recruitment for *L. budegassa* is evident in 2008, 2011, and 2012.

### RECENT MANAGEMENT ADVICE:

Based on ICES approach to data-limited stocks, ICES advises that landings should be no more than 37 450 tonnes. Discards are known to take place but cannot be quantified; therefore, total catches cannot be calculated.

#### 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 increased by more than 20% between the periods 2008–2010 (average of the three years) and 2011–2012 (average of the two years). This implies an increase in landings of at most 20% in relation to the average landings of the last three years, corresponding to landings in 2014 of no more than 26 691 t. Considering that effort in the main fisheries has decreased steadily and SSB has increased by more than 50%, no additional precautionary action is needed.

For *L. budegassa* the biomass is estimated to have increased by more than 20% between the periods 2008–2010 (average of the three years) and 2011–2012 (average of the two years). This implies an increase in landings of at most 20% in relation to the average landings of the last three years, corresponding to landings in 2014 of no more than 10 757 t. Considering that effort in the main fisheries has decreased steadily, no additional precautionary action is needed.

The landings advice for the two species combined is 37 448 t. Discards are known to take place but cannot be quantified; therefore, total catches cannot be calculated.

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

The value of 26 691 t and 10 757 advised by ICES represents an increase of 20% on the average reported landings over the period 2010–2012 for both species, *L. piscatorius* and *L. budegassa* and a 1% increase on the agreed TAC for 2014.

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.

## 2.41 Megrim (*Lepidorhombus whiffiagonis* and *Lepidorhombus boscii*) in VII and VIIIabde.

Advice for this stock for the years 2013 and 2014 was given in 2012 and the text below remains largely unchanged from the Consolidated STECF review of advice for 2013 (STECF-12-22).

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 15,000 t tonnes. Around 20–25% 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
<b>SSB (Spawning Stock Biomass)</b>			
	2006 2010	-	<b>2011</b>
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:

New data (landings, discards and surveys) available for this stock do not change the perception of the stock; therefore, the advice for this fishery in 2014 is the same as the advice for 2013 (see ICES, 2012a): *Based on the ICES approach for data limited stocks, ICES advises that landings should be no more than 12 000 tonnes.*

#### 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 and the advice for 2013 and 2014. The value of 12,000 t advised by ICES represents a reduction of 3% on the average reported landings over the period 2010-2012 and a 37% decrease compared to the agreed TAC for 2013.

## 2.42 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 379 t rebounding to 496 t in 2012. In 2012, 65% 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)		
	2010–2012	
Qualitative evaluation		Below poss. reference points
SSB (Spawning-Stock Biomass)		
	2008–2012	
Qualitative evaluation		Above poss. reference points

The average of the stock size indicator in the last two years (2011–2012) is 1% higher than the average of the three previous years (2008–2010).

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 14 000–15 000 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 Aarts and Poos Model estimates of SSB over this period, and the catches also include immature plaice.

**RECENT MANAGEMENT ADVICE:**

Based on ICES approach to data-limited stocks, ICES advises that catches should be no more than 1827 t in 2014. If discard rates do not change from the average of the last three years (2010–2012), this implies landings of no more than 497 t in 2014.

**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 biomass is estimated to have increased by 1% between the periods 2008–2010 (average of the three years) and 2011–2012 (average of the two years). This implies an increase in catches of at most 1% in relation to average catches of the last three years, corresponding to catches in 2014 of no more than 1827 t. If discard rates do not change from the average of the last three years (2010–2012), this implies landings in 2014 of no more than 497 t. Considering that recent fishing mortality is considered to be very low, no additional precautionary reduction is needed



**STECF COMMENTS:** STECF agrees with the ICES assessment of the state of the stock and the advice for 2014. The value of 497 t advised by ICES represents an increase of 1% on the average reported landings over the period 2010–2012 and a 69% decrease compared to the agreed TAC for 2013.

## 2.43 Plaice (*Pleuronectes platessa*) in the Celtic Sea (Divisions VIIIf and g)

**FISHERIES:** The fishery for Celtic Sea plaice involves vessels from France, Belgium, England and Wales and Ireland. In the 1970s, the VIIIfg 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 VIIIf,g.

Since 2000 the estimated landings have been below the TACs, and lowest catch levels of 386 t were recorded in 2005 and have remained around that level since then (2012 landings = 443t). Discards have fluctuated in that period between 500 and 1,300 t.

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 plaice are not known although there have been spatial and temporal changes in the distribution of effort.


Plaice in the Bristol Channel and Celtic Sea (ICES Divisions VIIIf 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 VIIIf,g is 27 cm.

**SOURCE OF MANAGEMENT ADVICE:** The main management advisory body is ICES. In 2012, advice was provided on the basis of trends derived from the Aarts and Poos (2009) model fitted to catch and tuning series data. In 2013, it proved impossible to use the same basis for advice as last year. Instead, the UK(E&W) beam trawl survey was used to infer trends in recruitment, stock size (spawning-stock biomass), and fishing mortality.


### REFERENCE POINTS:

No new reference point table provided by ICES. Last year no reference points were available.

### STOCK STATUS:

F (Fishing Mortality)		
	2010–2012	
Qualitative evaluation		Unknown

SSB (Spawning-Stock Biomass)		
	2008–2012	
Qualitative evaluation		Increasing

Since 2004 the landings have been relatively stable but the discards have been increasing. The average of the stock size indicator (SSB from the survey) in the last two years (2011–2012) is 50% higher than the average of the three previous years (2008–2010).

### RECENT MANAGEMENT ADVICE:

Based on ICES approach to data-limited stocks, ICES advises that catches should be no more than 1608 tonnes. If discard rates do not change from the average of the last three years, this implies landings of no more than 519 tonnes.

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 a biomass index is available, ICES uses as harvest control rule 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 spawning-stock biomass from the survey is estimated to have increased by more than 20% between the periods 2008–2010 (average of the three years) and 2011–2012 (average of the two years). This implies an increase in catches of 20% in relation to average catches of the last three years, corresponding to catches in 2014 of no more than 1608 t. Assuming that the discard rate remains the same as the average of the last three years (68%), the corresponding landings in 2014 are 519 t.

Considering that the biomass has increased by 50%, no additional precautionary reduction is needed.

**STECF COMMENTS:** STECF agrees with the ICES assessment of the state of the stock and the advice for 2014. The value of 519 t advised by ICES represents an increase of 20% on the average reported landings over the period 2010-2012 and a 40% increase compared to the agreed TAC for 2013.

## **2.44 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 VIId during their annual spawning migration. Landings from this stock (including a migration component caught in Division VIId) were 1,520 t in 2012. 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 VIId,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 <sub>trigger</sub>	1650	Preliminary based on lowest SSB (in converged part of XSA) from which the stock has recovered.
Approach	F <sub>MSY</sub>	0.24	F <sub>max</sub> 2012. This value is stock specific.
Precautionary Approach	B <sub>lim</sub>	Not defined.	
	B <sub>pa</sub>	Not defined.	
	F <sub>lim</sub>	Not defined.	
	F <sub>pa</sub>	Not	



		defined.	
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## STOCK STATUS:

F (Fishing Mortality)			
	2010	2011	2012
MSY ( $F_{MSY}$ )	✗	✗	✗ Above target
Precautionary approach ( $F_{pa}, F_{lim}$ )	?	?	? Undefined

SSB (Spawning-Stock Biomass)			
	2011	2012	2013
MSY ( $B_{trigger}$ )	✓	✓	✓ Above trigger
Precautionary approach ( $B_{pa}, B_{lim}$ )	?	?	? Undefined

The large reduction of F in 2009 was followed by smaller decreases in 2011–2012, but F still remains well above the  $F_{MSY}$  proxy. SSB has increased since 2008 and is currently well above MSY  $B_{trigger}$  due to the above-average recruitments in 2009–2011.

## RECENT MANAGEMENT ADVICE:

ICES advises on the basis of MSY transition that landings of plaice in Division VIIe in 2014 should be no more than 1397 t. Discards are known to take place but cannot be quantified; therefore the total catch cannot be calculated.

### Other considerations

#### MSY approach

Following the ICES MSY approach implies fishing mortality to be reduced to 0.24 (=  $F_{MSY}$  proxy), resulting in landings of 1148 t in 2014. This is expected to lead to an SSB of 5467 t in 2015. Discards are known to take place but cannot be quantified; therefore the total catch cannot be calculated.

Following the transition scheme towards the ICES MSY framework implies a fishing mortality of 0.29 for 2014. This results in landings of 1397 t in 2014, which is expected to lead to an SSB of 5227 t in 2015. Discards are known to take place but cannot be quantified; therefore the total catch cannot be calculated.

**STECF COMMENTS:** STECF agrees with the ICES assessment and advised landings for 2014.

STECF notes that the proposed proxy ( $F_{max 2012}$ ) for  $F_{MSY}$  = 0.24 may not be appropriate. STECF considers that  $F_{0.1}$  is a more appropriate proxy for  $F_{MSY}$  and should be used. However, fishing at  $F=0.24$  in the short term is predicted to maintain SSB well above MSY  $B_{TRIGGER}$ .

The landings value of 1397 t advised by ICES represents a decrease of 2% on the estimated average landings from VIIe over the period 2010-2012. The combined advice for plaice in VIId and VIId is for landings no greater than 5322 t, which represents a 5% increase on the estimated average landings of plaice from these areas over the last 3 years and less than a 1% decrease compared to the agreed TAC for 2013 for VIId and VIIe.

## 2.45 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 944 t in 1997 and have declined dramatically stabilizing at around 150 t – 200 t recently.

Plaice in Division VIIj are mainly caught by Irish vessels on sandy grounds off the southwest of Ireland. Plaice catches in Division VIIk are negligible. Discard rates are high; in 2012 42% of the plaice caught in Divisions VIIjk were discarded (30% by weight).

**SOURCE OF MANAGEMENT ADVICE:** The main management advisory body is ICES. The advice is based on an index-adjusted *status quo* catch (i.e. category 3.2.0 methods) is used.

**REFERENCE POINTS:** No reference points are defined for this stock since the analysis for this assessment area is based on landings only and does not account for discards which are considered to be substantial.

#### STOCK STATUS:

##### F (Fishing Mortality)

	2010-2012	
Qualitative evaluation		Above possible reference points

##### SSB (Spawning-Stock Biomass)

	2008-2012	
Qualitative evaluation		Increasing

Fishing mortality has been stable since 2008; it remains above potential reference points. The average spawning-stock biomass in the last two years (2011–2012) is 33% higher than the average of the three previous years (2008–2010). Recruits of age 4 have shown an increasing trend since 2006.

#### RECENT MANAGEMENT ADVICE:

Based on ICES approach to data-limited stocks, ICES advises that landings in 2014 should be no more than 135 t. Discards are known to take place but cannot be quantified; therefore total catches cannot be calculated.

#### *Other considerations*

##### *ICES approach to data limited stocks*

For data-limited stocks for which biomass trends 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 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 more than 20% between the periods 2008–2010 (average of the three years) and 2011–2012 (average of the two years). This implies an increase of landings of at most 20% in relation to the last available three-year average landings (i.e. 2009–2011), corresponding to landings of no more than 169 t. Additionally, as the stock is considered overexploited ICES advises that landings should decrease by 20% as a precautionary buffer. This results in landings of no more than 135 t in 2014.

Discards are known to take place but are only quantified for 2012; therefore total catches cannot be calculated.

**STECF COMMENTS:** STECF agrees with the ICES assessment of the state of the stock and the advice for 2014. The value of 135 t advised by ICES represents a reduction of 4% on the average reported landings over the period 2009-2011 and a 4% decrease compared to the agreed TAC for 2013.

## 2.46 Plaice (*Pleuronectes platessa*) in Division VIIbc

Advice for this stock for the years 2013 and 2014 was given in 2012 and with the exception of the advice, the text below remains largely unchanged from the Consolidated STECF review of advice for 2013 (STECF-12-22).

**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. The landings in 2012 amount to 29 t.

**SOURCE OF MANAGEMENT ADVICE:** The main management advisory body is ICES. No assessment was carried out for this stock in 2012 and 2013.

**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

The stock status is unknown and the available catch statistics are not considered reliable indicators of abundance.

### RECENT MANAGEMENT ADVICE:

The 2012 advice for this stock is biennial and valid for 2013 and 2014 (see [ICES, 2012](#)). “Based on the ICES approach for data limited stocks, ICES advises that catches should be no more than 30 tonnes”. ICES advises that the same catch advice is also applicable for 2015.

#### *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 and the advice for 2014 and 2015.

The value of 30 t advised by ICES represents an increase of 12% on the average reported landings over the period 2010-2012 and a 57% decrease compared to the agreed TAC for 2013.

## 2.47 Sole (*Solea solea*) in Division VIIa (Irish Sea)

Advice for this stock for the years 2013 and 2014 was given in 2012 and the text below remains largely unchanged from the Consolidated STECF review of advice for 2013 (STECF-12-22).

**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 have declined sharply since 2007 to around 300 t (294 t in 2012).

**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 survey.

**REFERENCE POINTS:**

	Type	Value	Technical basis
MSY Approach	MSY $B_{\text{trigger}}$	3100 t	Default to value of $B_{\text{pa}}$
	$F_{\text{MSY}}$	0.16	Provisional proxy based on stochastic simulations assuming a Ricker S/R relationship (range 0.1–0.25)
Precautionary Approach	$B_{\text{lim}}$	2200 t	$B_{\text{lim}} = B_{\text{loss}}$ . The lowest observed spawning stock, followed by an increase in SSB.
	$B_{\text{pa}}$	3100 t	$B_{\text{pa}} \sim B_{\text{lim}} * 1.4$ . The minimum SSB required ensuring a high probability of maintaining SSB above its lowest observed value, taking into account the uncertainty of assessments.
	$F_{\text{lim}}$	0.40	$F_{\text{lim}} = F_{\text{loss}}$ . 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.
	$F_{\text{pa}}$	0.30	This F is considered to have a high probability of avoiding $F_{\text{lim}}$ .

**STOCK STATUS:**

**F (Fishing Mortality)**

	2010	2011	2012	
MSY ( $F_{\text{MSY}}$ )	✗	✗	✗	Above target
Precautionary approach ( $F_{\text{pa}}, F_{\text{lim}}$ )	✓	○	○	Increased risk

**SSB (Spawning-Stock Biomass)**

	2011	2012	2013	
MSY ( $B_{\text{trigger}}$ )	✗	✗	✗	Below trigger
Precautionary approach ( $B_{\text{pa}}, B_{\text{lim}}$ )	✗	✗	✗	Reduced reproductive capacity

SSB has continuously declined since 2001 and has been below  $B_{\text{lim}}$  since 2006. The 2013 SSB is the lowest observed in the time-series. The fishing mortality has shown a declining trend since the mid-1980s; it has been relatively stable in recent years, but remains well above the  $F_{\text{MSY}}$  proxy. Recent recruitments have been lower than earlier in the time-series, with the 2011 recruitment being the lowest.

**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.

*Other considerations*

**MSY approach**

Following the ICES MSY approach implies fishing mortality to be reduced to 0.05 (66% lower than the  $F_{\text{MSY}}$  proxy because SSB in 2014 is below MSY  $B_{\text{trigger}}$ ), resulting in catches of less than 52 t in 2014. This is expected to lead to a SSB of 1278 t in 2015.

Following the transition towards the ICES MSY approach implies a fishing mortality of 0.10 for 2014. This results in catches of 95 t in 2014. This is expected to lead to an SSB of 1237 t in 2015.

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.

#### **Precautionary approach**

It is not possible to identify any non-zero catch that would be compatible with the precautionary approach.

**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 2014. STECF advises that this should be interpreted to mean that in 2014, catches of sole from Division VIIa should be reduced to the lowest possible level.

## **2.48 Sole (*Solea solea*) in Divisions VIIf,g (Celtic Sea)**

**FISHERIES:** The sole fishery is concentrated on the north Cornish coast off Trevose 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 1096 t in 2012.

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.

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 VIId).

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 sole are not known although there have been spatial and temporal changes in the distribution of effort.

**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 $B_{\text{trigger}}$	2200 t	$B_{\text{pa}}$
Approach	$F_{\text{MSY}}$	0.31	Provisional proxy based on stochastic simulations
Precautionary Approach	$B_{\text{lim}}$	Not defined	
	$B_{\text{pa}}$	2200 t	There is no evidence of reduced recruitment at the lowest biomass observed and $B_{\text{pa}}$ can therefore be set equal to the lowest observed SSB.
	$F_{\text{lim}}$	0.52	$F_{\text{lim}}: F_{\text{loss}}$
	$F_{\text{pa}}$	0.37	This F is considered to have a high probability of avoiding $F_{\text{lim}}$ and maintaining SSB above $B_{\text{pa}}$ in 10 years, taking into account

			the uncertainty of assessments. $F_{pa}: F_{lim} \times 0.72$ implies a less than 5% probability that $(SSB_{MT} < B_{pa})$ .
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## STOCK STATUS:

### F (Fishing Mortality)

	2010	2011	2012	
MSY ( $F_{MSY}$ )	✗	✓	✗	Above target
Precautionary approach ( $F_{pa}, F_{lim}$ )	✓	✓	○	Increased risk

### SSB (Spawning-Stock Biomass)

	2011	2012	2013	
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  $F_{MSY}$  in 2005 and remained there until 2011. In 2012 it increased to above  $F_{pa}$ . Recruitment has been fluctuating around average. The 2009 year class is the lowest of the time-series.

## RECENT MANAGEMENT ADVICE:

ICES advises on the basis of the MSY approach that catches in 2014 should be no more than 920 t. Discards are considered to be low; therefore all catches are assumed to be landed.

### Other considerations

#### MSY approach

Following the ICES MSY approach implies a fishing mortality at 0.31, resulting in catches of 920 t in 2014. This is expected to lead to an SSB of 3465 t in 2015. Discards are considered to be low; therefore all catches are assumed to be landed.

No transition to the ICES MSY approach is needed since in 2010 the fishing mortality was already below  $F_{MSY}$ .

#### Precautionary approach

The fishing mortality in 2014 should be no more than  $F_{pa}$ , corresponding to catches of less than 1071 t in 2014. This is expected to keep SSB above  $B_{pa}$  in 2015. Discards are considered to be low; therefore all catches are assumed to be landed.

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

## 2.49 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 increasing 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. Landings in 2012 amount to 871 t.

**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 $B_{\text{trigger}}$	2800 t	Based on the lower 95% confidence limits with exploitation at $F=0.27$ from LT simulations.
Approach	$F_{\text{MSY}}$	0.27	Based on stochastic LT simulations.
Precautionary approach	$B_{\text{lim}}$	1300 t	WKFRAME 2 meta-analysis (ICES, 2011).
	$B_{\text{pa}}$	1800 t	WKFRAME 2 meta-analysis (ICES, 2011).
	$F_{\text{lim}}$	Not defined.	
	$F_{\text{pa}}$	Not defined.	

**STOCK STATUS:**

F (Fishing Mortality)			
	2010	2011	2012
MSY ( $F_{\text{MSY}}$ )	✓	✓	✓ Appropriate
Precautionary approach ( $F_{\text{pa}}, F_{\text{lim}}$ )	?	?	? Undefined

SSB (Spawning-Stock Biomass)			
	2011	2012	2013
MSY ( $B_{\text{trigger}}$ )	✓	✓	✓ Above trigger
Precautionary approach ( $B_{\text{pa}}, B_{\text{lim}}$ )	✓	✓	✓ Full reproductive capacity

The fishing mortality has fluctuated around  $F_{\text{MSY}}$  since the early 1990s and is estimated to have been below  $F_{\text{MSY}}$  since 2009. SSB has been around MSY  $B_{\text{trigger}}$  for about two decades, with an increase since 2009. Recruitment has been fluctuating without trend. The 2010 and 2011 year classes are estimated to be below average.

**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 approach that catches in 2014 should be no more than 832 tonnes. All catches are assumed to be landed.

*Other considerations*

**MSY approach**

Following the ICES MSY framework implies a fishing mortality at 0.27, resulting in catches of 832 t in 2014. All catches are assumed to be landed. This is expected to lead to an SSB of 2894 t in 2015.

**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 2014 of 0.27 ( $F_{MP}$ , the management plan long-term target), suggesting a TAC of 832 t in 2014 which is less than the 15% annual TAC deviation cap in the plan. Consequently the management plan implies a TAC for 2014 of 832 t ( $F = 0.27$ ). Fishing at this level is expected to lead to an SSB of 2894 t in 2015.

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

## 2.50 Other Demersal elasmobranchs in the Celtic Sea and Irish Sea

Advice from ICES for Angel sharks (*Squatina squatina*) and Smooth Hounds (*Mustellus spp*) is provided at the NE Atlantic regional level and is given in Sections 8.17 and 8.18 of this report.

## 2.51 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 but it has increased in the last years. Landings in 2012 were 5,700t.

**SOURCE OF MANAGEMENT ADVICE:** The main management advisory body is ICES. This year an analytical assessment (FLSAM) and short term forecast are presented for this stock. The advice for 2014 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)				
	2010	2011	2012	
MSY ( $F_{MSY}$ )	✓	✓	✓	Appropriate
Precautionary approach ( $F_{pa}, F_{lim}$ )	?	?	?	Undefined

SSB (Spawning-Stock Biomass)				
	2011	2012	2013	
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 above the average of the time-series since 2006 (2004 year class).

### Management plans

No specific management objectives are known to ICES. A management plan is currently being developed for Division VIIa (North).

### RECENT MANAGEMENT ADVICE:

ICES advises on the basis of the MSY approach that catches in 2014 should be no more than 5251 t. Discards are considered to be low and all catches are therefore assumed to be landed.

ICES advises that activities that have a negative impact on the spawning habitat of herring, such as extraction of marine aggregates and marine construction on the spawning grounds, should not occur.

### Other considerations

#### MSY approach

Following the ICES MSY approach implies fishing mortality at  $F_{MSY} = 0.26$ , resulting in catches of less than 5251 t in 2014. This is expected to lead to an SSB of 16 275 t in 2015. Discards are considered to be low, and therefore, all catches are assumed to be landed.

#### 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 using  $B_{pa}$  as a target in 2014.

**STECF COMMENTS:** STECF agrees with the ICES assessment of the state of the stock and the advice for 2014, for which catches should be no more than 5,251t.

## 2.52 Herring (*Clupea harengus*) in Divisions VIIa (South of 52°30'N) and VIIg,h,j,k (Celtic Sea and South of Ireland)

**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 1990s, landings fluctuated between about 19,000 and 23,600 t. From 1998 to 2009, landings decreased from 20,300t to around 5,800t. Since then landings increased to 11,500t in 2011 and 21,600 in 2012.

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 an age-based analytical assessment (FLICA).

### REFERENCE POINTS:

	Type	Value	Technical basis
MSY	$MSY B_{trigger}$	61 000 t.	Stochastic simulations on segmented regression stock–recruitment relationship.

Approach	$F_{MSY}$	0.25	Stochastic simulations on segmented regression stock–recruitment relationship.
Management Plan	$SSB_{MGT}$	61 000 t.	Stochastic simulations on segmented regression stock recruit relationship.
	$F_{MGT}$	0.23	If SSB in TAC year >61 000.
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.	

(Changed in 2013)

#### STOCK STATUS:

F (Fishing Mortality)				
	2010	2011	2012	
MSY ( $F_{MSY}$ )	✓	✓	✓	Appropriate
Precautionary approach ( $F_{pa}, F_{lim}$ )	?	?	?	Undefined

SSB (Spawning-Stock Biomass)				
	2011	2012	2013	
MSY ( $B_{trigger}$ )	✓	✓	✓	Above Trigger
Precautionary approach ( $B_{pa}, B_{lim}$ )	✓	✓	✓	Full reproductive capacity

The current SSB is the highest since the 1960s. F is well below  $F_{MSY}$  but has increased slightly since 2010. There are three recent strong year classes (2003/4, 2005/6, and 2007/8) in the fishery. The 2008/9 and 2009/10 year classes are currently estimated to be above average.

#### MANAGEMENT AGREEMENT:

##### Long-term management plan for herring in the Celtic Sea and Division VIIj, as agreed by the Pelagic RAC

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.*

In 2012 ICES evaluated this plan and found it to be in accordance with the precautionary approach.

#### **RECENT MANAGEMENT ADVICE:**

ICES advises on the basis of the MSY approach that catches should be no more than 35942 t in 2014. All catches are assumed to be landed.

ICES advises that activities that have a negative impact on the spawning habitat of herring, such as extraction of marine aggregates and marine construction on the spawning grounds, should not occur.

#### ***Other considerations***

##### ***Management plan***

In 2011 the Pelagic RAC agreed a new proposed long-term management plan (Annex 5.4.15). This plan has a target  $F$  of 0.23 and a 30% constraint on TAC change. This TAC constraint prevents sudden changes of the TAC and accounts for uncertainties in the assessment and forecast in the event of strong or low incoming recruitment. This plan would lead to a TAC in 2014 of 22 360 t. In 2012 ICES evaluated this plan and found it to be in accordance with the precautionary approach. It leads to sustainable yield and provides stability in catches over time, at the expense of maximizing yield. ICES was not able to simulate the effect of the closed area, but from an operational point of view it seems to have worked to reduce  $F$  under the recent recovery plan. The Commission has communicated to ICES that its preference is that ICES advice follows the ICES MSY transitional framework, while the outcomes from following this plan should be presented in the outlook table. This plan has a target  $F = 0.23$  and a 30% constraint in TAC change. This plan would result in catch advice of 22 360 t for 2014.

##### ***MSY approach***

Following the ICES MSY approach implies fishing mortality be increased to 0.25 which is higher than the current  $F$  (0.15), resulting in landings of less than 35 942 t in 2014. This is expected to lead to an SSB of 115063t in 2015. Discards are considered to be low, and therefore, all catches are assumed to be landed. Because  $F$  has been below  $F_{MSY}$  since 2007, a transition to MSY is not relevant.

##### ***Precautionary approach***

The SSB is well above  $B_{pa}$ .  $F_{pa}$  is undefined, but current  $F$  is well below  $F_{MSY}$ . ICES does not advise using  $B_{pa}$  as a target in 2014.

**STECF COMMENTS:** STECF agrees with the ICES assessment of the state of the stock and the advice for 2014 that catches should be no more than 35,942 t.

STECF notes that the communication from the commission to ICES to provide management advice following the MSY framework is not consistent with its rules for proposing TACs outlined in COM(2013) 319 Final, which states “Where long-term plans governing TACs or effort limits apply, these have to be followed. The Commission will also propose TACs or effort limits at levels consistent with Commission proposals for long-term plans. Where plans developed by the Regional Advisory Councils have been assessed by ICES and STECF as conforming to MSY standards, such plans will also be followed”. STECF notes that the provisions of the long term management plan for Celtic Sea herring would imply catches of 22,360 t for 2014.

## 2.53 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 2013.

**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

## 2.54 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 2012 landings were 4,400t.

**SOURCE OF MANAGEMENT ADVICE:** The main management advisory body is ICES. The advice is based on the ICES approach to data limited stocks.

**REFERENCE POINTS:** No reference points are defined.

**STOCK STATUS:**

F (Fishing Mortality)	
	2010–2012
Qualitative evaluation	? Insufficient information

SSB (Spawning-Stock Biomass)	
	2008–2012
Qualitative evaluation	↗ Increasing

The average lpu of mid-water trawl is considered a stock size indicator ( $\text{kg hour}^{-1}$ ). In the last two years (2011–2012) it has been 137% higher than the average of the three previous years (2008–2010).

## RECENT MANAGEMENT ADVICE:

Based on ICES approach to data-limited stocks, ICES advises that catches should be no more than 3832 tonnes. All catches are assumed to be landed.

### Management plans

No specific management objectives are known to ICES.

**STECF COMMENTS:** STECF agrees with the ICES assessment of the state of the stock and the advice for 2014 that catches should be no more than 3,832t.

## 3 Resources of the Bay of Biscay and Iberian Waters

### 3.1 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),

#### 3.1.1 Norway lobster (*Nephrops norvegicus*) in FU 23 & FU 24, Bay of Biscay (Divisions VIIIa, b)

Advice for this stock for the years 2013 and 2014 was given in 2012 and the text below remains largely unchanged from the Consolidated STECF review of advice for 2013 (STECF-12-22).

**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

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.

### 3.1.2 Norway lobster (*Nephrops norvegicus*) in Division VIIIc (FU 25 & FU 31)

Advice for this stock for the years 2013 and 2014 was given in 2012 and the text below remains largely unchanged from the Consolidated STECF review of advice for 2013 (STECF-12-22).

**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<sub>pue</sub> 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.

### **3.1.3 Norway lobster (*Nephrops norvegicus*) in Divisions VIII d, e**

Advice for this stock for the years 2013 and 2014 was given in 2012 and the text below remains largely unchanged from the Consolidated STECF review of advice for 2013 (STECF-12-22).

**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.

### **3.1.4 Norway lobster (*Nephrops norvegicus*) in Division IX and X.**

The stock status and advice for this stock for 2014 remains unchanged from that given for 2013. The text below therefore remains largely unchanged from the Consolidated STECF review of advice for 2013 (STECF-12-22).

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 t landings exceeded 2000 t, while they were 273 t in 2011, of which 150 t were taken from FUs 28 - 29. 2012 saw a slight increase in total landings to 353 t.

**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 of 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 *Ipue* 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.

## **3.2 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. Total catch in 2012 were equal to 16,600t, of which 14,600t were landings (4,370t trawlers, 4,100t other fleets and 6,100t unallocated) and 2,100t discards (13% of the total catch).

**SOURCE OF MANAGEMENT ADVICE:** The main management advisory body is ICES. ICES advice is for Subarea VIIIc and Division IXa. 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. French catches are not considered in the assessment until the full time-series is reviewed. Unallocated landings have been included since 2011. Projections for catch options and management advice for 2014 were based on the assessment conducted in 2013.

### **REFERENCE POINTS:**

	<i>Type</i>	<i>Value</i>	<i>Technical basis</i>
MSY Approach	MSY $B_{\text{trigger}}$	Not defined.	
	$F_{\text{MSY}}$	0.24	$F_{\text{max}}$ (ICES, 2010).
Precautionary Approach	$B_{\text{lim}}$	Not defined.	
	$B_{\text{pa}}$	Not defined.	
	$F_{\text{lim}}$	Not defined.	
	$F_{\text{pa}}$	Not defined.	

## STOCK STATUS:

F (Fishing Mortality)				
	2010	2011	2012	
MSY ( $F_{\text{MSY}}$ )	✗	✗	✗	Above target
Precautionary approach ( $F_{\text{pa}}, F_{\text{lim}}$ )	?	?	?	Undefined
SSB (Spawning-Stock Biomass)				
	2011	2012	2013	
MSY ( $B_{\text{trigger}}$ )	?	?	?	Undefined
Precautionary approach ( $B_{\text{pa}}, B_{\text{lim}}$ )	?	?	?	Undefined
Qualitative evaluation	↗	↗	↗	Increasing

Fishing mortality has decreased in recent years but is well above the  $F_{\text{MSY}}$  proxy in 2012. SSB has increased since 1998 and is above the average in 2012. Most recruitments since 2005 have been above the historical mean.

**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 catches should be no more than 13 123 t in 2014. If discard rates do not change from the average of the years 2010–2012, this implies landings of no more than 12 025 t.

## Other considerations

### Management plan

Following the agreed recovery plan ([EC Reg. No. 2166/2005](#)), a 10% reduction in  $F$  would lead to a TAC of 16 750 t, more than 15% above the 2013 TAC (14 144 t). A 15% TAC increase leads to a TAC of 16 266 t in 2014. If the discard rate remains as the mean of the last three years the catches would thus be 17 772 t. This catch is expected to lead to an SSB of 29 830 t in 2015. ICES did not evaluate the plan; however, some elements of the recovery plan were evaluated by ICES in 2010 (ICES, 2010).

The current recovery plan uses target values based on precautionary reference points that are no longer appropriate.

### MSY approach

Because MSY  $B_{\text{trigger}}$  has not been identified for this stock, the ICES MSY approach has been applied without consideration of SSB in relation to MSY  $B_{\text{trigger}}$ .

Following the ICES MSY approach implies a reduction in fishing mortality to 0.24, resulting in catches of no more than 10 001 t in 2014 and landings of 9 172 t if the discarding rate remains as the mean of the last three years. This is expected to lead to an SSB of 41 764 t in 2015.

Following the transition to the MSY approach implies a reduction in fishing mortality to 0.33, resulting in catches of no more than 13 123 t in 2014 and landings of 12 025 t if the discarding rate remains as the mean of the last three years. This is expected to lead to an SSB of 36 861 t in 2015.

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

STECF notes that following the provisions of the recovery plan would imply that the TAC for 2014 should be 16,266 t corresponding to an increase of 15% compared to the agreed TAC for 2013.

### 3.3 Whiting (*Merlangius merlangus*) in Subareas VIII, IX and X

The stock status and advice for this stock for 2014 remains unchanged from that given for 2013. The text below therefore remains largely unchanged from the Consolidated STECF review of advice for 2013 (STECF-12-22).

**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. Preliminary official landings data for whiting in Subarea VII and Divisions IXa are 1 878 t. Landings statistics need to be quality-assured and confirmed for the region. Associated effort should be complied. Survey information is available and could provide information on recruitment.

**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. The advice for 2014 is the same catch advised for 2013 (even though its value cannot be quantified), not that a further 20% reduction in catch be implemented.

This is the second 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 2014. STECF notes that the stock unit definition of whiting in this area is not clear and that further work is required.

### 3.4 Whiting (*Merlangius merlangus*) - IX, X

This stock is dealt with in Section 4.3 of this report.

### 3.5 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 of this report.

### 3.6 Anglerfish (*Lophius piscatorius* and *Lophius budegassa*) in VIIC, 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. 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 2012 were 1300 t; 39% were taken by bottom trawl, 48% by Spanish gillnet, and 13% by Portuguese artisanal gear types. For *Lophius budegassa*, total landings in 2012 were 1,024 t; 72% were taken by bottom otter trawl, 10% Spanish gillnet, and 18% Portuguese artisanal gear types. Discarding is known to occur for both species but cannot be quantified.

**SOURCE OF MANAGEMENT ADVICE:** The management advisory body is ICES. ICES advice is for Subarea VIIC and Division IXa. 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 discards in the assessment since although discarding occurs, it can not be quantified.

#### REFERENCE POINTS

##### *Lophius piscatorius*

	Type	Value	Technical basis
MSY	MSY B <sub>trigger</sub>	Not defined.	
Approach	F <sub>MSY</sub>	0.19	F <sub>0.1</sub> (ICES, 2012b).
Precautionary Approach	B <sub>lim</sub>	Not defined.	
	B <sub>pa</sub>	Not defined.	
	F <sub>lim</sub>	Not defined.	
	F <sub>pa</sub>	Not defined.	

##### *Lophius budegassa*

	Type	Value	Technical basis
MSY	MSY B <sub>trigger</sub>	50% B <sub>MSY</sub>	B <sub>MSY</sub> is implicit estimated from surplus production model ( <a href="#">ICES, 2012</a> ).
Approach	F <sub>MSY</sub>	Relative value	Implicit, estimated from surplus production model ( <a href="#">ICES, 2012</a> ). Fishing mortality values expressed relative to F <sub>MSY</sub> .
Precautionary Approach	B <sub>lim</sub>	Not defined.	
	B <sub>pa</sub>	Not defined.	
	F <sub>lim</sub>	Not defined.	
	F <sub>pa</sub>	Not defined.	

## STOCK STATUS:

### *Lophius piscatorius*

	F (Fishing Mortality)			
	2010	2011	2012	
MSY ( $F_{MSY}$ )	✗	✓	✓	Appropriate
Precautionary approach ( $F_{pa}, F_{lim}$ )	?	?	?	Undefined
	Spawning-Stock Biomass (SSB)			
	2006–2012	2013		
MSY ( $B_{trigger}$ )	?	?		Undefined
Precautionary approach ( $B_{pa}, B_{lim}$ )	?	?		Undefined
Qualitative evaluation	➡	➡		Stable

Fishing mortality has been decreasing and is in 2012 estimated at just below the  $F_{MSY}$  proxy. SSB has been increasing since 1994 and has remained relatively stable since 2005. Recruitment has been low in recent years with no evidence of strong year classes since 2001.

### *Lophius budegassa*

F (Fishing Mortality)				
	2010	2011	2012	
MSY ( $F_{MSY}$ )	✓	✓	✓	Appropriate
Precautionary approach ( $F_{pa}, F_{lim}$ )	?	?	?	Undefined
Biomass				
	2011	2012	2013	
MSY ( $B_{trigger}$ )	✓	✓	✓	Above trigger
Precautionary approach ( $B_{pa}, B_{lim}$ )	?	?	?	Undefined

Biomass at the beginning of 2013 is estimated to be above MSY  $B_{trigger}$ . Fishing mortality has decreased since 1999 and in 2012 it was estimated to be below  $F_{MSY}$ .

**MANAGEMENT OBJECTIVES:** No specific management objectives have been defined for these stocks.

## RECENT MANAGEMENT ADVICE:

For *Lophius piscatorius* ICES advises on the basis of the MSY approach that landings should be no more than 1476 t in 2014. For *Lophius budegassa* ICES advises on the basis of the MSY approach that landings should be no more than 1153 t in 2014. Combined landings of *Lophius piscatorius* and *Lophius budegassa* should be no more than 2629 t in 2014. Discards are known to take place but cannot be quantified; therefore, total catches cannot be calculated.

### Other considerations

#### MSY approach

##### *Lophius piscatorius*

No MSY  $B_{trigger}$  has been defined for this stock, therefore, the ICES MSY approach has been applied without consideration of SSB in relation to MSY  $B_{trigger}$ . The status of the stock in relation to any potential biomass reference point is unknown.

Following the ICES MSY approach implies fishing mortality to be increased by 5.5%. To maintain fishing mortality for both stocks at or below the  $F_{MSY}$  proxy, the F multiplier of *L. piscatorius* is applied to both stocks,



resulting in landings of no more than 1476 t of *L. piscatorius* in 2014. This is expected to lead to a 4% SSB increase in 2015.

#### *Lophius budegassa*

This stock is below  $F_{MSY}$  and above  $MSY B_{trigger}$ . To maintain fishing mortality for both stocks at or below  $F_{MSY}$ , the  $F$  multiplier of *L. piscatorius* is applied to both stocks, resulting in landings of *L. budegassa* of no more than 1153 t in 2014. This is expected to lead to a 3% biomass increase in 2015.

#### *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 2014.

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 also notes that contrary to the statement on current fishing morality for *L. Piscatorius*,  $F$  in 2012 is estimated to be below  $F_{MSY}$ .

STECF notes that anglerfish in VIIIc and IXa are taken in mixed-trawl fisheries and thus also affected by the southern hake and *Nephrops* recovery plan ([Council Regulation \(EC\) No. 2166/2005](#)) effort limitation.

To ensure recovery of anglerfish in VIIIc and IXa, it is essential that the provisions of the management plan for southern 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.

### **3.7 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 of this report).

### **3.8 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 2012, landings were 806 t for *L. boscii*; 95% were taken by bottom otter trawl, 2% by pairtrawl, and 3% by other gear types. Discards were estimated at 371 t for the main fleet, 34% in weight. For *L. whiffiagonis* landings were 288 t in 2012; 98% were taken by bottom otter trawl, 1% by pairtrawl, and 1% by other gear types. Discards were estimated at 31 t, 10% in weight.

**SOURCE OF MANAGEMENT ADVICE:** The management advisory body is ICES. ICES advice is for Subarea VIIIc and Division IXa. The advice is based on an age-based analytical assessment based on landings and CPUE data series from surveys and commercial fleets. Discards are substantial, but not included in the assessment. The two stocks are caught together and the fisheries advice therefore combines both stocks.

#### *Lepidorhombus boscii*

	Type	Value	Technical basis
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*

	Type	Value	Technical basis
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)				
	2010	2011	2012	
MSY ( $F_{MSY}$ )	✗	✗	✓	Appropriate
Precautionary approach ( $F_{pa}, F_{lim}$ )	?	?	?	Undefined
SSB (Spawning-Stock Biomass)				
	2011	2012	2013	
MSY ( $B_{trigger}$ )	?	?	?	Undefined
Precautionary approach ( $B_{pa}, B_{lim}$ )	?	?	?	Undefined
Qualitative evaluation	↗	↗	↗	Increasing

SSB decreased from the late 1980s to a minimum in 2001, but since then SSB has increased to a record high in 2013. Fishing mortality was above the  $F_{MSY}$  proxy until 2011, and in 2012 there was a sharp decrease in F. Recruitment has been around the average since 2000, with the exception of a record high in 2009.

*Lepidorhombus whiffiagonis*

F (Fishing Mortality)				
	2010	2011	2012	
MSY ( $F_{MSY}$ )	✓	✓	✗	Above target
Precautionary approach ( $F_{pa}, F_{lim}$ )	?	?	?	Undefined
SSB (Spawning-Stock Biomass)				
	2011	2012	2013	
MSY ( $B_{trigger}$ )	?	?	?	Undefined
Precautionary approach ( $B_{pa}, B_{lim}$ )	?	?	?	Undefined
Qualitative evaluation	↗	↗	→	Stable

The SSB has increased from a minimum observed in 2009 and is currently the highest observed in the last 15 years. Fishing mortality has decreased since the 1990s and is currently around the  $F_{MSY}$  proxy. 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 2014 should be no more than 1957 t. If discard rates do not change from the average estimated for the last 11 years (2000–2012), this implies catches of no more than 2460 t. For *L. whiffiagonis* landings in 2014 should be no more than 300 t. If discard rates do not change from the average estimated for the last 11 years (2000–2012), this implies catches of no more than 330 t. Combined landings of *Lepidorhombus boscii* and *Lepidorhombus whiffiagonis* should be no more than 2257 t and catches should be no more than 2790 t in 2014.

#### Other considerations

#### MSY approach

Because the two megrim species (*L. whiffiagonis* and *L. boscii*) are not separated in the landings, the advice of the two stocks is linked.  $F_{sq}$  is below  $F_{MSY}$  for both stocks. To maintain fishing mortality for both stocks at or below  $F_{MSY}$ , the  $F$  multiplier of *L. boscii* is applied to both stocks.

For *L. boscii* following the MSY approach implies fishing mortality at  $F_{MSY} = 0.18$ , resulting in landings of no more than 1957 t in 2014. This is expected to lead to an SSB of 7012 t in 2015. For *L. whiffiagonis*, this implies fishing mortality at 0.15, resulting in landings of 300 t in 2014. This is expected to lead to an SSB of 1168 t in 2015.

**STECF COMMENTS:** STECF agrees with the ICES assessment of the state of the stock and the advice for 2014. STECF notes that discards of four-spot megrim and megrim are substantial, estimated to be in the range of 39-63% and 10%–45% of the catch in numbers respectively, and are not included in the assessment.

### 3.9 Plaice (*Pleuronectes platessa*) in VIII, IX and X.

The stock status and advice for this stock for 2014 remains unchanged from that given for 2013. The text below therefore remains largely unchanged from the Consolidated STECF review of advice for 2013 (STECF-12-22).

**FISHERIES:** Plaice is fished by various fleets and gear types covering small-scale artisanal and trawl fisheries. 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, and associated effort should be compiled. Preliminary 2012 official landings for plaice in Subarea VIII and Division IXa were equal to 248 t.

**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.

The “Joint statement by the Council and the Commission” (Council of the European Union Document [Doc 5315/13 PECHE 15](#), 15 January 2013) states:

*The Council and the Commission note that the fishing opportunities regulations include a number of TACs for stocks for which there is limited information on stock status and which are of low economic importance, or are taken only as by-catches, or which show low levels of quota uptake. In these cases, the Council and the*

*Commission consider it appropriate to constrain catches at or below the TAC levels fixed for 2013. To this end, without prejudice to the Commission's right of initiative and the Council's prerogatives under Article 293(1) TFEU, the Commission and the Council consider that it would be desirable to maintain the 2013 TAC level for the stocks listed below for the following five years.*

Plaice TAC unit VIII, IX, X and CECF 34.1.1 is included in the list of the Joint statement by the Council and the Commission.

**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. The advice for 2014 is the same catch advised for 2013 (even though its value cannot be quantified), not that a further 20% reduction in catch be implemented. Due to the uncertainty in the landings data, ICES is not able to quantify the resulting catch. This is the second 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 for 2014.

STECF notes that the stock unit definition of plaice in this area is not clear and that further work is required.

### **3.10 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. Discards are estimated to have been limited in this fishery in the past, but there are some recent reports of high-grading practices due to the landing limits adopted by the industry.

Total landings in 2012 were 4,300t (inshore trawlers 7%, offshore otter trawlers 17%, offshore beam-trawlers 9%, and fixed nets 66%).

**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.

In addition to the two commercial tuning fleets, fisheries-independent data (ORHAGO survey) were incorporated in the assessment this year, following an Inter-Benchmark Procedure. This is considered to be an improvement in the quality of the assessment. The catch and SSB in the forecast are dominated by year classes for which geometric mean recruitment is assumed. The ORHAGO survey provides information on age 1, which could in the future also be used in predicting the incoming year-class strength. The update of the maturity ogive may improve the assessment quality.

#### **REFERENCE POINTS:**

	<i>Type</i>	<i>Value</i>	<i>Technical basis</i>
MSY Approach	MSY B <sub>trigger</sub>	13 000 t	B <sub>pa</sub> (provisional estimate.)
	F <sub>MSY</sub>	0.26	F <sub>max</sub> (ICES, 2010) because stock–recruitment relationship, limited variations of recruitment, and fishing mortality pattern are known with low uncertainty.
Precautionary	B <sub>lim</sub>	Not defined.	
	B <sub>pa</sub>	13 000 t	The probability of reduced recruitment increases when SSB is

Approach			below 13 000 t, based on the historical development of the stock.
	$F_{lim}$	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](#), Annex 7.4.21). 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)				
	2010	2011	2012	
MSY ( $F_{MSY}$ )	✗	✗	✗	Above target
Precautionary approach ( $F_{pa}, F_{lim}$ )	✓	✓	⚠	Increased risk

SSB (Spawning-Stock Biomass)				
	2011	2012	2013	
MSY ( $B_{trigger}$ )	✓	✓	✓	Above trigger
Precautionary approach ( $B_{pa}, B_{lim}$ )	✓	✓	✓	Full reproductive capacity

The most recent estimates of SSB are above the MSY  $B_{trigger}$ . Fishing mortality has been above the  $F_{MSY}$  proxy, and since 2003 it has been around  $F_{pa}$ . SSB in 2012 was revised upwards by 4%.  $F$  in 2011 was revised downwards by 23%. Recruitment values since 2004 are among the lowest in the time-series, with the exception of the 2009 recruitment which is the highest observed.

### RECENT MANAGEMENT ADVICE:

ICES advises on the basis of the transition to the MSY approach that catches in 2014 should be no more than 3270 tonnes. All catches are assumed to be landed.

#### 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 2014. 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 approach implies fishing mortality at the  $F_{MSY}$  proxy = 0.26, resulting in catches of no more than 3051 t in 2014. This is expected to lead to an SSB of 19 105 t in 2015, corresponding to a 14% increase compared with the 2014 SSB. All catches are assumed to be landed.

To follow the transition scheme towards the ICES MSY approach implies fishing mortality at 0.28, resulting in catches of 3270 t in 2014. This is expected to lead to an SSB of 18 847 t in 2015, corresponding to a 12% increase compared with the 2014 SSB. All catches are assumed to be landed.

### PA approach

The fishing mortality in 2013 should be no more than  $F_{pa}$ , corresponding to landings of less than 4606 t in 2014. This is expected to keep SSB above  $B_{pa}$  in 2015 (17,278 t).

**STECF COMMENTS:** STECF agrees with the ICES assessment of the state of the stock but notes that the ICES advice is not consistent with a 15% constraint in interannual variation in TAC. A total catch of 3270 in 2014 on the basis of the MSY transition approach as advised by ICES will lead to a 20% change in TAC. Taking into account a 15% constraint in interannual variation in TAC, would imply that total catches in 2014 should be no more than 3490 t.

STECF further notes that although the spawning stock biomass is evaluated by ICES to be equal or above the precautionary level of 13,000 t, the Council has not decided on (a) a long-term target fishing mortality rate, or (b) a rate of reduction in the fishing mortality rate for application until the target fishing mortality rate decided under (a) has been reached as specified in Article 3.1 of Annex 7.4.21 of the multiannual plan for Bay of Biscay sole in Divisions VIIIa and VIIIb, Council Regulation (EC) No. 388/2006.

## 3.11 Sole (*Solea spp.*) - VIIIcde, IX, X

The stock status and advice for this stock for 2014 remains unchanged from that given for 2013. The text below therefore remains largely unchanged from the Consolidated STECF review of advice for 2013 (STECF-12-22).

**FISHERIES:** Sole is caught mainly in a small-scale multi-gear coastal mixed fishery. Only preliminary landings are available. 2012 official landings for *Solea* spp. (*S. solea*, *S. senegalensis*, and *P. lascaris*) in Divisions VIIIc and were equal to 516t (only Portuguese landings available for Division IXa in 2011 and 2012).

**SOURCE OF MANAGEMENT ADVICE:** The main management advisory body is ICES. ICES advice is for Subarea VIIIc and Division IXa.

**REFERENCE POINTS:** No reference points have been defined for sole in Divisions VIIIc and IXa.

### STOCK STATUS:

F (Fishing Mortality)		
	1977–2011	
Qualitative evaluation	?	Insufficient information

SSB (Spawning-Stock Biomass)		
	1977–2011	
Qualitative evaluation	?	Insufficient information

The available information is insufficient to evaluate stock trends and exploitation status. More information is needed on the contribution of individual *Solea* species to the total landings, which are clearly incomplete and erratic. Landings statistics need to be confirmed and associated effort should be compiled. Sole is poorly suited for monitoring by the surveys carried out in this area. Specific data on life history parameters and length composition is only available for some areas in Division IXa and should be collected for other areas. 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.

The “Joint statement by the Council and the Commission” (Council of the European Union Document [Doc 5315/13 PECHE 15](#), 15 January 2013) states:

*The Council and the Commission note that the fishing opportunities regulations include a number of TACs for stocks for which there is limited information on stock status and which are of low economic importance, or are taken only as by-catches, or which show low levels of quota uptake. In these cases, the Council and the Commission consider it appropriate to constrain catches at or below the TAC levels fixed for 2013. To this end, without prejudice to the Commission's right of initiative and the Council's prerogatives under Article 293(1)*

TFEU, the Commission and the Council consider that it would be desirable to maintain the 2013 TAC level for the stocks listed below for the following five years.

Sole TAC unit Divisions VIIIc, VIId, and VIIE, and Subareas IX and X; EU waters of CECAF 34.1.1 are included in the list of the Joint statement by the Council and the Commission.

**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. The advice for 2014 is the same catch advised for 2013 (even though its value can not be quantified), not that a further 20% reduction in catch be implemented.

This is the second 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 2014.

STECF notes that the stock unit definition of sole in this area is not clear and that further work is required.

### **3.12 Rays and skates in ICES Subareas VIII and IX**

Advice for this stock for the years 2013 and 2014 was given in 2012 and the text below remains unchanged from the Consolidated STECF review of advice for 2013 (STECF-12-22).

**FISHERIES:** Most catches of elasmobranchs in the Bay of Biscay are from trawler fleets operating in Divisions VIIId, b, d and IXa (Spain). Elasmobranch catches from western Iberian waters (ICES Division IXa) are mainly from the Portuguese polyvalent fleet and in particular from the métiers using nets or trammel nets.

Skates and rays fisheries are currently managed under a common TAC, although this complex comprises species that have different vulnerabilities to exploitation. TAC advice is based on the status of the main commercial species, with species-specific advice for other species also provided where relevant.

Demersal elasmobranchs in this region are caught in mixed target and non-target fisheries. TACs alone cannot adequately manage these stocks as catches may still be taken in mixed fisheries and discarded, even after the TAC is exhausted.

Management measures such as closed areas/seasons or effort restrictions may better protect demersal elasmobranchs. In particular, measures to protect spawning/nursery grounds would be beneficial. ICES could provide advice on such measures.

At present rays and skates fisheries are managed by means of a generic, multi-species TAC, along with prohibitions for severely depleted species.

There are few records of the *Dipturus* complex in this ecoregion. Most records are from the northern part of the ecoregion. It is likely that both *D. cf. intermedia* and *D. cf. flossada* occur in this area. Without further information on stock structure and distribution, it is not possible to provide separate advice for these two species in this ecoregion.

**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 <sub>trigger</sub>	Not defined	
Approach	F <sub>MSY</sub>	Not defined	

Precautionary Approach	B <sub>lim</sub>	Not defined	
	B <sub>pa</sub>	Not defined	
	F <sub>lim</sub>	Not defined	
	F <sub>pa</sub>	Not defined	

### STOCK STATUS:

Three commercial skate species (thornback ray, spotted ray, and cuckoo ray) show increasing trends in relative abundance in fishery-independent trawl surveys. There is evidence of a long-term decline to depleted levels in the distribution and relative abundance of one commercial species (*Dipturus batis* complex). Trends in the relative abundance of two other commercial species (blonde ray, undulate ray) are unclear. Starry ray is an abundant non-commercial species and is almost exclusively discarded, and stock trends are decreasing. Discard survivorship is not known.

The advice is based on the stock status of the main commercial species in the ecoregion, with species-specific advice provided below. Landings of skates and rays in the North Sea have generally declined, and this is associated with changes in species composition and relative abundance.

Status of individual stocks is given in the table below.

Species	Area	State of stock
<i>Raja clavata</i> (thornback ray)	VIII	Stable /increasing
	IXa	Stable
<i>Leucoraja naevus</i> (cuckoo ray)	VIIIabd	Increasing
	XIa	Uncertain
<i>Leucoraja naevus</i> (cuckoo ray)	VIII	Uncertain
	IXa	Uncertain
other species	VIII	Uncertain
	IXa	Uncertain
<i>Dipturus batis</i> (Common skate) complex	All areas	Depleted
<i>Raja montagui</i> (Spotted Ray)	VII and IXa	Uncertain

**RECENT MANAGEMENT ADVICE:** The previous advice was given for 2011 and 2012. The basis of this advice was the precautionary approach. This year, individual advice is given for each of the main species, on the basis of ICES approach to data-limited stocks.

### Advice Summary for 2013-2014

ICES provides advice on the overall exploitation (landings and discards) of the ray and skates species assemblage, and also individual species (Table 7.4.24.1). ICES does not advise that general or species-specific TACs be established for each species, at present. This is because a TAC is not considered the most effective means to regulate fishing mortality in these bycatch species.

ICES advises that a suite of species- and fishery-specific measures be developed to manage the commercial fisheries and achieve recovery of the depleted species. Such measures should be developed by management authorities involving all stakeholders; ICES could assist in this process.

Management measures should be framed in a mixed-fisheries context, considering the overall behaviour of demersal fleets, and the drivers for such behaviour. When the TAC is exhausted, catches may continue to take place, but are discarded. In order to achieve optimal harvesting of the commercial species, and to assist recovery of the depleted species, a suite of measures should be put in place.

Closure to fishing of spawning and/or nursery grounds, and measures to protect the spawning component of the population (e.g. maximum landing size) are powerful tools to manage rays and skates. In some cases, single-

species TACs may be appropriate, especially for easily identified species and/or discrete stocks in limited distribution areas.

Given that the European Community intends to introduce a ban on discards, minimum or maximum landing sizes should be carefully considered before they are introduced, because they could lead to increased discards. Size limits may best be applied in target fisheries, if discard (escapee) survival can be shown to be high.

ICES advises that white skate (*Rostroraja alba*) should remain on the Prohibited species list, as it appears to be depleted in this area.

#### Advice for 2013-2014 by individual stocks

Species	Area	Advice
<i>Raja clavata</i> (thornback ray)	VIII	0%
	IXa	-20%
<i>Leucoraja naevus</i> (cuckoo ray)	VIII	+6%
	IXa	-20%
Other species	VIII	-20%
	IXa	-20%
Other species	IXa	-20%
<i>Raja alba</i> (White skate)	All areas	Remain on prohibited species list
<i>Dipturus batis</i> (Common skate) complex	All areas	No targeted fisheries, minimize by-catch
<i>Raja montagui</i> (Spotted Ray)	VIII and IXa	-20%
<i>Raja brachyuran</i> (Blonde ray)	IXa	-20%

#### Outlook for 2012 and 2013

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 2013 and 2014. 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.

**STECF COMMENTS:** STECF agrees with the ICES advice.

### 3.13 *Scyliorhinus canicula* and *Scyliorhinus stellaris* in Subareas VIII, IX and X

#### 3.13.1 *Scyliorhinus canicula* in VIIIc and IXa

Advice for this stock for the years 2013 and 2014 was given in 2012 and the text below remains unchanged from the Consolidated STECF review of advice for 2013 (STECF-12-22).

**FISHERIES:** Lesser spotted dogfish *Scyliorhinus canicula* is taken primarily as a by-catch in mixed demersal fisheries targeting other species and a large proportion of the catch is discarded with survivorship considered to be high, although in some coastal areas there are seasonal small-scale directed fisheries (especially for use as



bait in pot fisheries, but this is unquantified). In the Bay of Biscay and Iberian waters landings of *Scyliorhinus* spp. have recorded since the mid 1990s. For division VIIc and IXa and landings have fluctuated between 305t and 1374t reaching 904t in 2011.

**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 <sub>trigger</sub>	Not defined	
Approach	F <sub>MSY</sub>	Not defined	
Precautionary	B <sub>lim</sub>	Not defined	
Approach	B <sub>pa</sub>	Not defined	
	F <sub>lim</sub>	Not defined	
	F <sub>pa</sub>	Not defined	

**STOCK STATUS:**

F (Fishing Mortality)		
	2009–2011	
MSY (F <sub>MSY</sub> )	?	Unknown
Precautionary approach (F <sub>pa</sub> , F <sub>lim</sub> )	?	Unknown
Qualitative evaluation	?	Unknown
SSB (Spawning-Stock Biomass)		
	2005–2011	
MSY (B <sub>trigger</sub> )	?	Unknown
Precautionary approach (B <sub>pa</sub> , B <sub>lim</sub> )	?	Unknown
Qualitative evaluation	↓	Decreasing

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 assessment:

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

Species-specific landings of lesser-spotted dogfish are stable though data are not complete. The average of the stock size indicator (kg per 30 minutes) in the last two years (2010-2011) is 9% lower than the average of the five previous years (2005-2009).

**RECENT MANAGEMENT ADVICE:**

*Scyliorhinus canicula* (Lesser-spotted dogfish)

Management Objective (s)	Landings in 2011 and 2012
Transition to an <b>MSY approach</b> with caution at low stock size	Less than 1.7 thousand t
Cautiously avoid impaired recruitment ( <b>Precautionary Approach</b> )	Less than 1.7 thousand t
Cautiously avoid impaired recruitment and achieve other objective(s) of a <b>management plan</b> (e.g., catch stability)	n/a

There is no TAC in place for *Scyliorhinus canicula*.

#### Advice for 2013-2014 by individual stocks

Species	Area	Advice
<i>Scyliorhinus canicula</i> (lesser spotted dogfish)	VIIIc, IXa	Decrease in catches of 9% No individual TAC

For this stock the abundance is estimated to have decreased by 9% between 2005 and 2009 (average of the five years) and 2010–2011 (average of the two years). This implies a 9% decrease in catches in relation to the last three years' average. Because the data for catches of lesser-spotted dogfish are not fully documented (due to the historical use of generic landings categories), ICES is not in a position to quantify the result.

Given that there is a consistent increase in stock size over an extended period of time, no additional precautionary buffer is needed.

ICES does not advise that an individual TAC be set for this stock, at present.

#### Outlook for 2013 and 2014

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 2013 and 2014. The rate of exploitation of these stocks relative to  $F_{MSY}$  is not currently known.

**STECF COMMENTS:** STECF agrees with the ICES advice.

#### 3.13.2 *Scyliorhinus canicula* in VIIIabd

Advice for this stock for the years 2013 and 2014 was given in 2012 and the text below remains unchanged from the Consolidated STECF review of advice for 2013 (STECF-12-22).

**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. For divisions VIIIabd landings have fluctuated from 833t to 1727t with an increasing global trend. In 2011 Lesser spotted dogfish landing were 1459t.



**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 Approach	$B_{lim}$	Not defined	
	$B_{pa}$	Not defined	
	$F_{lim}$	Not defined	

	F <sub>pa</sub>	Not defined	
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## STOCK STATUS:

F (Fishing Mortality)		
	2009–2011	
MSY (F <sub>MSY</sub> )	?	Unknown
Precautionary approach (F <sub>pa</sub> , F <sub>lim</sub> )	?	Unknown
Qualitative evaluation		Decreasing
SSB (Spawning-Stock Biomass)		
	2005–2011	
MSY (B <sub>trigger</sub> )	?	Unknown
Precautionary approach (B <sub>pa</sub> , B <sub>lim</sub> )	?	Unknown
Qualitative evaluation		Increasing

Species-specific landings of lesser-spotted dogfish are stable, though data are not complete. The stock is estimated to be increasing because commercial and survey catch rates are increasing. Given increased abundance and reduced catches, it can be inferred that exploitation rate (fishing mortality) has declined. The average of the stock size indicator (kg day<sup>-1</sup>) in the last two years (2010-2011) is 39% higher than the average of the five previous years (2005-2009).

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 assessment:

Species	Area	State of stock
<i>Scyliorhinus canicula</i> (lesser spotted dogfish)	VIIIabd	Increasing

## RECENT MANAGEMENT ADVICE:

*Scyliorhinus canicula* (Lesser-spotted dogfish)

Management Objective (s)	Landings in 2011 and 2012
Transition to an <b>MSY approach</b> with caution at low stock size	Less than 1.7 thousand t
Cautiously avoid impaired recruitment ( <b>Precautionary Approach</b> )	Less than 1.7 thousand t
Cautiously avoid impaired recruitment and achieve other objective(s) of a <b>management plan</b> (e.g., catch stability)	n/a

There is no TAC in place for *Scyliorhinus canicula*.

### Advice for 2013-2014 by individual stocks

Species	Area	Advice
<i>Scyliorhinus canicula</i> (lesser spotted dogfish)	VIIIabd	Maximum increase of 20% No individual TAC

## Outlook for 2013 and 2014

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 2012 and 2014. The rate of exploitation of these stocks relative to  $F_{MSY}$  is not currently known.

**STECF COMMENTS:** STECF agrees with the ICES advice.

## 3.14 Rays and skates in ICES Subareas X, XII, and XIV (Azores and Mid-Atlantic Ridge).


Advice for this stock for the years 2013 and 2014 was given in 2012 and the text below remains unchanged from the Consolidated STECF review of advice for 2013 (STECF-12-22).

**FISHERIES:** There are at least seven species of skate (Rajidae) in the shallower parts of the Azores and Mid-Atlantic Ridge, with other deep-water species also occurring in the area. Thornback ray is the dominant ray species in this area. Stock boundaries are not known for the species in this area, neither are the potential movements of species that also occur on the continental shelf of mainland Europe. The deep-water species at Azores and the Mid-Atlantic Ridge may have relatively wide geographic distributions. The connectivity between shallower water species around the Azores with mainland Europe is unclear, and these species may form discrete stocks. This area is mainly a natural deep-water environment exploited by small-scale fisheries in the Portuguese EEZ in the Azores and industrial deep-sea fisheries in international waters. Landings from the Mid-Atlantic Ridge remain very small and variable, or even absent, and few vessels find the Mid-Atlantic Ridge fisheries profitable. Demersal elasmobranchs are caught in the Portuguese EEZ in the Azores by a multispecies demersal fishery, using handlines and bottom longlines, and by the black scabbardfish fishery using bottom longlines. The most commercially important elasmobranchs caught and landed from these fisheries are *Raja clavata* and *Galeorhinus galeus*. Rays and skates (mainly thornback ray) at the Azores and Mid-Atlantic Ridge (ICES Divisions X, XII, and XIV are predominantly an Portuguese fishery. Landings increased from around 50 tonnes in the late 80's and early 90's to about 100 tonnes in the late 90's and early 2000's. Recently landings have increased from 60 tonnes in 2009 to 91 tonnes in 2011.

**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:

F (Fishing Mortality)		
	2009–2011	
MSY ( $F_{MSY}$ )	?	Unknown
Precautionary approach ( $F_{pa}, F_{lim}$ )	?	Unknown
Qualitative evaluation		Increasing
SSB (Spawning-Stock Biomass)		
	2005–2011	
MSY ( $B_{trigger}$ )	?	Unknown
Precautionary approach ( $B_{pa}, B_{lim}$ )	?	Unknown

Qualitative evaluation		Decreasing
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Landings have fluctuated over time, but have been higher since the mid-1990s. Existing survey data are limited for nearly all species. The dominant species in catches at Azores and the Mid-Atlantic Ridge is thornback ray; for this species the average of the stock size indicator (in number) in the last two years (2010–2011) is lower by more than 50% compared to the three previous years with data (2005, 2007, and 2008).

## **RECENT MANAGEMENT ADVICE:**

### **Advice for 2013-2014**

As thornback ray is the dominant ray species at Azores and the Mid-Atlantic Ridge, the advice for skates and rays is based on the status of this species. Based on ICES approach to data-limited stocks, ICES advises that catches should be decreased by 36%. Because the data for catches are not fully documented and not reliable, ICES is not in a position to quantify the result.

ICES does not advise that general or species-specific TACs be established at present. This is because a TAC is not the most effective means to regulate fishing mortality in these bycatch species. ICES advises that a suite of species- and fishery-specific measures be developed to manage the commercial fisheries on these species and achieve recovery of the depleted species. Such measures should be developed in collaboration between management authorities and all stakeholders. ICES could assist in this process. Species- and fishery-specific measures may include seasonal and/or area closures, technical measures, and tailored measures for target fisheries.

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

### ***Other considerations***

#### ***ICES approach to data-limited stocks***

As thornback ray is the dominant ray species at Azores and the Mid-Atlantic Ridge, advice for skates and rays is based on the status of this species.

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 five preceding values, combined with recent catch or landings data. Knowledge about the exploitation status also influences the advised catch.

For thornback ray the abundance is estimated to have decrease by more than 20% between 2005 and 2009 (average of the three years with data) and 2010–2011 (average of the two years). This implies a decrease of catches of 20% in relation to the last three years' average catch.

Additionally, considering that exploitation is unknown, ICES advises that catches should decrease by a further 20% as a precautionary buffer, corresponding to a total catch reduction of 36%. Because the data for catches are not fully documented and considered unreliable, ICES is not in a position to quantify the result.

ICES does not advise that general or species-specific TACs be established at present. This is because a TAC is not the most effective means to regulate fishing mortality in these bycatch species. ICES advises that a suite of species- and fishery-specific measures be developed to manage the commercial fisheries for these species and achieve recovery of the depleted species. Such measures should be developed in collaboration between management authorities and all stakeholders. ICES could assist in this process. Species- and fishery-specific measures may include seasonal and/or area closures, technical measures, and tailored measures for target fisheries.

### ***Additional considerations***

There is no TAC for skates in this region. Landings of skates and rays have fluctuated between 60 and 90 t per year since 2001. Restrictive quotas on other deep-water species may affect the catch of skates and rays due to restrictions in effort.

Management measures such as closed areas/seasons or effort restrictions may be preferable to manage fisheries and protect rays and skates, rather than a TAC. In particular, measures to protect spawning/nursery grounds would be beneficial. ICES could provide advice on such measures.

Fisheries are restricted in certain areas of the Mid-Atlantic ridge to protect coral and other vulnerable ecosystems.

Fishing below 200 m using gillnets and other forms of tangle netting is banned to prevent damage to vulnerable habitats.

Management of deep-water fisheries by NEAFC contains measures that affect fisheries where these species are caught. These include effort limitations, area and gear restrictions (<http://www.neafc.org/measures>). The recommendations that are relevant to elasmobranchs in this region include:

- Recommendation III (2006): Since 2006 NEAFC has prohibited fisheries with gillnets, entangling nets, and trammelnets at depths below 200 m and has introduced measures to remove and dispose of unmarked or illegal fixed gear and retrieve lost gear to minimize ghost fishing;
- Recommendations IX (2007) and IX (2008): Bottom fishing (bottom trawling and fishing with static gear, including bottom-set gillnets and longlines) was forbidden in some areas of Hatton Bank and Rockall Bank;
- Recommendation XVI (2008): The access to the new bottom fishing areas (considered as other areas not mapped as actual existing bottom fishing areas) was limited;
- Recommendation VII (2009) and REC VI (2010): Since 2009 effort was limited and set at 65% of the highest level put into deep-sea fishing in previous years for the relevant species;
- Recommendation XIV (2009): During 2009 five areas (including three seamounts) on the Mid-Atlantic Ridge in the high seas in the Northeast Atlantic, were closed temporarily to bottom fisheries (fishing gears that are likely to contact the seabed) under its policy for area management.

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

### 3.15 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 and at present, STECF is unable to provide additional information and advice for subareas VIII, IX and X separately. Advice from ICES on tope is provided at the NE Atlantic regional level and is given in Section 8.10 of this report.

### 3.16 Other Demersal elasmobranchs in the Bay of Biscay and Iberia

Advice from ICES for Angel sharks (*Squatina squatina*) and Smooth Hounds (*Mustellus spp*) is provided at the NE Atlantic regional level and is given in Sections 8.17 and 8.18 of this report.

### 3.17 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 and 2012 were 14 530 t and 14 402 t respectively.

**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 $B_{\text{pa}}$ .
	$F_{\text{MSY}}$	Not defined.	
Precautionary approach	$B_{\text{lim}}$	21 000 t	$B_{\text{lim}}: B_{\text{loss}} = 21\,000\text{ t (1989 SSB)}$ .
	$B_{\text{pa}}$	33 000 t	$B_{\text{pa}} = B_{\text{loss}} \times \exp(1.645\sigma)$ .
	$F_{\text{lim}}$		Not defined.
	$F_{\text{pa}}$	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)			
	2010	2011	2012
MSY ( $F_{MSY}$ )	?	?	Undefined
SSB (Spawning-Stock Biomass)			
	2011	2012	2013
MSY ( $B_{trigger}$ )	✓	✓	✓ Above trigger
Precautionary approach ( $B_{pa}, B_{lim}$ )	✓	✓	✓ Full reproductive capacity

The spawning-stock biomass has been above the limit reference point since 2006 and above the MSY  $B_{escapement}$  since 2010. Recruitment in 2013 is around the 30th percentile of the historical series. The harvest rate in 2012 was below the average of the historical series since 1987 (the years 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 2013 to 30 June 2014 should be no more than 18 000 tonnes.

### *Other considerations*

#### *Management plan*

Following the management plan proposed by the European Commission in 2009 ([COM/2009/399 final](#)), the TAC for the fishing season running from 1 July 2013 to 30 June 2014 should be established at 17 100 tonnes (as stated in Annex 1 of the proposal for an SSB in the range 56 001–57 000 t).

#### *MSY approach*

If the objective is to maintain the spawning-stock biomass above the provisional MSY  $B_{escapement}$  in 2014, a catch of less than 51 000 t can be taken in the period 1 July 2013 to 30 June 2014. However, such a catch is not considered precautionary as it leads to a 31% probability of SSB being less than  $B_{lim}$  by 2014.

#### *PA approach*

To reduce the risk to less than 5% of the SSB in 2014 falling below  $B_{lim}$ , catches in the period 1 July 2013–30 June 2014 should be less than 18 000 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 previously recommended 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 Waters 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 depend heavily on the coming recruitment for which there is no information yet. The autumn JUVENA survey started in 2003. ICES considers that the JUVENA acoustic index of juveniles is a valid indicator of the strength of the incoming recruitment and hence useful for improving the forecast of the population and potentially its assessment. The use of this index as a tool to forecast next year's population, could serve to either review the TAC that currently runs from July to June, or to generate preliminary 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 (2010-2011, 2011-12 and 2012-13). The provision of the proposed management plan prescribe a TAC of 17 100 tonnes for the period 1 July 2013 to 30 June 2014 and would give rise to a SSB in 2014 in the range 68,001–69,000 t as specified in Annex 1 of the proposed plan.

### 3.18 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 and 5,589 t in 2012 (99.6% purse-seiners, 0.4% other gear types).

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

**REFERENCE POINTS:** No reference points have been set for the stock. The observed harvest on the southern stock has been in the range of 10–40%. These harvest rates correspond to approximately 90–66% spawning biomass per recruit (SBPR).

#### STOCK STATUS:

F (Fishing Mortality)	
	2010–2012
Qualitative evaluation	<div>?</div> Insufficient information
SSB (Spawning Stock Biomass)	
	2010–2012
Qualitative evaluation	<div>?</div> Variable without trend

In Division IXa South (where the main part of the catch is taken), the fishery seems to have been sustainable over the period and the survey biomass is highly variable without clear trends. The 2013 biomass index is 49% below the median historical survey results (PELAGO). In the northern area the biomass index (PELAGO and PELACUS) is 34% above of the historical median in 2013, decreasing from very high values in 2011. The observed harvest rate on the southern stock has been in the range of 10–40%; for the northern stock the harvest rate was around 14% in 2011, which is considered low. There is no information on recruitment that will form the bulk of the catches in 2014.

**RECENT MANAGEMENT ADVICE:** ICES cannot give catch advice for 2014. 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 historical fisheries and management measures seem to have been sustainable.

#### Other considerations

No reliable analytical assessment can be presented for this stock. This is because insufficient data are available. Fishing possibilities cannot be projected.

#### Precautionary considerations

The historical fisheries management seems to have been sustainable. No catch advice can be given for 2014 because of lack of available data for the year classes that will constitute the bulk of the biomass and catches.

#### Additional considerations

As this stock experiences high natural mortality and is highly dependent upon recruitment, an in-season management or alternative management measures could be considered. Information from the PELAGO and PELACUS spring surveys available on 1st of May could be used as a basis for in-year advice, depending on the availability of time-series for these surveys.

Results from the acoustic survey (ECOCÁDIZ) in early August this year will contribute to the perception about the state of the anchovy biomass in Division IXa South in 2013. Besides maintaining the current monitoring



system, an abundance survey of (0-group) juveniles is needed to improve catch advice. Juveniles will constitute the bulk of the spawning biomass and catch in 2014.

Recent studies on genetics indicate that the stock inhabiting Division IXa South (Algarve and Cadiz) is different genetically from the one inhabiting the remaining parts of Division IXa (Zarraonaindia *et al.*, 2012). Given the differences in genetics and stock dynamics between the northern and southern parts of the area, 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 the spring Portuguese acoustic survey as the main descriptor since this is the only 2013 index. A recruitment survey took place in autumn 2012 (ECOCÁDIZ RECLUTAS) pointing towards a recruitment below average, which is in line with the biomass index. The ECOCÁDIZ acoustic survey will be carried out in early August.

In the northern area, the combined PELAGO and PELACUS acoustic survey is used to describe the stock. The high 2011 biomass index in the survey is supported by high catches in this area. Length samples of the anchovy indicated that the outburst was due to recruitment from the area.

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

### 3.19 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.

### 3.20 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 2012 reached 24 900 t, just above the average of the last five years (2008-2012).

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

**REFERENCE POINTS:** No precautionary reference points have been defined for this stock.  $F_{35\%SPR}$  (0.11) is proposed as a proxy for  $F_{MSY}$ . Historical fishing mortalities have on average (0.09) been at or below the candidate  $F_{MSY}$  (though actual estimates are very uncertain).

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

#### STOCK STATUS:

F (Fishing Mortality)			
	2010	2011	2012
MSY ( $F_{MSY}$ )	✓	✓	✓ Appropriate
Precautionary approach ( $F_{pa}, F_{lim}$ )	?	?	? Not defined
SSB (Spawning-Stock Biomass)			
	2011	2012	2013
Qualitative evaluation	→	→	→ Below long term average

Fishing mortality has decreased in the last two years. The SSB has decreased gradually since 2007 and is at present around 30% below the long-term average. Recruitment is estimated to be above average in 2011.

#### RECENT MANAGEMENT ADVICE:

ICES advises on the basis of the MSY approach that catches should be no more than 35 000 t in 2014. All catches are assumed to be landed.

#### Other considerations

#### MSY approach

Since  $MSY B_{trigger}$  has not been identified for this stock, the ICES MSY approach has been applied without consideration of SSB in relation to  $MSY B_{trigger}$ .

Following the ICES MSY approach implies that fishing mortality can increase to  $F_{MSY}$ , resulting in catches of no more than 35 000 t in 2014. This is expected to lead to an SSB of 233 000 t in 2015. Discards are considered negligible and therefore all catches are assumed to be landed.

#### **Other considerations**

Currently, the biomass is 30% below the long-term average. Following the MSY approach implies an increase in fishing mortality. Managers may want to consider keeping  $F$  at the 2013 level to ensure a greater increase in biomass than by fishing at  $F_{MSY}$ .

The traditional fishery across fleets has for a long time targeted juvenile age classes. This exploitation pattern combined with at a moderate exploitation rate does not seem to have been detrimental to the dynamics of the stock.

The advice pertains to *Trachurus trachurus*, while the TAC is set for all *Trachurus* species, including *T. picturatus* (blue jack mackerel) and *T. mediterraneus*. In 2011 12% of the catches consisted of other species than *T. trachurus*, and this percentage can vary from year to year. ICES has no information on the status of the other *Trachurus* species in this area.

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

### **3.21 Horse mackerel (*Trachurus spp*) in CECAF areas (Madeira Island)**

No additional information on this stock was available to the STECF since 2012, hence the text below remains unchanged from the Consolidated STECF review of advice for 2013 (STECF-12-22).

STECF did not have access to any recent stock assessment information on *Trachurus spp* in this area. 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. A TAC in area ICES X for 2010 was set to 1,229 t and was taken exclusively by Portugal. No TAC has been set since 2010.

**STECF COMMENTS:** No comments

### **3.22 Horse mackerel (*Trachurus spp*) in CECAF areas (Canary Islands)**

No additional information on this stock was available to the STECF since 2012, hence the text below remains unchanged from the Consolidated STECF review of advice for 2013 (STECF-12-22).

STECF did not have access to any recent stock assessment information on horse mackerel in this area.

A TAC in area ICES X for 2010 was set at 1,229 t and was taken exclusively by Spain. No TAC has been set since 2010.

**STECF COMMENTS:** No comments

### **3.23 Horse mackerel (*Trachurus spp*) in ICES Subarea X (Azores Islands)**

No additional information on this stock was available to the STECF since 2012, hence the text below remains unchanged from the Consolidated STECF review of advice for 2013 (STECF-12-22).

STECF did not have access to any recent stock assessment information on *Trachurus spp* in ICES X. Therefore, there is no updated advice and the text of this section remains unchanged from the STECF Review of advice for 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)	
	2008–2010
Qualitative evaluation	 Insufficient information

SSB (Spawning-Stock Biomass)	
	2008–2010
Qualitative evaluation	 Increase

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 lpue 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.

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

### 3.24 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 2012 was 55 kt, where 100% are landings (99% purse seine and 1% 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)			
	2010	2011	2012
Quality considerations			 Above average

SSB (Spawning Stock Biomass)			
	2011	2012	2013
Quality considerations			 64% Below average

The biomass of age 1 and older fish has decreased since 2006. In 2012, the biomass was 64% below the long term average. Recruitment has been below the long term average since 2005. Fishing mortality fluctuated

without a clear trend. In 2010-2011 fishing mortality was well above the long term average but it decreased 33% from 2011 to 2012.

**RECENT MANAGEMENT ADVICE:** ICES advises on the basis of precautionary considerations taking into account current low biomass that catches in 2014 should be no more than 17 000 tonnes. Discards are considered to be negligible and all catches are assumed to be landed.

#### *Other considerations*

##### *Management plan*

ICES has evaluated a management plan as requested by the EC (ICES, 2013a). ICES concluded the plan is provisionally precautionary, causing low probabilities of unsustainable fishing mortality, when the biomass used for comparison in the harvest control rule is the B1+ in the beginning of the intermediate year.

Following the proposed EC management plan implies the TAC is set following the formula  $0.36 \cdot (B_{1+}(2013) - \text{lower trigger level}) = (0.36 \cdot (192 - 135))$  because biomass is currently between the two trigger points in the harvest rule, which results in a catches of no more than 20 520 t in 2014. Discards are considered to be negligible and all catches are assumed to be landed.

##### *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. However, taking into account the low biomass, below previous Bloss and the below average recruitment, fishing mortality F should be reduced further. In order that F reduces to zero at zero biomass the reduction should be the ratio between the current biomass ( $B_{1+(2013)}=192$  kt) and the average biomass in this period (484 kt, ratio of 40%) to  $F=0.10$ . This results in catches of no more than 17 000 t. Discards are considered to be negligible and all catches are assumed to be landed.

##### *Additional considerations*

##### Management plan evaluations

ICES has evaluated a proposed management plan developed by Portugal and Spain. Since the stock has no agreed biomass reference points and given the data available, ICES was unable to define a Blim to use for this evaluation. Therefore ICES concludes the plan is provisionally precautionary, because it gives low probabilities of exceeding Floss or driving B1+ below Bloss and high probability of rapid recovery when B1+ declines to below trigger values. The proposed plan implies a relatively modest exploitation rate with mean  $F=0.22$  which is 70% of natural mortality. Given that F slightly lower than natural mortality is a potential proxy for FMSY (DeRiso 1982), the plan results in exploitation in the lower range of candidate FMSY values.

Further exploration of sardine stock dynamics is required; for example it may be possible to draw inferences from studies of other sardine stock dynamics at low biomass. This will provide a better informed basis for determining precautionary criteria which may improve the evaluation of the current proposed plan. Additionally, alternative settings (lower target catch, higher trigger points) and catch stabilisers could be tested to improve the performance of the plan and make it more precautionary.

**STECF COMMENTS:** STECF agrees with the ICES assessment of the state of the stock and the advice for 2014. STECF notes that, as specified in the Commission Communication to the Council concerning a consultation on Fishing Opportunities for 2014 (COM(2013) 319 final, “the Commission will also propose TACs or effort limits at levels consistent with Commission proposals for long-term plans”. STECF further notes that for sardines in areas VIIIc and IXa, ICES has evaluated a management plan developed by Portugal and Spain as requested by the EC (ICES, 2013) and concluded that the plan is provisionally precautionary. STECF notes that, according to the proposed management plan, catch in 2014 should not exceed 20 520 t.

##### Reference

ICES. 2013. Management plan evaluation for sardine in Divisions VIIIc and IXa. Report of the ICES Advisory Committee, 2013. ICES Advice, 2013. Book 7. Section 7.3.5.1.

## **3.25 Sardine in Divisions VIIIa,b,d and Subarea VII**

**FISHERIES:** Most catches are taken by purse-seiners and pelagic trawlers. 90% of the French catches are made from purse-seiners. Sardine catches are highest in the second semester of the year. In Spain, vessels target

anchovy, mackerel, sardine, and horse mackerel; in summer, part of the fleet switches to tuna fishing during quarter 3. Discards are unknown but the available information suggest their magnitude is low and variable depending on the vessel type. Fleets and catches in subarea VII are very variable and present a mainly opportunistic nature although there are also locally some long well established small sardine fishery (e.g. Cornwall in UK, Brittany in France). In 2012, total catch was 37 kt, 100% being landed (80% purse seiners, 4% pelagic trawl, 16% diverse fleets in VII). Discards are considered negligible.



#### SOURCE OF MANAGEMENT ADVICE:

The main management advisory body is ICES.

#### REFERENCE POINTS:

No reference points are defined for this stock. Cohort curve analysis (Figure 7.4.20.2) from the acoustic survey and catches in Division VIIIabd suggests  $F$  is around or below natural mortality ( $M$ ), and is likely to be close to maximum sustainable yield.

#### STOCK STATUS:

F (Fishing Mortality)		
2000–2012		
Qualitative evaluation		Below possible reference points
SSB (Spawning Stock Biomass)		
2009–2013		
Qualitative evaluation		Decreasing to just below long term average

Catches have been relatively stable since 2000 with an increasing trend in divisions VIIa,b,d and decreasing in subarea VII. The average of the combined biomass indices in the last two years (2011-2012) are around 27% lower than the average of the three previous years (2008-2010) in the divisions VIIa,b,d. Recruitment in 2012 is the highest in the time series. An analysis shows that  $F$  is just below natural mortality and is likely to be close to maximum sustainable yield. There is no biomass or recruitment information for Subarea VII.

#### RECENT MANAGEMENT ADVICE:

This is the first time ICES gives advice for sardine in Divisions VIIa,b,d and subarea VII. ICES advises on the basis of precautionary considerations catches of no more than 28 049 t. Discards are assumed to be negligible, therefore all catches are assumed to be landed

#### *Other considerations*

No analytic assessment can be presented. The main cause of this is lack of data, and times series of age structure are too short for divisions VIIa,b,d while they are non-existent in subarea VII for major countries involved in that fishery. Therefore, fishing possibilities cannot be projected.

#### *ICES approach to data-limited stocks*

For data-limited stocks for which biomass indices 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 index values with the three preceding values, combined with recent catch data. Knowledge about the exploitation status also influences the advised catch.

For this stock the biomass is estimated to have decreased by more than 20 % between 2009- 2011 (average of the three years) and 2012-2013 (average of the two years). Indices are only available for VIIabd (where major catches come from) but considered representative for the whole stock.

This implies a decrease of catches of at most 20% in relation to the average of the last 3 year catch, corresponding to catches of no more than 28 049 t.

Considering that exploitation is likely to be close to maximum sustainable yield, no additional precautionary reduction is needed.

Discards are known to take place but considered negligible, therefore all catches are assumed to be landed.

#### *Additional considerations*

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 VIIIabd and subarea VII 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 VIIIabd and VII).

**STECF COMMENTS:** STECF agrees with the ICES assessment of the state of the stock but notes that the 20% reduction to the last 3 years catches result in 27554 t instead of the 28 049 tonnes as advised by ICES for 2014.

### 3.26 Blue jack mackerel (*Trachurus picturatus*) in Subdivision Xa2 (Azores)



**FISHERIES:** 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. Landings decreased substantially in 2011 and 2012 to 972 t and 567 t respectively. 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 the period 2010-2013 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)	
	2008–2010
Qualitative evaluation	 Insufficient information
SSB (Spawning-Stock Biomass)	
	2008–2010
Qualitative evaluation	 Increase

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:** The 2012 advice for this stock is biennial and valid for 2013 and 2014 (see [ICES, 2012](#)): *ICES advises on the basis of the approach for data limited stocks that catches should be no more than 1800 tonnes.*

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

### 3.27 Grey Gurnard (*Trigla gurnardus*) in the Bay of Biscay and Iberian waters

The stock status and advice for this stock for 2014 remains unchanged from that given for 2013. The text below therefore remains largely unchanged from the Consolidated STECF review of advice for 2013 (STECF-12-22).

**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. The advice for 2014 is the same catch advised for 2013 (even though its value cannot be quantified), not that a further 20% reduction in catch be implemented.

This is the second 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 2014.

STECF notes that in 2011, advice for grey gurnard was given for the Northeast Atlantic as a whole. Since 2012, 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.

### **3.28 Pollack (*Pollachius pollachius*) in the Bay of Biscay and Iberian waters**

The stock status and advice for this stock for 2014 remains unchanged from that given for 2013. The text below therefore remains largely unchanged from the Consolidated STECF review of advice for 2013 (STECF-12-22).

**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. Official landings of Pollack in Subarea VIII and Division IXa in 2012 are equal to 1 392 t. 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	?	Insufficient information

SSB (Spawning-Stock Biomass)		
		1977–2011
Qualitative evaluation	?	Insufficient information

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.

The “Joint statement by the Council and the Commission” (Council of the European Union Document [Doc 5315/13 PECHE 15](#), 15 January 2013) states:

*The Council and the Commission note that the fishing opportunities regulations include a number of TACs for stocks for which there is limited information on stock status and which are of low economic importance, or are taken only as by-catches, or which show low levels of quota uptake. In these cases, the Council and the Commission consider it appropriate to constrain catches at or below the TAC levels fixed for 2013. To this end, without prejudice to the Commission's right of initiative and the Council's prerogatives under Article 293(1) TFEU, the Commission and the Council consider that it would be desirable to maintain the 2013 TAC level for the stocks listed below for the following five years.*

Pollack TAC unit IX, X, CECF 34.1.1 (EU) is included in the list of the Joint statement by the Council and the Commission. This affects pollack in Division IXa, but not pollack in Subarea VIII.

**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. The advice for 2014 is the same catch advised for 2013 (even though its value cannot be quantified), not that a further 20% reduction in catch be implemented.

This is the second 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 2014.

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



### 3.29 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 the Bay of Biscay and Iberian waters. Advice from ICES on red gurnard is provided at the NE Atlantic regional level and is given in Section 8.6 of this report.

### 3.30 Red mullet (*Mullus surmuletus* and *Mullus barbartus*) in the Bay of Biscay and Iberian waters

STECF did not have access to any recent stock assessment information on red mullet in the Bay of Biscay and Iberian waters. Advice from ICES on red mullet is provided for Western Waters (Subareas and Divisions Vi, VIIa-c, e-k, VIII and IXa) and is given in Section 3.31 of this report.

### 3.31 Sea bass (*Dicentrarchus labrax*) in the Bay of Biscay (Divisions VIII a, b)

**FISHERIES:** Sea bass in the Bay of Biscay is mainly caught by France, accounting for more than 90% of international catches. In 2012 preliminary French official total landings were 2,325t and preliminary UK official landings were equal to 5t. Total ICES estimated landings based on an analysis of French logbook, auction and VMS data were equal to 2.551t. Sea bass is exploited by longlines mainly from July to October, and by pelagic trawling, gillnets, and in a mixed bottom trawl fishery from November to April on pre-spawning and spawning grounds when fish aggregate. From 2000 to 2008, pelagic trawlers caught around 25% of the total catches, decreasing to 9% in 2012 because pelagic trawlers shifted their activity to the English Channel. Spain accounts for about 10% of all catches, mainly with bottom otter trawls. Discarding is thought to be low; some discards may occur due to individual landing limitations by trip, but these are not quantified. Recreational fisheries are an important part of the total removals, but these are not accurately quantified. Commercial catches with all gear types exhibit a broad age range. Catches may be strongly influenced by intermittent strong year classes and periods of poor recruitment.

**SOURCE OF MANAGEMENT ADVICE:** The main management advisory body is ICES. The advice is based on a precautionary reduction of catches because of missing or non-representative data. The methods applied to derive quantitative advice for data-limited stocks are expected to evolve as they are further developed and validated.

**REFERENCE POINTS:** No reference points have been defined for this stock.

#### STOCK STATUS:

F (Fishing Mortality)		
2010–2012		
Qualitative evaluation	?	Insufficient information

SSB (Spawning-Stock Biomass)		
2010–2012		
Qualitative evaluation	?	Insufficient information

Only commercial landings are available, although recreational fisheries are significant. Surveys in France in 2009–2010 estimated that the recreational fishery (angling and non-angling gears) in the Atlantic area caught 3200 t of sea bass, of which 830 t were released. Around 60% (1920 t) of the recreational catch estimate was from the Bay of Biscay, which is similar to the commercial fisheries in this area. The commercial catches have been relatively stable over the last decade.

**MANAGEMENT OBJECTIVES:** No specific management objectives are known to ICES, and there is no TAC for this species.

**RECENT MANAGEMENT ADVICE:** Based on ICES approach to data-limited stocks, ICES advises that total catches should decrease by 20% in relation to the average catch of the last three years (2009–2011), corresponding to commercial catches of no more than 1890 t in 2014. All commercial catches are assumed to be landed. Recreational catches cannot be quantified; therefore, total catches cannot be calculated.

## 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 total catches should decrease by 20% in relation to the average catch of the last three years (2009–2011), corresponding to commercial catches of no more than 1890 t in 2014. All commercial catches are assumed to be landed. Recreational catches cannot be quantified; therefore, total catches cannot be calculated.

**STECF COMMENTS:** STECF agrees with the ICES advice for 2014 given for the commercial fisheries for sea bass in VIIIab. STECF notes however that incomplete estimates for recreational catches of seabass from France in Division VIIIab (Bay of Biscay) are of similar magnitude to the commercial catches. STECF notes that to control overall fishing mortality on the stock it would be appropriate to consider introducing some form of measures to control the recreational catch in addition to the commercial catch.

STECF notes that stock structure remains poorly known and further studies are needed. STECF further notes that there is a need to ensure adequate and representative sampling coverage of commercial fleets and recreational fisheries for this species, including the development of regional time-series of recreational fishery catch, effort, and catch composition.

### 3.32 Sea bass (*Dicentrarchus labrax*) in Iberian waters (Divisions VIIIc and IXa)

**FISHERIES:** Most sea bass landings come from coastal artisanal fisheries using various gears. In Division IXa 80–99% of landings are from this fisheries using mostly gillnets, trammelnets, and longline or handline. Official landings underestimate total catch to an unknown degree, since there is unregistered activity by recreational hook and line. Discarding is thought to be low. Recreational fisheries are an important part of the total removals, but these are not accurately quantified. Preliminary official landings extracted from the ICES Catch Statistics webpage on 15<sup>th</sup> May 2013 were 2 t from France and 271 t of from Portugal; estimates for Spanish landings were not yet available. Total ICES catch estimates for 2012 equal to 701 t.

**SOURCE OF MANAGEMENT ADVICE:** The main management advisory body is ICES. The advice is based on a precautionary reduction of catches because of missing or non-representative data. The methods applied to derive quantitative advice for data-limited stocks are expected to evolve as they are further developed and validated.

**REFERENCE POINTS:** No reference points have been defined for this stock.

#### STOCK STATUS:

F (Fishing Mortality)		
2010–2012		
Qualitative evaluation	?	Insufficient information

SSB (Spawning-Stock Biomass)		
2011–2013		
Qualitative evaluation	?	Insufficient information

Only commercial landings are available, although recreational fisheries may be significant. The commercial landings in the last two decades are variable between years without a long-term trend. No analytic assessment can be presented for this stock.

**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 total catches should decrease by 20% in relation to the average catch of the last three years (2009–2011), corresponding to commercial catches of no more than 598 tonnes in 2014. All commercial catches are assumed to be landed. Recreational catches cannot be quantified; therefore, total catches cannot be calculated.

## 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 total catches should decrease by 20% in relation to the average catch of the last three years (2009–2011), corresponding to commercial catches of no more than 598 tonnes in 2014. All commercial catches are assumed to be landed. Recreational catches cannot be quantified; therefore, total catches cannot be calculated.

**STECF COMMENTS:** STECF agrees with the ICES advice for 2014 given for the commercial fisheries for sea bass in VIIIc and IXa.

STECF notes however that recreational fisheries for seabass may be significant; to control overall fishing mortality on the stock it would be appropriate to consider introducing some form of measures to control the recreational catch in addition to the commercial catch.

STECF notes that stock structure remains poorly known and further studies are needed. STECF further notes that there is a need to ensure adequate and representative sampling coverage of commercial fleets and recreational fisheries for this species, including the development of regional time-series of recreational fishery catch, effort, and catch composition.

## **4 Eco-region 4: Resources in Icelandic and East Greenland waters**

### **4.1 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. A large 2005 year class is believed to be partly of offshore origin.

The offshore quota for the offshore component in total international fishery was 5,500 tons for 2013 as an experimental fishery. Total catch in 2012 of offshore component amounted to a total of 5,741 tons with 1,802 tons caught in West Greenland and 3,941 tons caught in East Greenland waters. Trawlers accounted for 69% of the total catch in West and East Greenland combined

The catches from the inshore component amounted to 10,673 t. in 2012 where 100% landings (73% poundnet and 27% handlines, longlines, gillnets, and other gear types). 0% discards, 0% industrial bycatch, and 0% unaccounted removals.

The TAC for the coastal fleet was 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 waters 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.

#### 4.1.1 Offshore 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	→	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. Following the 2003 year-class recruitment has been low until 2009 year class which is estimated as abundant. The offshore stock in West Greenland increased in 2012 compared to 2011 supported by the 2009 year-class.

**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:

New data (landings and surveys) available for this stock do not change the perception of the stock. Therefore, the advice for this fishery in 2014 is the same as the advice for 2013: “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

ICES advises that no fishery should take place in 2014 to allow for rebuilding of the offshore spawning stocks in West and East Greenland. 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.

Initiative to fulfil these objectives:

- Yearly scientific surveys in order to monitor the spawning population and recruitment

- Biological sampling from eventual experimental fishery
- Increased logbook requirements from eventual experimental fishery.

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 of no fishery in 2014. STECF also notes that the stock status plot has not been updated from offshore component.

#### 4.1.2 Inshore cod in ICES Subarea XIV and NAFO Subarea 1 (Greenland cod)

##### STOCK STATUS

F (Fishing Mortality)		
	2010–2012	
MSY ( $F_{MSY}$ )	?	Unknown
Precautionary approach ( $F_{pa}, F_{lim}$ )	?	Unknown
SSB (Spawning-Stock Biomass)		
	2010–2012	
MSY ( $B_{trigger}$ )	?	Above
Precautionary approach ( $B_{pa}, B_{lim}$ )	?	Above
Qualitative evaluation	↗	Increasing

The observed size of recent year classes suggests good recruitment. Survey indices suggest that the stock size is increasing. The current fishery does not appear to impair recruitment.

**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:

Based on the ICES approach to data-limited stocks, ICES advises that catches should be no more than 12,063 t in 2014. All catches are assumed to be landed.

##### Other considerations

##### ICES approach to data limited stocks

For this stock the biomass is estimated to have increased by 202% between the average of the three 2006, 2009, and 2010 surveys and the average of the two 2011–2012 surveys. Applying the uncertainty cap gives an increase of catches of 20% in relation to the average catch of the last three years, corresponding to catches of no more than 12,063 t in 2014. All catches are assumed to be landed.

##### 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 basis of the advice for 2014. However, the advised landings figure for 2014 of 12,063 t, based on a 20% increase in the average landings over the period 2010–2012 was incorrectly calculated and should be 12,380 t. The landings however should be taken from inshore component only.

## 4.2 Cod (*Gadus morhua*) in ICES Subarea XII

STECF does not have access to any information on cod in ICES Subarea XII

## 4.3 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. 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 in 2012 are estimated 194,000 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 modeling 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:

	Type	Value	Technical basis
Management plan	MP <sub>Btrigger</sub>	220 000 t	Set by managers, consistent with ICES MSY framework.
	Harvest Rate <sub>MP</sub>	0.2	Set by managers, consistent with ICES MSY framework.
MSY Framework	MSY B <sub>trigger</sub>	220 000t	Trigger point in HCR considered consistent with ICES MSY framework.
	F <sub>MSY</sub>	Not relevant	
Precautionary Approach	B <sub>lim</sub>	125 000 t	B <sub>loss</sub>
	B <sub>pa</sub>	Not defined	
	F <sub>lim</sub>	Not defined	
	F <sub>pa</sub>	Not defined	

### STOCK STATUS:

F (Fishing Mortality)				
	2010	2011	2012	
MSY (F <sub>MSY</sub> )	✓	✓	✓	Below possible candidate
Precautionary approach (F <sub>pa</sub> , F <sub>lim</sub> )	✓	✓	✓	Below possible candidate F <sub>pa</sub> and F <sub>lim</sub>
Management plan (HR <sub>MP</sub> )	✓	✓	✓	Within expected range
SSB (Spawning-stock Biomass)				
	2011	2012	2013	

MSY ( $B_{\text{trigger}}$ )	✓	✓	✓	Above trigger
Precautionary approach ( $B_{\text{lim}}$ )	✓	✓	✓	Full reproductive capacity
Management plan ( $MP_{B_{\text{trigger}}}$ )	✓	✓	✓	Above trigger

The spawning stock is increasing and is higher than has been observed over the last five decades. Fishing mortality has declined significantly in the last decade and is presently at a historical low and below likely candidates for  $F_{\text{pa}}$  and  $F_{\text{lim}}$ . Year classes since the mid-1980s are estimated to be relatively stable but with the mean around the lower values observed in the period 1955 to 1985. Fishing mortality has declined significantly in the last decade and is presently at a historical low and below likely candidates for  $F_{\text{pa}}$  and  $F_{\text{lim}}$ . 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. In 2009 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  $\alpha$  to the harvest rate.  $\alpha$  is set to 0.2 when SSB is higher than 220 thousand tonnes (SSBTRIGGER) but set to  $\alpha = 0.2 \text{ SSB} / \text{SSBTRIGGER}$

ICES has evaluated the plan and concludes that it is in accordance with the precautionary approach and the ICES MSY approach.

#### RECENT MANAGEMENT ADVICE:

ICES advises on the basis of the Icelandic 2009 management plan that the TAC in the fishing year 2013/2014 should be set at 215,000 t.

#### Other considerations

##### Management plan

Following the agreed management plan implies a TAC of 215,000 t in the fishing year 2013/2014. 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 landing advice for fishing year 2013/2014.

## 4.4 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 2012 are estimated to have been 46,200 t. with 44% taken by bottom trawl, 41% by longlines, 13% by Danish seine, and 2% by other gear. Discarding is considered minor since 2001.

For comparison the landings in 2007 were 110,000 tonnes which is the highest for over 40 years.

**SOURCE OF MANAGEMENT ADVICE:** The assessment is based on age-disaggregated landings from 1979 to 2012 and on two survey indices (Icelandic spring and autumn groundfish surveys). The assessment does not include discards.

Discards are considered negligible and not included in the assessment.

#### REFERENCE POINTS:



	<i>Type</i>	<i>Value</i>	<i>Technical basis</i>
MSY	HCR $B_{\text{trigger}}$	45 000 t.	Stochastic simulations (Björnsson, 2013).
Approach	$H_{\text{MSY}}$	0.52	Stochastic simulations (Björnsson 2013).
Precautionary	$B_{\text{lim}}$	45 000 t.	$B_{\text{loss}}$ (ICES, 2012).
Approach	$H_{\text{pa}}$	0.46	Stochastic simulations (Björnsson, 2013).
Management plan	$H_{\text{target}}$	0.40	Management plan.

## STOCK STATUS:

H (Harvest ratio)			
	2010	2011	2012
MSY ( $H_{\text{MSY}}$ )	✗	✓	✓ Below
Precautionary approach ( $H_{\text{pa}}$ )	✗	✓	✓ Below
Management target ( $H_{\text{target}}$ )	✗	✓	✓ Management plan has not been implemented.
SSB (Spawning-Stock Biomass)			
	2012	2013	2014
Management plan ( $B_{\text{trigger}}$ )	✓	✓	✓ Above
Precautionary approach ( $B_{\text{lim}}$ )	✓	✓	✓ Above

SSB increased from 2001 to 2004 after several strong year classes and was large from 2004 to 2008. Since then the spawning stock has decreased. Harvest ratio is currently estimated near  $H_{\text{target}}$  (0.4). Recruitment was high for the year classes 1998–2003, with five strong year classes, of which the 2003 year class was very strong. The 2008–2012 year classes are all estimated to be poor.

**MANAGEMENT AGREEMENTS:** A management plan was introduced last year and evaluated by ICES in March 2013 (Björnsson, 2013). It was considered to be precautionary and in conformity with the MSY approach. The plan was adopted by the Icelandic government in April 2013.

## RECENT MANAGEMENT ADVICE:

ICES advises on the basis of a management plan that catches in the fishing year 2013/2014 should be no more than 38,000 t. All catches are assumed to be landed.

### Other considerations

#### Management Plan

The TAC for the fishing year 2013/2014 should be no more than 0.4 times the estimated biomass of 45 cm and larger haddock in the beginning of 2014, corresponding to a TAC of 38,000 t.

**STECF COMMENTS:** STECF agrees with the ICES assessment of the state of the stock and the advised forecast catch options for fishing year 2013/2014.

## 4.5 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.

Total landings in 2012 were 52,000 t, where 76% 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 catch-age model is used to fit the catch at age data from the commercial fleets (ages 3–14, years 1980–2012) and using the Spring bottom-trawl survey index (ages 3–10, years 1985–2012) as a tuning series. 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 fluctuations in the spring survey data and irregular changes in the fleet selectivity. The vertical distribution and migrating



behaviour of saithe means that the bottom trawl survey does not produce reliable measurements of the stock. There are also indications of time-varying selectivity, so changes in the commercial catch-at-age may not reflect changes in the age distribution of the population. The combination of fluctuating spring survey data and time-varying fleet selectivity leads to high uncertainty in the estimates of current SSB and fishing mortality.

#### REFERENCE POINTS:

	Type	Value	Technical basis
MSY Approach	MSY $B_{trigger}$	65 000 t.	Stochastic evaluations.
	HR <sub>MSY</sub>	20%	Stochastic HCR evaluation (SSB 95% of the time over $B_{lim}$ ).
Precautionary approach	$B_{lim}$	61 000 t.	$B_{loss}$ as estimated in 2010.
	$B_{pa}$ , $F_{lim}$ , $F_{pa}$	Not defined.	
Management plan	HR <sub>MP</sub>	20%	
	MP $B_{trigger}$	65 000 t.	

#### STOCK STATUS:

HR (Harvest Rate)				
	2010	2011	2012	
MSY (HR <sub>MSY</sub> )	✓	✓	✓	Appropriate
Precautionary approach ( $F_{pa}$ , $F_{lim}$ )	?	?	?	Undefined
SSB (Spawning-Stock Biomass)				
	2011	2012	2013	
MSY ( $B_{trigger}$ )	✓	✓	✓	Above target
Precautionary approach ( $B_{lim}$ )	✓	✓	✓	Full reproductive capacity

The spawning stock of Icelandic saithe has been relatively large in recent years, near the maximum from 1980 to the present, and the harvest rate has declined from 28% to 17% (fishing mortalities 0.32 to 0.19) from 2008 to 2012. Year-classes 1998–2000 and 2002 were abundant, but recruitment has been around average since then.

#### MANAGEMENT AGREEMENTS:

In spring 2013, the Icelandic government adopted a management plan for managing the Icelandic saithe fishery. ICES has evaluated this management plan and concluded that it is in accordance with the precautionary approach and the ICES MSY framework.

#### RECENT MANAGEMENT ADVICE:

ICES advises on the basis of the Icelandic 2013 management plan that the TAC in the fishing year 2013/2014 should be 57,000 t.

#### Other considerations

#### Management plan

The TAC set in year  $t$  is valid for the upcoming fishing year, from 1 September in year  $t$  to 31 August in year  $t+1$ .

When  $SSB \geq B_{trigger}$ , the TAC set in year  $t$  equals the average of 0.20 times the current biomass and last year's TAC:

$$TAC_t = 0.5 \times 0.20 B_{t,4+} + 0.5 TAC_{t-1}$$

When SSB is below  $B_{trigger}$ , the harvest rate is reduced below 0.20:

$$TAC_t = SSB_t / B_{trigger} [ (1 - 0.5 SSB_t / B_{trigger}) 0.20 B_{t,4+} + 0.5 TAC_{t-1} ]$$

#### Additional considerations

### Information from the fishing industry

Commercial cpue from the most important fleets targeting saithe are available for 20 years or more. However, the potential for bias in commercial cpue (for example hyperstability) is a serious concern for shoaling species such as saithe. Therefore, although these indices have been explored for inclusion in the past, they were not considered in calibrating the present assessment, as they are considered unreliable as an indicator of abundance.

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

## 4.6 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 catch in 2012 was 29,309 t (96% demersal 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 2012 quotas in Greenland EEZ were fully utilised by all of the principal fleets. Within the Iceland EEZ, quotas in the fishing year 2011/2012 were fully utilized as in the preceding fishing years. In the Faeroe 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 landings in Va by Iceland, and in XIVb by Germany and the UK come partly as bycatch 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 (1985–2012), Greenland trawl fleet (1992–2012) and Faroese trawl fleet (1995–2012), and two trawl surveys (Va: 1996–2012, XIV: 1998–2012). Discards are assumed negligible and 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)			
	2010	2011	2011
MSY ( $F_{MSY}$ )	✗	✗	✗ Above target
Precautionary approach ( $F_{pa}$ , $F_{lim}$ )	?	?	? Undefined
SSB (Spawning-Stock Biomass)			
	2011	2012	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 56% 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 1.5 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 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. 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.

#### **RECENT MANAGEMENT ADVICE:**

ICES advises on the basis of the MSY approach that landings in 2014 should be no more than 20,000 t. All catches are assumed to be landed.

#### ***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 2014 of less than 20,000 t, which is expected to lead to a slight improvement in stock size in 2014. This advice is associated with a 33% reduction in  $F$ .

#### **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, but expected to occur within a decade with annual catches of less than 10,000 t.

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 of landings for 2014.

## **4.7 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. Since 2009 an increased redfish fishery has taken place in Subarea XIV. In Division Vb golden redfish is only bycatch in the saithe fishery and has decreased in recent years. *S. marinus* is to a certain extent caught together with “Icelandic slope *S. mentella*” in all areas.

Total catch of 2012 was 45,300 t; 92% bottom trawls took 92% and other gear-types 8%. Discarding is considered minimal.

**SOURCE OF MANAGEMENT ADVICE:** The main management advisory body is ICES. 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 1985–2012, the German groundfish survey 1985–2012 in Subarea XIV, and the Faroese spring (1994–2012) and summer (1996–2012) 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 $B_{\text{trigger}}$	Undefined	
Approach	$F_{\text{MSY}}$	Undefined	
Precautionary approach	$U_{\text{lim}}$	55	20% of highest observed survey index*.
	$U_{\text{pa}}$	155	60% of highest observed survey index*.
	$F_{\text{lim}}$	Undefined	
	$F_{\text{pa}}$	Undefined	

(unchanged since 1998)

*\*Technical basis for the survey index*

The basis for the calculation of the  $U_{\text{pa}}$  is the Icelandic spring groundfish survey index series starting in 1985. Since 1990 the average U has been around half of  $U_{\text{max}}$  – 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  $U_{\text{pa}}$  is therefore proposed at  $U_{\text{max}} * 0.6$ , 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)		
		2010–2012
MSY ( $F_{MSY}$ )	?	Unknown
Precautionary approach ( $F_{pa}, F_{lim}$ )	?	Unknown
Qualitative evaluation	●	Decreasing
SSB (Spawning-Stock Biomass)		
		2011–2013
MSY ( $B_{trigger}$ )	?	Unknown
Precautionary approach ( $U_{pa}, U_{lim}$ )	✓	Full reproductive capacity
Qualitative evaluation	↗	Increasing in main area

Landings have been stable at around 41 thousand tonnes since 1995. A major part of the catches consists of the 1998–2003 year-classes; the 1985 and 1990 year-classes are diminishing proportionally. SSB is estimated at around 60% of its maximum in 2013, which is two times higher than it was in 1995 when it was at its lowest. Fishing mortality has decreased from the 1990s by around 40% in 2012.

#### MANAGEMENT AGREEMENTS:

No formal agreement on the management of *S. marinus* exists among the three coastal states, Greenland, Iceland, and the Faroe Islands. In Greenland and Iceland, the fishery is regulated by a TAC and in the Faroe Islands by effort limitation.. 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:

Based on the ICES approach to data-limited stocks, ICES advises that catches should be no more than 51,980 t in 2014. All catches are assumed to be landed.

#### *Other considerations*

#### *ICES approach to data-limited stocks (DLS)*

The Gadget model has been adopted as indicative of the trend. ICES DLS approach, Category 2.1.1 is therefore used as basis for catch advice for this stock. Based on the prognosis of the GADGET model, the estimated landings for 2014 are 54,400 t, which is an increase of 26% compared to average landings in 2010–2012. This implies an increase of catches of at most 20% (uncertainty cap used) in relation to the average catch of the last three years, corresponding to catches of no more than 51,980 t. Considering that the current exploitation is not detrimental to the stock, the effort in the main fisheries has decreased significantly and biomass has increased, no additional precautionary reduction is needed.

#### *Precautionary considerations*

The stock is at full reproductive capacity, and it is above  $U_{pa}$ . There is evidence that stock size is increasing; the assessment that is indicative of trends shows that stock size has been increasing since 1995, and exploitation rate has reduced significantly (by at least a third). Hence the precautionary buffer has not been applied.

**STECF COMMENTS:** STECF agrees with the ICES assessment on the state of the stock and with advice of landings in 2014 51,980 t.. STECF notes that the ICES advice implies 20% increase in landings compared to the last three years average. 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).

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.

## 4.8 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. Total annual landings varied between 18,000 and 25,000 t in 2004-2010. Total landings of demersal *S. mentella* in Icelandic waters in 2011 were about 13,000 t. and in 2012 12,000 t, 100% taken with 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. The lack of long time-series indices of abundance prevents the determination of stock status. Information on recruitment is not available. The advice is based on survey indices and ICES approach to the Data Limited Stocks. Survey data are available from the Icelandic autumn groundfish survey in Division Va (since 2000). Cpu data are available from Icelandic trawlers in Division Va (since 1986). No survey biomass estimates were available for 2011.

**REFERENCE POINTS:** No precautionary reference points are established.

### STOCK STATUS:

F (Fishing Mortality)		
		2010–2012
MSY ( $F_{MSY}$ )	?	Unknown
Precautionary approach ( $F_{pa}, F_{lim}$ )	?	Unknown
SSB (Spawning-Stock Biomass)		
		2011–2013
MSY ( $B_{trigger}$ )	?	Unknown
Precautionary approach ( $B_{pa}, B_{lim}$ )	?	Unknown
Qualitative evaluation	↘	Decreasing

The average of the stock size indicator (survey index) in the last two years (2010/2011 and 2012) is 10.5% lower than the average of the three previous years (2007–2009). No survey biomass estimates were available for 2011.

**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:

Based on the ICES approach to data-limited stocks, ICES advises that catches should be no more than 9,875 t in 2014. All catches are assumed to be landed.

#### ***Other considerations***

##### ***ICES approach to data-limited stocks***

In cases where a biomass index is available for data-limited stocks, 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 (Category 3.2), the biomass is estimated to have decreased by 10.5% between the average of 2007–2009 (three years) and the average of 2010–2011 (two years). This implies a decrease in catches of 10.5% in relation to the average catch of the last three years, corresponding to catches of no more than 12,343 t. Additionally, considering that exploitation is unknown, ICES advises that catch should decrease by a further 20% as a precautionary buffer. This results in catches of no more than 9,875 t in 2014. All catches are assumed to be landed.

##### ***Additional considerations:***

ICES has since 2009 advised that a management plan be developed and implemented for Icelandic slope beaked redfish which takes into account the uncertainties in science and the properties of the fisheries. Although there are no explicit management objectives for Icelandic slope beaked redfish, it is within the Icelandic TAC system. Until 2010/2011 Icelandic authorities set a joint quota for golden redfish and Icelandic slope beaked redfish in Icelandic waters, but now separate quotas are set for the species. 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.

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 probably decreasing and with the advice of landings no more than 9,875 t in 2014. STECF notes that landings have been decreasing by 50% since 2008. STECF also notes that no survey biomass index from 2011 was available.

## **4.9 Beaked redfish (*Sebastes mentella*) in Division XIV (East Greenland demersal stock)**

The stock status and advice for this stock for 2014 remains unchanged from that given for 2013. The text below therefore remains largely unchanged from the Consolidated STECF review of advice for 2013 (STECF-12-22).

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 catches (2012) = 6,600 t, (100% taken with bottom trawl) . Discards are assumed to be negligible (less than 0.1%).

**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 2010–2012. 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:

New data (landings and surveys) available for this stock do not change the perception of this stock. Therefore, the advice for this fishery in 2014 is the same as the advice for 2013: “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 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.

### **4.10 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).

#### 4.11 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)

The results from the most recent assessment and advice for this stock were released in 2012. The text below remains unchanged from the Consolidated STECF review of advice for 2013 (STECF-12-22).

**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 ( $B_{pa}, B_{lim}$ )	?	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.

## **4.12 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*)**

The results from the most recent assessment and advice for this stock were released in 2012. The text below remains unchanged from the Consolidated STECF review of advice for 2013 (STECF-12-22).

**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.

## 4.13 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.

The Icelandic TACs for herring apply from 1 September to 1 May the following year. The catch is normally taken from September to February.

Total catch (2012/2013) is 72,000 t (increase from 2011/2012 season 47%), where 92% are landings (98.7% purse-seine, 1.3% gillnets) and 8% industrial by-catch (in mackerel fishery with pelagic trawls). 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. The discards are assumed to be negligible and not included in assessment.

### REFERENCE POINTS:

	Type	Value	Technical basis
MSY	MSY B <sub>trigger</sub>	300 000 t	B <sub>pa</sub>

Approach	$F_{MSY}$	0.22	HCS model for simulated harvest rules.
Precautionary Approach	$B_{lim}$	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 $\sigma = 0.25$ .
	$F_{lim}$	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)			
	2010	2011	2012
MSY ( $F_{MSY}$ )	✓	✓	✓ Appropriate
Precautionary approach ( $F_{pa}, F_{lim}$ )	✓	✓	✓ Harvested sustainably
SSB (Spawning-Stock Biomass)			
	2011	2012	2013
MSY ( $B_{trigger}$ )	✓	✓	✓ Above trigger
Precautionary approach ( $B_{pa}, B_{lim}$ )	✓	✓	✓ Full reproductive capacity

The spawning stock biomass has been declining until 2011, likely related to the *Ichthyophonus* infection in recent years. Since then SSB has increased and is above the reference points. The infection mortality is probably less than anticipated in recent assessments. Strong year classes, which show no signs of infection, are entering the fishable stock and currently infection mortality is observed to be zero. Fishing mortality is increasing and is currently around  $F_{MSY}$ .

## 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 the fishing season 2013/2014 should be no more than 87,000 t. All catches are assumed to be landed.

### Other considerations

#### MSY approach

Following the ICES MSY approach implies fishing mortality at  $F_{MSY} = 0.22$ , resulting in catches of no more than 87,000 t in 2013/2014. This is expected to lead to a SSB of 497,000 t in 2014. All catches are assumed to be landed.

### Additional considerations

#### Management considerations

It is unknown how long the current *Ichthyophonus* outbreak will be observed in the stock. Similar outbreaks in other herring stocks have lasted from 1 to 3 years. Analysis based on all available data show a significant infection mortality in 2009–2010. However, despite a high continuing prevalence of infection after that there are indications that the mortality due to infection was probably insignificant during 2011–2013.

**STECF COMMENTS:** STECF agrees with the ICES advice for 2014. STECF notes that the fishing mortality has shown increase since 2010 and effect of infestation with *Ichthyophonus* remain largely unpredictable, adding uncertainty to the assessment.

#### 4.14 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. 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.

The fishery in recent years has largely been confined to the period January–March, which coincides with the last three months of the capelin lifespan. In 2011 a summer fishery took place, for the first time since 2004. No capelin fishery took place during summer in 2012 and only a limited fishery in autumn 2012. The fishery was ongoing in spring 2013.

Total landings in 2011/12 season were 747,000t (75% purse-seine, 25% pelagic trawl). Discards are assumed to be negligible. Information on catches for 2012/13 is not yet available and is expected to be updated in 2014.

**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
SSB (Spawning-Stock Biomass)		
	2012	
MSY ( $B_{trigger}$ )	?	Undefined
Precautionary approach ( $B_{pa}, B_{lim}$ )	?	Undefined
Qualitative evaluation	→	Stable above average

The annual acoustic autumn survey that took place in October 2012 was used to predict the SSB of capelin. The predicted SSB in March 2014 is likely to be below the 400,000 t escapement threshold.

##### 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.

Since 1980 the TAC has been set in accordance with this 400 000 t SSB escapement strategy management plan. In June 1989 Greenland, Iceland and Norway signed an agreement on the division of the TAC between the parties involved in the fishery. This agreement has been revised several times since then, most recently in 2003.

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 predicts SSB to be above the escapement threshold.

#### ***Other considerations***

##### ***PA considerations***

ICES advises on the basis of precautionary approach that there should be no quota until new survey estimates have proven SSB to be above the escapement threshold.

##### ***Management plan***

There is no agreed method for the estimation of SSB from the autumn acoustic survey almost one and a half years ahead. The regression method used since 1992 was rejected by WKShort in 2009 and has not yet been replaced by an alternative method. This year's index value is low making the regression method particularly uncertain with an estimate of SSB at 488,000 t. In addition to the regression method two alternative estimation methods less prone to low index estimation bias were used and gave estimates of SSB at 220,000 t and 318,000 t. Both of these estimates are below the threshold for setting a non-zero preliminary TAC. Based on these considerations ICES considers that predicted SSB cannot be reliably estimated but that it is likely to be below the threshold of 400,000t.

#### ***Additional considerations***

##### ***Management considerations***

Historically, the fishing season for capelin begins in the period from late June to July/August. The availability of plankton is then at its highest and the fishable stock of capelin feeds very actively over large areas north of Iceland between Greenland and Jan Mayen, increasing rapidly in size, weight, and fatness.

Results from the summer and autumn surveys often show mixing of juveniles and adult capelin. In Icelandic waters, only purse-seine is allowed in areas where such conditions are likely to protect juveniles (see regulations), but in Greenlandic waters purse-seine and pelagic trawl are both allowed. The pelagic trawls used in the capelin fishery are very large and filter enormous volumes of seawater during normal operation. Einarsson *et al.* (2007) shows that these trawls only retain about 20% of the capelin passing through the opening of the trawl. At present it is not known what effect this filtering of the schools has on mortality but it seems reasonable to assume it is considerable, especially if the same schools are filtered (passed through) repeatedly. Therefore, as a precautionary measure to protect the juveniles, all fishing with pelagic trawl has been banned in the Icelandic waters where juveniles are generally found, either separately or mixed with the adults. This measure should also be considered in other areas where juvenile capelin occur, i.e. East Greenland.

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

STECF notes that the methods currently used to estimate future escapement provide conflicting and uncertain results, which in turn, compromise the ability to provide reliable advice on fishing opportunities. STECF considers that as long as the advice on fishing opportunities for Icelandic capelin continue to be decided based on an escapement strategy for capelin, alternative methods that are more robust to the variability in input data need to be developed. STECF suggests that the parties involved in providing the advice on Icelandic Capelin be requested to investigate whether alternative methods can be developed to ensure that future advice on fishing opportunities is more robust to uncertainty.



## 5 Resources in the Barents and Norwegian Seas

### 5.1 Northern Shrimp (*Pandalus borealis*) in Sub-areas I (Barents Sea) and IIb (Svalbard Waters)

The results from the most recent assessment and advice for this stock were released in 2012. The text below remains unchanged from the Consolidated STECF review of advice for 2013 (STECF-12-22).

**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 25 000 t in 2010 and 30,000 t in 2011. 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 $B_{\text{trigger}}$	0.5 of $B_{\text{MSY}}$ *	50% of $B_{\text{MSY}}$ (10 <sup>th</sup> percentile of the $B_{\text{MSY}}$ estimate); relative value
Approach	$F_{\text{MSY}}$	*	Resulting from the production model.
Precautionary approach	$B_{\text{lim}}$	0.3 of $B_{\text{MSY}}$ *	30% of $B_{\text{MSY}}$ (production reduced to 50% MSY); relative value
	$B_{\text{pa}}$	Not defined	Not needed: Risk of transgressing limits are directly estimated
	$F_{\text{lim}}$	1.7 of $F_{\text{MSY}}$ *	1.7 $F_{\text{MSY}}$ (the F that drives the stock to $B_{\text{lim}}$ ); relative value
	$F_{\text{pa}}$	Not defined	Not needed: Risk of transgressing limits are directly estimated

\* Fishing mortality is estimated in relation to  $F_{\text{MSY}}$  and total stock biomass is estimated in relation to  $B_{\text{MSY}}$ .

## STOCK STATUS:

F (Fishing Mortality)			
	2009	2010	2011
MSY ( $F_{MSY}$ )	✓	✓	✓ Below target
Precautionary approach ( $F_{lim}$ )	✓	✓	✓ Harvested sustainably

SSB (Spawning-Stock Biomass)			
	2010	2011	2012
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  $B_{trigger}$  and fishing mortality below  $F_{MSY}$ . The estimated risk of falling below  $B_{trigger}$  and  $B_{lim}$  or of exceeding  $F_{MSY}$  by the end of 2012 is less than 1%. Recruitment indices showed no major changes in the period 2004–2012.

**RECENT MANAGEMENT ADVICE:** ICES advises that catches of 60 000 tonnes in 2013 will maintain the stock at the current high biomass.

### Other considerations

#### MSY approach

The stock is well above MSY  $B_{trigger}$  and  $F$  is well below  $F_{MSY}$ . Catches of 60 000 t in 2013 will maintain the stock at current high biomass.

#### PA approach

There is a low risk in 2013 of the stock falling below  $B_{lim}$  or of the fishing mortality rate exceeding  $F_{lim}$  at catch options up to 90 000 t.

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

STECF notes that there is no TAC set for *Pandalus borealis* in this area.

## 5.2 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). Total catches in 2012 were 754,000 t (70% demersal trawls and 30% other gear types), all of which were landed.

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:

	Type	Value	Technical basis
Management	SSB <sub>MP</sub>	460 000 t.	B <sub>pa</sub> , TAC linearly reduced from F <sub>pa</sub> at SSB = B <sub>pa</sub> to zero at SSB = 0.
Plan	F <sub>MP</sub>	0.40	F <sub>pa</sub> , average TAC for the coming three years based on F <sub>pa</sub> .
MSY	MSY B <sub>trigger</sub>	460 000 t.	B <sub>pa</sub> and trigger point in HCR.
Approach	F <sub>MSY</sub>	0.40	Long-term simulations.
Precautionary Approach	B <sub>lim</sub>	220 000 t.	Change point regression.
	B <sub>pa</sub>	460 000 t.	The lowest SSB estimate having >90% probability of remaining above B <sub>lim</sub> .
	F <sub>lim</sub>	0.74	F corresponding to an equilibrium stock = B <sub>lim</sub> .
	F <sub>pa</sub>	0.40	The highest F estimate having >90% probability of remaining below F <sub>lim</sub> .

**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  $\pm 10\%$  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 TAC<sup>1</sup>.

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.

<sup>1</sup> 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)			
	2010	2011	2012
MSY ( $F_{MSY}$ )	✓	✓	✓ Appropriate
Precautionary approach ( $F_{pa}, F_{lim}$ )	✓	✓	✓ Harvested sustainably
Management plan ( $F_{MP}$ )	✓	✓	✓ Below target

SSB (Spawning-Stock Biomass)			
	2011	2012	2013
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 2002 and is now the highest observed. 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 in the time-series. Surveys indicate that year classes 2010–2012 are slightly above average.

## RECENT MANAGEMENT ADVICE:

ICES advises on the basis of the Joint Russian–Norwegian Fisheries Commission management plan that TAC in 2014 should be set at 993,000 t. All catches are assumed to be landed. Bycatches of Coastal cod and *Sebastes marinus* should be kept as low as possible.

### Other considerations

#### MSY considerations

Fishing at  $F_{MSY}$  (= 0.40) corresponds to catches of no more than 1131 kt in 2014. This is expected to keep SSB above MSY  $B_{trigger}$  in 2015 and close to the historical high.

#### Additional considerations

##### Management considerations

Unreported landings, as estimated by the Joint Norwegian–Russian analysis group, were reduced considerably compared to the period 2006–2008. For 2009–2012, unreported landings are estimated to be negligible.

##### Management plan

The plan aims to maintain  $F$  at  $F_{pa} = 0.40$  and to restrict between-year TAC changes to  $\pm 10\%$  unless SSB falls below  $B_{pa}$ , in which case the target  $F$  should be reduced.

The management plan was amended in 2009, adding a new condition: “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”, when SSB is above  $B_{pa}$ .

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

STECF notes that the catch prescribed by the management plan for 2014 of 993,000 t represents a 1% decrease on the agreed TAC for 2013. This level of catch corresponds to a fishing mortality rate of  $F=0.34$  in 2014, which represents a 48% increase in the assumed  $F$  for 2013 ( $= F_{2012} = 0.23$ ). If the agreed TAC for 2013 (1,000,000 t) is taken, the catch prescribed by the management plan for 2014 (993,000 t) will be an overestimate.

### 5.3 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 and the tonnage is assumed to be constant for 2010–2012. The regulations have not reduced catches, and current catches are considered to be too high. Commercial landings (2012) = 31.9 kt (49% gillnets, 27% Danish seine, 21% longline/handline, and 3% bottom trawl).

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. The 2012 survey resulted in a lower spawning-biomass index compared to 2011 and 2013 was therefore the second action year.

The trend for the stock appears stable. Under these circumstances regulation should be put in place such that catches are reduced in proportion to the required reductions in F. If the 2013 spawning-biomass index is above the 2012 index, application of the rebuilding plan implies that the regulations should ensure that catch in 2014 is at least 30% below the 2009 value. If the spawning-biomass index in 2013 is lower than the index in 2012, the fisheries regulations should ensure a reduction of catch in 2014 of at least 45% relative to 2009.

ICES has 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 approach.

#### STOCK STATUS:

F (Fishing Mortality)		
	2010–2012	
MSY ( $F_{MSY}$ )	?	Unknown
Precautionary approach ( $F_{pa}, F_{lim}$ )	?	Unknown
Qualitative evaluation	→	Variable without trend
SSB (Spawning-Stock Biomass)		
	2011–2013	
MSY ( $B_{trigger}$ )	?	Unknown
Precautionary approach ( $B_{pa}, B_{lim}$ )	?	Unknown

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 requires access to the 2013 autumn survey results that will be available in December. If the spawning-biomass index in the 2013 autumn survey is lower than the index in 2012, the fisheries regulations should aim at a reduction of F in 2014 of at least 45% relative to 2009. If the survey index is higher than in 2012, the plan stipulates the measures taken in 2013 should continue in 2014.

#### *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.

#### *Additional considerations*

##### *Management considerations*

For 2013 the rebuilding plan specifies a 30% reduction of F compared to 2009. No regulations in addition to those in place in 2011 and 2012 have been put in place in the winter and spring fisheries in 2013. To obtain the reductions implied by the rebuilding plan, stronger restrictions during the remaining part of 2013 are required in all areas where coastal cod is distributed.

In order to minimize catches of the Norwegian coastal cod, strong restrictions should apply to all fisheries catching cod in areas where coastal cod mixes with Northeast Arctic cod. The Norwegian–Russian TAC system for cod (Northeast Arctic and coastal) does not in practice restrict the overall catches of coastal cod. From the mid-1970s to 2003 an expected catch of 40 000 t from the coastal cod stock was added annually to the quota for Northeast Arctic cod. Since 2004, the additional catches expected from this stock has been set at around 20 000 t.

The implementation of the rebuilding plan requires measures to further reduce the effective fishing effort in all fisheries where coastal cod are caught, including recreational fisheries. The regulations introduced over the period 2004–2009 may have just marginally reduced F compared to the preceding years. There is no evidence that the regulations in 2011 and 2012 have succeeded in obtaining the further 15% reduction in F implied by the rebuilding plan. The estimate of commercial catches in 2012 is 28% higher than the 2009 catches instead of 15% lower as prescribed in the plan. Stronger measures are required to obtain the reductions in F specified in the rebuilding plan.

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

## **5.4 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 recent years and were close to zero in 2009–2012.

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). Total landings (2012) = 315 kt (70% trawl, 19% longline, and 11% 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:

	Type	Value	Technical basis
Management	SSB <sub>MP</sub>	80 000 t.	$B_{pa}$ . TAC is linearly reduced from $F_{pa}$ at SSB = $B_{pa}$ to zero at SSB = 0.



Plan			
	$F_{MP}$	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.	$B_{lim} \times \exp(1.645 \times 0.3)$ .
	$F_{lim}$	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	$F_{lim} \times \exp(-1.645 \times 0.3)$ .

(unchanged since 2011)

## STOCK STATUS:

F (Fishing Mortality)				
	2010	2011	2012	
MSY ( $F_{MSY}$ )	✓	✗	✗	Above target
Precautionary approach ( $F_{pa}, F_{lim}$ )	✓	✓	⚠	Increased risk
Management plan ( $F_{MP}$ )	✓	✗	✗	Above target

SSB (Spawning-Stock Biomass)				
	2011	2012	2013	
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, 2010, and 2012 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 landings in 2014 should be no more than 150 000 t. Discards are known to take place but cannot be quantified; therefore, total catches cannot be calculated.

### Other considerations

#### Management plan

The current harvest control rule (HCR) is based on  $F_{MSY}$ . ICES advises the continued use of the HCR with target  $F = 0.35$  and maximum  $\pm 25\%$  change in TAC compared with the previous year's TAC. This implies  $F_{MP} = 0.58$  in 2014, corresponding to landings of 150 000 t in 2014, which is expected to keep SSB above  $B_{pa}$  in 2015. The HCR 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 markedly higher than  $F_{MSY}$  and also above  $F_{pa}$ ; this is expected to occur in 2013–2014 due to three very large year classes followed by average recruitment.

#### MSY approach

Fishing at  $F_{MSY} = 0.35$  in 2014 corresponds to landings of no more than 100 000 t. This is expected to keep SSB above MSY  $B_{trigger}$  in 2015.

#### Precautionary approach

The fishing mortality in 2014 should be no more than  $F_{pa}$ , corresponding to landings of less than 127 000 t in 2014. This is expected to keep SSB above  $B_{pa}$  in 2015.

### Additional considerations

Non-reported landings (IUU) for the period 2002–2008 were estimated as ranging from 6 kt to 40 kt (between 4% and 34% of the international reported landings). The IUU estimate for 2009–2012 is zero.

**STECF COMMENTS:** STECF agrees with the ICES assessment of the state of the stock and the advice that on the basis of the Joint Russian–Norwegian Fisheries Commission management plan landings in 2014 should be no more than 150,000 t.

## 5.5 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). Total catch (2012) was 161 kt (46% trawl, 27% purse-seine, 18% gillnet, and 9% 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:** The management advisory body is ICES. The advice is based on analysis of catch-at-age data (XSA), using one commercial CPUE series and one survey index with a time-series split in 2002 (treated as two separate survey series).

**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  $\pm 15\%$  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  $\pm 15\%$ , 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	Trigger $SSB_{MP}$	220 000 t.	$B_{pa}$ , $F$ is linearly reduced from $F_{pa}$ at $SSB = B_{pa}$ to zero at $SSB = 0$ .
	$F_{MP}$	0.35	Average TAC for the coming three 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.	$B_{lim} \times \exp(1.645 \times \sigma)$ , where $\sigma = 0.3$ .
	$F_{lim}$	0.58	$F$ corresponding to an equilibrium stock = $B_{lim}$ .
	$F_{pa}$	0.35	$F_{lim} \times \exp(-1.645 \times \sigma)$ , where $\sigma = 0.3$ . This value is considered to have a 95% probability of avoiding the $F_{lim}$ .

(unchanged since: 2005)

#### STOCK STATUS:

F (Fishing Mortality)		
		2010–2012
MSY ( $F_{MSY}$ )	?	Unknown
Precautionary approach ( $F_{pa}, F_{lim}$ )	?	Unknown
Management plan ( $F_{MP}$ )	?	Unknown
SSB (Spawning-Stock Biomass)		
		2011–2013
MSY ( $B_{trigger}$ )	?	Unknown
Precautionary approach ( $B_{pa}, B_{lim}$ )	?	Unknown
Management plan ( $SSB_{MP}$ )	?	Unknown

The SSB has declined since 2005 and is likely to be close to  $B_{pa}$  in 2013. The fishing mortality was below  $F_{pa}$  from 1996 to 2009, but started to increase in 2005 and is likely to be close to  $F_{MP}$ .

#### RECENT MANAGEMENT ADVICE:

ICES advises that catches in 2014 should be no more than 140 000 t. All catches are assumed to be landed. Bycatches of coastal cod and *Sebastes marinus* in fisheries targeting saithe in subareas I and II should be kept as low as possible.

#### Other considerations

## Management plan

It is not possible to provide advice according to the management plan. However, the scenarios based on stable SSB and giving catches of 140 kt in 2014, are considered coherent with the objectives in the management plan.

## Additional considerations

Norwegian trawl fisheries for saithe have changed in recent years, with fewer and shorter fishing periods and a smaller proportion of directed saithe fishery. This is related to the increase in cod and haddock quotas. The use of a trawl cpue series in the tuning can thus be questioned. This series shows a stable stock situation, while the acoustic survey shows a decreasing trend. Including (scenario 1) or excluding (scenario 2) the cpue series gave divergent views on stock status and fishing levels, as including the cpue series indicates  $F < F_{pa}$  and  $SSB > B_{pa}$ , while the opposite is true when the cpue series is excluded. This led to a considerable difference in 2014 catch advice based on the target  $F$ s of the management plan (161 kt when including the cpue series (scenario 1) and 98 kt when excluding it (scenario 2)).

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.

**STECF COMMENTS:** STECF agrees with the ICES assessment of the historical trends in the stock but notes that the alternative assessment scenarios give completely different perceptions of the recent absolute levels of SSB and fishing mortality. One scenario results in estimates for SSB and  $F$  in 2012 of 299,000 t and  $F=0.25$  while the second scenario gives corresponding values of 150,000 t and  $F=0.41$ . It is not possible to determine which, if either of the two scenarios is likely to be the most representative of the true state of the stock. STECF notes however that if scenario 2 is the most representative, and catches in 2014 are 140,000 t, SSB in 2015 (144,000 t) will remain well below the Management plan  $B_{TRIGGER}$  value of 220,000 t and fishing mortality will be much higher ( $F=0.44$ ) than  $F_{pa}$  ( $F=0.35$ ) which is the target value for fishing mortality in the management plan. STECF notes that if scenario 2 is representative of the true state of the stock, to deliver a value for fishing mortality of  $F=0.35$  in 2014, landings in 2014 would need to be restricted to a level in the region of 115,000 t.

## 5.6 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. Total catch (2012) = 10.9 kt, where 100% were landings of which 67% was taken by pelagic trawl in international waters in the Norwegian Sea and 33% as bycatch in the demersal fisheries in the Barents Sea and adjacent waters.

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 and . No specific management objectives are so far implemented.

**SOURCE OF MANAGEMENT ADVICE:** The advisory body is ICES. The assessment is conducted using statistical catch-at-age (SCAA) 1992–2012. Additionally, the Schaefer biomass model (1952–2012) is also used.

**REFERENCE POINTS:** Given the current uncertainty on the absolute levels in the assessment model, reference points are not available for this stock.

#### STOCK STATUS:

F (Fishing Mortality)		
	2010–2012	
MSY ( $F_{MSY}$ )	?	Unknown
Precautionary approach ( $F_{pa}, F_{lim}$ )	?	Unknown
SSB (Spawning-Stock Biomass)		
	2011–2013	
MSY ( $B_{trigger}$ )	?	Unknown
Precautionary approach ( $B_{pa}, B_{lim}$ )	?	Unknown
Qualitative evaluation	→	

The total stock biomass (TSB) is estimated to have been relatively stable over the last ten years, with a higher proportion of mature fish than in the 1990s. The temporal patterns in recruitment-at-age 2 indicate a continued return to high levels of recruitment after the recruitment failure for the year classes 1996 to 2003. The estimate for 2012 (year class 2010), although highly uncertain, is the third highest since 1992. Spawning-stock biomass (SSB) steadily increased from 1992 to 2007, followed by a decline since 2009 as the poor year classes become mature.

**RECENT MANAGEMENT ADVICE:** ICES advises a *status quo* catch of *Sebastes mentella* of 24,000 t in 2014 and the measures currently in place to protect juveniles should be maintained. All catches are assumed to be landed.

#### Other considerations

##### MSY approach

ICES advises a *status quo* catch of 24 000 tonnes in 2014 and the measures currently in place to protect juveniles should be maintained. The advice is based on an expected catch (NEAFC TAC + bycatch) in 2013 of 24 000 t, the perception of a currently declining SSB, a period of poor year classes entering the fishery over the next few years, together with model uncertainties.

##### Additional considerations

The historical (1996–2003) failure in recruitment indicates there will be little recruitment to the SSB or the fishery in the coming years, and hence catches based on the long-term average  $F_{MSY}$  may be inappropriate in the short term. Given this period of poor recruitment and uncertainty concerning absolute biomass levels in the model, a more detailed evaluation is required on the appropriate  $F_{MSY}$  level (in both the long and the short term). Such an evaluation will be conducted in early 2014.

Documentation of the fishing effort involved and the catches taken in the international fishery is very important, and NEAFC is requested to provide timely and consistent information for future stock assessments and advice. National reporting of length distributions in the demersal and pelagic commercial catches is required.

#### Uncertainties

The assessment model used is an appropriate basis for advice. The trends in stock biomass and recruitment are robustly modelled by the assessment model, but the absolute biomass levels are uncertain (SSB is likely in the range 500 000 to 1 500 000 tonnes) and this uncertainty is poorly quantified. The catch advice must take these

uncertainties into account; this should be done at the management strategy evaluation. Two key factors causing these uncertainties are the lack of data on the stock structure for older fish, and the lack of an adequate survey index for the whole population.

The current analytical assessment should be expanded to include separate age groups up to 30 years (from the current 19+).

In order to assess the state of the stock, it is necessary to survey the whole distribution area of *S. mentella* in Subareas I and II, both the pelagic and the demersal components. Currently, the survey series does not appropriately cover the geographical distribution of the adult population. Priority should be given to data collection over the slope and open Norwegian Sea regions, where the adult population is most abundant, and to including these new surveys in the analytical assessment in the future. The acoustic/trawl survey conducted in 2008 and 2009 and planned in 2013 in the Norwegian Sea could be considered as a future biomass index of the mature fish, but the time-series is currently too short.

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

The analytical assessment and advice are provided for ICES Subareas I and II combined. The fishery for *S. mentella* operates in national and international waters, which are managed under different schemes and by two distinct management organizations: NEAFC and JNRFC. In international waters, the fishery is managed by NEAFC and, in recent years, an Olympic fishery has been conducted with a set TAC, which is not derived from a harvest control rule. In national waters, the redfish fishery is a bycatch fishery with specific bycatch regulations. STECF agrees with ICES that it is important that management decisions taken by NEAFC and JNRFC are coordinated to ensure that the total catch in ICES Subareas I and II does not exceed the recommended level.

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 2014 that there should be no fishery on *S. Marinus*, STECF notes that managers may wish to implement a more precautionary approach.

## 5.7 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. Commercial catches in 2012 were 5479 t, where 100% were landings (36% by gillnet, 62% by longline and trawl combined, 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 provides 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)		
		2010–2012
MSY ( $F_{MSY}$ )		Above
Precautionary approach ( $F_{pa}, F_{lim}$ )		Unknown
Qualitative evaluation		Increasing trend
SSB (Spawning-Stock Biomass)		
		2011–2013
MSY ( $B_{trigger}$ )		Unknown
Precautionary approach ( $B_{pa}, B_{lim}$ )		Unknown
Qualitative evaluation		SSB lowest in the 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 well above a sustainable level for a redfish stock. Recruitment has historically, especially since the late 1990s, been very low. Recently there have been signals of better recruitment, although it is not clear if these are *S. marinus*, or misidentified fish from the larger *S. mentella* stock. In any event it would take more than three years before these recruits could enter the fishery or the SSB.

#### RECENT MANAGEMENT ADVICE:

New data (landings and surveys) available for this stock do not change the perception of the stock. Therefore the advice for this stock in 2014–2016 is the same as the advice for 2013: ICES advises that there should be no fishing on this stock. All catches are assumed to be landed.

#### Other considerations

#### Outlook for 2014–2016

Projections were conducted for this stock using the Gadget model and indicate that if recruitment is similar to average for recent years (2001–2011), the stock size will be very low by 2017. There is little prospect of any improvement in the situation over the next three years, given the low current SSB, the recent downward trend in the stock, and the delay before any potential good recruitment can enter the fishery.

#### MSY approach

New data (landings and surveys) available for this stock do not change the perception of the stock. Therefore the advice for this stock in 2014–2016 is the same as the advice for 2013: ICES advises that there should be no fishing on this stock. All catches are assumed to be landed.

#### Additional considerations

The current fishing mortality is around 0.33, which is very high compared to the natural mortality of 0.05, and probably well above a sustainable level for a redfish species. Modelling simulations suggest that at current recruitment levels, a sustainable  $F_{MSY}$  may lie around  $F = 0.08$ . However, this would require a stabilization of the stock before it could apply, and the priority is to stop (and reverse) the ongoing decline in the stock.

A portion of the catch is taken in a directed *S. marinus* fishery and closure of this fishery would help reduce the fishing mortality, although a reduction in bycatch in other fisheries would also be required to reduce fishing mortality to sustainable levels.

**STECF COMMENTS:** STECF agrees with the ICES assessment of state of the *S. marinus* stock and the ICES advice for 2014–2016.



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 2014-2016 is to allow a fishery of up to 24,000 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.

## 5.8 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. Total catch in 2012 = 20 079 t, where 100% are landings (60% trawl, 28% longline, 10% gillnet, and 2% others). Not relevant for discards.

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 38<sup>th</sup> 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 the autumn 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)	
	2010–2012
MSY ( $F_{MSY}$ )	Unknown
Precautionary approach ( $F_{pa}, F_{lim}$ )	Unknown
SSB (Spawning-Stock Biomass)	
	2011–2013
MSY ( $B_{trigger}$ )	Unknown
Precautionary approach ( $B_{pa}, B_{lim}$ )	Unknown
Qualitative evaluation	Increasing trend

Only landings and survey trends of biomass and abundance are available for this stock. Biomass estimates indicate a stable or increasing trend since 1992.

### RECENT MANAGEMENT ADVICE:

New data (landings and surveys) available for this stock do not change the perception of the stock. The advice for this stock in 2014 is therefore the same as the advice for 2013: ICES advises that catches should be no more than 15 000 t in 2014. All catches are assumed to be landed.

### Other considerations



### ***PA approach***

New data (landings and surveys) available for this stock do not change the perception of the stock. Therefore the advice for this stock in 2014 is the same as the advice for 2013: ICES advises that catches should be no more than 15 000 t in 2014. (Average catch over the last 10 years). All catches are assumed to be landed.

### **Additional considerations**

#### ***Management considerations***

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. There is no overall measure of the state of the stock or the fishery. Surveys of various parts of the area show diverse trends, mostly indicating that there is an increase in biomass. These surveys are insufficiently informative to give a quantitative measure of recent trends to use directly for management of the stock as a whole (Category 3 advice). It is not possible to determine whether or not increases in catch in the last few years will be consistent with continued improvement in stock biomass which is still considered to be relatively low compared to the long term. The generally positive trends from the surveys over the last few years can be taken to indicate that current catch rates are not likely to be detrimental and precautionary catch reductions do not appear to be necessary (Category 5). Nevertheless, there is insufficient information to justify continuation of catch at the 2012 level. Given these diverse, but largely positive indicators, the overall conclusion is to maintain the advice at the recent catch.

The 38th Session of the Joint Russian–Norwegian Fisheries Commission (JRNFC) in 2009 decided to cancel the ban against targeted Greenland halibut fishery and established an annual TAC. The 42nd Session of JRNFC raised the TAC for 2013 to 19 000 t.

The next benchmark for the Northeast Arctic (NEA) Greenland halibut stock is scheduled for November 2013.

It should be noted that the catches in Division IVa (north of Shetland, on the border between Divisions IVa and IIa) increased from about 200 t in 2011 to about 1000 t in 2012. This fishery is in another management area (EU zone), and is not restricted by any TAC regulations. However, there are limits on catches by non-EU countries in this area.

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

## **5.9 Herring (*Clupea harengus*) in ICES subareas I & II (Norwegian Spring spawners)**

The results from the most recent assessment and advice for this stock were released in 2012. The text below remains unchanged from the Consolidated STECF review of advice for 2013 (STECF-12-22).

**FISHERIES:** The total catches in 2011 were 993000 t., mainly taken by Norway (573 000 t), Russia (144 000 t), Iceland (151 000 t), EU (68 000 t), and Faroe Islands (53 000 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>
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Management plan	SSB <sub>MP</sub>	5.0 million t	Medium-term simulations conducted in 2001.
	F <sub>MP</sub>	0.125	Medium-term simulations conducted in 2001.
MSY	MSY B <sub>trigger</sub>	5.0 million t	B <sub>pa</sub>
Approach	F <sub>MSY</sub>	0.15	Stochastic equilibrium analysis using a Beverton & Holt S/R relationship with data from 1950 to 2009.
Precautionary Approach	B <sub>lim</sub>	2.5 million t	MBAL (accepted in 1998).
	B <sub>pa</sub>	5.0 million t	B <sub>lim</sub> * exp(0.4*1.645).
	F <sub>lim</sub>	not defined	-
	F <sub>pa</sub>	0.15	Based on medium-term simulations.

(unchanged since: 2010)

## STOCK STATUS:

F (Fishing Mortality)				
	2009	2010	2011	
MSY (F <sub>MSY</sub> )	✗	✗	✓	At target
Precautionary approach (F <sub>pa</sub> )	✗	✗	✓	At target
Management plan (F <sub>MP</sub> )	✗	✗	✗	Above target

SSB (Spawning-stock Biomass)				
	2010	2011	2012	
MSY (B <sub>trigger</sub> )	✓	✓	✓	Above trigger
Precautionary approach (B <sub>pa</sub> , B <sub>lim</sub> )	✓	✓	✓	Full reproductive capacity
Management plan (SSB <sub>MP</sub> )	✓	✓	✓	Above trigger

The SSB is declining but still above B<sub>pa</sub> in 2012. Presently three large year classes (2002, 2003, and 2004) dominate the stock. All year classes from 2005 onwards have been small, generally less than half the geometric mean. Fishing mortality in 2011 is estimated below F<sub>MSY</sub> and F<sub>pa</sub>.

**RECENT MANAGEMENT ADVICE:** ICES advises on the basis of the management plan of EU, Faroe Islands, Iceland, Norway, and Russia that landings in 2013 should be no more than 619 000 t.

## Other considerations

### Management plans

Following the long-term management plan agreed by the EU, Faroe Islands, Iceland, Norway, and Russia implies a TAC of 619 000 tonnes in 2013. This is expected to lead to an SSB in 2014 of 4.3 million tonnes. This is below B<sub>trigger</sub> in the management plan. Even without any fishery in 2013 SSB is expected to drop below B<sub>trigger</sub>. The short-term prognoses indicate a decline in SSB from 6.1 million tonnes in 2012 to 5.1 and 4.3 million tonnes in 2013 and 2014, respectively; assuming exploitation in 2012 and 2013 is according to the management plan. SSB in 2014 is expected to be below B<sub>pa</sub> and B<sub>trigger</sub>. In that situation, from 2013 onwards, article 3 of the Management Plan would need to be applied, to set TACs for 2014 and future years. This implies a lower F until the SSB has increased to B<sub>trigger</sub>. Given the low recruitment in recent years, it is expected that SSB will decline further even if catches are low.

### MSY approach

Following the ICES MSY framework implies a fishing mortality of 0.15, resulting in landings of 734 000 tonnes in 2013. This is expected to lead to a decline in SSB in 2014 to 4.2 million tonnes.

Fishing mortality in 2010 is at FMSY, therefore the transition scheme towards the ICES MSY framework does not apply.

#### PA approach

Following the precautionary approach implies a fishing mortality in 2013 no higher than  $F_{pa}$  (0.15), corresponding to landings of less than 734 000 tonnes in 2013. This is expected to lead to a decline in SSB in 2014 to 4.2 million tonnes.

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

### 5.10 Capelin (*Mallotus villosus*) in ICES subareas I and II, excluding Division IIa-west of 5°W (Barents Sea capelin)

The results from the most recent assessment and advice for this stock were released in 2012. The text below remains unchanged from the Consolidated STECF review of advice for 2013 (STECF-12-22).

**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, 2010 and 2011 landings amounted to 307 000 t, 315 000 t and 360 000 t respectively. The landing over the winter period at the start of 2012 are 296 000 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:

	Type	Value	Technical basis
MSY	MSY $B_{trigger}$	Undefined	
Approach	$F_{MSY}$	Undefined	
Precautionary Approach	$B_{lim}$	200 000 t	Above SSB <sub>1989</sub> , the lowest SSB that has produced a good year class.
	$B_{pa}$	Undefined	
	$F_{lim}$	Undefined	
	$F_{pa}$	Undefined	

(unchanged since: 2010)

#### STOCK STATUS:

F (Fishing Mortality)				
	2010	2011	2012	
MSY ( $F_{MSY}$ )	-	-	-	Not relevant
Precautionary approach ( $F_{pa}, F_{lim}$ )	-	-	-	Not relevant

SSB (Spawning-Stock Biomass)				
	2011	2012	2013	
MSY ( $B_{trigger}$ )	?	?	?	Undefined

Precautionary approach ( $B_{lim}$ )	✓	✓	✓ Above limit reference point
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The maturing component in autumn 2012 was estimated to be 2.0 million tonnes. The spawning stock in 2013 will consist of fish from the 2009 and 2010 year classes. The survey estimate of the 2011 year class at age 1 is slightly below the long-term average and 0-group observations during the joint Russian–Norwegian ecosystem survey in August–September 2012 indicated that the 2012 year class is well 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 2013 should be no more than 200 000 tonnes.

#### *Other considerations*

##### *Management plan*

Following the management plan agreed by the Joint Norwegian–Russian Fisheries Commission, catches in 2013 should be no more than 200 000 t. The harvest control rule in the management plan is designed to ensure that the SSB remains above the proposed  $B_{lim}$  of 200 000 t (with 95% probability).

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

## 6 Eco-region 6: Resources in the Faeroe Plateau ecosystem

### 6.1 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 2012 were 6500 t, of which 59% was taken by the longlines, 5% by jigging, 35% by trawlers, and less than 1% by other gear types. There was no industrial by-catch 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 method was XSA calibrated by two research surveys (spring and summer surveys).

#### **REFERENCE POINTS:**

	Type	Value	Technical basis
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 $\sigma$ 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 $\sigma$ 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)				
	2010	2011	2012	
MSY ( $F_{MSY}$ )	✗	✗	✗	Above target
Precautionary approach ( $F_{pa}, F_{lim}$ )	○	○	○	Increased risk

SSB (Spawning-Stock Biomass)				
	2011	2012	2013	
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 2010 and now below  $F_{lim}$ , but still above  $F_{pa}$  and  $F_{MSY}$ . The 2009–2011 year classes are estimated to be below average. The perception of the status of the stock with respect to reference points and trends in this year's assessment is similar to that of last year's assessment. Comparing the 2011 estimates in last year's assessment (2012) with this year's assessment (2013) shows that recruitment has been revised upwards by 11%, the spawning-stock biomass revised downwards by 8%, and the fishing mortality revised upwards by 23%.

**MANAGEMENT OBJECTIVES:** 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 cod 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. 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  $B_{trigger}$ . The MSY  $B_{trigger}$  has been defined at 40 kt (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  $F_{MSY} \times B_{act}/B_{trigger}$  until the SSB has increased again above the MSY  $B_{trigger}$  and is thereafter kept at  $F_{MSY}$ . 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 2014 will be no more than  $F = 0.16$ , corresponding to a 69% reduction in the present fishing mortality. All catches are assumed to be landed.

## ***Other considerations***

### ***MSY approach***

ICES advises on the basis of the MSY approach to reduce fishing mortality by 69% in 2014 to 0.16. This is 49% below F<sub>MSY</sub>, because SSB in 2014 is 49% below MSY Btrigger.

### ***PA approach***

The fishing mortality should be kept below an F<sub>pa</sub> of 0.35. This translates into a reduction in fishing mortality by 33% as compared to the average of the last three years (0.52).

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

STECF notes that this stock is managed by an effort management system and that no TAC is set. However, STECF also notes that (given efficient effort control) the proposed Faroese management plan is consistent with the objective of achieving F<sub>MSY</sub>.

STECF notes that the advice from ICES to reduce fishing mortality to F=0.16, seems to imply a reduction of 61% on the present fishing mortality and not 69% as stated in the ICES advice.

## **6.2 Cod (*Gadus morhua*) in Vb2 (Faroe Bank cod)**

The stock status and advice for this stock for 2014 remains unchanged from that given for 2013. The text below therefore remains largely unchanged from the Consolidated STECF review of advice for 2013 (STECF-12-22).

**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 in the fishing years 2010–2011 and 2011–2012, respectively, a total of 78 and 100 fishing days were allowed to small jiggers in the shallow waters of the Bank even if this closure advice should apply to all fisheries..

## **6.3 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 2012 were down to 2613 t (in 2012 longliners accounted for 81% and trawlers for 19%).

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:

	Type	Value	Technical basis
MSY	MSY $B_{\text{trigger}}$	35 000 t.	$B_{\text{pa}}$
Approach	$F_{\text{MSY}}$	0.25	Stochastic simulations.
Precautionary Approach	$B_{\text{lim}}$	22 000 t.	Lowest observed SSB.
	$B_{\text{pa}}$	35 000 t.	$B_{\text{lim}} e^{1.645\sigma}$ , with $\sigma$ of 0.3.
	$F_{\text{lim}}$	0.40	$F_{\text{pa}} e^{1.645\sigma}$ , with $\sigma$ of 0.3.
	$F_{\text{pa}}$	0.25	$F_{\text{med}}(1998) = 0.25$ .

( $F_{\text{MSY}}$  and MSY  $B_{\text{trigger}}$  were 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  $F_{\text{pa}}$  and  $F_{\text{MSY}}$  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  $F_{\text{target}}$  of 0.45 to be consistent with the MSY approach.

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. This management plan includes a stepwise reduction of the fishing mortality to  $F_{\text{MSY}}$  in 2015 and a recovery plan if the SSB declines below the MSY  $B_{\text{trigger}}$ . The MSY  $B_{\text{trigger}}$  has been defined at 35,000 t (the former  $B_{\text{pa}}$ ) and  $F_{\text{MSY}}$  at 0.25. If the SSB declines below the MSY  $B_{\text{trigger}}$ , the fishing mortality will be reduced by the relationship  $F_{\text{MSY}} * B_{\text{act}} / \text{MSY } B_{\text{trigger}}$  until the SSB has increased again above the MSY  $B_{\text{trigger}}$  and is thereafter kept at  $F_{\text{MSY}}$ .

#### STOCK STATUS:

F (Fishing Mortality)			
	2010	2011	2012
MSY ( $F_{\text{MSY}}$ )	✗	✗	✓ At target
Precautionary approach ( $F_{\text{pa}}, F_{\text{lim}}$ )	○	○	○ Increased risk

SSB (Spawning-Stock Biomass)			
	2011	2012	2013
MSY ( $B_{\text{trigger}}$ )	✗	✗	✗ Below trigger
Precautionary approach ( $B_{\text{pa}}, B_{\text{lim}}$ )	✗	✗	✗ Reduced capacity reproductive



SSB has decreased since 2003 and has since 2010 been estimated to be below Blim. The fishing mortality has decreased from above Flim in 2003 to FMSY in 2012; average F for the last three years is, however, above FMSY. Recruitment from 2003 onwards has been well below the long-term average. This year's assessment shows that the 2012 assessment underestimated the 2011 recruitment by around 32%, underestimated the fishing mortality in 2011 by 31%, and overestimated the 2011 total and spawning-stock biomasses by 5% and 11%, respectively.

#### RECENT MANAGEMENT ADVICE:

ICES advises on the basis of the MSY approach that there should be no directed fishery on haddock in 2014. 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. All catches are assumed to be landed.

#### *Other considerations*

##### *MSY approach*

Based on stochastic simulations in 2012 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 2014 is estimated below MSY  $B_{trigger}$ , fishing mortality should be reduced further. F in 2014 should be no more than  $F_{MSY} \times B_{2013} / MSY B_{trigger}$ , however, because current biomass is estimated to be below Blim. ICES recommends no directed fishing in 2014 and that 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.

##### *PA approach*

Given the recent poor recruitment and slow growth and the low SSB, the forecast indicates that even a zero fishing mortality in 2014 will not result in getting the stock above Blim in 2015. 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 2014.

STECF notes that applying the MSY approach F in 2014 should be no more than  $F_{MSY} \times B_{2013} / MSY B_{trigger}$  suggesting a total catch not exceeding 1000 t. However, because current biomass is estimated to be below Blim. ICES recommends no directed fishing in 2014 and that measures should be put in place to minimize bycatches of haddock in other fisheries.

## 6.4 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 20,000 t 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 35500 t, of which 92% was taken by pair trawlers, 2.3% by single trawlers, and 5.6% 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:

	Type	Value	Technical basis
MSY	MSY $B_{trigger}$	55 000 t.	Breakpoint in segmented regression.



Approach	$F_{MSY}$	0.28	Provisional stochastic simulations (performed in 2011).
Precautionary Approach	$B_{lim}$	Undefined.	
	$B_{pa}$	55 000 t.	$B_{loss}$ in 2011.
	$F_{lim}$	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)			
	2010	2011	2012
MSY ( $F_{MSY}$ )	✗	✗	✗ Above target
Precautionary approach ( $F_{pa}$ )	✗	✗	✗ Harvested unsustainably

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

SSB has decreased substantially since 2005 but is estimated to be slightly above MSY  $B_{trigger}$ . Predicted recruitment in 2012 was below average (32 million). Fishing mortality has decreased from 2009 to 2011, but it increased in 2012 reflecting the rise in catches and is estimated above  $F_{MSY}$ . 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 2014 will be no more than  $F = 0.28$ , corresponding to a 46% reduction in the present fishing mortality. All catches are assumed to be landed.

#### Other considerations

##### MSY approach

Following the ICES MSY framework implies that fishing mortality in 2013 should be no more than  $F_{MSY} = 0.28$  (ICES, 2011), resulting in a reduction of 46% 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 46% in present fishing mortality.

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

STECF notes that this stock is managed by an effort management system and that no TAC is set. There are no incentives to discard fish under the effort management system. STECF also notes that a management plan based on MSY principles has been developed but not yet discussed by the political system. STECF also notes that (given efficient effort control) the proposed Faroese management plan is consistent with the objective of achieving  $F_{MSY}$ .

## **7 Widely distributed and migratory stocks**

### **7.1 European eel (*Anguilla anguilla*)**

The results from the most recent assessment and advice for this stock were released in 2012. The text below remains unchanged from the Consolidated STECF review of advice for 2013 (STECF-12-22).

The most recent comprehensive assessment for European eel was provided by ICES in 2011. Hence, with the exception of the text under the headings Updated Stock Status 2012 and Updated Advice for 2013, the following text remains unchanged from the STECF Review of advice for 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.

**UPDATED STOCK STATUS 2012:** Indications are that the eel stock remained in a critical state in 2012. The recruitment index (five-year average) is currently at its historical lowest, less than 1% for the North Sea for the

years 1960–1979. In 2012, recruitment for the series outside the North Sea increased, but remained less than 6.5% of the 1960–1979 average.

Recruitment of young (recruiting yellow eel, usually 8–20 cm in length) yellow eel has shown a continuous declining trend since the 1950s.

**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.

**UPDATED ADVICE FOR 2013:** ICES considered the updated time-series of relevant stock status indices and repeats the advice from last year:

“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.”

ICES has no new information regarding stocking and this issue has therefore not been revisited in 2012.

**STECF COMMENTS:** STECF agrees with status of the stocks and the ICES advice.

## 7.2 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. Several changes in fishing technology have occurred in the fishery in recent years : increased mesh sizes in several gears, introduction of the high vertical opening trawls in the mid-1990s, and introduction of selective gears in the *Nephrops* trawl fishery of the Bay of Biscay (square mesh panel). Total landings in 2012 = 75.2 kt (20% trawl, 21% gillnet, 18% longline, and 41% unspecified gears). Discards of 14.6 kt (16% of catches). Discard data are only available for some of the fleets and not all data are included in the assessment.

**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 4 survey series. This stock was benchmarked in 2010 and a further benchmark is scheduled for 2014.

### REFERENCE POINTS:

	Type	Value	Technical basis
MSY Approach	MSY $B_{trigger}$	Not defined.	
	$F_{MSY}$	0.24	$F_{30\%SPR}$ ( <a href="#">Section 9.3.2.1</a> in ICES, 2010).
Precautionary Approach	$B_{lim}$	Not defined.	
	$B_{pa}$	Not defined.	
	$F_{lim}$	Not defined.	
	$F_{pa}$	Not defined.	

(unchanged since: 2010)

**MANAGEMENT AGREEMENT:** A recovery plan was agreed by EU in 2004 (EC Reg. No. 811/2004). The aim of the plan is to increase the SSB to above 140 000 t with a fishing mortality ( $F_{MP}$ ) of 0.25, constrained by a year-to-year change in TAC of 15% when SSB is above 100 000 t. This plan has not been evaluated by ICES. 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)				
	2010	2011	2012	
MSY ( $F_{MSY}$ )	✗	✓	✓	Appropriate
Precautionary approach ( $F_{pa}, F_{lim}$ )	?	?	?	Undefined
SSB (Spawning-Stock Biomass)				
	2011	2012	2013	
MSY ( $B_{trigger}$ )	?	?	?	Undefined
Precautionary approach ( $B_{pa}, B_{lim}$ )	?	?	?	Undefined
Qualitative evaluation	↗	↗	✓	Above reference points poss.

The spawning biomass has been increasing since 2008 and is estimated to be record high in 2013. Fishing mortality has decreased sharply in recent years and was equal to the  $F_{MSY}$  proxy in 2011 and 2012. Recruitment fluctuations appear to be without substantial trend over the whole series. After low recruitments in 2009, 2010, and 2011, the last recruitment (2012) is estimated to be the highest in the time-series.

### **RECENT MANAGEMENT ADVICE:**

ICES advises on the basis of the MSY approach that landings should be no more than 81,846 t in 2014. Even though some discards are included in the assessment, the total amount of discards cannot be quantified. Therefore total catches cannot be calculated.

#### **Other considerations**

##### **MSY approach**

Because  $MSY B_{trigger}$  has not been identified for this stock, the ICES MSY approach has been applied without considering SSB in relation to  $MSY B_{trigger}$ .

Following the ICES MSY approach implies fishing mortality at  $F_{MSY} = 0.24$ , resulting in catches of no more than 84,111 t in 2014. This is expected to lead to an SSB of 333 kt in 2015. If discard rates do not change, this implies landings of no more than 81,846 t in 2014.

Not all discards are accounted for in the model and in the forecast, and therefore cannot be quantified even though they are substantial (in 2012 other observed, but also partial, discards accounted for 10% by weight of the total catch).

##### **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.

#### **Additional considerations**

Discards of juvenile hake can be substantial in some areas and fleets. The spawning-stock biomass and the long-term yield can be substantially improved by reducing mortality of small fish. This could be achieved by measures that reduce unwanted bycatch through shifting the selection pattern towards larger fish. TACs have been ineffective in regulating the fishery in recent years as landings greatly exceeded the TACs.

Hake in the ICES area is managed and assessed as two separate stocks. There is no biological basis for the current ICES stock definition of northern and southern hake. These stocks have similar biology with an unknown degree of mixing.

**STECF COMMENTS:** STECF agrees with the ICES assessment of the state of the stock and the advised landings for 2014 of 81,846 t. Given that total discards are not accounted for in the assessment model and catch forecast, the predicted catch of 84,811 t is an underestimate.

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.

## **7.3 Blue whiting (*Micromesistius poutassou*) in ICES subareas I-IX, XII & XIV**

The results from the most recent assessment and advice for this stock were released in 2012. The text below remains unchanged from the Consolidated STECF review of advice for 2013 (STECF-12-22).

**FISHERIES:** Blue whiting is exploited mainly by fleets from Norway, Russia, the Faroe Islands, and Iceland but the Netherlands, Scotland, Denmark, Ireland, Sweden, Germany and Spain also take substantial catches. The fishery for blue whiting was fully established in 1977. The Northern blue whiting stock is fished in Subareas II, V, VI, and VII and most of the catches are taken in the directed pelagic trawl fishery in the spawning and post-spawning areas (Divisions Vb, VIa,b and VIIb,c). Catches are also taken in the directed and mixed fishery in Subarea IV and Division IIIa, and in the pelagic trawl fishery in the Subareas I and II, in Divisions Va, and XIVa,b. The fisheries in the northern areas have taken 330 000 t to 640,000 t per year in the first half of the nineties, after which catches increased to close to 1 000 000 t in the latter part of the decade. Catches have been above one million tonnes for most years after 2000 (except 2009, 2010 and 2011) with 2003 and 2004 having recorded the highest catches (>2,300,000 t). In the southern areas (Subarea VIII, IX, Divisions VIId,e and g-k) catches have been stable around 30 000 t between 1987 and 2011 with the exception of 2004 when 85,000 t were recorded and in 2007 when landings were less than 18 000 t. In Division IXa blue whiting is mainly taken as bycatch in mixed trawl fisheries.

Total landings over all areas decreased drastically from 1.25 million t in 2008 to 104 thousand t in 2011.

**SOURCE OF MANAGEMENT ADVICE:** The main body for management advice is ICES. The assessment is based on catch-at-age data from commercial catches in 1981–2011 and one international blue whiting spawning stock survey (IBWSS) 2004–2012. The IBWSS survey is the only survey that covers almost the entire distributional area of the spawning stock.

Due to the large uncertainties in the 2010 survey data the IBWSS index has been excluded from the assessment since 2011, because the survey in 2010 is believed to have missed significant concentrations, making it not comparable with the remainder of the time-series.

Limited information was available on discarding and discards were therefore not included in the assessment. However, discarding is considered to be minor.

#### REFERENCE POINTS:

	Type	Value	Technical basis
Management plan	SSB <sub>MP</sub>	2.25 million t	B <sub>pa</sub>
	F <sub>MP</sub>	0.18	Management strategy evaluation conducted in 2008 (Anon., 2008; ICES, 2008).
MSY Approach	MSY B <sub>trigger</sub>	2.25 million t	B <sub>pa</sub>
	F <sub>MSY</sub>	0.18	Management strategy evaluation conducted in 2008 (Anon., 2008; ICES, 2008).
Precautionary Approach	B <sub>lim</sub>	1.50 million t	B <sub>loss</sub>
	B <sub>pa</sub>	2.25 million t	B <sub>lim</sub> exp(1.645*σ), with σ = 0.25.
	F <sub>lim</sub>	Undefined.	Previous estimates are not considered valid (ICES, 2012b).
	F <sub>pa</sub>	Undefined.	Previous estimates are not considered valid (ICES, 2012b).

(unchanged since: 2012)

**MANAGEMENT AGREEMENT:** A management plan was agreed by Norway, the EU, the Faroe Islands, and Iceland, and subsequently endorsed by NEAFC in 2008. The plan uses i) a target fishing mortality (F = 0.18) if SSB is above B<sub>pa</sub>, ii) a linear reduction to F = 0.05 if SSB is between B<sub>pa</sub> and B<sub>lim</sub>, and iii) F = 0.05 if SSB is below B<sub>lim</sub>. ICES has evaluated the plan in 2008 and concluded that it is in accordance with the precautionary approach. Work is underway to evaluate a NEAFC request concerning an alternative management plan. ICES will issue advice in advance of WGWIDE 2013.

For assessment purposes ICES considers blue whiting in ICES Subareas I–IX, XII, and XIV as a single stock.

#### STOCK STATUS:

F (Fishing Mortality)			
	2009	2010	2011
MSY (F <sub>MSY</sub> )	✗	✗	✓ At target
Precautionary approach (F <sub>pa</sub> , F <sub>lim</sub> )	?	?	? undefined
Management plan (F <sub>MP</sub> )	✗	✗	✓ At target

SSB (Spawning-Stock Biomass)			
	2010	2011	2012
MSY (B <sub>trigger</sub> )	✓	✓	✓ Above trigger
Precautionary approach (B <sub>pa</sub> , B <sub>lim</sub> )	✓	✓	✓ Full reproductive capacity
Management plan (SSB <sub>MP</sub> )	✓	✓	✓ Above trigger

Historical low landings and fishing mortality at 0.04 in 2011, in combination with an increase in recruitment since 2010, have stopped the steep decline in SSB since 2004. SSB has increased by one million tonnes from 2011 to 2012 (3.8 million tonnes) and is above Bpa at the beginning of 2012. An increase in recruitment has been observed for the last two years, but the absolute recruitment strength is uncertain.

**RECENT MANAGEMENT ADVICE:** ICES advises on the basis of the management plan agreed by Norway, the EU, the Faroe Islands, and Iceland, that catches in 2013 should be no more than 643 000 tonnes.

#### *Other considerations*

#### *Management plan*

The management plan agreed by Norway, EU, the Faroe Islands, and Iceland November 2008 implies a TAC of 643 000 tonnes in 2013, compared to 391 000 tonnes in 2012. This is expected to lead to an increase in SSB in 2014 to 5.67 million tonnes, which is above SSBMP.

#### *MSY approach*

Following the ICES MSY framework implies fishing mortality to be at  $F_{MSY} = 0.18$ , corresponding to catches of 643 000 tonnes in 2013. This is expected to lead to an increase in SSB in 2014 to 5.67 million tonnes, which is above MSY  $B_{trigger}$ .

#### *PA approach*

No PA F-reference points are available for this stock. Even with an F twice the size of F in 2012 SSB will be above Bpa in 2014.

#### *Additional considerations*

Recruitment (age 1) is estimated significantly higher in 2011 than in the years 2007–2009 with the historically low recruitments. Information from surveys and the fishery indicates a steep increase in recruitment in the two most recent years. Also, indices suggest that recruitment (age 1) in 2012 is at a similar or higher level.

ICES (2012b) evaluated available evidence on sub-stock structure and came to the conclusion that there is no scientific evidence in support of multiple stocks with distinct spawning locations or timings. The emerging picture is one of a single stock whose large-scale spatial spread varies as a function of hydrographic conditions and total abundance; this is commonly described as an abundance–occupancy relationship. Further, there seem to be a number of core nursery and feeding areas with marginal areas being occupied at times of high stock abundance. As a result, ICES considers blue whiting in ICES Subareas I–IX, XII, and XIV as a single stock for assessment purposes.

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

#### **7.3.1** Blue whiting (*Micromesistius poutassou* L.) in Sub -areas IIa(1)-North Sea (1)

Blue Whiting in these sub-areas is assessed together with all other areas as a single stock. See section 7.3.

#### **7.3.2** Blue whiting (*Micromesistius poutassou* L.) in Sub -areas Vb(1), VI, VII

Blue Whiting in these sub-areas is assessed together with all other areas as a single stock. See section 8.3.

#### **7.3.3** Blue whiting (*Micromesistius poutassou* L.) in Sub -areas VIIIabd

Blue Whiting in these sub-areas is assessed together with all other areas as a single stock. See section 7.13.

#### **7.3.4** Blue whiting (*Micromesistius poutassou* L.) in Sub -areas VIIIe

Blue Whiting in these sub-areas is assessed together with all other areas as a single stock. See section 7.1.

#### **7.3.5** Blue whiting (*Micromesistius poutassou* L.) in Sub -areas VIIIc, IX, X

Blue Whiting in these sub-areas is assessed together with all other areas as a single stock. See section 7.13.

## 7.4 Horse mackerel (*Trachurus trachurus*) in ICES Divisions IIa, IVa, Vb, VIa, VIIa-c,e-k and VIIIa-e (western stock)

The results from the most recent assessment and advice for this stock were released in 2012. The text below remains unchanged from the Consolidated STECF review of advice for 2013 (STECF-12-22).

**FISHERIES:** Catches of ‘Western’ horse mackerel increased in the 1980s with the appearance of the extremely strong 1982-year-class. Changes in the migration pattern became evident at the end of the 1980s when the largest fish in the stock (mainly the 1982-year-class) migrated into Divisions IIa and IVa during the 3rd and 4th quarters. Following the changes in migration, a target fishery on horse mackerel developed in Division IVa by the Norwegian purse seiners. Most catches by other countries were taken in Sub-areas VI, VII and Divisions VIIIa-e.

The catches in Division IVa have dropped considerably since 1996 and Western horse mackerel has in recent years been taken in a variety of fisheries exploiting juvenile fish for the human consumption market (with midaged fish mostly for the Japanese market), and older fish either for human consumption purposes (mostly for the African market) or for industrial purposes. The proportion of catches (in weight) in the areas where juveniles are distributed increased gradually from about 40% in 1997 to about 65% in 2003, but declined to 40% in 2005. Since 2005, there have been no obvious changes in fishing patterns. Overall catch levels increased from 123 000 t in 2007 to 218 000 t in 2010. The estimated catches for 2011 amount to 200 000 t.

**SOURCE OF MANAGEMENT ADVICE:** The main management advisory body is ICES. There is uncertainty in the absolute estimates of SSB. The only fishery-independent information for this stock is a measure of egg production from surveys conducted every three years. The assessment assumes that fecundity at size is constant from year to year. If this assumption is incorrect then the assessment results may be biased.

### REFERENCE POINTS:

	Type	Value	Technical basis
MSY	MSY $B_{\text{trigger}}$	Not defined	
Approach	$F_{\text{MSY}}$	0.13	$F_{0.1}$ from the yield-per-recruit analysis
Precautionary Approach	$B_{\text{lim}}$	Not defined <sup>1)</sup>	
	$B_{\text{pa}}$	Not defined <sup>1)</sup>	
	$F_{\text{lim}}$	Not defined	
	$F_{\text{pa}}$	Not defined	

(unchanged since: 2010)

<sup>1)</sup> Previous PA biomass reference points were considered not consistent with the perceived state of the stock, the exploitation rate and the evaluation of MSY reference points.

### MANAGEMENT AGREEMENT:

In 2007, a management plan based on the triennial egg survey was proposed by the Pelagic RAC and has been used since 2008 to set the EU TAC. The management plan was evaluated by ICES in 2007 and was found to be precautionary only in the short term because some relevant scenarios were not evaluated. ICES reviewed the plan again in 2012 and could not unequivocally conclude that the original or modified HCR is consistent with the precautionary approach in the long term. ICES further advises that the plan should be subjected to a complete review. ICES does not advise on the basis of the management plan because Norway objected to the use of the plan for advice; in addition ICES considers that the plan needs to be re-evaluated according to its original provisions (a three-year re-evaluation period). The realignment of the stock and management areas, as outlined in the plan, has been included in the TAC regulations since 2010.

### 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

The SSB, which has varied between 1.16 and 2.69 million tonnes during 1995–2011, is estimated to be at 1.66 million tonnes in 2012. Fishing mortality has been increasing since 2007 and is now above  $F_{MSY}$  ( $F_{2011} = 0.18$ ). Recruitment has been low from 2004 onwards.

**RECENT MANAGEMENT ADVICE:** ICES advises on the basis of the MSY approach that catches in 2013 should be no more than 126 000 t.

#### *Other considerations*

##### *MSY approach*

Following the ICES MSY framework implies a fishing mortality of 0.13 in 2013, corresponding to catches in 2013 of 126 000 tonnes. This is expected to lead to a decline in SSB in 2014 to 1.20 million tonnes. Applying the transition rule will imply a catch that is not much different from the  $F_{MSY}$  catch in 2013.

##### *PA approach*

There are no PA reference points defined for this stock.

##### *Management plans*

Following the proposed plan from the Pelagic RAC implies a catch in 2013 of 183 000 tonnes. This is expected to lead to a decline in SSB in 2014 to 1.14 million tonnes.

##### *Additional considerations*

Note that the TAC advice based on the MSY approach results in an SSB in 2014 that is approaching the lowest SSB in the time-series. Although the low SSB does not necessarily equate to reduced recruitment, it should be noted that the buffer against increased fishing pressure has been reduced.

The TAC should apply to all areas where Western horse mackerel is caught.

The advice for horse mackerel assumes that all catches are counted against the TAC for each stock separately. ICES advises that the management areas correspond to the distribution areas which include all EU, Norwegian, and Faroese waters where horse mackerel are caught. The management areas for the North Sea and Western horse mackerel were changed in 2010 to more appropriately reflect the stock distributions.

Western horse mackerel are taken in a variety of fisheries for human consumption with juvenile fish directed mostly at the Japanese market, and large fish at the African market. Since 2003, the fishery has been more directed toward younger fish (ages 1–3) than fish of ages 4 to 8. In 2011, fishing mortality on younger ages reached a record-high level. This indicates that the fishery now relies more on recent year classes which are generally poor.

**STECF COMMENTS:** STECF agrees with the ICES assessment and the advice. STECF further notes that even with an  $F_{0.1}$  of 0.13 as proxy for  $F_{msy}$ , SSB is still predicted to decline in 2014.

## **7.5 Northeast Atlantic Mackerel (*Scomber scombrus*) - combined Southern, Western and North Sea spawning components)**

The results from the most recent assessment and advice for this stock were released in 2012. The text below remains unchanged from the Consolidated STECF review of advice for 2013 (STECF-12-22).

**FISHERIES AND STOCK:** ICES currently uses the term “Mackerel in Northeast Atlantic” to define the mackerel present in the area extending from ICES Division IXa in the south to Division IIa in the north, including mackerel in the North Sea and Division IIIa. Catches cannot be allocated specifically to spawning area components on biological grounds but by convention, catches from the Southern and Western components are separated according to the areas in which these are taken.

To keep track of the development of spawning biomass in the different spawning areas, mackerel in the Northeast Atlantic stock are divided into three area components: the Western Spawning Component, the North Sea Spawning Component, and the Southern Spawning Component. The Western Component is defined as mackerel spawning in the western area (ICES Divisions and Subareas VI, VII, and VIII a, b, d, e). This component currently accounts for 78% the entire Northeast Atlantic stock. Similarly, the Southern Component is defined as mackerel spawning in the southern area (ICES Divisions VIIIc and IXa). Although the North Sea component has been at an extremely low level since the early 1970s, ICES considers that the North Sea Component still exists as a discrete unit. This component spawns in the North Sea and Skagerrak (ICES Subarea IV and Division IIIa). Current knowledge of the state of the spawning components is summarised below.

Traditionally, the fishing areas with higher catches of mackerel have been in the northern North Sea (along the border of Divisions IVa and IIa), around the Shetland Isles, and off the west coast of Scotland and Ireland. The southern fishery off Spain’s northern coast has also accounted for significant catches. In recent years significant catches have also been taken in Icelandic and Faroese waters, areas where almost no catches were reported prior to 2008. In 2011, catches in this area constituted approximately 32% of the total reported landings. In 2011 Greenland has reported catches for the first time. In the Icelandic and Faroese fisheries, in the north-western part of the distribution area, mackerel have been partly taken together with herring. In the southern part of the distribution area, Atlantic mackerel (*Scomber scombrus*) can be caught together with Spanish mackerel (*Scomber colias*). Catches of both species are reported separately.

**Western Component:** The catches of this component were low in the 1960s, but increased since. The main catches are taken in directed fisheries by purse-seiners and mid-water trawlers. Large catches of the western component are taken in the northern North Sea, west of Scotland and in the Norwegian Sea. A separate assessment for this stock component has not been conducted in recent years as a recent extension of the time-series of NEA mackerel data now allows the estimation of the mean recruitment from 1972 onwards. Estimates of the spawning-stock biomass, derived from egg surveys, indicates an increase from 2.47 million t in 2004 to 3.43 million t in 2010.

**North Sea Component:** Very large catches were taken in the 1960s in the purse-seine fishery, reaching a maximum of about 1 million t in 1967. The component subsequently collapsed and catches declined to less than 100,000 t in the late 1970s. Catches during the last ten years have been assumed to be about 10,000 t. Estimates of the SSB of the North Sea component derived from the North Sea egg survey indicate a decrease from 0.22 million t in 2005 to 0.17 million t in 2011.

**Southern Component:** Mackerel in this component are taken in a mixture of purse-seine, demersal trawl, line, and gillnet fisheries. The highest catches (87%) from the Southern component are taken in the first half of the year, mainly from Division VIIIc, and consist of adult fish. In the second half of the year, the catches are mainly taken in Division IXa and contain a high proportion of juveniles. Catches from the Southern component increased from about 20 000 t in the early 1990s to about 40 000 tonnes in the early 2000s, reaching a peak at 108 000 tonnes in 2009 and decreasing to 19 000 tonnes in 2011. The 2011 decline was due to pay-back of 18 000 tonnes and tighter regulations. Estimates of the SSB of the Southern component derived from egg surveys indicate an increase from 0.28 million tonnes in 2004 to 0.85 million tonnes in 2010.

**SOURCE OF MANAGEMENT ADVICE:** The advisory body is ICES. This assessment is based on catch numbers-at-age for the period 1972–2011 and triennial egg survey estimates of SSB from 1992 to 2010. Some sampling for discards has been carried out since 2000 and a formal requirement was initiated in the EU in 2002. Estimating proportions of catch discarded and slipped is problematic in pelagic fisheries due to high variability in discard and slipping practices. In some fleets no sampling for discards is carried out. The discards included in the catch in the assessment are an underestimate. Recruit surveys provide information on the distribution of young mackerel, but are subject to high variability and have not proved useful in estimating year-class strength.

**REFERENCE POINTS:**

	<i>Type</i>	<i>Value</i>	<i>Technical basis</i>
Management plan	SSB <sub>trigger</sub>	2.2 million t	Medium-term simulations conducted in 2008.
	F <sub>target</sub>	0.20–0.22	Medium-term simulations conducted in 2008.
MSY Approach	MSY B <sub>trigger</sub>	2.2 million t	SSB associated with high long-term yield and low probability of stock depletion based on management strategy evaluation (ICES, 2008).
	F <sub>MSY</sub>	0.22	F associated with above.
Precautionary Approach	B <sub>lim</sub>	1.67 million t	B <sub>loss</sub> of the 2007 assessment for combined stock (Western, Southern and North Sea components).
	B <sub>pa</sub>	2.3 million t	B <sub>loss</sub> of the Western component in 1998 assessment raised by 15% to account for the southern component.
	F <sub>lim</sub>	0.42	F <sub>loss</sub>
	F <sub>pa</sub>	0.23	F <sub>lim</sub> * 0.55 (CV 36%).

(unchanged since: 2010)

**MANAGEMENT AGREEMENT:** A management plan was agreed by Norway, Faroe Islands and the EU in October 2008. ICES has evaluated the plan and concluded that the plan is precautionary under the assumption that the TAC equals the total removals from the stock. However, since 2009, the management plan has not been followed and there was no international agreement on TACs for 2010, 2011 and 2012.

1. For the purpose of this long-term management plan, “SSB” means the estimate according to ICES of the spawning stock biomass at spawning time in the year in which the TAC applies, taking account of the expected catch.
2. When the SSB is above 2,200,000 tonnes, the TAC shall be fixed according to the expected landings, as advised by ICES, on fishing the stock consistent with a fishing mortality rate in the range of 0.20 to 0.22 for appropriate age groups as defined by ICES.
3. When the SSB is lower than 2,200,000 tonnes, the TAC shall be fixed according to the expected landings as advised by ICES, on fishing the stock at a fishing mortality rate determined by the following:

$$\text{Fishing mortality } F = 0.22 * \text{SSB} / 2,200,000$$

4. Notwithstanding paragraph 2, the TAC shall not be changed by more than 20% from one year to the next, including from 2009 to 2010.
5. In the event that the ICES estimate of SSB is less than 1,670,000 tonnes, the Parties shall decide on a TAC which is less than that arising from the application of paragraphs 2 to 4.
6. The Parties may decide on a TAC that is lower than that determined by paragraphs 2 to 4.
7. The Parties shall, as appropriate, review and revise these management measures and strategies on the basis of any new advice provided by ICES

#### STOCK STATUS:

F (Fishing Mortality)			
	2009	2010	2011
MSY (F <sub>MSY</sub> )	✗	✗	✗ Above target
Precautionary approach (F <sub>pa</sub> , F <sub>lim</sub> )	○	○	○ Increased risk
Management Plan (F <sub>MP</sub> )	✗	✗	✗ Above target
SSB (Spawning-stock Biomass)			
	2010	2011	2012

MSY ( $B_{\text{trigger}}$ )	✓	✓	✓	Above trigger
Precautionary approach ( $B_{\text{pa}}, B_{\text{lim}}$ )	✓	✓	✓	Full reproductive capacity
Management Plan ( $SSB_{\text{MP}}$ )	✓	✓	✓	Above trigger

Fishing mortality in 2011 is estimated to be 0.31, above  $F_{\text{MSY}}$  and  $F_{\text{pa}}$ . Fishing mortality was above  $F_{\text{lim}}$  during the early 2000s. SSB has increased considerably since 2002 and remains high, above  $B_{\text{pa}}$  and MSY  $B_{\text{trigger}}$ , but is currently declining. The 2005 and 2006 year classes are the strongest year classes in the time-series. There is insufficient information to reliably estimate the size of the 2009–2011 year classes.

**RECENT MANAGEMENT ADVICE:** ICES advises on the basis of the Norway, Faroe Islands, and EU management plan that catches in 2013 should be between 497 000 tonnes and 542 000 tonnes.

ICES advise that the existing measures to protect the North Sea spawning component should remain in place. These are:

- There should be no fishing for mackerel in Divisions IIIa and IVb,c at any time of the year;
- There should be no fishing for mackerel in Division IVa during the period 15 February–31 July;
- The 30 cm minimum landing size at present in force in Subarea IV should be maintained.

### *Other considerations*

#### *Management plans*

Following the management plan (agreed by the EU, Norway, and Faroes in 2008) implies a TAC between 497 and 542 thousand tonnes in 2013, corresponding to a catch reduction between 47% and 42% compared to the estimated catches in 2012. This would lead to an estimated SSB in 2014 between 2.61 and 2.56 million tonnes.

#### *MSY approach*

Following the ICES MSY framework implies that fishing mortality should be reduced to 0.22 ( $F_{\text{MSY}}$ ), resulting in a total catch of 542 thousand tonnes in 2012. This would lead to an estimated SSB in 2014 of 2.56 million tonnes.

Following the transition scheme towards the ICES MSY Harvest Control Rule implies that fishing mortality should be reduced to  $F_{\text{pa}}$  (= 0.23), resulting in a total catch of 564 thousand tonnes in 2013. This would lead to an estimated SSB in 2014 of 2.53 million tonnes.

#### *PA approach*

Following the precautionary approach (PA) implies that fishing mortality in 2012 should be no higher than  $F_{\text{pa}}$  ( $F = 0.23$ ), corresponding to a total catch of 564 thousand tonnes in 2013. This is expected to maintain SSB above  $B_{\text{pa}}$  in 2014.

#### *Additional considerations*

Distribution and timing of migrations and spawning in recent years have resulted in the development of new fisheries and have also impacted the operations of well established fisheries. Information on variability in mackerel behaviour and distribution was examined at an ICES Workshop in 2012. The workshop concluded that a temporal shift to an earlier spawning migration of NEA mackerel, from March–April to February, is indicated in the southern area (Cantabrian Sea) in 2012, suggesting very early spawning. Spawning distribution has expanded towards the north and northwest, but most of the eggs are still produced in the historical core spawning area located from the west of the Celtic Sea to the west of Ireland. The expansion seems to be less related to changes in the environmental conditions, than to the increase in stock size. This has led to part of the stock spawning in previously unused areas.

The TAC should apply to all areas where mackerel are caught. Catches since 2008 have been considerably in excess of ICES advice, which was based on the management plan. This situation continued in 2011. The absence of comprehensive international agreements on the exploitation of the stock (between all nations involved in the fishery) remains a critical concern, and prevents control of the total exploitation rate. Because the management plan has not been followed, the expected 2012 catch needed to be estimated (see table below). The estimation procedure took account of the declared quotas, interannual transfer of quotas not fished in 2011,

an estimate of the part of the quotas that are not expected to be fished in 2012, discards, estimated overshoot in catches, and quota payback. The total estimated catch in 2012 (930 135 tonnes) used for projections corresponds to a fishing mortality of 0.36, which is well above  $F_{MSY}$  and the stipulated range in the management plan for this stock. Maintaining such a catch in 2013 and 2014 would result in a decrease of the stock size in the short term. ICES notes that interannual transfers occur and that their consistency with the PA has not been evaluated.

ICES Estimation of 2012 catch	Tonnes	Reference
EU quota and Swedish quota	398 575	European Council Regulation COM (2012) 0182
EU deduction (DE+LT+PL+UK overcatch in 2011)	-6 907	European Commission press release 1 Aug 2012
UK-Ireland payback	-18 222	European Council Regulation 2012/147
Spanish payback	-5 500	European Council Regulation 2011/165
Norwegian quota	181 095	European Council Regulation COM (2012) 0182
Russian quota	62 072	NEAFC HOD 12/27
Discards	9 012	Previous years estimate
Icelandic quota	145 000	Ministry of Fisheries and Agriculture: Press release 17 Feb. 2012
Interannual quota transfer 2011→2012 (Iceland)	5 811	<a href="http://www.fiskistofa.is">http://www.fiskistofa.is</a>
Faroeese quota	148 375	Ministry of Foreign Affairs : Press release 29 Feb 2012
Interannual quota transfer 2011→2012 (Faroe Islands)	3 000	WGWIDE estimate
Greenland quota	5 410	Greenland Fisheries License Control Authority 24 Aug 2012
Expected overcatch	2 414	Based on 2011 overcatch percentage
Total expected catch (incl. discards)	930 135	

**STECF COMMENTS:** STECF agrees with the ICES assessment of the state of the stock and that on the basis of the Norway, Faroe Islands and EU management plan that catches in 2012 should be 497 000 tonnes and 542 000 tonnes.

STECF notes that Iceland and the Faroe Islands set autonomous quotas for 2009, 2010, 2011 and 2012 resulting in catches far greater than those advised by ICES. If catches in 2013 exceed those prescribed by the management plan to the extent recently experienced, the SSB in 2014 is predicted to decline by about 11% compared to 2013.

## 7.6 Red Gurnard (*Aspitrigla cuculus*) in the Northeast Atlantic

Advice for this stock for the years 2013 and 2014 was given in 2012 and the text below remains unchanged from the Consolidated STECF review of advice for 2013 (STECF-12-22).

**FISHERIES AND STOCK:** Red gurnard (*Aspitrigla cuculus*) is a benthic species widely distributed in the northeast Atlantic from South Norway and north of the British Isles to Mauritania, on grounds between 20 and 250 m. This benthic species is abundant in the Channel and on the shelf west of Brittany. Data are not available to determine stock identity for red gurnard.

Red gurnards are mainly caught by demersal trawlers in mixed fisheries, mostly in Divisions VIIId-k and VIIId,b and in Division IVc. A preliminary analysis has shown that discarding is above 50% of the catch in the English Channel. There are no technical measures specifically dedicated to red gurnard or other gurnard species.

**SOURCE OF MANAGEMENT ADVICE:** The main body for management advice is ICES.

**REFERENCE POINTS:** No reference points have been defined for this stock.

**MANAGEMENT AGREEMENT:**

There are no current management agreements. There is no TAC for this species.

**STOCK STATUS:**

F (Fishing Mortality)		
	2009–2011	
Qualitative evaluation	?	Insufficient information

SSB (Spawning-stock Biomass)		
	2010–2012	
Qualitative evaluation	→	Stable

In the area with the highest abundance (Celtic Sea) the abundance index has fluctuated without a trend since 2002. In the Bay of Biscay the abundance index has also fluctuated without trend, but the 2011 estimate is the highest in the time-series.

Landings data are not available 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:** Based on ICES approach to data-limited stocks, ICES advises that catches should be reduced by 20%. Because the data for catches of red 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*

##### *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 red gurnard are considered highly unreliable, ICES is not in a position to quantify the result.

#### *Additional considerations:*

Currently there is no TAC for this species in the ICES area and it is not clear whether there should be one or several management units. There is no minimum landing size.

Higher occurrences of red gurnard with patchy distribution have been observed along the western coast of Ireland and Scotland from the Shetland Islands to the Celtic Sea and the English. The distribution seems continuous from the Celtic Sea into the North Sea and into the Bay of Biscay. Therefore it was decided not to split this species over the different ecoregions.

The biomass indicator from IBTS-Q1 has shown an increased abundance at the northern border of the North Sea, following an expansion of the stock area from west of Scotland. In the Eastern Channel, the CGFS-Q4 indicator has shown a wide fluctuation and a declining tendency since 2009. In western Iberian waters, the PGFS-Q4 indicator fluctuates at a low level.

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

## **7.7 Boarfish (*Capros aper*) in the Northeast Atlantic**

The results from the most recent assessment and advice for this stock were released in 2012. The text below remains unchanged from the Consolidated STECF review of advice for 2013 (STECF-12-22).


**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)	
	2009-2011
Qualitative evaluation	 Below possible ref. pts.

SSB (Spawning Stock Biomass)	
	2009-2011
Qualitative evaluation	 Above possible ref. pts.

Qualitative information suggests that boarfish are not over-exploited. The age composition of the commercial catch is not truncated and contains a full range of ages.

**RECENT MANAGEMENT ADVICE:** ICES advises on the basis of the MSY approach that catches in 2013 should be no more than 82 000 t.

*Other considerations*

*MSY approach*

$F_{0.1}$  is used as a proxy for  $F_{MSY}$ . The  $F_{0.1}$  estimate converted to a harvest rate (12.2%) was applied to total biomass estimated (673,047 t) from the 2012 acoustic survey. On this basis, ICES advises that catches in 2013 should not be more than 82 000 t.

*Additional considerations:*

*Management considerations*

The stock appears to be large, widely distributed, and not over-exploited. The FAO gives guidelines on how new and developing fisheries should be dealt with. It is recommended that expansion should only take place in a cautious manner. The overall objective in managing such a new fishery should be to prevent the development of the fleet's capacity outpacing the ability of management to understand the effect of existing fishing effort. In view of the rapid development of the fishery in recent years, a cautious approach is warranted in exploiting boarfish.

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. This proposed closed season has been followed by participating vessels on a voluntary basis in 2011 and 2012. A closed season was also proposed in Division VIIg to prevent catches of Celtic Sea herring, known to form feeding aggregations in this region at these times. If catches of a single species other than boarfish totals more than 5% of the total catch in the boarfish fishery, by day and by ICES statistical rectangle, and this species is covered by a TAC, then boarfish fishery must cease in that rectangle. In 2012, a management plan has been proposed by the Pelagic RAC. This includes a nested set of harvest control rules that are designed to deal with whatever level of information is available to assess stock status. This plan has yet to be evaluated.

Bottom trawl survey data suggest 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 (Cardador and Chaves, 2010). 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.

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

## 7.8 Spurdog (*Squalus acanthias*) in the North East Atlantic

The results from the most recent assessment and advice for this stock were released in 2012. The text below remains unchanged from the Consolidated STECF review of advice for 2013 (STECF-12-22).

**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. WGEF has attempted various analytic assessments of NE Atlantic spurdog using a number of different approaches. Although these models have not proved entirely satisfactory (as a consequence of the quality of the assessment input data), these exploratory assessments and survey data all indicate a decline in spurdog.

**REFERENCE POINTS:**

	Type	Value	Technical basis
MSY	MSY $B_{\text{trigger}}$	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	$B_{\text{lim}}$	Not defined.	
	$B_{\text{pa}}$	Not defined.	
	$F_{\text{lim}}$	Not defined.	
	$F_{\text{pa}}$	Not defined.	

**STOCK STATUS:**

F (Fishing Mortality)				
	2010	2011	2012	
MSY Exploitation Ratio	✓	✓	✓	Below target
Precautionary approach ( $F_{\text{pa}}, F_{\text{lim}}$ )	?	?	?	Undefined

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

*Other considerations*

**Outlook for 2013 and 2014**

No short-term forecast is provided for this stock. The updated assessment does not alter the perception of the stock as being depleted.

### ***Management plans***

There is a generic EC Action Plan for the Conservation and Management of Sharks, but no specific management objectives are known.

### ***MSY considerations***

Exploitation status is below  $F_{prop,MSY}$ , as estimated from the results of the assessment. However, biomass has declined to record low level in recent years and therefore to allow the stock to rebuild, catches should be reduced to the lowest possible level in 2013 and 2014. 2011 projections assuming status quo  $F_{prop}$  (linked to total assumed catch of 540 t in 2011) suggest that the stock will rebuild by 9–15% of its 2011 level by 2015.

Although  $MSY B_{trigger}$  has not been identified for this stock, it is highly likely that SSB is below any candidate  $MSY B_{trigger}$ .

### ***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 2013 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.

A rebuilding plan should be developed for this stock, noting that the time for recovery will be over a decadal time frame.

### ***Additional considerations:***

Analyses of microsatellite data conducted by Verisimmo et al. (2010, a WD submitted to WGEF) found genetic homogeneity between east and west Atlantic spurdog, but the authors suggested this could be accomplished by transatlantic migrations of a very limited number of individuals.

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 extend in 2012. Reports suggest that the zero TAC in 2011 and 2012 have increased the discards of spurdogs in mixed fisheries.

In 2009, a maximum landing length (100 cm) was introduced in EC waters, and this deterred many of the fisheries targeting spurdog. In theory, the maximum landing length of 100 cm will restrict fisheries targeting mature females, but will not impede females being discarded if they are harvested together with smaller individuals (< 100 cm). As the mortality rate of discarded spurdogs is unknown, the maximum landing length alone does not afford complete protection of mature females. Norway has a minimum catch size of 70 cm (first introduced in 1964), and from 2011 no directed fishery.

A rebuilding plan is needed for this stock. Rebuilding measures should incorporate biomass targets and rebuilding timelines. Enhanced data collection schemes should be developed in the form of science–industry collaborations.

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.

**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.

## 7.9 Basking shark (*Cetorhinus maximus*) in the North East Atlantic

The results from the most recent assessment and advice for this stock were released in 2012. The text below remains unchanged from the Consolidated STECF review of advice for 2013 (STECF-12-22).

**FISHERIES:** According to WGEF, a single stock of basking sharks *Cetorhinus maximus* exists in the ICES area. The stock structure is unknown. In the absence of such information, the basking shark population in the Northeast Atlantic is presumed to be a single stock. There are indications that this stock has connectivity with the western and southern Atlantic.. 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. 2011 landings

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. Out of 15 reported instances of incidental bycatch in French fisheries (2009-2011), four were released alive. From Norway, there were 11 records of incidental bycatch (2006-2012), of which two were released alive and two were landed. Other sources of mortality (e.g. ship strikes) are unknown. Other sources of mortality (e.g. ship strikes) are 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 been 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 $B_{\text{trigger}}$	Not defined	
Approach	$F_{\text{MSY}}$	Not defined	
Precautionary	$B_{\text{lim}}$	Not defined	
Approach	$B_{\text{pa}}$	Not defined	
	$F_{\text{lim}}$	Not defined	
	$F_{\text{pa}}$	Not defined	

(unchanged since: 2010)

## STOCK STATUS:

F (Fishing Mortality)		
	2009–2011	
MSY ( $F_{\text{MSY}}$ )	?	Unknown
Precautionary approach ( $F_{\text{pa}}, F_{\text{lim}}$ )	?	Unknown
SSB (Spawning-Stock Biomass)		
	2010–2012	
MSY ( $B_{\text{trigger}}$ )	?	Unknown
Precautionary approach ( $B_{\text{pa}}, B_{\text{lim}}$ )	?	Unknown
Qualitative evaluation	✗	Likely below poss. reference points

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.

## Outlook for 2013

No reliable assessment can be presented for this stock. This is because of lack of data.

## Other considerations

### MSY approach

Given the international conservation status of this species, MSY is not considered to be a suitable target.

**STECF COMMENTS:** STECF agrees with the ICES advice.

## 7.10 Tope (*Galleorhinus galeus*) in the North East Atlantic

The results from the most recent assessment and advice for this stock were released in 2012. The text below remains unchanged from the Consolidated STECF review of advice for 2013 (STECF-12-22).

**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 371t in 2005. Since then reported landings fluctuated between 300t and 500 t. Reported landings in 2011 are estimated at 301t. 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:

F (Fishing Mortality)		
	2010–2011	
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 ( $B_{pa}, B_{lim}$ )	?	Unknown
Qualitative evaluation	?	Decreasing

The state of the stock is unknown. Landings of tope have been relatively stable during the last two decades, albeit lower than in the late 1970s and early 1980s. Tope is not encountered in surveys in sufficient numbers to determine trends. 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:** Based on ICES approach to data-limited stocks, ICES advises that catches should be reduced by 20%. Because the data for catches of tope are not fully documented and

considered unreliable (due to the historical use of generic landings categories), ICES is not in a position to quantify the result. Measures to identify pupping areas should be taken.

### ***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 average of the last three years. However, as species-specific landings data are not complete, it is not possible to quantify the current catch.

Additional measures should be identified that can regulate exploitation of this stock. Such measures may include seasonal and/or area closures, technical measures, and tailored measures for any target fisheries. Such measures should be developed by stakeholder consultations, considering the overall mixed fisheries context.

#### ***Additional considerations***

There is limited information on the distribution of tope pups, though they have been reported to occur in certain inshore areas (e.g. southern North Sea and the Bristol Channel). The current lack of more precise data on the location of pupping and nursery grounds, and their importance to the stock, precludes spatial management of the fisheries at the moment. Nevertheless, protecting pupping and nursery habitats has been considered an important tool for the Australian stock, where seasonal closures and gear restrictions have been used to protect pregnant females when they migrate to pupping grounds.

Occasional records of pups are recorded in UK surveys are from the southern North Sea (IVc), though they have also been recorded in the northern Bristol Channel (VIIf). The lack of more precise data on the location of pupping and nursery grounds, and their importance to the stock, precludes spatial management for this species at the present time.

A genetic study (Chabot and Allen, 2009) on the eastern Pacific population including comparisons with samples from Australia, South and North America and UK, shows that there is little to no gene flow between these populations, meaning an apparent lack of migration.

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

## **7.11 Porbeagle (*Lamna nasus*) in the North East Atlantic**

The results from the most recent assessment and advice for this stock were released in 2012. The text below remains unchanged from the Consolidated STECF review of advice for 2013 (STECF-12-22).

**FISHERIES:** Porbeagle is a highly migratory and schooling species. Sporadic targeted fisheries developed on these schools. Porbeagle has been exploited commercially since the early 1800s, principally by Scandinavian fishers; however, the “boom” period for this fishery in the Northeast Atlantic began in the 1930s. 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.

By the beginning of the 1960s, the Norwegian fishery extended briefly to the Orkney–Shetland area and the Faroes before moving to the Northwest Atlantic waters. The Danish fishery operated in the North Sea where the catches decreased in the middle of the 1960s. However, a seasonal and profitable French longline fishery began in the 1970s in the Celtic Sea and Bay of Biscay. It lasted until the TAC was reduced to zero. Prior to the closure of the fishery, the French fleet was composed of about five boats based at Yeu Island (Atlantic coast of France).

There is a by-catch by demersal trawlers and gillnets from many countries, including Ireland, UK, Denmark, France and Spain in the North Sea, west of Ireland and Biscay.

An unquantified amount of discarding now takes place in mixed demersal trawl and gillnet fisheries operating in EC waters. Discard mortality is unknown.

**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	MSY $B_{\text{trigger}}$	Not defined	
Approach	$F_{\text{MSY}}$	Not defined	
Precautionary	$B_{\text{lim}}$	Not defined	
	$B_{\text{pa}}$	Not defined	
Approach	$F_{\text{lim}}$	Not defined	
	$F_{\text{pa}}$	Not defined	

(unchanged since: 2010)

#### STOCK STATUS:

F (Fishing Mortality)		
	2008–2011	
MSY ( $F_{\text{MSY}}$ )	?	Unknown
Precautionary approach ( $F_{\text{pa}}, F_{\text{lim}}$ )	?	Unknown
SSB (Spawning-Stock Biomass )		
	2008–2011	
MSY ( $B_{\text{trigger}}$ )	?	Unknown
Precautionary approach ( $B_{\text{pa}}, B_{\text{lim}}$ )	?	Unknown
Qualitative evaluation	✗	Depleted

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:

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 2012-2013**

Exploratory assessments conducted in 2009 and 2010 were not considered a basis for advice.

#### ***Other considerations***

Based on the catch trend, the stock is estimated to be well below its historical high levels of the 1930s–1950s. This is demonstrated by the observation that the Northern fisheries have ceased and have not been resumed.

No new information has been provided since 2009 regarding the catches except an analysis of the French cpue (1972–2008), which underlines the important local variations of porbeagle abundance and hence the difficulties in assessing the state of the stock without a long cpue time-series and for the whole distribution area of the stock.

The catch time-series has been improved since 2009, notably by the report of the estimated bycatch of the Spanish swordfish longline fishery. However, catch data are considered to be underestimated because some countries have incomplete recordings of porbeagle (or they have been reported as generic sharks).

APEX Tagging program results was presented during the ICCAT 2012 : 1960 porbeagle tagged off the northeast coast of USA since 1961, 360 recaptures were registered in 2011 with a maximum of 10 year at liberty (average 41% < year at liberty) suggesting few intrusion in the central Atlantic.

UK electronic tagging studies (14 sharks and 2062 days of data) were conducted recently around the British Isles. The furthest confirmed distance recorded by a porbeagle shark from the British Isles, was from a shark which moved to the west central Atlantic after being tagged in north-west Ireland during the summer.

A recent genetic study suggests that the stock is genetically robust, although further confirmation is required.

The history of the fishery is not well documented, and reports often emphasized or omitted some aspects (economic drivers, Danish participation, results of the 1958–62 Norway prospecting) that may alter the perception of the fishery dynamics.

#### ***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***

There is no new information to alter the perception of the depleted nature of the stock. In view of the low reproductive capacity of porbeagle, a zero fishing mortality appears the only option that can allow a recovery of the stock. There should be no fishery, and landings of porbeagle should not be allowed.” A rebuilding plan should be developed for this stock, noting that the time for recovery will exceed a decadal time frame.

**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 bycatches of this species and that regarding the large distribution of this species and its aggregative behaviour, some international collaborative survey could be a way fill the lack of information requested for an assessment.

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.

Porbeagle has been recently listed to the CITES Appendix III (2012/044) by Belgium, Cyprus, Denmark<sup>11</sup>, Estonia, Finland, France, Germany, Greece, Ireland, Italy, Latvia, Lithuania, Malta, Netherlands, Poland, Portugal, Slovenia, Spain, Sweden and United Kingdom of Great Britain and Northern Ireland. Appendix III is a list of wildlife and plant species identified by particular CITES Party countries as being in need of international trade controls.



## 7.12 Thresher sharks (*Alopius vulpinus* and *Alopius superciliosus*) in the North East Atlantic

The results from the most recent assessment and advice for this stock were released in 2012. The text below remains unchanged from the Consolidated STECF review of advice for 2013 (STECF-12-22).

Two species of thresher shark occur in the ICES areas: common thresher (*Alopius vulpinus*) and bigeye thresher (*A. superciliosus*). Of these, *A. vulpinus* is the dominant species taken in the continental shelf fisheries of the ICES area. There is little information on the stock identity of these circumglobal sharks, and WGEF assumes that there is a single NE Atlantic and Mediterranean stock of *A. vulpinus*. This stock probably extends into the CECAF area. The presence of a nursery ground in the Alboran Sea provides the rationale for including the Mediterranean Sea within the stock area.

There are no target fisheries for thresher sharks in the NE Atlantic; although they are taken as a bycatch in longline and driftnet fisheries. Both species are caught mainly in longline fisheries for tunas and swordfish, although they may also be taken in drift-net and gillnet fisheries. The fisheries data for the ICES area are scarce, and they are unreliable, because it is likely that the two species (*Alopius vulpinus* and *A. superciliosus*) are mixed in the records.

ICCAT is responsible for the management of this species in the tuna fisheries.

Article 19 of EC Regulation No. 44/2012 prohibits the retention, transshipment or landing any part or whole carcass of bigeye thresher shark *Alopius superciliosus* in any fishery, and also prohibits any directed fishery for thresher sharks *Alopius* spp. in the ICCAT area.

### **Additional considerations**

Some Van Bertalanffy growth parameters for the bigeye thresher shark of the tropical northeastern Atlantic estimated on 117 specimens ranging from 176 to 407 cm TL as well as maturity information on the bigeye thresher shark from the Atlantic were provided by Fernandez-Carvalho et al. (2011 and 2012). Significant differences were found in the size distribution of the species and the sex ratios between the North and South Atlantic. Sizes at first maturity (L50) were estimated at 206.09 cm FL for females and 159.74 cm FL for males.

Ecological risk assessments were undertaken by ICCAT for 11 pelagic sharks (ICCAT, 2011). These analyses demonstrated that the bigeye thresher has the lowest productivity and highest vulnerability with a productivity rate of 0.010, and that the common thresher is 10<sup>th</sup> in rank with a productivity rate of 0.141

One *A. superciliosus* were electronically tagged in Gulf of Mexico in 2008 by Carlson & Gulak. After 120 days at sea the bigeye thresher shark moved from 51 km, spending most of his time between 25 and 50 m depth in waters between 20 and 22 °C. Compare to previous studies by Weng & Block (2004) this individual exhibit very light diurnal movement pattern that may be caused by the deep of the tagging location.

**STECF COMMENTS:** STECF suggest that in view of the wide distribution of the species and the lack of information on stocks identity, catches by all nations should be reported to the relevant RFMO in an attempt to improve the fishery-dependent data on thresher sharks.

## 7.13 Blue shark (*Prionace glauca*) in the North East Atlantic

The results from the most recent assessment and advice for this stock were released in 2012. The text below remains unchanged from the Consolidated STECF review of advice for 2013 (STECF-12-22).

The DELASS project and the ICCAT Shark Assessment Working Group consider there to be one stock of blue shark *Prionace glauca* in the North Atlantic. Thus the ICES area is only part of the stock. ICCAT, 2008 considered that the 5°N parallel was the most appropriate division between North and South Atlantic stocks of blue shark.

In recent years, more information has become available about fisheries taking blue shark in the North Atlantic. Although the available data are limited, it offers some information on the situation in fisheries and trends. Although there are no large-scale directed fisheries for this species, it is a major bycatch in many fisheries for tunas and billfish, where it can comprise up to 70% of the total catches and thereby exceed the actual catch of targeted species.

ACOM has never provided advice for blue shark in the ICES area. ICCAT is the responsible agency for assessment of this species. No specific management advice has been provided by ICCAT for this stock, to date.

Regarding the stock assessment of blue shark of the North and South Atlantic carried out in 2008, ICCAT estimated that the biomass is above MSY. As in the 2004 stock assessment, many runs of the model (using surplus production models, age-structured models and models without catches), the state of the stock seems to be close to the levels of unexploited biomass and the fishing mortality rates seem to be considerably below the level to attain MSY. Although the results of all the models used are conditional on the assumptions considered (for example, historical estimates of the catches and effort, the relationship between catch rates and abundance, the initial status of the stock in the 1950s and the various life cycle parameters), the majority of the models predicted, from a coherent mode, that the blue shark stocks are not over-exploited and that over-fishing is not occurring.

There are no measures regulating the catches of blue shark in the North Atlantic. EC Regulation No. 1185/2003 prohibits the removal of shark fins of this species, and subsequent discarding of the body. This regulation is binding on EC vessels in all waters and non-EC vessels in Community waters.

ICCAT is responsible for the management of this species in the tuna fisheries.

**STECF COMMENTS:** STECF has no comments.

## 7.14 Portuguese dogfish (*Centroscyrnus coelolepis*) in the north-east Atlantic

The results from the most recent assessment and advice for this stock were released in 2012. The text below remains unchanged from the Consolidated STECF review of advice for 2013 (STECF-12-22).

**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. Unless suitable data can be found to enable splitting of the catch data, historical catch levels will remain uncertain. 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. Portuguese dogfish is an unavoidable bycatch taken in several mixed trawl fisheries and mixed longline fisheries. It is also taken as a bycatch in other fisheries, for example the anglerfish gillnet fishery. Fishing effort has declined since restrictions on deep-water fishing were put in place in 2007 (STECF, 2011). Fishery-independent data are derived from surveys that take place in a restricted part of the whole distribution area considered for each of the two stocks.

**SOURCE OF MANAGEMENT ADVICE:** The main advisory body is ICES. No analytical assessment was carried out in 2012. The assessment is based on commercial CPUE 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

No reference points have been defined for this stock.

Trends in relative abundance estimates show that Portuguese dogfish abundance has declined to levels below any candidate reference point. Landings have declined in response to reduced abundance and restrictive management measures (e.g. TAC = 0 from 2010 onwards).

### STOCK STATUS:

F (Fishing Mortality)		
2009–2011		
MSY ( $F_{MSY}$ )	?	Unknown

<b>Precautionary approach</b> ( $F_{pa}, F_{lim}$ )	?	Unknown
<b>SSB (Spawning-Stock Biomass)</b>		
	<b>2009–2011</b>	
<b>MSY</b> ( $B_{trigger}$ )	?	Unknown
<b>Precautionary approach</b> ( $B_{pa}, B_{lim}$ )	?	Unknown
<b>Qualitative evaluation</b>	✗	Below any candidate reference point

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.

There is no information to alter the perception of this stock as being depleted since the 2006 catch per unit effort estimates (ICES, 2006). Due to its very low productivity, Portuguese dogfish can only sustain very low rates of exploitation.

**RECENT MANAGEMENT ADVICE:** ICES advice for 2013 and 2014, on the basis of the precautionary approach, was that there should be no catches of Portuguese dogfish.

Management Objective (s)	Landings in 2011 and 2012
Transition to an <b>MSY approach</b> with caution at low stock size	TAC = 0
Cautiously avoid impaired recruitment ( <b>Precautionary Approach</b> )	TAC = 0
Cautiously avoid impaired recruitment and achieve other objective(s) of a <b>management plan</b> (e.g., catch stability)	n/a

Due to its very low productivity, Portuguese dogfish can only sustain very low rates of exploitation. The rates of exploitation and stock sizes of deepwater sharks cannot be quantified. Given their very poor state, ICES recommends a zero catch of Portuguese dogfish.

This is the first time ICES has given separate advice for this species. Until now, advice has been given for this species and leafscale gulper shark combined. No new assessment was performed in 2012. However, there is no information to alter the perception of the stock as being depleted. The advice is the same as was provided for 2011 and 2012.

#### *Other considerations*

#### **Outlook for 2013-2014**

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

#### **Management considerations**

TACs only regulate the landings, and a low TAC on a low-value bycatch species could induce more discards. Because this species is caught as a bycatch in demersal fisheries, it would benefit from a reduction in the overall demersal fishing effort.

#### **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.

**STECF COMMENTS:** STECF agrees with the ICES advice for Portuguese dogfish.

STECF notes that for 2013 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 51/2006 Annex 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)

## 7.15 Kitefin shark (*Dalatias licha*) in the north-east Atlantic

The results from the most recent assessment and advice for this stock were released in 2012. The text below remains unchanged from the Consolidated STECF review of advice for 2013 (STECF-12-22).

**FISHERIES** Kitefin is mainly distributed in the Azorean Islands, but occurs widely at low abundance throughout the ICES area. The population structure is not well understood. Currently there are no targeted commercial fisheries for kitefin shark in the Northeastern Atlantic, though they are taken as a bycatch in trawl and hook-and-line fisheries. The target Azorean fishery stopped in 1998. After that occasional high bycatch values were reported by Portugal from Subarea VI in 2000, 2001, and 2003. Large interannual fluctuations in landings and the decrease in landings after 1991 are believed to have been driven by fluctuations in market prices

**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 2012.

### REFERENCE POINTS

No reference points have been defined for this assessment unit. No new information is available to alter the perception of a stock that is depleted below any candidate biomass reference point.

### 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	✗	Below any candidate reference points.

### RECENT MANAGEMENT ADVICE:

The advice, and its basis, is the same as was provided for 2011 and 2012. ICES advise for 2013-2014 on the basis of the precautionary approach that no targeted fisheries should be permitted unless there are reliable estimates of current exploitation rates and sufficient data to assess productivity. There should be no fisheries unless there is evidence that this will be sustainable.

The advice is precautionary. The methods applied to derive quantitative advice for data-limited stocks are expected to evolve as they are further developed and validated.

TACs only regulate the landings, and a low TAC on a low-value bycatch species could induce more discards.

Management Objective (s)	Landings in 2011 and 2012
Transition to an <b>MSY approach</b> with caution at low stock size	TAC = 0

Cautiously avoid impaired recruitment ( <b>Precautionary Approach</b> )	TAC = 0
Cautiously avoid impaired recruitment and achieve other objective(s) of a <b>management plan</b> (e.g., catch stability)	n/a

### ***Other considerations***

Stock assessments of kitefin shark from Subarea X were made during the 1980s, using an equilibrium Fox production model (Silva, 1987). The stock was considered intensively exploited with the average observed total catches (809 t) near the estimated maximum sustainable yield ( $MSY = 933$  t). An optimum fishing effort of 281 days bottom net fishing and 359 man trips fishing with handlines were suggested, corresponding approximately to the observed effort. During the DELASS project (Heessen, 2003) a Bayesian stock assessment approach using three cases of the Pella–Tomlinson biomass dynamic model with two fisheries (handline and bottom gillnets) was performed (ICES, 2003, 2006). The stock was considered depleted based on the probability of the biomass 2001 being less than  $B_{MSY}$ . These assessment results must be interpreted with caution because the cpue used by the assessment may not reflect abundance trends. No assessments have been performed since because of the lack of information.

There are no current target fisheries and no fishery-independent surveys to monitor the stock. ICES considers that the development of a fishery should not be permitted unless data at the level of sustainable catches are made available.

It could be useful to evaluate the status of the kitefin shark stock in the closed areas around the Azores.

### ***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.

**STECF COMMENTS:** STECF agrees with the ICES advice for kitefin shark.

STECF notes that for 2013 a TAC of 0 t has already been agreed for deepwater sharks.

STECF also considers 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)

## **7.16 Leaf-scale gulper shark (*Centrophorus squamosus*) in the north-east Atlantic**

The results from the most recent assessment and advice for this stock were released in 2012. The text below remains unchanged from the Consolidated STECF review of advice for 2013 (STECF-12-22).

**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. Leafscale gulper shark is both taken as unavoidable bycatch in several mixed trawl fisheries and mixed longline fisheries. They are taken as a bycatch in other fisheries, for example the anglerfish gillnet fishery. Fishing effort has declined since restrictions on deep-water fishing were put in place in 2007 (STECF, 2011).

**SOURCE OF MANAGEMENT ADVICE:** The main advisory body is ICES. No analytical assessment was carried out in 2012. The assessment is based on commercial CPUE trends. Landings data on these species remain very problematical and, in many cases, reliable data are only available for combined siki sharks. Retrospective splitting of the data into species categories and reconstruction of historic data from mixed

categories is based on limited information and is problematic. Unless suitable data can be found to enable splitting of catch data, historical catch levels will remain uncertain.

**REFERENCE POINTS:** No reference points have been defined for this stock. Trends in relative abundance estimates show that leafscale gulper shark abundance has declined to levels below any candidate reference point.

#### 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	✗	Below any candidate reference points.

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:** This is the first time ICES has given separate advice for this species. Until now, advice was given for this species and Portuguese dogfish combined. No new assessment was performed in 2012. However, there is no information to alter the perception of the stock as being depleted. The advice is the same as was provided for 2011 and 2012. ICES advises on the basis of the precautionary approach that there should be no catches of leafscale gulper shark for 2013 and 2014. Due to its very low productivity, leafscale gulper shark can only sustain very low rates of exploitation. The rates of exploitation 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.

Management Objective (s)	Landings in 2011 and 2012
Transition to an <b>MSY approach</b> with caution at low stock size	TAC = 0
Cautiously avoid impaired recruitment ( <b>Precautionary Approach</b> )	TAC = 0
Cautiously avoid impaired recruitment and achieve other objective(s) of a <b>management plan</b> (e.g., catch stability)	n/a

TACs only regulate the landings, and a low TAC on a low-value bycatch species could induce more discards. Because the elasmobranch species are caught as a bycatch in demersal fisheries, they would benefit from a reduction in the overall demersal fishing effort.

#### Other considerations

#### Outlook for 2013-2014

No analytical assessment can be presented for this stock. Therefore, 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.

**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 considers 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 51/2006 Annex 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).

## 7.17 Angel shark (*Squatina squatina*) in the north-east Atlantic

The results from the most recent assessment and advice for this stock were released in 2012. The text below remains unchanged from the Consolidated STECF review of advice for 2013 (STECF-12-22).

**FISHERIES:** Angel shark was rarely reported in landings data prior to it being listed as a prohibited species. It is believed that the peak in UK landings in 1997 from Divisions VIIj–k were either misreported anglerfish (also called monkfish) or hake, as angel shark is more of a coastal species. These figures have been removed from the landings data. French landings have declined from >20 t per year in the 1970s to less than 1 t per year prior to the prohibition on landings. Angel shark landings in Subarea VIII have always been very low.

**SOURCE OF MANAGEMENT ADVICE:** Advice on angel shark is provided by ICES.

**REFERENCE POINTS:** No reference points have been proposed for this species.

### 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	✗	Depleted

There are few recent records of captures of angel shark and it may be extirpated from areas of former habitat. Small local populations do exist, particularly in the Celtic seas ecoregion (Cardigan Bay, Division VIIa, and Tralee Bay, Division VIIj), although numbers here may also be in decline. It is considered to be extirpated in the North Sea, although it may still occur in Division VIId.

**RECENT MANAGEMENT ADVICE:** ICES advises on the basis of the precautionary approach that there should be no catches of angel shark, and that it should remain a species prohibited from being fished. Measures should be taken to minimize bycatch.

**MANAGEMENT PLANS:** Angel shark is currently on the EU prohibited species list.

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



## 7.18 Smoothhounds (*Mustellus* spp) in the north-east Atlantic

The results from the most recent assessment and advice for this stock were released in 2012. The text below remains unchanged from the Consolidated STECF review of advice for 2013 (STECF-12-22).

**FISHERIES:** Smooth-hounds are taken as a bycatch in mixed demersal and gillnet fisheries. Smooth-hounds are important species for recreational fisheries in some areas. Although landings data are preliminary and underestimate true landings, it is clear that catches have increased in recent years. This increase may reflect the increased abundance and/or improved marketing opportunities for the species (given the zero TAC for spurdog).

**SOURCE OF MANAGEMENT ADVICE:** Advice on smoothhounds is provided by ICES.

**REFERENCE POINTS:** No reference points have been proposed for this species.

### STOCK STATUS:

F (Fishing Mortality)		
	2005–2011	
MSY ( $F_{MSY}$ )	?	Unknown
Precautionary approach ( $F_{pa}, F_{lim}$ )	?	Unknown
SSB (Spawning-Stock Biomass)		
	2005–2011	
MSY ( $B_{trigger}$ )	?	Unknown
Precautionary approach ( $B_{pa}, B_{lim}$ )	?	Unknown
Qualitative evaluation	↗	Increasing

The relative abundance of smooth-hounds in trawl surveys in Subareas IV, VII, and VIII have increased in recent years. The average of the stock size indicator (number hr<sup>-1</sup>) in the last two years (2010–2011) is 42% higher than the average of the five previous years (2005–2009) in the Celtic Sea, and 45% higher for the southern North Sea and eastern English Channel. There has been a general increase in smooth-hound abundance since the early 1990s.

Commercial landings have increased in recent years, although landings data are considered unreliable, due to the widespread use of generic landings categories (e.g. dogfish and hounds). The quality of landings data is improving for the genus. Species-specific data are considered unreliable and ICES can currently only provide advice at the genus level.

**RECENT MANAGEMENT ADVICE:** Based on ICES approach to data-limited stocks, ICES advises that catches should be reduced by 4%. Because the data for catches of smooth-hounds are not fully documented and considered highly unreliable (due to the historical use of generic landings categories), ICES is not in a position to quantify the result.

**MANAGEMENT PLANS:** There is a generic EC Action Plan for the Conservation and Management of Sharks, but no specific management objectives are known to ICES.

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

## 8 Deepwater Resources

The results from the most recent assessment and advice for this stock were released in 2012. The text below remains unchanged from the Consolidated STECF review of advice for 2013 (STECF-12-22).

*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).
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-	Tusk in Division Va		Gadget – benchmarked assessment using Iceland spring survey

Code	Stock name	Category	Comment
Ice		1	
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 (VIIIf,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.
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.

Code	Stock name	Category	Comment
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.

## 8.1 Alfonsinos/Golden eye perch (*Beryx spp.*)

The results from the most recent assessment and advice for this stock were released in 2012. The text below remains unchanged from the Consolidated STECF review of advice for 2013 (STECF-12-22).

**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.

## 8.2 Ling (*Molva molva*)

The results from the most recent assessment and advice for this stock were released in 2012. The text below remains unchanged from the Consolidated STECF review of advice for 2013 (STECF-12-22).

**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).

### 8.2.1 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)		
MSY ( $F_{MSY}$ )	2009–2011	
	?	Unknown



<b>Precautionary approach</b> ( $F_{pa}, F_{lim}$ )	?	Unknown
<b>Qualitative evaluation</b>	→	Stable, but unknown in relation to poss. Ref. points
<b>SSB (Spawning-Stock Biomass)</b>		
	2009–2011	
<b>MSY</b> ( $B_{trigger}$ )	?	Unknown
<b>Precautionary approach</b> ( $B_{pa}, B_{lim}$ )	?	Unknown
<b>Qualitative evaluation</b>	→	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.

#### 8.2.2 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 increase 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.

### 8.2.3 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 Btrigger.

#### 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.

#### 8.2.4 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.

### 8.3 Blue Ling (*Molva dypterygia*).

The results from the most recent assessment and advice for this stock were released in 2012. The text below remains unchanged from the Consolidated STECF review of advice for 2013 (STECF-12-22).

**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.

#### 8.3.1 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
<b>MSY (<math>F_{MSY}</math>)</b>	?	Unknown
<b>Precautionary approach (<math>F_{pa}, F_{lim}</math>)</b>	?	Unknown

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.




### 8.3.2 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.

### 8.3.3 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.

## 8.4 Tusk (*Brosme brosme*)

The results from the most recent assessment and advice for this stock were released in 2012. The text below remains unchanged from the Consolidated STECF review of advice for 2013 (STECF-12-22).

**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.)

#### 8.4.1 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.

#### 8.4.2 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 Approach	$B_{lim}$	Not defined.	
	$B_{pa}$	Not defined.	
	$F_{lim}$	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 FMSY proxy. However STECF considers that  $F_{0.1}$  (0.16) is a more precautionary proxy of  $F_{\text{msy}}$  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.

### 8.4.3 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 XIIa<sub>1</sub> and XIVb<sub>1</sub>. 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)		
Qualitative evaluation	2009–2011	
	?	Unknown
SSB (Spawning-Stock Biomass)		
Qualitative evaluation	2009–2011	
	?	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.

#### 8.4.4 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.

#### 8.4.5 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.

## 8.5 Greater silver smelt or argentine (*Argentina silus*)

The results from the most recent assessment and advice for this stock were released in 2012. The text below remains unchanged from the Consolidated STECF review of advice for 2013 (STECF-12-22).

**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.




### 8.5.1 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

<b>MSY (<math>F_{MSY}</math>)</b>		Unknown
<b>Precautionary approach (<math>F_{pa}, F_{lim}</math>)</b>		Unknown
<b>Qualitative evaluation</b>		Increasing

SSB (Spawning-Stock Biomass)		
		2007–2011
<b>MSY (<math>B_{trigger}</math>)</b>		Unknown
<b>Precautionary approach (<math>B_{pa}, B_{lim}</math>)</b>		Unknown
<b>Qualitative evaluation</b>		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.

### 8.5.2 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
<b>MSY (<math>F_{MSY}</math>)</b>		Unknown

<b>Precautionary approach</b> ( $F_{pa}, F_{lim}$ )	?	Unknown
<b>Qualitative evaluation</b>	?	Unknown
<b>SSB (Spawning-Stock Biomass)</b>		
		2009–2011
<b>MSY</b> ( $B_{trigger}$ )	?	Unknown
<b>Precautionary approach</b> ( $B_{pa}, B_{lim}$ )	?	Unknown
<b>Qualitative evaluation</b>	?	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.

## 8.6 Black scabbardfish (*Aphanopus carbo*)

The results from the most recent assessment and advice for this stock were released in 2012. The text below remains unchanged from the Consolidated STECF review of advice for 2013 (STECF-12-22).

**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.

### 8.6.1 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
<b>MSY (<math>F_{MSY}</math>)</b>	?	Unknown
<b>Precautionary approach (<math>F_{pa}, F_{lim}</math>)</b>	?	Unknown
<b>Qualitative evaluation</b>	✓	Above poss ref points

SSB (Spawning-Stock Biomass)		
		2009–2011
<b>MSY (<math>B_{trigger}</math>)</b>	?	Unknown
<b>Precautionary approach (<math>B_{pa}, B_{lim}</math>)</b>	?	Unknown
<b>Qualitative evaluation</b>	✓	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.

#### 8.6.2 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 ( $B_{pa}, B_{lim}$ )	?	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 lpue 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.

### 8.6.3 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.

## 8.7 Greater forkbeard (*Phycis blennoides*)

The results from the most recent assessment and advice for this stock were released in 2012. The text below remains unchanged from the Consolidated STECF review of advice for 2013 (STECF-12-22).

**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.

## 8.8 Orange roughy (*Hoplostethus atlanticus*)

The results from the most recent assessment and advice for this stock were released in 2012. The text below remains unchanged from the Consolidated STECF review of advice for 2013 (STECF-12-22).

**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.

## 8.9 Roundnose grenadier (*Coryphaenoides rupestris*)

The results from the most recent assessment and advice for this stock were released in 2012. The text below remains unchanged from the Consolidated STECF review of advice for 2013 (STECF-12-22).

**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).

### 8.9.1 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.



### **8.9.2 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:**

	<i>Type</i>	<i>Value</i>	<i>Technical basis</i>
MSY Approach	MSY $B_{\text{trigger}}$	44 900 t	$B_{\text{loss}}$ (2012 assessment).
	$B_{\text{MSY}}^*$	69 100 t	Half of carrying capacity $K$ , estimated from the surplus production model.
	$H_{\text{MSY}}^*$	0.08	Half of the intrinsic growth rate $r$ , estimated from the surplus production model.
Precautionary Approach	$B_{\text{lim}}$	Not defined.	
	$B_{\text{pa}}$	Not defined.	
	$F_{\text{lim}}$	Not defined.	
	$F_{\text{pa}}$	Not defined.	

#### **STOCK STATUS:**

<b><math>F_{\text{proxy}}</math> (Harvest Rate)</b>		
	<b>2009–2011</b>	
<b>MSY (<math>H_{\text{MSY}}</math>)</b>		Below target
<b>Precautionary approach (<math>F_{\text{pa}}, F_{\text{lim}}</math>)</b>		Unknown
<b>Stock Biomass</b>		
	<b>2009–2011</b>	

MSY ( $B_{\text{trigger}}$ )		Above target
Precautionary approach ( $B_{\text{pa}}, B_{\text{lim}}$ )		Unknown

Total biomass for Division Vb and Subareas VI and VII is estimated to have been below  $B_{\text{MSY}}$  since 2002, decreasing until 2006. The stock is currently above MSY  $B_{\text{trigger}}$ . The harvest rate is below target ( $H_{\text{MSY}}$ ).

#### 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 XIIb).

#### 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 agrees with the ICES assessment of the state of the stock and agrees with the advice for 2013 and 2014.



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.

### 8.9.3 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.

#### 8.9.4 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)		
Qualitative evaluation	?	2009–2011
		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.

## **8.10 Red (blackspot) seabream (*Pagellus bogaraveo*) in ICES Subareas VI, VII, VIII, IX and X (Azores)**

The results from the most recent assessment and advice for this stock were released in 2012. The text below remains unchanged from the Consolidated STECF review of advice for 2013 (STECF-12-22).

**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 List of Acronyms

ACOM	The Advisory Committee of ICES
ACFM	The Advisory Committee on Fishery Management
ALADYM	Age-Length Based Dynamic Model
ASPM	Age structured population model
$B_{MSY}$	The spawning stock biomass that can support MSY
BRP	Biological Reference Points
CCAMLR	Committee for the Conservation of Antarctic Marine Living resources
CCSBT	Commission for the Conservation of Southern Bluefin Tuna
CECAF	Committee for Eastern Central Atlantic Fisheries
CITES	Convention on International Trade on Endangered Species
CNR	National Council of Research (Italy)
CPFD	Catch per fishing day
CPS	Commission du Pacifique Sud
CPUE	Catch per unit effort
CTMFM	Comisión Técnica Mixta del Frente Marítimo
DEPM	Daily egg production method
DFO	Department of Fisheries and Oceans
EIAA	Economic Interpretation of the ACFM Advice
EIFAC	European Inland Fishery Advisory Committee
EEZ	Exclusive economic zone
EPO	Eastern Pacific Ocean
F	Fishing mortality
FAO	Fisheries and Agriculture Organization
FAD	Fishing Attracting Device
FARWEST	Fisheries Assessment Research in Western Mediterranean
FIGIS	Fisheries Geographical Information System
FICZ	Falkland Island Inner Conservation Zone
FIFD	Falkland Islands Fisheries Department
FISHSTAT	FAO Fisheries Statistics
$F_{MSY}$	The fishing mortality rate that is expected to deliver MSY
FOCZ	Falkland Island Outer Conservation Zone
FRCC	Fisheries Resources Conservation Committee
FU	Functional Units
GFCM	General Fisheries Commission for the Mediterranean
GRUND	GRUpo Nazionale Demersali (Italy)
GSA	Geographical Sub Area

HCMR	Hellenic Centre for Marine Research
IATTC	Inter American Tropical Tuna Commission
IBSFC	International Baltic Sea Fisheries Commission
ICA	Integrated catch at age analysis
ICCAT	International Commission for Conservation of Atlantic Tuna
ICES	International Council for the Exploration of the Sea
ICS	International Scientific Committee for Tuna and Tuna-like species in the North Pacific Ocean
IFREMER	Institut Français de Recherche pour l'Exploitation de la Mer
IEO	Instituto Español de Oceanografía
INIDEP	Instituto Nacional de Investigación y Desarrollo Pesquero
IOTC	Indian Ocean Tuna Commission
ISMAR	Institute of Marine Science (Italy)
IUCN	International Union for Conservation of Nature
IUU	Illegal, Unregulated and Unreported
JRC	Joint Research Centre of the European Commission
LCA	Length-based cohort analysis
LLUCET	Project to study the recruitment and juveniles of hake
LPUE	Landings per unit effort
MBAL	Minimum biologically acceptable level
MEDITS	International Bottom Trawl Surveys in the Mediterranean
MEDLAND	Mediterranean Landings
MEY	Maximum Economic Yield
MSY	Maximum sustainable yield
MSVPA	Multi Species VPA
NAFO	Northwest Atlantic Fisheries Organisation
NEA	North East Atlantic
NEI	Not Elsewhere Included
NEMED	<i>Nephrops</i> in Mediterranean Sea
NRIFSF	National Research Institute for Far Seas Fisheries - Japan
PA	Precautionary Approach
PICTs	Pacific Islands Countries and Territories
PO	Pacific Ocean
RRAG	Renewable Resources Assessment Group
SAC	Scientific Advisory Committee (GFCM)
SAFC	South Atlantic Fisheries Commission
SAGP&A	Secretaría de Agricultura, Ganadería, Pesca y Alimentos (Argentina)
SEAFO	Southeast Atlantic Fisheries Organisation
SCRS	ICCAT Standing Committee on Research and Statistics
SCSA	Sub-Committee on Stock Assessment (GFCM)

SCTB	Standing Committee on Tuna and Billfish (western and central Pacific Ocean)
STECF-SGMED	Subgroup on the Mediterranean
SGRST STECF	Subgroup on Resource Status
SPC	Southern Pacific Commission
SPRFMO	South Pacific Regional Fisheries Management Organisation
SSB	Spawning stock biomass
SSB/R	Spawning stock biomass per recruit
STECF	Scientific, Technical and Economic Committee for Fisheries
SURBA	Survey Based Assessment (software)
TAC	Total Allowable Catch
WCPO	Western Central Pacific Organisation
WCPFC	Western Central Pacific Fishery Organisation
WECAF	Committee for Western Central Atlantic Fisheries
WGEF	Working Group on Elasmobranch Fishes
WIO	Western Indian Ocean
WP	IOTC Working Parties
WPB	IOTC Working Parties on Billfish
WPTT	IOTC Working Parties on Tropical Tunas
WPO	Western Pacific Ocean
XSA	Extended survivors analysis
Y/R	Yield per recruit

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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/ewg1308>

List of background documents:

1. EWG-13-08 – Doc 1 - Declarations of invited and JRC experts.





European Commission

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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., Somarakis, S., Stransky, C., Theret, F., Ulrich, C., Vanhee, W. & Van Oostenbrugge, H.

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#### Abstract

STECF EWG-13-08 was held on 1-5 July 2013 in Copenhagen (Denmark). The meeting produced the 2nd report in 2013 focussing on the review of stocks of EU interest. STECF adopted the report during its plenary meeting on 8-12 July 2013.

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