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**Report of the ICES Advisory
Committee 2012**

**Book 7
Bay of Biscay and Atlantic Iberian
Waters**

International Council for the Exploration of the Sea

Conseil International pour l'Exploration de la Mer

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7 BAY OF BISCAY AND IBERIAN SEAS

7.1 Ecosystem overview

This Section has not been updated in 2012. The most recent ecosystem overview is available in ICES Advisory Report 2008, Section 7.1. This overview can also be found on the ICES website: <http://www.ices.dk/committe/acom/comwork/report/2008/2008/7.1-7.2%20Bay%20of%20Biscay%20and%20Iberian%20ecosystem%20overview.pdf>

7.2 Human impacts on the ecosystem

7.2.1 Fishery effects on benthos and fish communities

This Section has not been updated in 2012. The most recent description on Fishery effects on benthos and fish communities is available in ICES Advisory Report 2008, Section 7.2. This description can also be found on the ICES website: <http://www.ices.dk/committe/acom/comwork/report/2008/2008/7.1-7.2%20Bay%20of%20Biscay%20and%20Iberian%20ecosystem%20overview.pdf>

7.3 Assessments and Advice

7.3.1 Assessment and advice regarding protection of biota and habitats

In 2011, ICES has not provided advice regarding protection of biota and habitats for this area.

7.3.2 Assessments and Advice regarding fisheries

Mixed fisheries and fisheries interactions

This Section has not been updated in 2012. The most recent description on mixed fisheries and fisheries interactions is available in ICES Advisory Report 2008, Section 7.3. This description can also be found on the ICES website: <http://www.ices.dk/committe/acom/comwork/report/2008/2008/7.3%20Bay%20of%20Biscay%20and%20Iberian%20Seas%20Fisheries%20Advice.pdf>

Sources of Information













ICES. 2008. Report of the ICES Advisory Committee, 2008. ICES Advice, 2008. Book 7, 122 pp.
ICES. 2012. Report of the ICES Advisory Committee, 2012 ICES Advice, 2012. Book 7.

The state and advice of the individual stocks are presented in the stock sections. The state of stocks and advice are summarized in the tables below (table 7.3.2.1 for advice for 2013 alone, table 7.3.2.2 for stocks with advice valid for 2013 and 2014).

Table 7.3.2.1 State of the stock and advice for 2013 in the Bay of Biscay and Iberian waters ecoregion.

| Stock | State of the stock | | | | Outlook options for 2013 | | | ICES advice for 2013 (in tonnes or effort) |
|--|--|--|---|---|--|---|-----------------|---|
| | Fishing mortality in relation to F_{MSY} | Fishing mortality in relation to the precautionary approach (F_{PA}/F_{lim}) | Spawning biomass in relation to $MSY B_{trigger}$ | Spawning biomass in relation to the precautionary approach (B_{PA}/B_{lim}) | MSY/DLS ¹ approach (within the precautionary approach) | Precautionary approach considerations / | Management plan | |
| Hake in Divisions VIIIc and IXa (Southern stock) | Not available ? | Not available ? | Qualitative evaluation: increasing ↗ | | Landings no more than 10 600 t | - | TAC of 14 144 t | MSY transition: landings should be no more than 10 600 t. |
| Four-spot-megrim (<i>L. boscii</i>) in Div. VIIIc and IXa | Not available ? | Not available ? | Qualitative evaluation: Stable → | | <i>L. boscii</i> (four-spot megrim): landings no more than 780 t; Combined megrims: no more than 890 t | - | - | MSY approach: landings should be no more than 780 t. Combined landings of <i>Lepidorhombus boscii</i> and <i>Lepidorhombus whiffiagonis</i> should be no more than 890 t. |
| Megrim (<i>L. whiffiagonis</i>) in Div. VIIIc and IXa | Not available ? | Not available ? | Not available ? | Not available ? | <i>L. whiffiagonis</i> (megrim): landings no more than 110 t; Combined megrims: landings no more than 890 t | - | - | MSY approach: landings should be no more than 110 t. Combined landings of <i>Lepidorhombus whiffiagonis</i> and <i>Lepidorhombus boscii</i> should be no more than 890 t. |
| White anglerfish (<i>L. piscatorius</i>) in Div. VIIIc and IXa | Not available ? | Not available ? | Qualitative evaluation: Stable → | | <i>L. piscatorius</i> : landings no more than 1350 t; Combined anglerfish: no more than 2090 t | - | - | MSY approach: landings should be no more than 1350 t. Combined landings of <i>Lophius piscatorius</i> and <i>Lophius budegassa</i> should be no more than 2090 t. |
| Black-bellied anglerfish (<i>L. budegassa</i>) in Div. VIIIc and IXa | Not available ? | Not available ? | Not available ? | Not available ? | <i>L. budegassa</i> : landings no more than 740 t; Combined anglerfishes: no more than 2090 t | - | - | MSY approach: landings should be no more than 740 t. Combined landings of <i>Lophius piscatorius</i> and <i>Lophius budegassa</i> should be no more than 2090 t. |
| Horse mackerel (<i>Trachurus trachurus</i>) in Division IXa (Southern stock) | Not available ? | Not available ? | Not available ? | Not available ? | - | Landings no more than 26 000 t. | - | Precautionary considerations: landings should be no more than 26 000 t. |

¹ Data-limited Stock.

| Stock | State of the stock | | | | Outlook options for 2013 | | | ICES advice for 2013 (in tonnes or effort) |
|---|---|---|---|--|---|--|---|--|
| | Fishing mortality in relation to F_{MSY} | Fishing mortality in relation to the precautionary approach (F_{PA}/F_{lim}) | Spawning biomass in relation to $MSY B_{trigger}$ | Spawning biomass in relation to the precautionary approach (B_{PA}/B_{lim}) | MSY/DLS ¹ approach (within the precautionary approach) | Precautionary approach considerations / | Management plan | |
| Sardine in Divisions VIIIc and IXa | Qualitative evaluation: Stable  | | Qualitative evaluation: Stable  | | - | Landings no more than 55 000 t | - | Precautionary considerations: landings should be no more than 55 000 t. |
| Anchovy in Subarea VIII (Bay of Biscay) | Undefined  | n/a | Above trigger ²  | Full reproductive capacity ¹  | Catch no more than 65 000 t (1 July 2012 to 30 June 2013) | Catches no more than 28 000 t (1 July 2012 to 30 June 2013) | TAC of 20 700 t (1 July 2012 to 30 June 2013) | Precautionary approach: catches from 1 July 2012 to 30 June 2013 should be no more than 28 000 t. |
| Anchovy in Division IXa | Insufficient information  | | North: 10 fold increase South: Variable without trend North  / South  | | - | Insufficient data on yearclasses that constitute main biomass 2013 to give Advice. | - | ICES cannot give catch advice for 2013. Historic fisheries and management seem to have been sustainable. |
| Sole in Divisions VIIIa,b (Bay of Biscay) | Above target  | Increased risk  | Above trigger  | Full reproductive capacity  | Landings of no more than 3500 t | Landings no more than 4500 t | Not applicable | MSY transition: landings should be no more than 3500 t. |

² First 6 months of 2012.





















Table 7.3.2.2 State of the stock and advice for 2013 in the Bay of Biscay and Iberian waters ecoregion, for stocks with biennial advice (valid for 2013 and 2014).

Where advice cannot be quantified, the advice is for a % change applied the first year and kept stable the next year.

| Stock | State of the stock | | | | Outlook options for 2013 - 2014 | | | ICES advice for 2013 and 2014 (in tonnes or effort – % change apply only once) |
|--|--|--|--|---|---|---|----------------------|---|
| | Fishing mortality in relation to F_{MSY} | Fishing mortality in relation to the precautionary approach (F_{PA}/F_{lim}) | Spawning biomass in relation to $MSY B_{trigger}$ | Spawning biomass in relation to the precautionary approach (B_{PA}/B_{lim}) | MSY/DLS ³ approach (within the precautionary approach) | Precautionary approach / considerations | Management plan | |
| Sole in Divisions VIIIc and IXa (Atlantic Iberian waters) | Insufficient information ? | Insufficient information ? | Insufficient information ? | Insufficient information ? | Catches should decrease by 20% in relation to the last three years average ⁴ | - | - | Data-limited stock approach: catches should decrease by 20% |
| Plaice in Subarea VIII and Division IXa | Insufficient information ? | Insufficient information ? | Insufficient information ? | Insufficient information ? | Catches should decrease by 20% in relation to the last three years average ⁴ | - | - | Data-limited stock approach: catches should decrease by 20% |
| Pollack in Subarea VIII and Division IXa | Insufficient information ? | Insufficient information ? | Insufficient information ? | Insufficient information ? | Catches should decrease by 20% in relation to the last three years average ⁴ | - | - | Data-limited stock approach: catches should decrease by 20% |
| Whiting in Subarea VIII and Division IXa | Insufficient information ? | Insufficient information ? | Insufficient information ? | Insufficient information ? | Catches should decrease by 20% in relation to the last three years average ⁴ | - | - | Data-limited stock approach: catches should decrease by 20% |
| Blue Jack mackerel (<i>Trachurus picturatus</i>) in Subdivision Xa2 (Azores) | Unknown ? | Unknown ? | Qualitative evaluation: Stable after increase → | Qualitative evaluation: Stable after increase → | Catches no more than 1800 t | - | - | Data-limited stock approach: catches no more than 1800 t |
| <i>Nephrops</i> in Divisions VIIIa,b (FU 23-24) | Qualitative evaluation: Above possible reference points ⊗ | Qualitative evaluation: Above possible reference points ⊗ | Qualitative evaluation: increasing ↗ | Qualitative evaluation: increasing ↗ | Catches no more than 3200 t | - | Cannot be calculated | Data-limited stock approach: Catches no more than 3200 t |
| <i>Nephrops</i> in Division VIIIc: <i>Nephrops</i> in North Galicia (FU 25) | Not available ? | Not available ? | Qualitative evaluation: decreasing ↘ | Qualitative evaluation: decreasing ↘ | - | Zero catch | Cannot be calculated | Precautionary considerations: Zero catch |
| <i>Nephrops</i> in Division IXa: <i>Nephrops</i> in West Galicia and North Portugal (FU 26-27) | Not available ? | Not available ? | Qualitative evaluation: decreasing ↘ | Qualitative evaluation: decreasing ↘ | - | Zero catch | Cannot be calculated | Precautionary considerations: Zero catch |

³ Data-limited Stock.

⁴ Due to uncertainty in landing data this cannot be quantified.

| Stock | State of the stock | | | | Outlook options for 2013 - 2014 | | | ICES advice for 2013 and 2014 (in tonnes or effort – % change apply only once) |
|--|---|--|--|---|--|---|----------------------|---|
| | Fishing mortality in relation to F_{MSY} | Fishing mortality in relation to the precautionary approach (F_{PA}/F_{lim}) | Spawning biomass in relation to $MSY B_{trigger}$ | Spawning biomass in relation to the precautionary approach (B_{PA}/B_{lim}) | MSY/DLS ³ approach (within the precautionary approach) | Precautionary approach / considerations | Management plan | |
| <i>Nephrops</i> in Division IXa: <i>Nephrops</i> in South-West and South Portugal (FU 28-29) | Qualitative evaluation: decreasing  | | Qualitative evaluation: decreasing  | | Catches no more than 110 t | - | Cannot be calculated | Data-limited stock approach: Catches no more than 110 t |
| <i>Nephrops</i> in Division IXa: <i>Nephrops</i> in Gulf of Cadiz (FU 30) | Not available  | | Qualitative evaluation: decreasing  | | Catches no more than 90 t | - | Cannot be calculated | Data-limited stock approach: Catches no more than 90 t |
| <i>Nephrops</i> in Division VIIIc: <i>Nephrops</i> in the Cantabrian Sea (FU 31) | Not available  | | Qualitative evaluation: decreasing  | | - | Zero catch | Cannot be calculated | Precautionary considerations: Zero catch |
| Lesser-spotted dogfish (<i>Scyliorhinus canicula</i>) in Divisions VIIIa,b,d (Bay of Biscay) | Qualitative evaluation: decreasing  | | Qualitative evaluation: increasing  | | Catches could increase by maximum 20% in relation to the last three years average ⁴ | - | - | Data-limited stock approach: catches could increase by a maximum of 20% |
| Lesser-spotted dogfish (<i>Scyliorhinus canicula</i>) in Divisions VIIIc and IXa (Atlantic Iberian waters) | Unknown  | | Qualitative evaluation: decreasing  | | Catches should decrease by 9% in relation to the last three years average ⁴ | - | - | Data-limited stock approach: catches should decrease by 9% |
| Rays and skates in Biscay and Iberia | | | | | | | | |
| Thornback ray (<i>Raja clavata</i>) in Subarea VIII | Unknown  | | Qualitative evaluation: Stable/increasing  | | Catches should not increase ⁴ | - | - | Data-limited stock approach: catches should not increase |
| Cuckoo ray (<i>Leucoraja naevus</i>) in Subarea VIII | Unknown  | | Qualitative evaluation: Stable/increasing  | | Catches could increase by maximum 6% in relation to the last three years average ⁴ | - | - | Data-limited stock approach: catches could increase by a maximum of 6% |
| Spotted ray (<i>Raja montagui</i>) in Subarea VIII | Unknown  | | Unknown  | | Catches should decrease by 20% in relation to the last three years average ⁴ | - | - | Data-limited stock approach: catches should decrease by 20% |
| Spotted ray (<i>Raja montagui</i>) in Division IXa | Unknown  | | Unknown  | | Catches should decrease by 20% in relation to the last three years average ⁴ | - | - | Data-limited stock approach: catches should decrease by 20% |
| Cuckoo ray (<i>Leucoraja naevus</i>) in Division IXa | Unknown  | | Unknown  | | Catches should decrease by 20% in relation to the last three years average ⁴ | - | - | Data-limited stock approach: catches should decrease by 20% |

| Stock | State of the stock | | | | Outlook options for 2013 - 2014 | | | ICES advice for 2013 and 2014 (in tonnes or effort – % change apply only once) |
|---|--|--|---|---|---|--|-----------------|---|
| | Fishing mortality in relation to F_{MSY} | Fishing mortality in relation to the precautionary approach (F_{PA}/F_{lim}) | Spawning biomass in relation to $MSY B_{trigger}$ | Spawning biomass in relation to the precautionary approach (B_{PA}/B_{lim}) | MSY/DLS ³ approach (within the precautionary approach) | Precautionary approach / considerations | Management plan | |
| Thornback ray (<i>Raja clavata</i>) in Division IXa | Unknown ? | | Qualitative evaluation: Stable → | | Catches should decrease by 20% in relation to the last three years average ⁴ | - | - | Data-limited stock approach: catches should decrease by 20% |
| Blonde ray (<i>Raja brachyura</i>) in Division IXa | Unknown ? | | Unknown ? | | Catches should decrease by 20% in relation to the last three years average ⁴ | - | - | Data-limited stock approach: catches should decrease by 20% |
| Common skate (<i>Dipturus batis</i>) complex in Subarea VIII and Division IXa | Unknown ? | | Qualitative evaluation: Depleted ✗ | | - | No targeted fishery and measures to minimise bycatch | - | Precautionary approach: No targeted fishery, minimize bycatch |
| Other skates and rays in Subarea VIII and Division IXa | Unknown ? | | Unknown ? | | Catches should decrease by 20% in relation to the last three years average ⁴ | - | - | Data-limited stock approach: catches should decrease by 20% |

Table 7.3.2.3 Summary of the state of the stock and advice in the North Sea (see section 1.2 for categories definitions).

| | |
|--|----|
| Total Number of stock in the ecoregion | 32 |
| Data rich stocks | 9 |
| Data-limited stocks | 23 |

Table 7.3.2.4 Status of data rich stocks (n=9) for the North Sea ecoregion relative to MSY and PA reference points for Fishing Mortality (F) and Spawning Stock Biomass (SSB). Table shows percentage of stocks per stock status. Values in brackets denote the number of data rich stocks per stock status.

| | | Spawning Stock Biomass... | | | |
|---------------------------------|---|---|--|--|---------------------------------|
| | | is at or above MSY $B_{trigger}$ $SSB_{2012} \geq MSY B_{trigger}$ | is below MSY $B_{trigger}$ $SSB_{2012} < MSY B_{trigger}$ | is not defined or not available | |
| MSY Approach | Fishing Mortality... | ✔ | ✘ | ? | |
| | is at or below MSY ($F_{2011} \leq F_{MSY}$) | ✔ | | | |
| | is above MSY ($F_{2011} > F_{MSY}$) | ✘ | 11% (1) | | |
| | is not defined or not available | ? | 11% (1) | | 78% (7) |
| Precautionary Approach | | is at or above PA $SSB_{2012} \geq B_{pa}$ | is at increased risk $B_{pa} > SSB_{2012} > B_{lim}$ | is below limit $SSB_{2012} < B_{lim}$ | is not defined or not available |
| | Fishing Mortality... | ✔ | ⊕ | ✘ | ? |
| | is at or below PA ($F_{2011} \leq F_{pa}$) | ✔ | | | |
| | is at increased risk ($F_{lim} > F > F_{pa}$) | ⊕ | 11% (1) | | |
| | is above PA ($F_{2011} > F_{pa}$) | ✘ | | | |
| is not defined or not available | ? | 11% (1) | | 78% (7) | |

Table 7.3.2.5 Summary of the catch advice of Data Limited Stocks (n=22, for one stock, insufficient information was available to be able to give advice) in relation to recent catch, as an indicator of the stock status. Table shows percentage of stocks within each DLS category for which the advice corresponds to an increase or decrease in relation to recent catch. Values in brackets denote the number of stocks.

| DLS Category ⁵ | Catch Advice Increase | Catch Advice Decrease | Zero catch advised | No increase in catch advised |
|---------------------------|-----------------------|-----------------------|--------------------|------------------------------|
| 3 | 14% (3) | 14% (3) | 14% (3) | 5% (1) |
| 4 | | | | |
| 5 | | 45% (10) | 5% (1) | 5% (1) |
| 6 | | 5% (1) | | |

⁵ Detailed categories are available under section 1.2.

ECOREGION Bay of Biscay and Atlantic Iberian waters
STOCK Hake in Divisions VIIIc and IXa (Southern stock)

Advice for 2013

ICES advises on the basis of the transition to the MSY approach that landings in 2013 should be no more than 10 600 tonnes.

Stock status

| F (Fishing Mortality) | | | |
|--|------|------|-----------------|
| | 2009 | 2010 | 2011 |
| MSY (F_{MSY}) | ✘ | ✘ | ? Not available |
| Precautionary approach (F_{pa}, F_{lim}) | ? | ? | ? Not available |
| SSB (Spawning-Stock Biomass) | | | |
| | 2010 | 2011 | 2012 |
| MSY ($B_{trigger}$) | ? | ? | ? Not available |
| Precautionary approach (B_{pa}, B_{lim}) | ? | ? | ? Not available |
| Qualitative evaluation | ↗ | ↗ | ↗ Increasing |

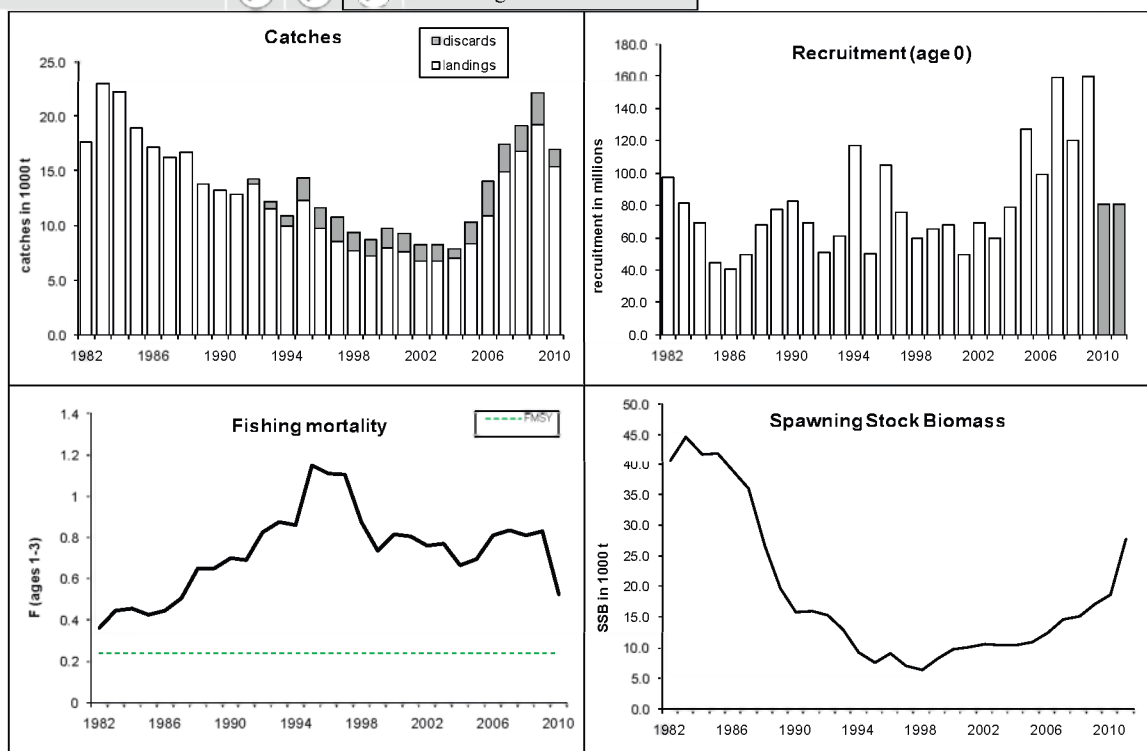
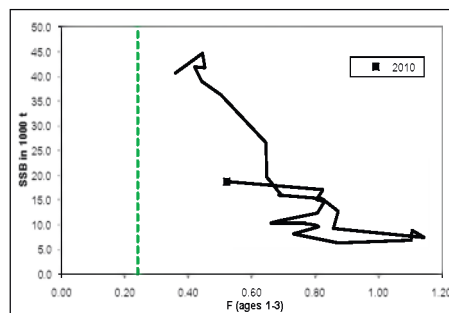


Figure 7.4.1.1 Hake in Divisions VIIIc and IXa. Summary of stock assessment (weights in thousand tonnes). Assumed recruitments are shaded. Top right: SSB/F for the time-series used in the assessment.

No assessment has been carried out in 2012. The stock status is based on last year's assessment. Fishing mortality has been stable over the last decade and about three times above F_{MSY} . In 2010 fishing mortality was estimated to have decreased by 37% relative to 2009. SSB has increased since 1998 and is estimated to have increased considerably in 2011. Recruitment has been high since 2005.

Management plans

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.

Biology

European hake is widely distributed over the Northeast Atlantic shelf. Although there is no clear evidence of multiple populations in the Northeast Atlantic, ICES assumes two different stock units. Hake is a top predator and a cannibalistic species. Hake spawns throughout the year, with a peak in February. Hake growth is known to be faster than previously estimated (based on tagging studies conducted on the northern stock).

The fisheries

Hake is caught by a multi-gear fleet (otter trawlers, pairtrawlers, gillnetters, longliners, and artisanal). Hake is caught by the trawl fleet in mixed fisheries together with megrim, anglerfish, blue whiting, horse mackerel, mackerel, and crustaceans. Discards occur mainly in the trawl fisheries which targets smaller fish than gillnetters and longliners.

| | |
|---------------------------|--|
| Catch distribution | Total catch (2010) = 17.3 kt, where 15.7 kt are landings (55% trawlers and 45% others) and 1.6 kt discards. There were insufficient data to update this information for 2011; however, values for 2010 are still considered appropriate. |
|---------------------------|--|

Effects of the fisheries on the ecosystem

Since hake is a top predator, its abundance has implications on the survival of other species, e. g. blue whiting, horse mackerel, sardine, and hake (cannibalism).

Quality considerations

It was not possible to include Spanish commercial data for 2011 in the assessment. Therefore, the assessment model could not be updated this year. Projections for catch options and management advice for 2013 were based on the assessment conducted in 2011. This implies that assumptions on recruitment and fishing mortality have to be made for two intermediate years (2011 and 2012) instead of one (2012). In addition, the 2010 recruitment has been replaced with an average value. This has resulted in a larger uncertainty in the results of the forecast for 2013 and 2014. The proportion of 2013 landings that depends on average recruitment assumptions (year classes 2010–2013) is 62%.

The 2010 fishing mortality estimate is considered uncertain.

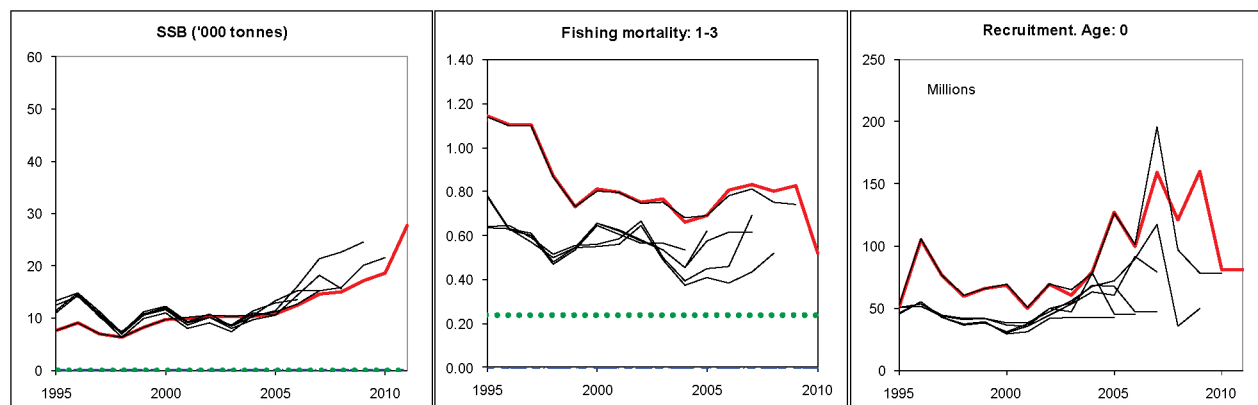


Figure 7.4.1.2 Hake in Divisions VIIIc and IXa. Historical assessment results (final-year recruitment estimates included). F corresponds to ages 1–3 in the last two assessments, but to ages 2–5 in previous assessments. This stock was benchmarked in 2010.

Scientific basis

| | |
|-----------------------------|---|
| Assessment type | Length–age analytical assessment (GADGET model). |
| Input data | Three survey indices (SpGFS-WIBTS-Q4; SPGFS-caut-WIBTS-Q4; PtGFS-WIBTS-Q4); two commercial indices (SP-CORUTR; P-TR). |
| Discards and bycatch | Discards are included in the assessment. |
| Indicators | None. |
| Other information | This stock was benchmarked in 2010 (WKROUND, 2010). |
| Working group report | WGHMM |

ECOREGION Bay of Biscay and Atlantic Iberian waters
STOCK Hake in Divisions VIIIc and IXa (Southern stock)

Reference points

| | <i>Type</i> | <i>Value</i> | <i>Technical basis</i> |
|------------------------|--------------------------|--------------|--------------------------------|
| MSY Approach | MSY B_{trigger} | Not defined. | |
| | F_{MSY} | 0.24 | F_{max} (ICES, 2010). |
| Precautionary Approach | B_{lim} | Not defined. | |
| | B_{pa} | Not defined. | |
| | F_{lim} | Not defined. | |
| | F_{pa} | Not defined. | |

(unchanged since: 2011)

Outlook for 2012

Basis: $F(2011) = 0.72^{1)} = F_{sq} = \text{mean } F(2008-2010)$; $SSB(2012) = 25.08$; $HC \text{ landings}(2011) = 25.02$; $\text{Discards}(2011) = 2.1$;
 $F(2012) = 0.71^{1)}$; $SSB(2013) = 20.63$; $HC \text{ landings}(2012) = 21.24$; $\text{Discards}(2012) = 1.67$; $R = GM(1989-2009) = 80.8 \text{ millions}$.

| Rationale | Human consumption landings (2013) | Basis | F Total (2013) ¹⁾ | F HC (2013) | F Disc (2013) | Catch Total (2013) | Discards (2013) | SSB (2014) | %SSB change ²⁾ | %TAC change ³⁾ |
|------------------|-----------------------------------|----------------------------------|------------------------------|-------------|---------------|--------------------|-----------------|------------|---------------------------|---------------------------|
| MSY framework | 7.80 | $F_{MSY} [F_{sq} * 0.36]$ | 0.24 | 0.22 | 0.02 | 8.43 | 0.63 | 29.28 | +17% | -37% |
| MSY transition | 10.55 | $0.4 * F_{2010} + 0.6 * F_{MSY}$ | 0.35 | 0.32 | 0.03 | 11.42 | 0.86 | 26.19 | +4% | -14% |
| EU Recovery plan | 14.144 | $TAC_{2012} * 1.15$ | 0.51 | 0.47 | 0.04 | 15.30 | 1.18 | 22.11 | -12% | +15% |
| Zero catch | 0.00 | $F = 0$ | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 37.85 | +51% | -100% |
| Other options | 2.34 | $F_{sq} * 0.1$ | 0.07 | 0.06 | 0.00 | 2.53 | 0.19 | 35.32 | +41% | -81% |
| | 6.62 | $F_{sq} * 0.3$ | 0.20 | 0.19 | 0.01 | 7.15 | 0.53 | 30.60 | +22% | -46% |
| | 10.38 | $F_{sq} * 0.5$ | 0.34 | 0.31 | 0.03 | 11.22 | 0.85 | 26.38 | +5% | -16% |
| | 10.45 | -15% TAC | 0.34 | 0.32 | 0.03 | 11.31 | 0.85 | 26.19 | +4% | -15% |
| | 12.30 | Equal TAC | 0.42 | 0.39 | 0.03 | 13.31 | 1.02 | 24.15 | -4% | 0% |
| | 13.67 | $F_{sq} * 0.7$ | 0.49 | 0.45 | 0.04 | 14.80 | 1.14 | 22.64 | -10% | +11% |
| | 14.14 | +15% TAC | 0.51 | 0.47 | 0.04 | 15.32 | 1.18 | 22.07 | -12% | +15% |
| | 16.52 | $F_{sq} * 0.9$ | 0.64 | 0.59 | 0.05 | 17.92 | 1.40 | 19.32 | -23% | +34% |
| | 17.80 | $F_{sq} * 1$ | 0.71 | 0.66 | 0.06 | 19.32 | 1.52 | 17.81 | -29% | +45% |
| | 1.00 | $F_{sq} * 1.1$ | 0.79 | 0.73 | 0.06 | 20.6 | 1.64 | 16.40 | -35% | +54% |

Weights in thousand tonnes.

¹⁾ Note that very small differences in F can result from the conversion of multipliers in length-based models to equivalent values in age-based models.

²⁾ SSB 2014 relative to SSB 2013.

³⁾ Human consumption landings 2013 relative to TAC 2012.

MSY approach

No MSY B_{trigger} has been identified for this stock. The stock status in relation to any potential biomass reference points is unknown. In view of the optimistic signs of the stock, i.e. i) increasing trend in SSB in the last three years (2008–2010); ii) high recent recruitments; and iii) a decrease in fishing mortality in 2010, ICES will follow the MSY framework, assuming that SSB in 2013 will be above any potential candidate of MSY B_{trigger} .

Following the ICES MSY framework implies a reduction in fishing mortality to 0.24, resulting in landings of no more than 7800 t in 2013. This is expected to lead to an SSB of 29 300 t in 2014.

Following the transition scheme towards the ICES MSY framework implies a reduction in fishing mortality to 0.35, resulting in landings of no more than 10 600 t in 2013. This is expected to lead to an SSB of 26 200 t in 2014.

Management plan

Following the agreed recovery plan ([EC Reg. No. 2166/2005](#)) implies a 15% TAC increase to 14 144 t in 2013, which is expected to lead to an SSB of 22 074 t in 2014. ICES did not evaluate the plan; however, some elements of the recovery plan were evaluated by ICES in 2010 ([Section 7.3.3.1](#) in ICES, 2010).

The aim of the plan is to recover the stock to a spawning-stock biomass above 35 000 tonnes, based on the previous B_{pa} . This target is no longer valid due to a new perception of the historical stock dynamics.

Additional considerations

A number of regulatory measures are adopted for fishing southern hake, including minimum mesh sizes, closed areas, and seasonal restrictions ([EC No. 850/98](#)). Fishing effort limitations corresponding to a 10% reduction were initiated in 2005, with a reduction of allowed fishing days in order to establish a maximum number of days by fishing gear. TACs have been ineffective in regulating the fishery in recent years as landings greatly exceeded the TACs.

The minimum landing size for southern hake is 27 cm. There is no correspondence between minimum landing size and the trawl mesh size currently in force. This has resulted in high discard rates.

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.

SSB has increased in recent years, most likely as a result of high recruitment in the five most recent years (2005–2009). The underlying dynamics of recruitment are unknown. Hake is now considered to be a species with faster dynamics than realized in the past, i.e. fast growth and higher natural mortality. This makes the hake population more sensitive to fishing intensity and recruitment strength.

Data requirements

Hake is a top predator. Improving the trophic information, e.g. sampling of stomach contents, will eventually lead to better ecosystem advice. Hake otoliths are currently collected but not used in the assessment due to lack of a validated ageing method. It is therefore important that research on hake ageing from otoliths be continued.

Comparison with previous assessment

No assessment has been carried out in 2012. The advice this year is based on last year's assessment (ICES, 2011). The basis for the advice is the same as last year, the MSY transition.

Sources

- ICES. 2010. Report of the ICES Advisory Committee, 2010. ICES Advice 2010. Book 7, pp. 4–16.
- ICES. 2011. Report of the Working Group on the Assessment of Southern Shelf Stocks of Hake, Monk, and Megrin (WGHMM), 5–11 May 2011, ICES Headquarters, Copenhagen. ICES CM 2011/ACOM:11.
- ICES. 2012. Report of the Working Group on the Assessment of Southern Shelf Stocks of Hake, Monk, and Megrin (WGHMM), 10–15 May 2012, ICES Headquarters, Copenhagen. ICES CM 2012/ACOM:11.

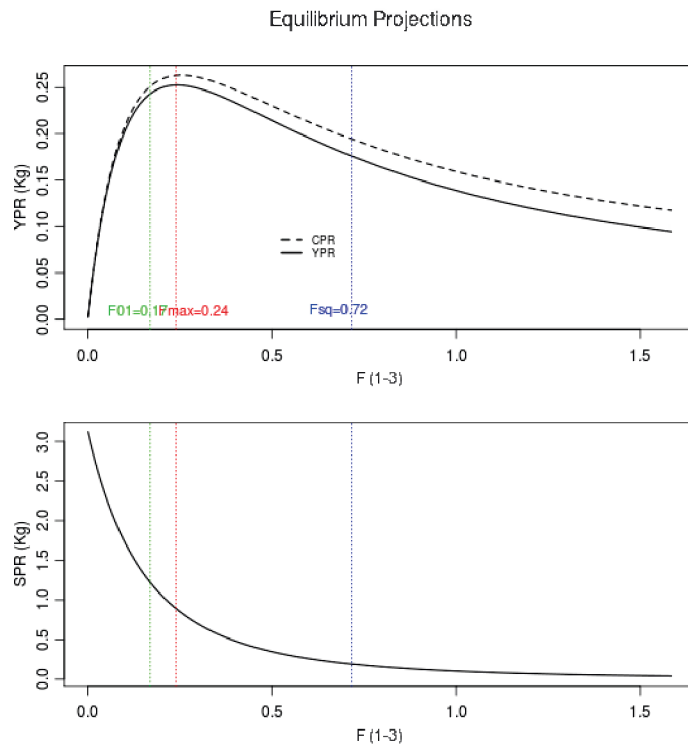


Figure 7.4.1.3 Hake in Divisions VIIIc and IXa. Equilibrium projections of long-term yield-per-recruit (upper panel) and SSB-per-recruit (lower panel) at different fishing mortality rates.

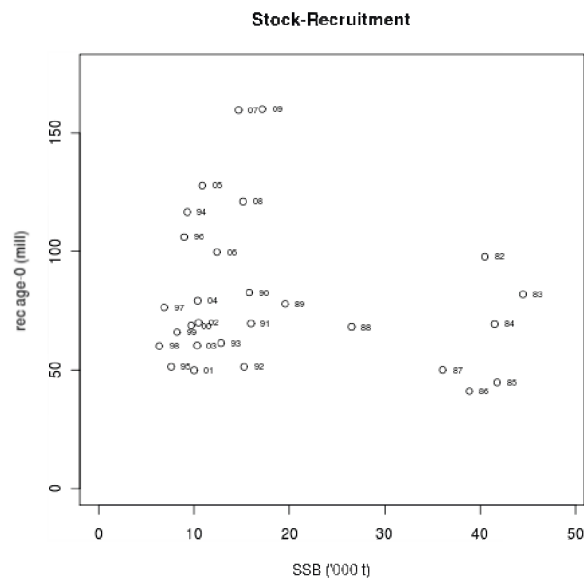


Figure 7.4.1.4 Hake in Divisions VIIIc and IXa. Stock–recruitment relationship.

Table 7.4.1.1 Hake in Divisions VIIIc and IXa. ICES advice, management, and landings, discards, and catches.

| Year | ICES Advice | Predicted landing corresp. to advice ¹ | Agreed TAC ² | ICES landings | Discards | ICES catch |
|-------------------|--|---|----------------------------|-------------------|-------------------|-------------------|
| 1987 | Precautionary TAC; juvenile protection | 15.0 | 25.0 | 16.2 | - | - |
| 1988 | TAC; juvenile protection | 15.0 | 25.0 | 16.4 | - | - |
| 1989 | TAC; juvenile protection | 15.0 | 20.0 | 13.8 | - | - |
| 1990 | TAC; juvenile protection | 15.0 | 20.0 | 13.2 | - | - |
| 1991 | Precautionary TAC | 10.0 | 18.0 | 12.8 | - | - |
| 1992 | Precautionary TAC | 10.3 | 16.0 | 13.8 | 0.5 | 14.3 |
| 1993 | F = 10% of F ₉₁ | 1.0 | 12.0 | 11.5 | 0.7 | 12.2 |
| 1994 | F lowest possible, at least reduced by 80% | 2.0 | 11.5 | 9.9 | 1.0 | 10.9 |
| 1995 | F lowest possible | - | 8.5 | 12.2 | 2.1 | 14.3 |
| 1996 | F lowest possible | - | 9.0 | 9.7 | 1.9 | 11.6 |
| 1997 | F lowest possible | - | 9.0 | 8.5 | 2.3 | 10.8 |
| 1998 | 60% reduction in F | 4.0 | 8.2 | 7.7 | 1.7 | 9.4 |
| 1999 | Reduce F below F _{pa} | 9.5 | 9.0 | 7.2 | 1.5 | 8.7 |
| 2000 | 20% reduction from 1994–98 average landings | < 7.7 | 8.5 | 7.9 | 1.8 | 9.7 |
| 2001 | Reduce F below F _{pa} ; no increase in landings | 8.5 | 8.9 | 7.6 | 1.7 | 9.2 |
| 2002 | F below F _{pa} | < 8.0 | 8.0 | 6.7 | 1.5 | 8.2 |
| 2003 | Lowest possible catch / rebuilding plan | 0 | 7.0 | 6.7 | 1.4 | 8.1 |
| 2004 | Zero catch | 0 | 5.95 | 6.9 | 1.1 | 8.0 |
| 2005 | Zero catch | 0 | 5.968 | 8.3 | 2.0 | 10.3 |
| 2006 | Zero catch | 0 | 6.661 | 10.8 | 3.2 | 14.0 |
| 2007 | Zero catch | 0 | 6.128 | 14.9 | 3.0 | 17.9 |
| 2008 | Zero catch | 0 | 7.047 | 16.8 | 2.4 | 19.2 |
| 2009 | Zero catch | 0 | 8.104 | 19.2 | 3.2 | 22.4 |
| 2010 | Reach B _{pa} in 2011 | 4.9 | 9.300 | 15.7 ³ | 1.6 | 17.3 |
| 2011 | See scenarios | < 9.9 | 10.695 | 2.2 ⁴ | 0.74 ⁴ | 2.95 ⁴ |
| 2012 | MSY transition | <14.3 | 12.299 | | | |
| 2013 ⁴ | MSY transition | <10.6 | | | | |

Weights in thousand tonnes.

¹ Advice prior to 2011 corresponds to catches (discards were included in the 2010 assessment year).² Applies to ICES Division VIIIc and Subareas IX and X; EU waters of CECAF 34.1.1.³ Note that total 2010 landings include 0.36 kt from France that were not included in the assessment (see Table 7.4.1.2).⁴ Without Spanish catches.

Table 7.4.1.2 Hake in Divisions VIIIc and IXa. Landings estimates (thousand tonnes) by country and gear.

| YEAR | SPAIN | | | | | | | | PORTUGAL | | | | FRANCE | TOTAL | | | | |
|--------|-------|---------|----------|--------|-----------|----------|----------|------|----------|------|-------|------|--------|-------|------|------|-------|------|
| | ART | GILLNET | LONGLINE | Cd TRW | Pr-Bk TRW | PAIR TRW | BAKA TRW | DISC | LAND | ART | TRAWL | DISC | LAND | TOTAL | DISC | LAND | CATCH | |
| 1972 | 7.10 | - | - | - | 10.20 | | | | 17.3 | 4.70 | 4.10 | - | 8.8 | - | - | 26.1 | 26.1 | |
| 1973 | 8.50 | - | - | - | 12.30 | | | | 20.8 | 6.50 | 7.30 | - | 13.8 | 0.20 | - | 34.8 | 34.8 | |
| 1974 | 1.00 | 2.60 | 2.20 | - | 8.30 | | | | 14.1 | 5.10 | 3.50 | - | 8.6 | 0.10 | - | 22.8 | 22.8 | |
| 1975 | 1.30 | 3.50 | 3.00 | - | 11.20 | | | | 19.0 | 6.10 | 4.30 | - | 10.4 | 0.10 | - | 29.5 | 29.5 | |
| 1976 | 1.20 | 3.10 | 2.60 | - | 10.00 | | | | 16.9 | 6.00 | 3.10 | - | 9.1 | 0.10 | - | 26.1 | 26.1 | |
| 1977 | 0.60 | 1.50 | 1.30 | - | 5.80 | | | | 9.2 | 4.50 | 1.60 | - | 6.1 | 0.20 | - | 15.5 | 15.5 | |
| 1978 | 0.10 | 1.40 | 2.10 | - | 4.90 | | | | 8.5 | 3.40 | 1.40 | - | 4.8 | 0.10 | - | 13.4 | 13.4 | |
| 1979 | 0.20 | 1.70 | 2.10 | - | 7.20 | | | | 11.2 | 3.90 | 1.90 | - | 5.8 | - | - | 17.0 | 17.0 | |
| 1980 | 0.20 | 2.20 | 5.00 | - | 5.30 | | | | 12.7 | 4.50 | 2.30 | - | 6.8 | - | - | 19.5 | 19.5 | |
| 1981 | 0.30 | 1.50 | 4.60 | - | 4.10 | | | | 10.5 | 4.10 | 1.90 | - | 6.0 | - | - | 16.5 | 16.5 | |
| 1982 | 0.27 | 1.25 | 4.18 | 0.49 | 3.92 | | | | 10.1 | 5.01 | 2.49 | - | 7.5 | - | - | 17.6 | 17.6 | |
| 1983 | 0.37 | 2.10 | 6.57 | 0.57 | 5.29 | | | | 14.9 | 5.19 | 2.86 | - | 8.0 | - | - | 22.9 | 22.9 | |
| 1984 | 0.33 | 2.27 | 7.52 | 0.69 | 5.84 | | | | 16.7 | 4.30 | 1.22 | - | 5.5 | - | - | 22.2 | 22.2 | |
| 1985 | 0.77 | 1.81 | 4.42 | 0.79 | 5.33 | | | | 13.1 | 3.77 | 2.05 | - | 5.8 | - | - | 18.9 | 18.9 | |
| 1986 | 0.83 | 2.07 | 3.46 | 0.98 | 4.86 | | | | 12.2 | 3.16 | 1.79 | - | 4.9 | 0.01 | - | 17.2 | 17.2 | |
| 1987 | 0.53 | 1.97 | 4.41 | 0.95 | 3.50 | | | | 11.4 | 3.47 | 1.33 | - | 4.8 | 0.03 | - | 16.2 | 16.2 | |
| 1988 | 0.70 | 1.99 | 2.97 | 0.99 | 3.98 | | | | 10.6 | 4.30 | 1.71 | - | 6.0 | 0.02 | - | 16.7 | 16.7 | |
| 1989 | 0.56 | 1.86 | 1.95 | 0.90 | 3.92 | | | | 9.2 | 2.74 | 1.85 | - | 4.6 | 0.02 | - | 13.8 | 13.8 | |
| 1990 | 0.59 | 1.72 | 2.13 | 1.20 | 4.13 | | | | 9.8 | 2.26 | 1.14 | - | 3.4 | 0.03 | - | 13.2 | 13.2 | |
| 1991 | 0.42 | 1.41 | 2.20 | 1.21 | 3.63 | | | | 8.9 | 2.71 | 1.25 | - | 4.0 | 0.01 | - | 12.8 | 12.8 | |
| 1992 | 0.40 | 1.48 | 2.05 | 0.98 | 3.79 | | | 0.14 | 8.7 | 3.77 | 1.33 | 0.33 | 5.1 | - | 0.5 | 13.8 | 14.3 | |
| 1993 | 0.37 | 1.26 | 2.74 | 0.54 | 2.67 | | | 0.24 | 7.6 | 3.04 | 0.87 | 0.44 | 3.9 | - | 0.7 | 11.5 | 12.2 | |
| 1994 | 0.37 | 1.90 | 1.47 | 0.32 | | 0.82 | 1.90 | 0.29 | 6.8 | 2.30 | 0.79 | 0.71 | 3.1 | - | 1.0 | 9.9 | 10.9 | |
| 1995 | 0.37 | 1.59 | 0.96 | 0.46 | | 2.34 | 2.94 | 0.93 | 8.6 | 2.56 | 1.03 | 1.18 | 3.6 | - | 2.1 | 12.2 | 14.3 | |
| 1996 | 0.23 | 1.15 | 0.98 | 0.98 | | 1.46 | 2.17 | 0.91 | 7.0 | 2.01 | 0.76 | 0.99 | 2.8 | - | 1.9 | 9.7 | 11.6 | |
| 1997 | 0.30 | 1.04 | 0.76 | 0.88 | | 1.32 | 1.78 | 1.07 | 6.1 | 1.52 | 0.90 | 1.20 | 2.4 | - | 2.3 | 8.5 | 10.8 | |
| 1998 | 0.32 | 0.75 | 0.62 | 0.53 | | 0.88 | 1.95 | 0.57 | 5.0 | 1.67 | 0.97 | 1.11 | 2.6 | - | 1.7 | 7.7 | 9.4 | |
| 1999 | 0.33 | 0.60 | 0.00 | 0.57 | | 0.87 | 1.59 | 0.35 | 4.0 | 2.12 | 1.09 | 1.17 | 3.2 | - | 1.5 | 7.2 | 8.7 | |
| 2000 | 0.26 | 0.85 | 0.15 | 0.58 | | 0.83 | 1.98 | 0.62 | 4.7 | 2.09 | 1.16 | 1.21 | 3.3 | - | 1.8 | 7.9 | 9.7 | |
| 2001 | 0.32 | 0.55 | 0.11 | 1.20 | | 1.06 | 1.12 | 0.37 | 4.4 | 2.02 | 1.20 | 1.29 | 3.2 | - | 1.7 | 7.6 | 9.2 | |
| 2002 | 0.22 | 0.58 | 0.12 | 0.88 | | 1.37 | 0.75 | 0.38 | 3.9 | 1.81 | 0.97 | 1.11 | 2.8 | - | 1.5 | 6.7 | 8.2 | |
| 2003 | 0.37 | 0.43 | 0.17 | 1.25 | | 1.36 | 1.07 | 0.41 | 4.7 | 1.13 | 0.96 | 1.05 | 2.1 | - | 1.5 | 6.7 | 8.2 | |
| 2004 | 0.45 | 0.42 | 0.13 | 1.06 | | 1.66 | 1.13 | 0.22 | 4.8 | 1.27 | 0.80 | 0.69 | 2.1 | - | 0.9 | 6.9 | 7.8 | |
| 2005 | 0.72 | 0.63 | 0.09 | 0.88 | | 2.77 | 1.14 | 0.38 | 6.2 | 1.10 | 0.96 | 1.60 | 2.1 | - | 2.0 | 8.3 | 10.3 | |
| 2006 | 0.48 | 0.71 | 0.35 | 0.63 | | 4.70 | 1.81 | 2.65 | 8.7 | 1.22 | 0.91 | 0.61 | 2.1 | - | 3.3 | 10.8 | 14.1 | |
| 2007 | 0.83 | 1.80 | 0.89 | 0.50 | | 6.71 | 2.07 | 1.19 | 12.8 | 1.41 | 0.72 | 1.31 | 2.1 | - | 2.5 | 14.9 | 17.4 | |
| 2008 | 1.12 | 2.64 | 1.51 | 0.53 | | 6.32 | 2.44 | 1.45 | 14.6 | 1.27 | 0.94 | 0.86 | 2.2 | - | 2.3 | 16.8 | 19.1 | |
| 2009 | 1.36 | 2.92 | 2.10 | 0.55 | | 7.37 | 2.54 | 0.98 | 16.8 | 1.39 | 0.96 | 1.96 | 2.4 | - | 2.9 | 19.2 | 22.1 | |
| 2010 | 0.72 | 1.71 | 1.88 | 0.68 | | 6.33 | 1.71 | 1.00 | 13.0 | 1.61 | 0.73 | 0.58 | 2.3 | 0.36 | * | 1.6 | 15.7 | 17.3 |
| 2011** | | | | | | | | | | 1.72 | 0.49 | 0.74 | 2.2 | | 0.7 | 2.2 | 3.0 | |

* French catches are not considered in the assessment until the full time-series is reviewed.

** It was not possible to include Spanish commercial data for 2011 in the assessment.

Table 7.4.1.3 Hake in Divisions VIIIc and IXa. Stock summary.

| Year | F (1–3) | Recruitment (millions) | SSB (‘000 tonnes) | Landings (‘000 tonnes) | Discards (‘000 tonnes) | Catch (‘000 tonnes) |
|-------------|--------------------|-----------------------------------|------------------------------|-----------------------------------|-----------------------------------|--------------------------------|
| 1982 | 0.359 | 97.8 | 40.5 | 17.6 | | 17.6 |
| 1983 | 0.445 | 81.9 | 44.5 | 22.9 | | 22.9 |
| 1984 | 0.453 | 69.3 | 41.5 | 22.2 | | 22.2 |
| 1985 | 0.420 | 44.8 | 41.8 | 18.9 | | 18.9 |
| 1986 | 0.442 | 41.1 | 38.9 | 17.2 | | 17.2 |
| 1987 | 0.502 | 50.1 | 36.1 | 16.2 | | 16.2 |
| 1988 | 0.644 | 68.2 | 26.5 | 16.7 | | 16.7 |
| 1989 | 0.648 | 77.9 | 19.5 | 13.8 | | 13.8 |
| 1990 | 0.694 | 82.7 | 15.8 | 13.2 | | 13.2 |
| 1991 | 0.684 | 69.6 | 16.0 | 12.8 | | 12.8 |
| 1992 | 0.821 | 51.2 | 15.2 | 13.8 | 0.5* | 14.3 |
| 1993 | 0.871 | 61.5 | 12.8 | 11.5 | 0.7* | 12.2 |
| 1994 | 0.855 | 117.4 | 9.2 | 9.9 | 1.0* | 10.9 |
| 1995 | 1.143 | 50.3 | 7.6 | 12.2 | 2.1* | 14.3 |
| 1996 | 1.104 | 105.4 | 9.0 | 9.7 | 1.9* | 11.6 |
| 1997 | 1.101 | 76.1 | 6.9 | 8.5 | 2.3* | 10.8 |
| 1998 | 0.872 | 59.9 | 6.4 | 7.7 | 1.7* | 9.4 |
| 1999 | 0.731 | 65.7 | 8.2 | 7.2 | 1.5* | 8.7 |
| 2000 | 0.811 | 68.4 | 9.7 | 7.9 | 1.8* | 9.7 |
| 2001 | 0.799 | 49.7 | 10.0 | 7.6 | 1.7* | 9.2 |
| 2002 | 0.753 | 69.5 | 10.4 | 6.7 | 1.5* | 8.2 |
| 2003 | 0.768 | 60.3 | 10.3 | 6.7 | 1.5* | 8.2 |
| 2004 | 0.659 | 78.9 | 10.4 | 6.9 | 0.9 | 7.9 |
| 2005 | 0.693 | 127.4 | 10.9 | 8.3 | 2.0 | 10.3 |
| 2006 | 0.807 | 99.5 | 12.4 | 10.8 | 3.3 | 14.1 |
| 2007 | 0.830 | 159.2 | 14.7 | 14.9 | 2.5 | 17.4 |
| 2008 | 0.803 | 120.7 | 15.1 | 16.8 | 2.3 | 19.1 |
| 2009 | 0.825 | 159.7 | 17.2 | 19.2 | 2.9 | 22.2 |
| 2010 | 0.521 | 80.8** | 18.7 | 15.4 | 1.6 | 16.9*** |
| 2011 | | 80.8** | 27.7 | | | |

* Estimated from survey abundance, discards, and discards/landings rate.

** Replaced by geometric mean 1989–2009.

*** Catch in 2010 does not include 0.36 kt from France.

ECOREGION Bay of Biscay and Atlantic Iberian waters
STOCK Four-spot megrim (*Lepidorhombus boscii*) in Divisions VIIIc and IXa

Advice for 2013

ICES advises on the basis of the MSY approach that landings in 2013 should be no more than 780 t. Combined landings of *Lepidorhombus boscii* and *Lepidorhombus whiffiagonis* should be no more than 890 t.

Stock status

| F (Fishing Mortality) | | | |
|--|------|------|-------------------|
| | 2009 | 2010 | 2011 |
| MSY (F_{MSY}) | ✘ | ✘ | ⊛ ? Not available |
| Precautionary approach (F_{pa}, F_{lim}) | ⊛ ? | ⊛ ? | ⊛ ? Not available |
| SSB (Spawning-Stock Biomass) | | | |
| | 2010 | 2011 | 2012 |
| MSY ($B_{trigger}$) | ⊛ ? | ⊛ ? | ⊛ ? Not available |
| Precautionary approach (B_{pa}, B_{lim}) | ⊛ ? | ⊛ ? | ⊛ ? Not available |
| Qualitative evaluation | ➡ | ➡ | ➡ Stable |

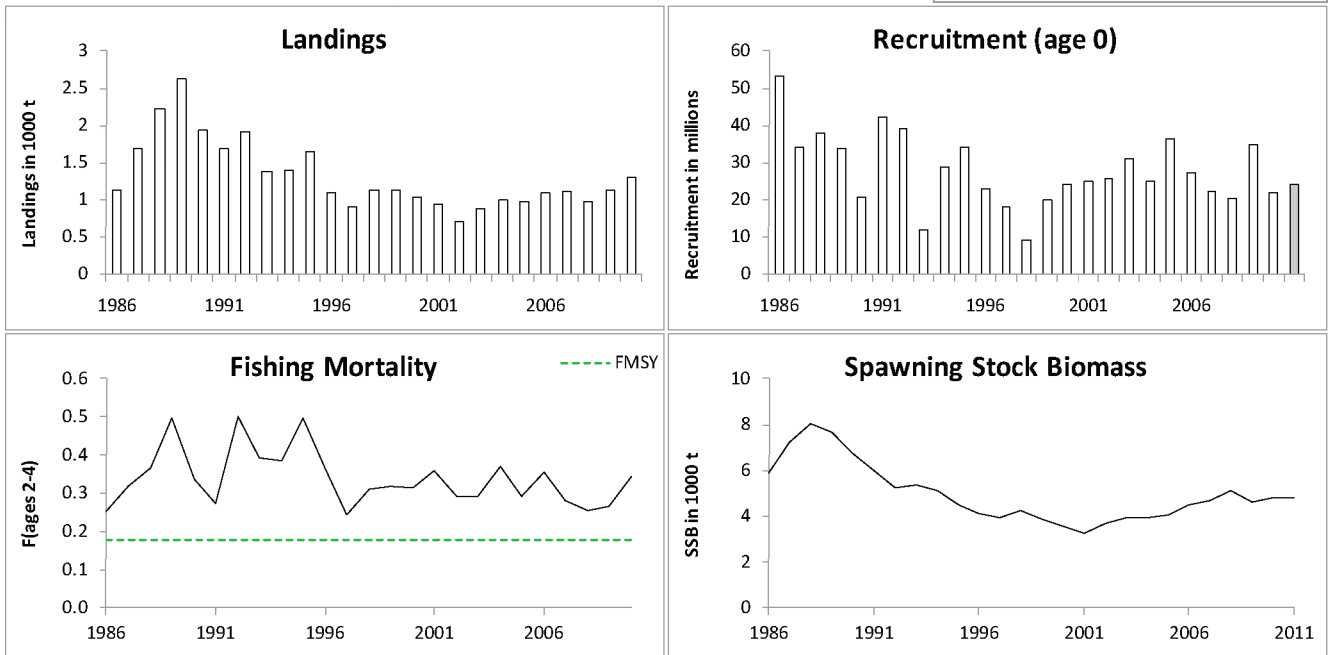
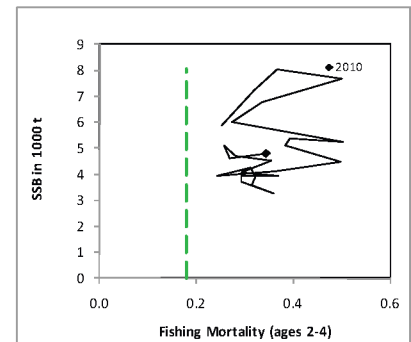


Figure 7.4.2.1 Four-spot megrim (*Lepidorhombus boscii*) in Divisions VIIIc and IXa. Summary of stock assessment (weights in thousand tonnes). Assumed recruitment values are shaded. Top right: SSB/F for the time-series used in the assessment.

No assessment has been carried out in 2012. The stock status is based on last year's assessment. SSB has decreased from the late 1980s to a minimum in 2001, but since then been slowly increasing. Fishing mortality has been stable and above F_{MSY} . Recruitment has been around average since 2000.

Management plans

No specific management objectives are known to ICES.

Biology

Four-spot megrim (*L. boscii*) is the most southerly distributed of the two megrim species. It occurs in both ICES Divisions VIIIc and IXa and it is predominant on all soft bottoms of the continental shelf. It has a preferential depth range of 100 to 450 m. It spawns from January to April, with spawning peak in March.

The fisheries

The southern four-spot megrim stock is almost exclusively caught in mixed bottom-trawl fisheries targeting demersal fish, including megrim (*L. whiffiagonis*), hake, anglerfish, and *Nephrops*. Management measures aimed at reducing fishing mortality on any of these stocks should also reduce fishing pressure on four-spot megrim. Since 2000, the Spanish trawl fleet has changed its main target species, focusing more often on species such as horse mackerel, blue whiting, or mackerel, and do not usually take megrim in the catch.

Catch distribution Total landings (2010) = 1297 t, of which 95.3% are bottom otter trawl, 0.8% pairtrawl, 3.6% Portuguese artisanal, and 0.3% other gear types). In addition, discards were estimated at 266 t (underestimated, only Spain included). There were insufficient data to update this information for 2011; however, values for 2010 are still considered appropriate.

Quality considerations

It was not possible to include Spanish commercial data for 2011 in the assessment. The assessment model could not be updated this year. Projections for catch options and management advice for 2013 were based on the assessment conducted in 2011. This implies that assumptions on recruitment and fishing mortality must be made for two intermediate years (2011 and 2012) instead of one (2012), which resulted in a larger uncertainty in the results of the forecast for 2013 and 2014. The proportion of 2013 landings that depends on average recruitment assumptions (year classes 2011–2013) is 7%.

The only tuning index since year 2000 (Spanish survey, SpGFS-WIBTS-Q4) does not cover the whole stock area. Discards are in the range of 39–63% (in numbers). Not including discards in the assessment therefore compromises its quality; however, due to the incomplete time-series available, discards cannot be included in the current assessment model.

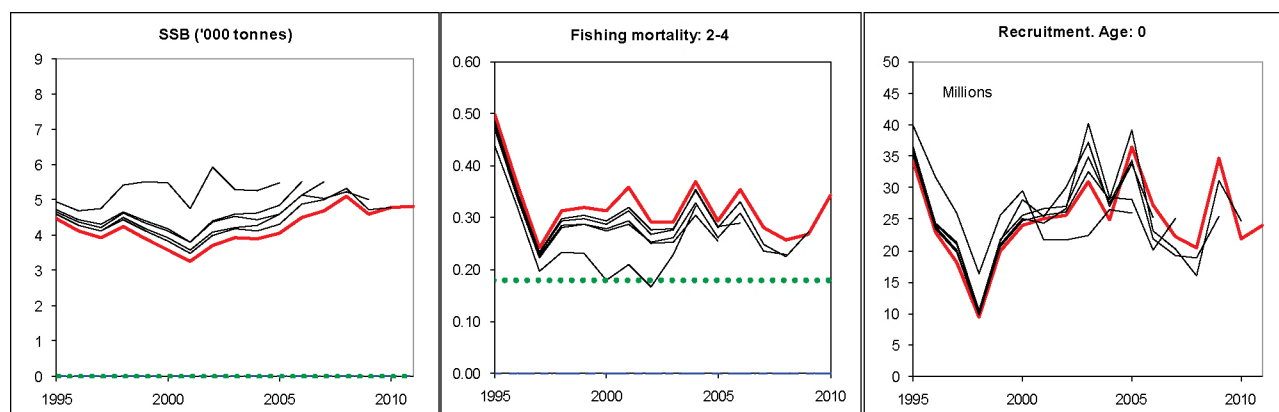


Figure 7.4.2.2 Four-spot megrim (*Lepidorhombus boscii*) in Divisions VIIIc and IXa. Historical assessment results (final-year recruitment estimates included).

Scientific basis

| | |
|-----------------------------|--|
| Assessment type | Age-based assessment (XSA). |
| Input data | One commercial lpue series (SP-CORUTR8c) ; one cpue survey series (SpGFS-WIBTS-Q4). |
| Discards and bycatch | Not included in the assessment. |
| Indicators | None. |
| Other information | This stock is caught together with <i>L. whiffiagonis</i> (Section 7.4.3) and the fisheries advice therefore combines both stocks. |
| Working group report | WGHMM |

ECOREGION Bay of Biscay and Atlantic Iberian waters
STOCK Four-spot megrim (*Lepidorhombus boscii*) in Divisions VIIIc and IXa

Reference points

| | <i>Type</i> | <i>Value</i> | <i>Technical basis</i> |
|------------------------|-------------------|--------------|-----------------------------|
| MSY Approach | MSY $B_{trigger}$ | Not defined. | |
| | F_{MSY} | 0.18 | $F_{40\%SPR}$ (ICES, 2010). |
| Precautionary Approach | B_{lim} | Not defined. | |
| | B_{pa} | Not defined. | |
| | F_{lim} | Not defined. | |
| | F_{pa} | Not defined. | |

(unchanged since: 2010)

Outlook for 2013

Basis: F (2011–2012) = F_{sq} = mean F (2008–2010) = 0.29; SSB (2012) = 4.90; SSB (2013) = 4.85; landings (2011) = 1.06; landings (2012) = 1.14; R (age 0) = GM (1990–2008) = 24 million.

| Rationale | <i>L. boscii</i> | Combined species | Basis | <i>L. boscii</i> | | | |
|----------------|------------------|-----------------------------|--|------------------|------------|----------------------------|----------------------------|
| | Landings (2013) | Landings (2013) | | F (2013) | SSB (2014) | % SSB change ¹⁾ | % TAC change ²⁾ |
| MSY framework | 0.78 | 0.89 | $F_{MSY} [F_{sq} * 0.62]$ | 0.18 | 5.21 | +7% | -26% |
| MSY transition | 1.05 | 1.20 | $0.4 * F_{2010} + 0.6 * F_{MSY} [F_{sq} * 0.87]$ | 0.25 | 4.91 | +1% | -1% |
| Zero catch | 0 | 0 | $F=0$ | 0.00 | 6.09 | +26% | -100% |
| Other options | 0.14 | 0.16 | $F_{sq} * 0.1$ | 0.03 | 5.93 | +22% | -87% |
| | 0.27 | 0.31 | $F_{sq} * 0.2$ | 0.06 | 5.78 | +19% | -74% |
| | 0.65 | 0.74 | $F_{sq} * 0.5$ | 0.14 | 5.36 | +11% | -39% |
| | 0.90 | 1.03 | -15% TAC [$F_{sq} * 0.73]$ | 0.21 | 5.08 | +5% | -15% |
| | 0.92 | 1.06 | $F_{sq} * 0.75$ | 0.22 | 5.05 | +4% | -13% |
| | 1.06 | 1.21 | 0% TAC [$F_{sq} * 0.88]$ | 0.25 | 4.90 | +1% | 0% |
| | 1.17 | 1.35 | $F_{sq} * 1$ | 0.29 | 4.77 | -2% | +11% |
| 1.21 | 1.39 | +15% TAC [$F_{sq} * 1.04]$ | 0.30 | 4.73 | -2% | +15% | |

Weights in thousand tonnes.

¹⁾ SSB 2014 relative to SSB 2013.

²⁾ Landings of combined megrim species in 2013 relative to TAC 2012.

MSY approach

Since the two megrim species (*L. whiffiagonis* and *L. boscii*) are not separated in the landings, the advice of the two stocks is linked. The reduction in fishing mortality applied to the stock with highest fishing mortality (*L. boscii*) in relation to F_{MSY} should be applied to both stocks. Given the continuous decline of SSB to the lowest observed in the time-series of *L. whiffiagonis*, the transition framework is not appropriate for advice for both megrim stocks and advice is therefore based on the MSY framework, reversing the SSB decline of *L. whiffiagonis* in the short term. This approach was already applied in 2010 and 2011.

To follow the ICES MSY framework fishing mortality must be reduced to 0.18, resulting in maximum landings of 780 t in 2013. This is expected to lead to an SSB of 5210 t in 2014.

Additional considerations

The two megrim species (*L. whiffiagonis* and *L. boscii*) are managed under a common TAC. They are caught and recorded together in the landings statistics. It is impossible to manage adequately each species under a common TAC.

This problem is highlighted by the different status of the two stocks. *L. whiffiagonis* is the stock in poorest conditions in terms of SSB, while for *L. boscii* the SSB is slightly increasing but currently overexploited in relation to F_{MSY} .

The spatial distribution of the two stocks shows some differences that could be utilized for separate management of the two stocks. Both megrim species are distributed in Divisions VIIIc and IXa, but *L. whiffiagonis* is more northern than *L. boscii*. In addition, there is a certain bathymetric segregation between the two species. *L. boscii* has a preferential depth range of 100 to 450 m and *L. whiffiagonis* of 50 to 300 m.

Discards of four-spot megrim are substantial and estimated to be in the range of 39–63% in numbers.

Comparison with last year's assessment and advice

No new assessment was performed in this year, due to the lack of 2011 data. The basis for the advice is the same as last year, the MSY framework.

Sources

ICES. 2010. Report of the Working Group on the Assessment of Southern Shelf Stocks of Hake, Monk, and Megrim (WGHMM), 5–11 May 2010, Bilbao, Spain. ICES CM 2010/ACOM:11.

ICES. 2011. Report of the Working Group on the Assessment of Southern Shelf Stocks of Hake, Monk, and Megrim (WGHMM), 5–11 May 2011, ICES Headquarters, Copenhagen. ICES CM 2011/ACOM:11.

ICES. 2012. Report of the Working Group on the Assessment of Southern Shelf Stocks of Hake, Monk, and Megrim (WGHMM), 10–16 May 2012, ICES Headquarters, Copenhagen. ICES CM 2012/ACOM:11.

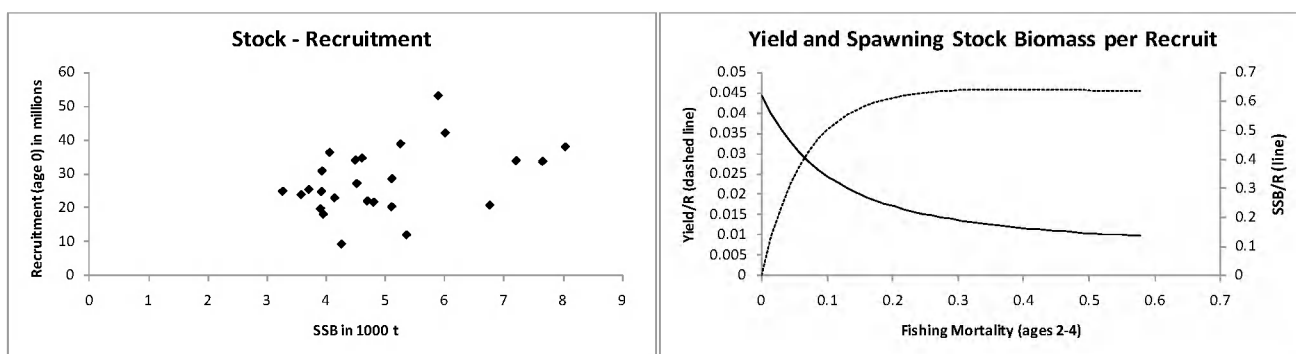


Figure 7.4.2.3 Four-spot megrim (*Lepidorhombus boscii*) in Divisions VIIIc and IXa. Stock–recruitment relationship (left) and yield and spawning-stock biomass per recruit (right).

Table 7.4.2.1 Four-spot megrim (*Lepidorhombus boscii*) in Divisions VIIIc and IXa. ICES advice, management, and landings.

| Year | ICES Advice ¹ | Predicted total landings corresp. to advice ¹ | Predicted landings corresp. to advice <i>L. boscii</i> | Agreed TAC ^{1,2} | ICES landings ¹ | Landings <i>L. boscii</i> |
|------|---|--|--|---------------------------|----------------------------|---------------------------|
| 1987 | Not dealt with | | | 13.0 | 2.19 | 1.69 |
| 1988 | Not dealt with | | | 13.0 | 3.04 | 2.22 |
| 1989 | Not dealt with | | | 13.0 | 3.34 | 2.63 |
| 1990 | Not dealt with | | | 13.0 | 2.93 | 1.95 |
| 1991 | No advice | | | 14.3 | 2.29 | 1.68 |
| 1992 | No advice | | | 14.3 | 2.44 | 1.92 |
| 1993 | <i>L. boscii</i> no gain in increasing F, <i>L. whiff.</i> safe biological limits | | | 8.0 | 1.76 | 1.38 |
| 1994 | No gains in increasing F | | | 6.0 | 1.88 | 1.40 |
| 1995 | Concern about low SSB | | | 6.0 | 1.87 | 1.65 |
| 1996 | Mixed fishing aspects | | | 6.0 | 1.43 | 1.10 |
| 1997 | Reduce F by at least 50% | | | 6.0 | 1.25 | 0.90 |
| 1998 | Reduce F by at least 50% | 0.9 | | 6.0 | 1.57 | 1.12 |
| 1999 | Reduce F by at least 50% | 1.0 | | 6.0 | 1.46 | 1.12 |
| 2000 | Reduce F by at least 20% | < 1.5 | | 5.0 | 1.29 | 1.04 |
| 2001 | No increase in F | 1.61 | | 5.0 | 1.11 | 0.93 |
| 2002 | No increase in F | 1.55 | | 4.0 | 0.84 | 0.72 |
| 2003 | No increase in F | 1.55 | | 2.4 | 1.01 | 0.88 |
| 2004 | No increase in F | 1.38 | | 1.336 | 1.14 | 0.99 |
| 2005 | No increase in F ³ | 1.09 | | 1.336 | 1.13 | 0.98 |
| 2006 | No increase in F | 1.2 | | 1.269 | 1.30 | 1.09 |
| 2007 | No increase in F | 1.4 | | 1.440 | 1.26 | 1.10 |
| 2008 | No increase in F | 1.4 | | 1.430 | 1.11 | 0.93 |
| 2009 | Same advice as last year | 1.4 | | 1.430 | 1.22 | 1.13 |
| 2010 | Reduce F to F _{0.1} | 0.9 | | 1.287 | 1.38 | 1.30 |
| 2011 | MSY framework | < 0.89 | < 0.78 | 1.094 | 0.22 ⁴ | 0.18 ⁴ |
| 2012 | MSY framework | < 0.86 | < 0.76 | 1214 | | |
| 2013 | MSY framework | < 0.89 | < 0.78 | | | |

Weights in thousand tonnes.

¹⁾ For both species combined.

²⁾ For Division VIIIc and Subareas IX and X; EU waters of CECAF 34.1.1.

³⁾ Single-stock boundary and the exploitation of this stock should be conducted in the context of mixed fisheries protecting stocks outside safe biological limits.

⁴⁾ Without the Spanish landings.

Table 7.4.2.2

Four-spot megrim (*Lepidorhombus boscii*) in Divisions VIIIc and IXa. Landings (in tonnes) by country and area.

| Year | Spain | | | Portugal | Total |
|------|-------|------|-------|----------|-----------|
| | VIIIc | IXa | Total | IXa | VIIIc IXa |
| 1986 | 799 | 197 | 996 | 128 | 1124 |
| 1987 | 995 | 586 | 1581 | 107 | 1688 |
| 1988 | 917 | 1099 | 2016 | 207 | 2223 |
| 1989 | 805 | 1548 | 2353 | 276 | 2629 |
| 1990 | 927 | 798 | 1725 | 220 | 1945 |
| 1991 | 841 | 634 | 1475 | 207 | 1682 |
| 1992 | 654 | 938 | 1592 | 324 | 1916 |
| 1993 | 744 | 419 | 1163 | 221 | 1384 |
| 1994 | 665 | 561 | 1227 | 176 | 1403 |
| 1995 | 685 | 826 | 1512 | 141 | 1652 |
| 1996 | 480 | 448 | 928 | 170 | 1098 |
| 1997 | 505 | 289 | 794 | 101 | 896 |
| 1998 | 725 | 284 | 1010 | 113 | 1123 |
| 1999 | 713 | 298 | 1011 | 114 | 1125 |
| 2000 | 674 | 225 | 899 | 142 | 1041 |
| 2001 | 629 | 177 | 807 | 124 | 931 |
| 2002 | 343 | 247 | 590 | 130 | 720 |
| 2003 | 393 | 314 | 707 | 169 | 876 |
| 2004 | 534 | 295 | 829 | 177 | 1006 |
| 2005 | 473 | 321 | 794 | 189 | 983 |
| 2006 | 542 | 348 | 891 | 201 | 1092 |
| 2007 | 591 | 295 | 886 | 218 | 1104 |
| 2008 | 546 | 262 | 808 | 172 | 980 |
| 2009 | 577 | 342 | 919 | 215 | 1134 |
| 2010 | 616 | 484 | 1100 | 197 | 1297 |
| 2011 | na | na | na | 181 | na |

¹⁾ na = not available.

Table 7.4.2.3

Four-spot megrim (*Lepidorhombus boscii*) in Divisions VIIIc and IXa. Summary of stock assessment.

| Year | Recruitment Age 0 thousands | SSB tonnes | Landings tonnes | Mean F Ages 2–4 |
|----------------|--|-----------------------|----------------------------|----------------------------|
| 1986 | 53249 | 5890 | 1124 | 0.2512 |
| 1987 | 34015 | 7206 | 1688 | 0.3173 |
| 1988 | 38131 | 8038 | 2223 | 0.3665 |
| 1989 | 33796 | 7653 | 2629 | 0.4988 |
| 1990 | 20878 | 6760 | 1945 | 0.3356 |
| 1991 | 42252 | 6007 | 1682 | 0.2721 |
| 1992 | 39025 | 5252 | 1916 | 0.5016 |
| 1993 | 12081 | 5355 | 1384 | 0.3933 |
| 1994 | 28729 | 5106 | 1403 | 0.3837 |
| 1995 | 34229 | 4489 | 1652 | 0.4978 |
| 1996 | 23014 | 4139 | 1098 | 0.3645 |
| 1997 | 18163 | 3949 | 896 | 0.2428 |
| 1998 | 9351 | 4256 | 1123 | 0.3124 |
| 1999 | 19859 | 3899 | 1125 | 0.3200 |
| 2000 | 23998 | 3573 | 1041 | 0.3136 |
| 2001 | 25023 | 3260 | 931 | 0.3588 |
| 2002 | 25556 | 3703 | 720 | 0.2920 |
| 2003 | 31005 | 3925 | 876 | 0.2913 |
| 2004 | 24925 | 3917 | 1006 | 0.3688 |
| 2005 | 36496 | 4054 | 983 | 0.2933 |
| 2006 | 27302 | 4514 | 1092 | 0.3545 |
| 2007 | 22180 | 4690 | 1104 | 0.2808 |
| 2008 | 20385 | 5103 | 980 | 0.2566 |
| 2009 | 34771 | 4603 | 1134 | 0.2675 |
| 2010 | 21810 | 4797 | 1297 | 0.3430 |
| 2011 | 24016* | 4818 | | |
| Average | 27855 | 4929 | 1322 | 0.3391 |

*GM(1990–2008).

ECOREGION Bay of Biscay and Atlantic Iberian waters
STOCK Megrim (*Lepidorhombus whiffiagonis*) in Divisions VIIIc and IXa

Advice for 2013

ICES advises on the basis of the MSY approach that landings in 2013 should be no more than 110 t. Combined landings of *Lepidorhombus whiffiagonis* and *Lepidorhombus boscii* should be no more than 890 t.

Stock status

| | | F (Fishing Mortality) | | |
|--|--|------------------------------|------|-----------------|
| | | 2009 | 2010 | 2011 |
| MSY (F_{MSY}) | | ✓ | ✓ | ⊘ Not available |
| Precautionary approach (F_{pa}, F_{lim}) | | ⊘ | ⊘ | ⊘ Not available |
| | | SSB (Spawning-Stock Biomass) | | |
| | | 1990–2011 | 2012 | |
| MSY ($B_{trigger}$) | | ⊘ | ⊘ | ⊘ Not available |
| Precautionary approach (B_{pa}, B_{lim}) | | ⊘ | ⊘ | ⊘ Not available |
| Qualitative evaluation | | ⚡ | ⊘ | ⊘ Not available |

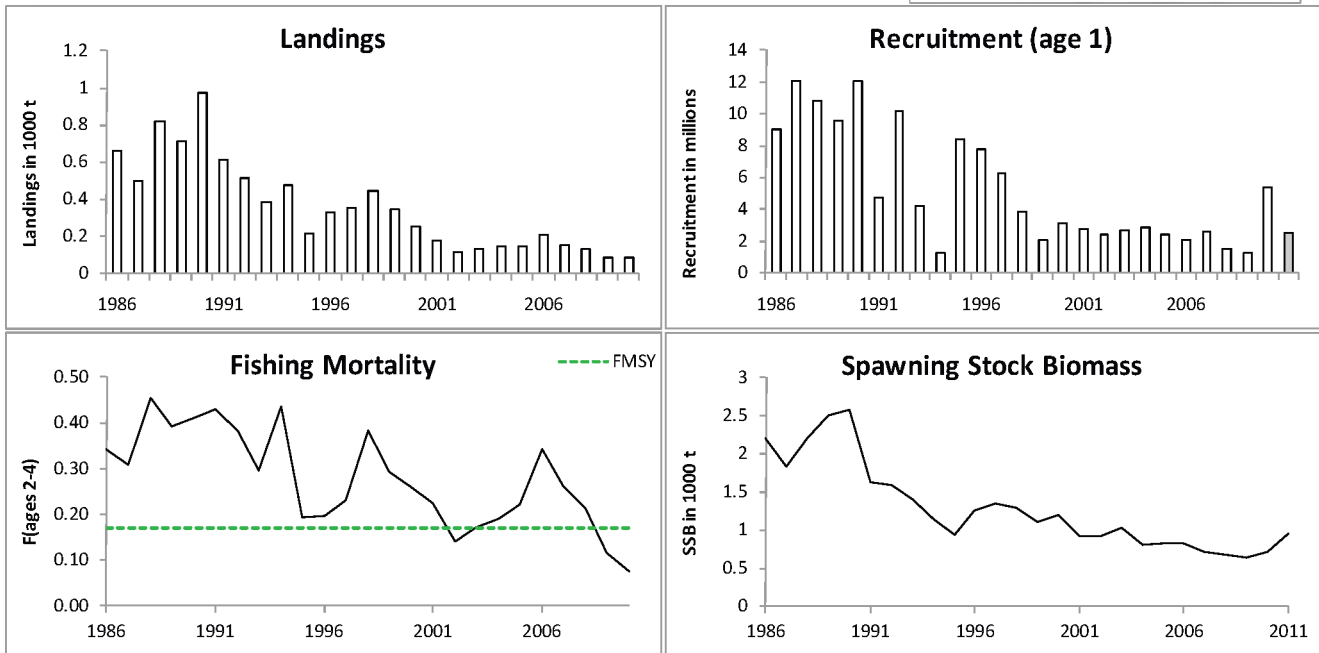
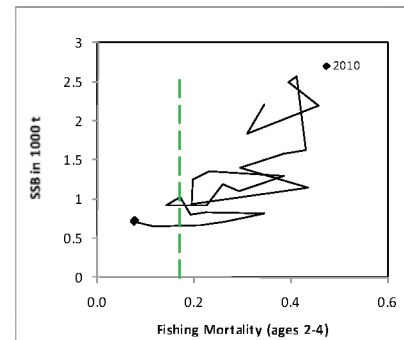


Figure 7.4.3.1 Megrim (*Lepidorhombus whiffiagonis*) in Divisions VIIIc and IXa. Summary of stock assessment (weights in thousand tonnes). Assumed recruitment values are shaded. Top right: SSB/F for the time-series used in the assessment.

No assessment has been carried out in 2012. The stock status is based on last year’s assessment. SSB has decreased from the late 1980s, and has been low since 2004. Fishing mortality has fluctuated over the times-series, but has decreased after 2006. Recruitment has been low for over a decade with the exception of the high 2009 year-class estimate.

Management plans

No specific management objectives are known to ICES.

Biology

Megrim (*L. whiffiagonis*) is the most northerly distributed of the two megrim species. It occurs in both ICES Divisions VIIIc and IXa, with its highest abundance in Division VIIIc. It has a preferential depth range of 50 to 300 m. Megrim spawns from January to April, with spawning peak in March.

The fisheries

The southern megrim stock is almost exclusively caught in mixed bottom-trawl fisheries targeting demersal fish, including four-spot megrim, southern hake, anglerfish, and *Nephrops*. Management measures aimed at reducing fishing mortality on any of these stocks should also reduce fishing pressure on megrim. Since 2000, the Spanish trawl fleet has changed its main target species, focusing more often on species such as horse mackerel, blue whiting, or mackerel, and normally not taking megrim in the catch.

Catch distribution Total landings (2010) = 83 t (94.6% bottom otter trawl, 2.2% pairtrawl, 2.7% Portuguese artisanal, and 0.5% other gear types); and 4.6 t discards (underestimated, only Spain included). There were insufficient data to update this information for 2011; however, values for 2010 are still considered appropriate.

Quality considerations

It was not possible to include Spanish commercial data for 2011 in the assessment. The assessment model could not be updated this year. Projections for catch options and management advice for 2013 were based on the assessment conducted in 2011. This implies that assumptions on recruitment and fishing mortality must be made for two intermediate years (2011 and 2012) instead of one (2012), which resulted in a larger uncertainty in the results of the forecast for 2013 and 2014. The proportion of 2013 landings that depends on average recruitment assumptions (year classes 2011–2013) is 22%.

There is a consistent retrospective pattern with an overestimation of SSB and underestimation of fishing mortality.

Discard levels are estimated to be in the range of 10–45% (in numbers). Not including discards in the assessment compromises its quality; however, due to the incomplete time-series available, discards cannot be included in the current assessment model.

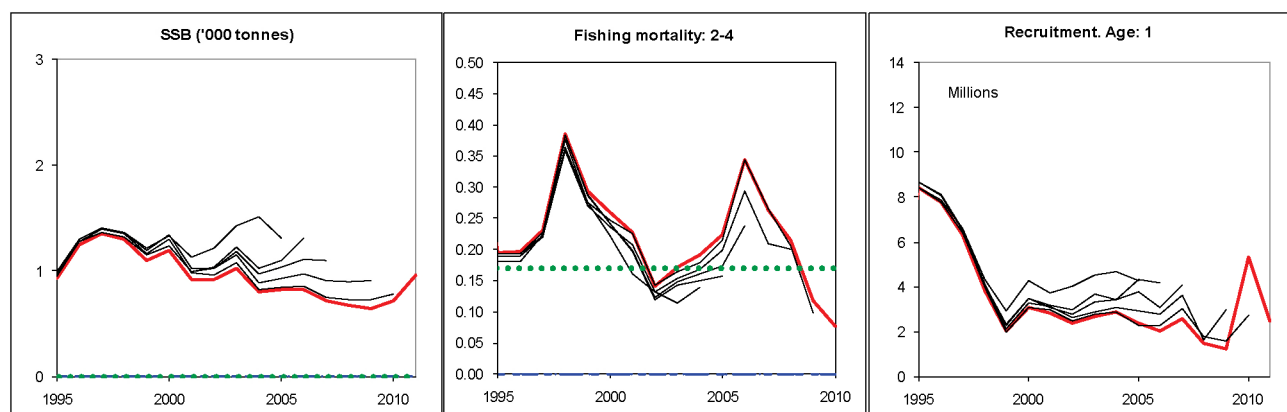


Figure 7.4.3.2 Megrim (*Lepidorhombus whiffiagonis*) in Divisions VIIIc and IXa. Historical assessment results (final-year recruitment estimates included).

Scientific basis

| | |
|-----------------------------|--|
| Assessment type | Age-based assessment (XSA). |
| Input data | Two commercial lpuce series (SP-CORUTR&c and SP-AVILESTR); one cpue survey series (SpGFS-WIBTS-Q4). |
| Discards and bycatch | Not included in the assessment. |
| Indicators | None. |
| Other information | This stock is caught together with <i>L. boscii</i> (Section 7.4.2) and the fisheries advice therefore combines both stocks. |
| Working group report | WGHMM |

ECOREGION Bay of Biscay and Atlantic Iberian waters
STOCK Megrim (*Lepidorhombus whiffiagonis*) in Divisions VIIIc and IXa

Reference points

| | <i>Type</i> | <i>Value</i> | <i>Technical basis</i> |
|------------------------|-------------------|--------------|-----------------------------|
| MSY Approach | MSY $B_{trigger}$ | Not defined. | |
| | 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. | |

(unchanged since: 2010)

Outlook for 2013

Basis: F (2011-2012) = F_{sq} = mean F (2008–2010) = 0.14; SSB (2012) = 1.07; SSB (2013) = 1.13; landings (2011) = 0.14; landings (2012) = 0.16; R (age 1) = GM (1998–2008) = 2.5 million.

| Rationale | <i>L. whiff.</i> | Combined species | Basis | <i>L. whiffiagonis</i> | | | |
|------------------------------|------------------|------------------|---------------------------------------|------------------------|------------|----------------------------|----------------------------|
| | Landings (2013) | Landings (2013) | | F (2013) | SSB (2014) | % SSB change ¹⁾ | % TAC change ²⁾ |
| MSY framework ³⁾ | 0.11 | 0.89 | $F_{sq} * 0.62$ | 0.08 | 1.21 | +7% | -26% |
| MSY transition ⁴⁾ | 0.15 | 1.20 | $F_{sq} * 0.87$ | 0.12 | 1.16 | +3% | -1% |
| Zero catch | 0 | 0 | $F=0$ | 0.00 | 1.33 | +18% | -100% |
| Other options | 0.02 | 0.16 | $F_{sq} * 0.1$ | 0.01 | 1.31 | +16% | -87% |
| | 0.04 | 0.31 | $F_{sq} * 0.2$ | 0.03 | 1.29 | +14% | -74% |
| | 0.09 | 0.74 | $F_{sq} * 0.5$ | 0.07 | 1.23 | +9% | -39% |
| | 0.13 | 1.03 | 15% TAC decrease $[F_{sq} * 0.73]$ | 0.10 | 1.19 | +5% | -15% |
| | 0.13 | 1.06 | $F_{sq} * 0.75$ | 0.10 | 1.18 | +5% | -13% |
| | 0.15 | 1.21 | 0% TAC change $[F_{sq} * 0.88]$ | 0.12 | 1.16 | +3% | 0% |
| | 0.17 | 1.35 | $F_{sq} * 1$ | 0.14 | 1.14 | +1% | +11% |
| | 0.18 | 1.39 | 15% TAC increase $[F_{sq} * 1.04]$ | 0.14 | 1.13 | +1% | +15% |

Weights in thousand tonnes.

¹⁾ SSB 2014 relative to SSB 2013.

²⁾ Landings of combined megrim species in 2013 relative to TAC 2012.

³⁾ F reduction corresponding to the MSY framework of *L. boscii*, see Section 7.4.2.

⁴⁾ F reduction corresponding to the transition scheme to the MSY framework of *L. boscii*, see Section 7.4.2.

MSY approach

Since the two megrim species (*L. whiffiagonis* and *L. boscii*) are not separated in the landings, the advice of the two stocks is linked. The reduction in fishing mortality applied to the stock with the highest fishing mortality (*L. boscii*) in relation to F_{MSY} should be applied to both stocks. Given the continuous decline of SSB to the lowest observed in the time-series of *L. whiffiagonis*, the transition framework is not appropriate for advice for both megrim stocks and advice is therefore based on the MSY framework, reversing the SSB decline of *L. whiffiagonis* in the short term. This approach was already applied in 2010 and 2011.

Following the ICES MSY framework implies fishing mortality to be reduced to 0.08, resulting in landings of 110 t in 2013. This is expected to lead to an SSB of 1210 t in 2014.

Additional considerations

The two megrim species (*L. whiffiagonis* and *L. boscii*) are managed under a common TAC. They are caught and recorded together in the landings statistics. It is impossible to manage adequately each species under a common TAC. This problem is highlighted by the different status of the two stocks. *L. whiffiagonis* is the stock in poorest conditions in terms of SSB, while for *L. boscii* the SSB is slightly increasing but currently overexploited in relation to F_{MSY} .

The spatial distribution of the two stocks shows some differences that could be utilized for separate management of the two stocks. Both megrim species are distributed in Divisions VIIIc and IXa, but *L. whiffiagonis* is more northern than *L. boscii*. In addition, there is a certain bathymetric segregation between the two species. *L. boscii* has a preferential depth range of 100 to 450 m and *L. whiffiagonis* of 50 to 300 m.

Discards of megrim are substantial and estimated to be in the range of 10%–45% of the catch in numbers.

The projected increase in SSB is mainly due to the estimated good 2009 year class, and the strength of this year class needs to be confirmed in future assessments.

Comparison with last year's assessment and advice

No new assessment was performed this year, due to the lack of 2011 data. The basis of this year's advice is the same as last year, the ICES MSY framework.

Sources

- ICES. 2010. Report of the Working Group on the Assessment of Southern Shelf Stocks of Hake, Monk, and Megrim (WGHMM), 5–11 May 2010, Bilbao, Spain. ICES CM 2010/ACOM:11.
- ICES. 2011. Report of the Working Group on the Assessment of Southern Shelf Stocks of Hake, Monk, and Megrim (WGHMM), 5–11 May 2011, ICES Headquarters, Copenhagen. ICES CM 2011/ACOM:11.
- ICES. 2012. Report of the Working Group on the Assessment of Southern Shelf Stocks of Hake, Monk, and Megrim (WGHMM), 10–16 May 2012, ICES Headquarters, Copenhagen. ICES CM 2012/ACOM:11.

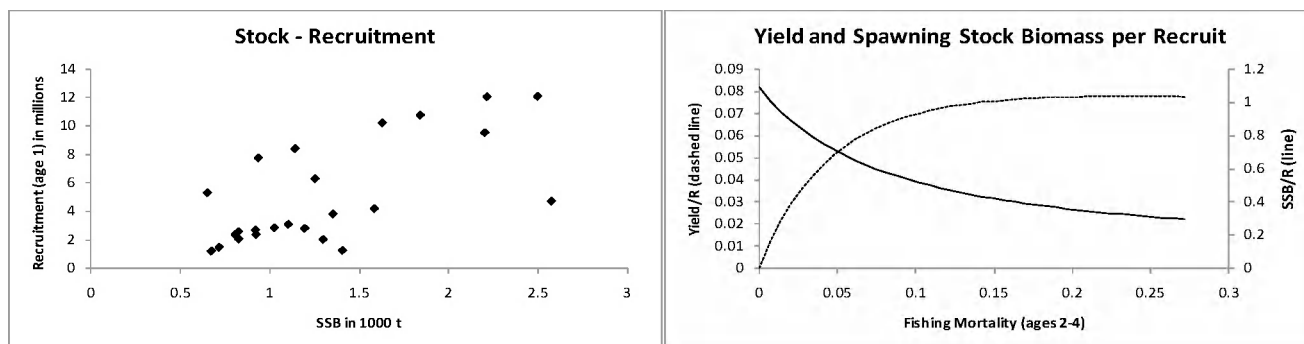


Figure 7.4.3.3 Megrim (*Lepidorhombus whiffiagonis*) in Divisions VIIIc and IXa. Stock–recruitment relationship and yield and spawning-stock biomass per recruit.

Table 7.4.3.1 Megrim (*Lepidorhombus whiffiagonis*) in Divisions VIIIc and IXa. ICES advice, management, and landings.

| Year | ICES Advice ¹⁾ | Predicted total landings corresp. to advice ¹⁾ | Predicted landings corresp. to advice | Agreed TAC ¹⁾²⁾ | ICES landings ¹⁾ | Landings <i>L. whiffiagonis</i> |
|------|---|---|---------------------------------------|----------------------------|-----------------------------|---------------------------------|
| 1987 | Not dealt with | | | 13.0 | 2.19 | 0.50 |
| 1988 | Not dealt with | | | 13.0 | 3.04 | 0.82 |
| 1989 | Not dealt with | | | 13.0 | 3.34 | 0.71 |
| 1990 | Not dealt with | | | 13.0 | 2.93 | 0.98 |
| 1991 | No advice | | | 14.3 | 2.29 | 0.61 |
| 1992 | No advice | | | 14.3 | 2.44 | 0.52 |
| 1993 | <i>L. boscii</i> no gain in increasing F, <i>L. whiff.</i> safe biological limits | | | 8.0 | 1.76 | 0.38 |
| 1994 | No gains in increasing F | | | 6.0 | 1.88 | 0.48 |
| 1995 | Concern about low SSB | | | 6.0 | 1.87 | 0.22 |
| 1996 | Mixed fishing aspects | | | 6.0 | 1.43 | 0.33 |
| 1997 | Reduce F by at least 50% | | | 6.0 | 1.25 | 0.36 |
| 1998 | Reduce F by at least 50% | 0.9 | | 6.0 | 1.57 | 0.45 |
| 1999 | Reduce F by at least 50% | 1.0 | | 6.0 | 1.46 | 0.35 |
| 2000 | Reduce F by at least 20% | < 1.5 | | 5.0 | 1.29 | 0.25 |
| 2001 | No increase in F | 1.61 | | 5.0 | 1.11 | 0.18 |
| 2002 | No increase in F | 1.55 | | 4.0 | 0.84 | 0.12 |
| 2003 | No increase in F | 1.55 | | 2.4 | 1.01 | 0.13 |
| 2004 | No increase in F | 1.38 | | 1.336 | 1.14 | 0.15 |
| 2005 | No increase in F ³⁾ | 1.09 | | 1.336 | 1.13 | 0.15 |
| 2006 | No increase in F | 1.2 | | 1.269 | 1.30 | 0.21 |
| 2007 | No increase in F | 1.4 | | 1.440 | 1.26 | 0.16 |
| 2008 | No increase in F | 1.4 | | 1.430 | 1.11 | 0.18 |
| 2009 | Same advice as last year | 1.4 | | 1.430 | 1.22 | 0.08 |
| 2010 | Reduce F to F _{0.1} | 0.9 | | 1.287 | 1.38 | 0.08 |
| 2011 | MSY framework | < 0.89 | < 0.11 | 1.094 | 0.22 ⁴⁾ | 0.03 ⁴⁾ |
| 2012 | MSY framework | <0.86 | <0.10 | 1214 | | |
| 2013 | MSY framework | <0.89 | <0.11 | | | |

Weights in thousand tonnes.

¹⁾ For both species combined.

²⁾ For Division VIIIc and Subareas IX and X; EU waters of CECAF 34.1.1.

³⁾ Single-stock boundary and the exploitation of this stock should be conducted in the context of mixed fisheries protecting stocks outside safe biological limits.

⁴⁾ Without the Spanish landings.

Table 7.4.3.2 Megrim (*Lepidorhombus whiffiagonis*) in Divisions VIIIc and IXa. Landings (in tonnes) by country and division.

| Year | Spain | | | Portugal | Total |
|------|-------|-----|-------|----------|------------|
| | VIIIc | IXa | Total | IXa | VIIIc, IXa |
| 1986 | 508 | 98 | 606 | 53 | 659 |
| 1987 | 404 | 46 | 450 | 47 | 497 |
| 1988 | 657 | 59 | 716 | 101 | 817 |
| 1989 | 533 | 45 | 578 | 136 | 714 |
| 1990 | 841 | 25 | 866 | 111 | 977 |
| 1991 | 494 | 16 | 510 | 104 | 614 |
| 1992 | 474 | 5 | 479 | 37 | 516 |
| 1993 | 338 | 7 | 345 | 38 | 383 |
| 1994 | 440 | 8 | 448 | 31 | 479 |
| 1995 | 173 | 20 | 193 | 25 | 218 |
| 1996 | 283 | 21 | 305 | 24 | 329 |
| 1997 | 298 | 12 | 310 | 46 | 356 |
| 1998 | 372 | 8 | 380 | 66 | 446 |
| 1999 | 332 | 4 | 336 | 7 | 343 |
| 2000 | 238 | 5 | 243 | 10 | 253 |
| 2001 | 167 | 2 | 169 | 5 | 175 |
| 2002 | 112 | 3 | 115 | 3 | 117 |
| 2003 | 113 | 3 | 116 | 17 | 134 |
| 2004 | 142 | 1 | 144 | 5 | 149 |
| 2005 | 120 | 1 | 121 | 26 | 147 |
| 2006 | 173 | 2 | 175 | 35 | 210 |
| 2007 | 139 | 2 | 141 | 14 | 155 |
| 2008 | 114 | 2 | 116 | 17 | 133 |
| 2009 | 74 | 2 | 77 | 7 | 84 |
| 2010 | 66 | 8 | 74 | 10 | 83 |
| 2011 | na | na | na | 34 | na |

¹⁾ na = not available.

Table 7.4.3.3Megrim (*Lepidorhombus whiffiagonis*) in Divisions VIIIc and IXa. Summary of stock assessment.

| Year | Recruitment Age 1 thousands | SSB tonnes | Landings tonnes | Mean F Ages 2–4 |
|-------------|--|-----------------------|----------------------------|----------------------------|
| 1986 | 9042 | 2215 | 659 | 0.3441 |
| 1987 | 12089 | 1842 | 497 | 0.3098 |
| 1988 | 10788 | 2203 | 817 | 0.4560 |
| 1989 | 9555 | 2498 | 714 | 0.3937 |
| 1990 | 12115 | 2576 | 977 | 0.4119 |
| 1991 | 4737 | 1629 | 614 | 0.4307 |
| 1992 | 10243 | 1585 | 516 | 0.3849 |
| 1993 | 4209 | 1406 | 383 | 0.2950 |
| 1994 | 1271 | 1141 | 479 | 0.4359 |
| 1995 | 8430 | 935 | 218 | 0.1942 |
| 1996 | 7779 | 1253 | 329 | 0.1958 |
| 1997 | 6308 | 1353 | 356 | 0.2307 |
| 1998 | 3840 | 1298 | 446 | 0.3848 |
| 1999 | 2037 | 1103 | 343 | 0.2932 |
| 2000 | 3102 | 1195 | 253 | 0.2586 |
| 2001 | 2819 | 923 | 175 | 0.2261 |
| 2002 | 2396 | 919 | 117 | 0.1415 |
| 2003 | 2703 | 1024 | 134 | 0.1708 |
| 2004 | 2867 | 806 | 149 | 0.1913 |
| 2005 | 2391 | 826 | 147 | 0.2226 |
| 2006 | 2065 | 824 | 210 | 0.3437 |
| 2007 | 2593 | 716 | 155 | 0.2634 |
| 2008 | 1491 | 672 | 133 | 0.2140 |
| 2009 | 1234 | 650 | 84 | 0.1168 |
| 2010 | 5338 | 717 | 83 | 0.0759 |
| 2011 | 2504* | 962 | | |
| Average | 5152 | 1280 | 360 | 0.2794 |

*GM(1998–2008).

ECOREGION Bay of Biscay and Atlantic Iberian waters
STOCK White anglerfish (*Lophius piscatorius*) in Divisions VIIIc and IXa

Advice for 2013

ICES advises on the basis of the MSY transition that landings in 2013 should be no more than 1350 t. Combined landings of *Lophius piscatorius* and *Lophius budegassa* should be no more than 2090 t.

Stock status

| | F (Fishing Mortality) | | |
|--|-----------------------|------|-----------------|
| | 2009 | 2010 | 2011 |
| MSY (F_{MSY}) | ✘ | ✘ | ⊛ Not available |
| Precautionary approach (F_{pa}, F_{lim}) | ⊛ | ⊛ | ⊛ Not available |
| Spawning-Stock Biomass (SSB) | | | |
| | 2005–2011 | | 2012 |
| MSY ($B_{trigger}$) | ⊛ | | ⊛ Not available |
| Precautionary approach (B_{pa}, B_{lim}) | ⊛ | | ⊛ Not available |
| Qualitative evaluation | ➡ | | ➡ Stable |

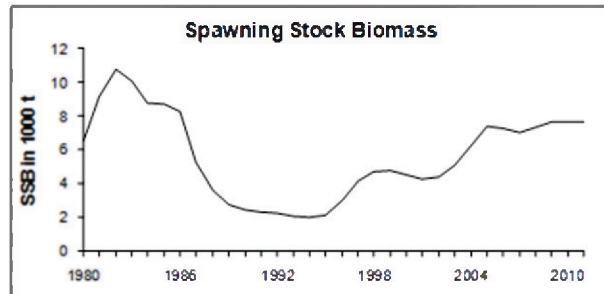
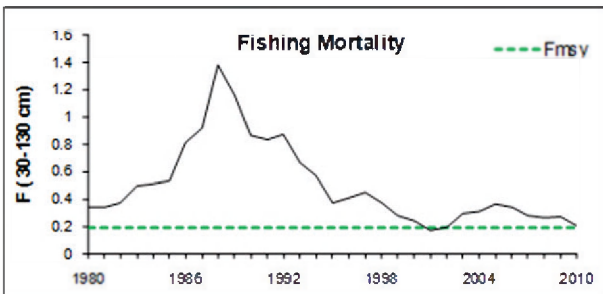
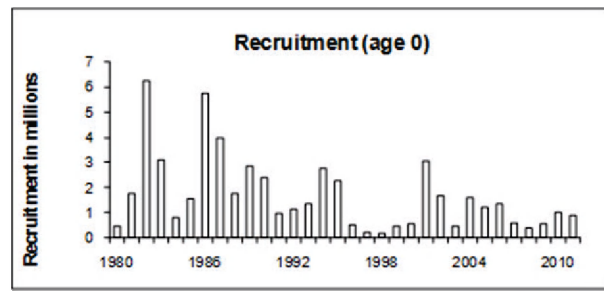
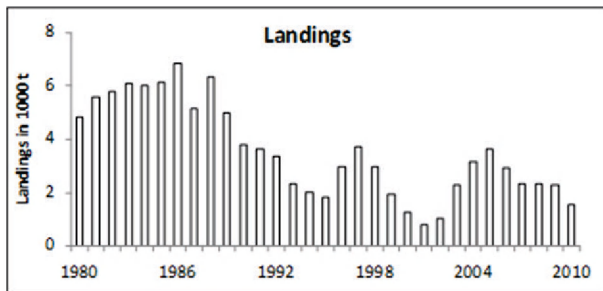
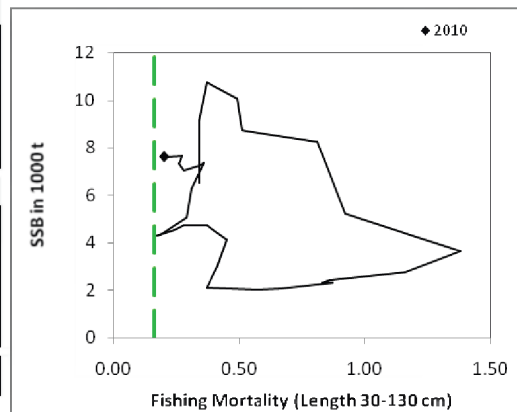


Figure 7.4.4.1 White anglerfish (*Lophius piscatorius*) in Divisions VIIIc and IXa. Summary of stock assessment (weights in thousand tonnes). Top right: SSB/F for the time-series used in the assessment.

The stock status is based on an assessment using data only until 2010. Fishing mortality has decreased since 2005, and for 2010 fishing mortality was estimated to be 26% lower than in 2009. SSB has been increasing since 1994 and remained stable from 2009.

Management plans

No specific management objectives are known to ICES.

Biology

Recent growth studies showed a faster growth than previously assumed (Landa *et al.*, 2008). The lack of a validated age reading criterion precludes the use of assessment models based on age data (ICES, 2012a).

The fisheries

Anglerfish species, *Lophius piscatorius* and *L. budegassa*, are caught together in bottom trawl and gillnet fisheries. These fisheries also catch hake, *Nephrops*, and megrim. Discarding is considered low. There is no minimum landing size for anglerfish, but a minimum selling weight of 500 g was fixed in 1996 to ensure marketing standards.

Catch distribution Total landings (2010) = 1.5 kt, of which 30% were taken by bottom trawl, 62% by Spanish gillnet, and 8% by Portuguese artisanal gear types. Discarding rate in the Spanish bottom trawl fishery is 2.4% by weight. There were insufficient data to update this information for 2011; however, values for 2010 are still considered appropriate.

Quality considerations

It was not possible to include Spanish commercial data for 2011 in the assessment. The assessment model could not be updated with 2011 commercial data. The assessment agreed at the benchmark meeting (ICES, 2012a) was used as basis of projection for catch options and management advice for 2013. This implies that assumption on recruitment and fishing mortality have to be made for two intermediate years (2011 and 2012) instead of one (2012), which resulted in a larger uncertainty in the results of the forecast for 2013 and 2014. The proportion of 2013 landings that depends on recruitment assumptions (year classes 2011–2013) is 23%.

The stock is assessed using a length-based model, so length sampling is key information for this stock. Due to the wide size range of the species the length sampling should be increased to ensure adequate data for the assessment.

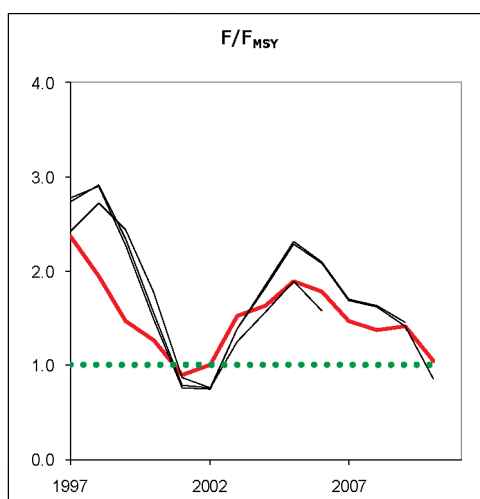


Figure 7.4.4.2 White anglerfish (*Lophius piscatorius*) in Divisions VIIIc and IXa. Historical assessment results. This stock was benchmarked in 2012.

Scientific basis

| | |
|-----------------------------|---|
| Assessment type | Length-based model (SS3). |
| Input data | Landings, length distribution, two commercial lpue series (SP-CORUTR8c and SP-CEDGNS8c) and a survey series (SpGFS-WIBTS-Q4). |
| Discards and bycatch | Not included in the assessment and considered to be low. |
| Indicators | None. |
| Other information | This stock was benchmarked in 2012 (WKFLAT). This stock is caught together with <i>L. budegassa</i> (Section 7.4.5) and the two species have a common TAC. The fisheries advice therefore combines both stocks. |
| Working group report | WGHMM |

ECOREGION Bay of Biscay and Atlantic Iberian waters
STOCK White anglerfish (*Lophius piscatorius*) in Divisions VIIIc and IXa

Reference points

| | Type | Value | Technical basis |
|------------------------|-------------------|--------------|--------------------------|
| MSY Approach | MSY $B_{trigger}$ | Not defined. | |
| | F_{MSY} | 0.19 | $F_{0.1}$ (ICES, 2012b). |
| Precautionary Approach | B_{lim} | Not defined. | |
| | B_{pa} | Not defined. | |
| | F_{lim} | Not defined. | |
| | F_{pa} | Not defined. | |

(unchanged since 2012)

Yield and spawning biomass per Recruit F -reference points (2012):

| | Fish Mort Length 30–130 cm | Yield/R | SSB/R |
|----------------------------------|----------------------------|---------|-------|
| Average last 3 years (2008–2010) | 0.24 | 2.11 | 9.39 |
| $F_{max}^{[*]}$ | - | - | - |
| $F_{0.1}$ | 0.19 | 2.02 | 13.24 |
| $F_{40\%SPR}$ | 0.12 | 1.68 | 22.70 |
| $F_{35\%SPR}$ | 0.13 | 1.79 | 20.01 |
| $F_{30\%SPR}$ | 0.15 | 1.90 | 17.08 |

[*] F_{max} not well defined.**Outlook for 2013**

Basis: $F(2012) = F(2011) = \text{mean } F(2008-2010) = 0.24$; $SSB(2012) = 7.3$; $SSB(2013) = 7.2$; Landings (2011) = 1.6; Landings (2012) = 1.5; $R(2011) = \text{prediction from 2011 survey index} = 0.89$ million; $R(2012) = GM(1980-2011) = 1.17$ million.

| Rationale | <i>L. pisc.</i> | Combined species | Basis | <i>L. piscatorius</i> | | | | |
|----------------|-----------------|------------------|---|-----------------------|------------|----------------------------|---------------------------|--------------------------------|
| | Landings (2013) | Landings (2013) | | F (2013) | SSB (2014) | % SSB change ¹⁾ | %TAC change ²⁾ | %Landings change ³⁾ |
| MSY framework | 1.32 | 2.05 | F_{MSY} [$F_{2012} * 0.79$] | 0.19 | 7747 | +7% | -38% | -16% |
| MSY transition | 1.35 | 2.09 | $0.4 * F_{2010} + 0.6 * F_{MSY}$ [$F_{2012} * 0.81$] | 0.194 | 7719 | +6% | -37% | -15% |
| Zero catch | 0 | 0 | $F=0$ | 0 | 9082 | +20% | -100% | -100% |
| Other options | 1.84 | 2.80 | -15% TAC [$F_{2012} * 1.15$] | 0.28 | 7218 | 0% | -15% | +15% |
| | 2.15 | 3.30 | Equal TAC [$F_{2012} * 1.38$] | 0.33 | 6903 | -5% | 0% | +35% |
| | 2.45 | 3.80 | +15% TAC [$F_{2012} * 1.62$] | 0.39 | 6593 | -10% | +15% | +45% |
| | 1.63 | 2.54 | $F_{2012} * 1$ | 0.24 | 7433 | +3% | -23% | +4% |

Weights in thousand tonnes.

1) SSB 2014 relative to SSB 2013.

2) Landings of combined anglerfish species in 2013 relative to TAC 2012 (3300 t).

3) Landings 2013 relative to landings 2012 (both species combined).

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 multiplicative factor is applied to current fishing mortality (F_{2012}) for both species. This year the *L. piscatorius* multiplier is used.

MSY approach

No MSY B_{trigger} has been defined for this stock. The status of the stock in relation to any potential biomass reference point is unknown.

Following the ICES MSY framework implies fishing mortality to be reduced to 0.19, resulting in landings of no more than 1320 t in 2013. This is expected to lead to a 7% SSB increase in 2014.

Following the transition scheme towards the ICES MSY framework implies fishing mortality to be reduced to 0.19, based on $(F_{2010} * 0.4) + (F_{\text{MSY}} * 0.6)$, resulting in landings of no more than 1350 t in 2013. This is expected to lead to a 6% increase in SSB in 2014.

As the two anglerfish species are not separated in the landings, the advice of the two stocks is linked. The F-multiplier applied to both anglerfish species is based on *L. piscatorius*, the stock exploited with an F higher than F_{MSY} .

Additional considerations

The two anglerfish species are managed under a common TAC. They are usually caught and recorded together in the landings statistics. It is impossible to manage adequately each species separately under a common TAC. This problem is highlighted by the different status of the two stocks. *L. piscatorius* constitutes around 70% of the total anglerfish landings.

As anglerfish are taken in mixed trawl fisheries, this stock is also affected by the southern hake and *Nephrops* recovery plan ([Council Regulation \(EC\) No. 2166/2005](#)) effort limitation.

Data and methods

A new assessment model was used this year as basis for the advice, using length-based data which better reflect the dynamics of the stock and include fishery-independent data. Evaluation of the stock status is based on the assessment accepted in the last benchmark (March 2012), which does not include data for 2011.

Comparison with previous assessment and advice

In previous years, a surplus-production model was used to determine the stock status. In the 2012 benchmark a new model assessment (SS3) was applied, resulting in a slightly changed perception of the state of the stock in 2010 in terms of F. In terms of trends, the assessment is consistent with the assessment conducted, particularly in confirming the decrease in fishing mortality since 2005.

The basis for this year advice is the transition to the MSY approach. The advice last year was based on the MSY framework.

Sources

- ICES. 2012a. Report of the Benchmark Workshop on the Flatfish Species and Anglerfish (WKFLAT), 1–8 March 2012, Bilbao, Spain. ICES CM 2012/ACOM:46.
- ICES. 2012b. Report of the Working Group on the Assessment of Southern Shelf Stocks of Hake, Monk, and Megrim (WGHMM), 10–16 May 2012, ICES Headquarters, Copenhagen. ICES CM 2012/ACOM:11.
- Landa, J., Duarte, R., and Quincoces, I. 2008. Growth of white anglerfish (*Lophius piscatorius*) tagged in the Northeast Atlantic and a review of age studies on anglerfish. ICES Journal of Marine Science, 65: 72–80.

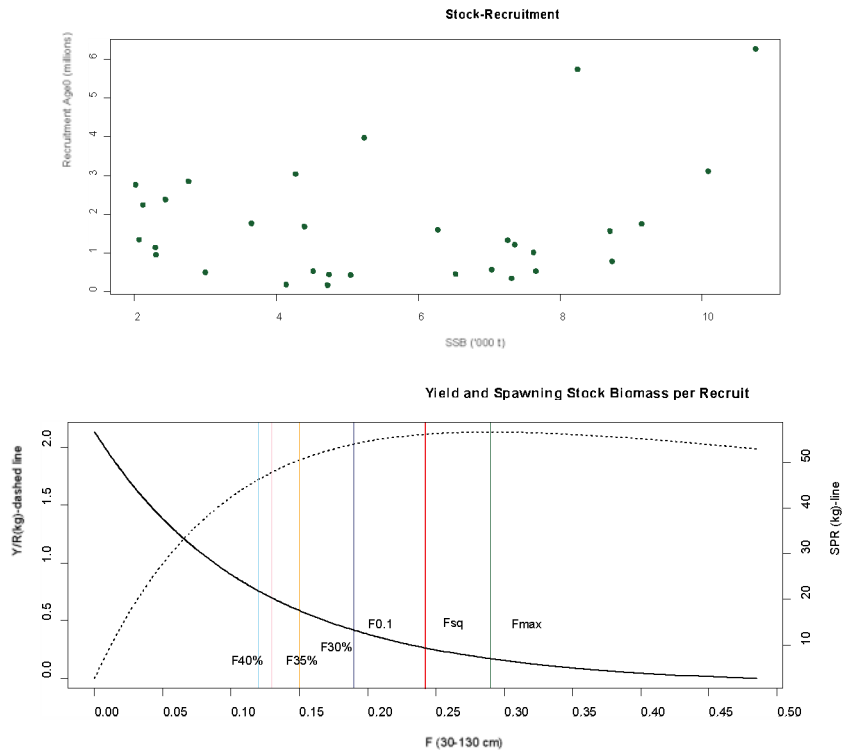


Figure 7.4.4.3 White anglerfish (*Lophius piscatorius*) in Divisions VIIIc and IXa. Stock–recruitment plot (upper panel) and yield and spawning-stock biomass per recruit (lower panel).

Table 7.4.4.1 White anglerfish (*Lophius piscatorius*) in Divisions VIIIc and IXa. ICES advice, management, and landings.

| Year | ICES Advice ¹ | Predicted landings corresp. to advice for combined species | Predicted landings corresp. to advice for <i>L. piscatorius</i> | Agreed TAC ^{1,2} | ICES landings for combined species | ICES landings <i>L. piscatorius</i> |
|------|---------------------------------------|--|---|---------------------------|------------------------------------|-------------------------------------|
| 1987 | Not dealt with | - | | 12.0 | 8.9 | 5.1 |
| 1988 | Not dealt with | - | | 12.0 | 10.0 | 6.3 |
| 1989 | Not dealt with | - | | 12.0 | 7.6 | 5.0 |
| 1990 | Not dealt with | - | | 12.0 | 6.1 | 3.8 |
| 1991 | No advice | - | | 12.0 | 5.8 | 3.6 |
| 1992 | No advice | - | | 12.0 | 4.2 | 3.4 |
| 1993 | No long-term gain in increasing F | - | | 13.0 | 4.5 | 2.3 |
| 1994 | No advice | - | | 13.0 | 3.6 | 2.0 |
| 1995 | If required a precautionary TAC | - | | 13.0 | 3.6 | 1.8 |
| 1996 | If required a precautionary TAC | - | | 13.0 | 4.6 | 3.0 |
| 1997 | If required a precautionary TAC | - | | 13.0 | 5.5 | 3.7 |
| 1998 | Restrict catch to < 80% recent levels | | | 10.0 | 5.1 | 3.0 |
| 1999 | Reduce F to F _{pa} | 4.2 | | 8.5 | 3.8 | 1.9 |
| 2000 | 60% reduction in F | 1.6 | | 6.8 | 2.6 | 1.3 |
| 2001 | 50% reduction in F | 2.8 | | 6.0 | 1.8 | 0.8 |
| 2002 | 30% reduction in F | 3.5 | | 4.8 | 1.8 | 1.0 |
| 2003 | 5% reduction in F | 3.2 | | 4.0 | 3.2 | 2.3 |
| 2004 | F = 0 or recovery plan ³ | 0 ³ | | 2.3 | 4.1 | 3.1 |
| 2005 | F = 0 or recovery plan | 0 | | 2.0 | 4.5 | 3.6 |
| 2006 | F = 0 or recovery plan | 0 | | 2.0 | 4.1 | 3.0 |
| 2007 | F = 0 or recovery plan | 0 | | 2.0 | 3.6 | 2.3 |
| 2008 | F = 0 or recovery plan | 0 | | 2.0 | 3.3 | 2.3 |
| 2009 | Same advice as last year | 0 | | 1.8 | 3.0 | 2.2 |
| 2010 | F = 0 or management plan | 0 | | 1.5 | 2.4 | 1.6 |
| 2011 | MSY framework | 1.5 | 1.0 | 1.6 | 0.3 ⁴ | 0.1 ⁴ |
| 2012 | MSY framework | 3.3 | 2.2 | 3.3 | | |
| 2013 | MSY transition | 2.09 | 1.35 | | | |

Weights in thousand tonnes.

¹⁾ For *Lophius piscatorius* and *L. budegassa* combined.

²⁾ For Division VIIIc and Subareas IX and X; EU waters of CECAF 34.1.1.

³⁾ Single-stock boundary and the exploitation of this stock should be conducted in the context of mixed fisheries protecting stocks outside safe biological limits.

⁴⁾ Without Spanish landings.

Table 7.4.4.2 White anglerfish (*Lophius piscatorius*) in Divisions VIIIc and IXa. Landings (in tonnes) by country and main fishing fleets, as estimated by the working group.

| Year | Div. VIIIc | | | Div. IXa | | | | Div. VIIIc+IXa TOTAL |
|------|------------|---------|-------|----------|-----------|-----|-------|-------------------------|
| | SPAIN | | TOTAL | SPAIN | PORTUGAL | | TOTAL | |
| | Trawl | Gillnet | | Trawl | Artisanal | | | |
| 1978 | n/a | n/a | n/a | 258 | | 115 | 373 | |
| 1979 | n/a | n/a | n/a | 319 | | 225 | 544 | |
| 1980 | 2806 | 1270 | 4076 | 401 | | 339 | 740 | 4816 |
| 1981 | 2750 | 1931 | 4681 | 535 | | 352 | 887 | 5568 |
| 1982 | 1915 | 2682 | 4597 | 875 | | 310 | 1185 | 5782 |
| 1983 | 3205 | 1723 | 4928 | 726 | | 460 | 1186 | 6114 |
| 1984 | 3086 | 1690 | 4776 | 578 | 186 | 492 | 1256 | 6032 |
| 1985 | 2313 | 2372 | 4685 | 540 | 212 | 702 | 1454 | 6139 |
| 1986 | 2499 | 2624 | 5123 | 670 | 167 | 910 | 1747 | 6870 |
| 1987 | 2080 | 1683 | 3763 | 320 | 194 | 864 | 1378 | 5141 |
| 1988 | 2525 | 2253 | 4778 | 570 | 157 | 817 | 1543 | 6321 |
| 1989 | 1643 | 2147 | 3790 | 347 | 259 | 600 | 1206 | 4996 |
| 1990 | 1439 | 985 | 2424 | 435 | 326 | 606 | 1366 | 3790 |
| 1991 | 1490 | 778 | 2268 | 319 | 224 | 829 | 1372 | 3640 |
| 1992 | 1217 | 1011 | 2228 | 301 | 76 | 778 | 1154 | 3382 |
| 1993 | 844 | 666 | 1510 | 72 | 111 | 636 | 819 | 2329 |
| 1994 | 690 | 827 | 1517 | 154 | 70 | 266 | 490 | 2007 |
| 1995 | 830 | 572 | 1403 | 199 | 66 | 166 | 431 | 1834 |
| 1996 | 1306 | 745 | 2050 | 407 | 133 | 365 | 905 | 2955 |
| 1997 | 1449 | 1191 | 2640 | 315 | 110 | 650 | 1075 | 3714 |
| 1998 | 912 | 1359 | 2271 | 184 | 28 | 497 | 710 | 2981 |
| 1999 | 551 | 1013 | 1564 | 79 | 9 | 285 | 374 | 1938 |
| 2000 | 269 | 538 | 808 | 107 | 4 | 340 | 451 | 1259 |
| 2001 | 231 | 294 | 525 | 57 | 16 | 190 | 263 | 788 |
| 2002 | 385 | 341 | 726 | 110 | 29 | 168 | 307 | 1032 |
| 2003 | 911 | 722 | 1633 | 312 | 29 | 305 | 645 | 2278 |
| 2004 | 1260 | 1269 | 2528 | 264 | 27 | 335 | 626 | 3154 |
| 2005 | 1378 | 1622 | 3000 | 371 | 29 | 244 | 643 | 3644 |
| 2006 | 1166 | 1247 | 2413 | 260 | 29 | 260 | 549 | 2963 |
| 2007 | 955 | 1009 | 1964 | 181 | 13 | 192 | 386 | 2350 |
| 2008 | 894 | 1168 | 2062 | 138 | 11 | 127 | 275 | 2337 |
| 2009 | 850 | 1058 | 1909 | 213 | 10 | 148 | 371 | 2280 |
| 2010 | 313 | 955 | 1268 | 158 | 2 | 119 | 279 | 1547 |
| 2011 | n/a | n/a | n/a | n/a | 46 | 80 | n/a | n/a |

n/a: not available

Table 7.4.4.3 White anglerfish (*Lophius piscatorius*) in Divisions VIIIc and IXa. Summary of the assessment.

| Year | Recruit Age0 (thousands) | Total Biomass (t) | Total SSB (t) | Landings (t) | Yield/SSB | F (30-130 cm) |
|------|-----------------------------|----------------------|------------------|--------------|-----------|---------------|
| 1980 | 464 | 12527 | 6518 | 4817 | 0.74 | 0.34 |
| 1981 | 1755 | 14541 | 9147 | 5566 | 0.61 | 0.34 |
| 1982 | 6263 | 14290 | 10748 | 5782 | 0.54 | 0.37 |
| 1983 | 3113 | 13621 | 10085 | 6113 | 0.61 | 0.49 |
| 1984 | 789 | 13801 | 8723 | 6031 | 0.69 | 0.51 |
| 1985 | 1570 | 13313 | 8693 | 6139 | 0.71 | 0.53 |
| 1986 | 5733 | 11231 | 8241 | 6870 | 0.83 | 0.81 |
| 1987 | 3976 | 7736 | 5234 | 5139 | 0.98 | 0.92 |
| 1988 | 1774 | 7619 | 3644 | 6321 | 1.73 | 1.38 |
| 1989 | 2857 | 5946 | 2752 | 4995 | 1.82 | 1.16 |
| 1990 | 2386 | 4883 | 2429 | 3790 | 1.56 | 0.86 |
| 1991 | 968 | 4793 | 2295 | 3640 | 1.59 | 0.83 |
| 1992 | 1151 | 4559 | 2288 | 3382 | 1.48 | 0.87 |
| 1993 | 1343 | 3666 | 2060 | 2329 | 1.13 | 0.66 |
| 1994 | 2773 | 3507 | 2012 | 2007 | 1.00 | 0.57 |
| 1995 | 2249 | 4055 | 2116 | 1835 | 0.87 | 0.37 |
| 1996 | 507 | 5988 | 2996 | 2956 | 0.99 | 0.41 |
| 1997 | 192 | 7216 | 4136 | 3715 | 0.90 | 0.45 |
| 1998 | 184 | 6739 | 4715 | 2981 | 0.63 | 0.37 |
| 1999 | 456 | 5868 | 4740 | 1939 | 0.41 | 0.28 |
| 2000 | 543 | 5246 | 4515 | 1256 | 0.28 | 0.24 |
| 2001 | 3040 | 5016 | 4269 | 788 | 0.18 | 0.17 |
| 2002 | 1691 | 5755 | 4389 | 1034 | 0.24 | 0.19 |
| 2003 | 441 | 7940 | 5041 | 2279 | 0.45 | 0.29 |
| 2004 | 1606 | 9477 | 6273 | 3156 | 0.50 | 0.31 |
| 2005 | 1223 | 9857 | 7353 | 3646 | 0.50 | 0.36 |
| 2006 | 1340 | 9480 | 7253 | 2932 | 0.40 | 0.34 |
| 2007 | 582 | 9249 | 7029 | 2349 | 0.33 | 0.28 |
| 2008 | 357 | 9522 | 7306 | 2338 | 0.32 | 0.26 |
| 2009 | 536 | 9474 | 7652 | 2280 | 0.30 | 0.27 |
| 2010 | 1024 | 8940 | 7618 | 1548 | 0.20 | 0.20 |
| 2011 | 886* | | 7629 | | | |

*Prediction from the 2011 survey.

ECOREGION Bay of Biscay and Atlantic Iberian waters
STOCK Black-bellied anglerfish (*Lophius budegassa*) in Divisions VIIIc and IXa

Advice for 2013

ICES advises on the basis of the MSY transition that landings in 2013 should be no more than 740 t. Combined landings of *Lophius piscatorius* and *Lophius budegassa* should be no more than 2090 t.

Stock status

| F (Fishing Mortality) | | | |
|---|------|------|-----------------|
| | 2009 | 2010 | 2011 |
| MSY (F_{MSY}) | ✓ | ✓ | ⊗ Not available |
| Precautionary approach (F_{pa} - F_{lim}) | ⊗ | ⊗ | ⊗ Not available |
| Biomass | | | |
| | 2010 | 2011 | 2012 |
| MSY ($B_{trigger}$) | ✓ | ✓ | ⊗ Not available |
| Precautionary approach (B_{pa} - B_{lim}) | ⊗ | ⊗ | ⊗ Not available |

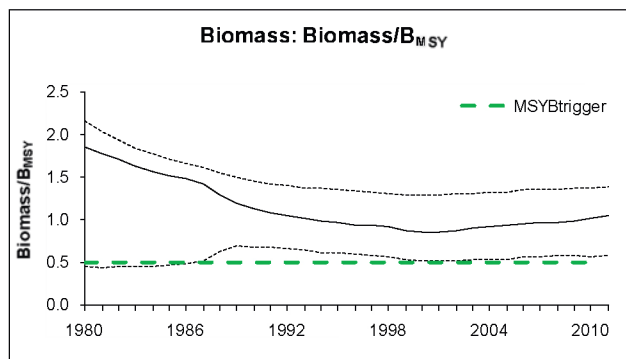
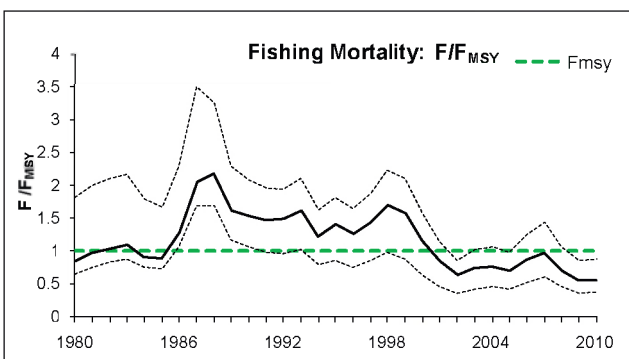
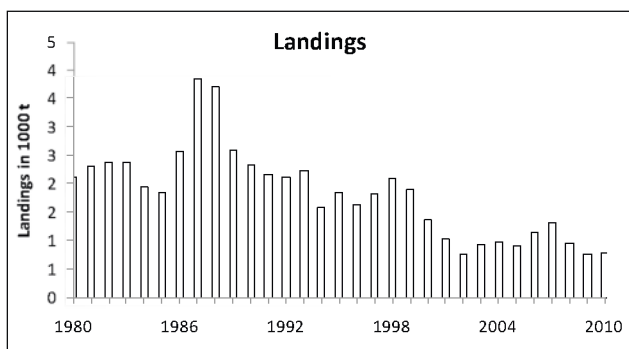
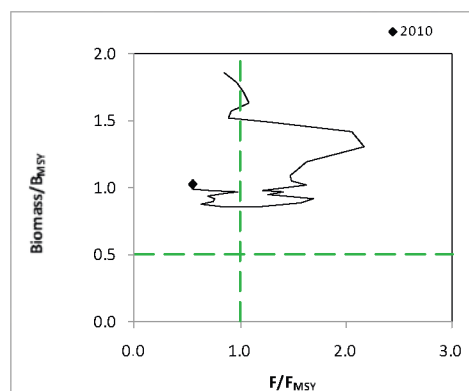


Figure 7.4.5.1 Black-bellied anglerfish (*Lophius budegassa*) in Divisions VIIIc and IXa. Summary of stock assessment: Landings (top left), F/F_{MSY} (bottom left), and B/B_{MSY} (bottom right) with 80% confidence intervals (dotted black line). Top right: SSB/B_{MSY} and F/F_{MSY} for the time series used in the assessment.

The stock status is based on an assessment using data only until 2010. Fishing mortality has decreased since 1999, remaining below F_{MSY} since 2001. Biomass has increased since 2002, and is far above $MSY B_{trigger}$.

Management plans

No specific management objectives are known to ICES.

Biology

Recent growth studies showed a faster growth than previously assumed for *L. piscatorius* (Landa *et al.*, 2008). This could also be the case for *L. budegassa*.

The fisheries

Anglerfish species, *Lophius piscatorius* and *L. budegassa*, are caught together in bottom trawl and gillnet fisheries. Anglerfish, hake, *Nephrops*, and megrim are partly caught in the same mixed fisheries. Spanish trawl discards have increased to 11% of their catch in 2010. Discards in the Portuguese trawl fisheries seem to be negligible. There is no minimum landing size for anglerfish, but a minimum selling weight of 500 g was fixed in 1996 to ensure marketing standards.

Catch distribution Total landings (2010) = 0.78 kt, with 72% bottom otter trawl, 10% Spanish gillnet, and 19% Portuguese artisanal gear types. The discarding rate in Spanish bottom trawl is 11% by weight. There were insufficient data to update this information for 2011; however, values for 2010 are still considered appropriate.

Quality considerations

It was not possible to include Spanish commercial data for 2011 in the assessment. The assessment model could not be updated with 2011 commercial data. Projections for catch options and management advice for 2013 were based on the assessment conducted in 2012 at the benchmark meeting (ICES, 2012a).

The assessment is considered to have improved with the inclusion of the Spanish “A Coruña” series, which corresponds to a fuller coverage of the fishery distribution. The assessment results are considered uncertain, as reflected by the large confidence intervals. The model is not able to reflect the full dynamics of the various tuning fleets.

Due to the wide size range of the species the length sampling should be increased to ensure adequate data for future development of improved assessment methods. In the absence of accurate ageing, a growth model is also needed. This will require tagging experiments.

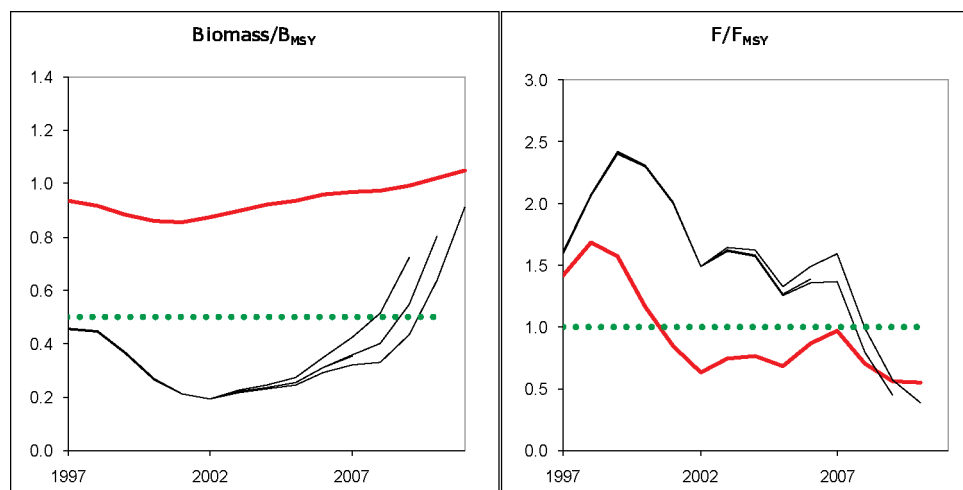


Figure 7.4.5.2 Black-bellied anglerfish (*Lophius budegassa*) in Divisions VIIIc and IXa. Historical assessment results. This stock was benchmarked in 2012.

Scientific basis

| | |
|-----------------------------|--|
| Assessment type | Surplus production model (ASPIC). |
| Input data | Landings and three commercial lpue series (SP-CORUTR&c, PT-TRF9a and PT-TRC9a). |
| Discards and bycatch | Not included in the assessment. |
| Indicators | None. |
| Other information | This stock was benchmarked in 2012 (WKFLAT). This stock is caught together with <i>L. piscatorius</i> (Section 7.4.4) and the fisheries advice therefore combines both stocks. |
| Working group report | WGHMM |

ECOREGION Bay of Biscay and Atlantic Iberian waters
STOCK Black-bellied anglerfish (*Lophius budegassa*) in Divisions VIIIc and IXa

Reference points

| | <i>Type</i> | <i>Value</i> | <i>Technical basis</i> |
|------------------------|-------------------|----------------|--|
| MSY | MSY $B_{trigger}$ | 50% B_{MSY} | B_{MSY} is implicit estimated from surplus production model (ICES, 2012). |
| Approach | F_{MSY} | Relative value | Implicit, estimated from surplus production model (ICES, 2012). Fishing mortality values expressed relative to F_{MSY} . |
| Precautionary Approach | B_{lim} | Not defined. | |
| | B_{pa} | Not defined. | |
| | F_{lim} | Not defined. | |
| | F_{pa} | Not defined. | |

(unchanged since: 2012)

Outlook for 2013

Basis: $F_{sq}/F_{MSY} = F(2012)/F_{MSY} = F(2011)/F_{MSY} = \text{mean } F(2008-2010)/F_{MSY} = 0.6$; $B(2013)/B_{MSY} = 1.09$; Landings (2012) = 0.90.

| Rationale | <i>L. bud.</i> | Combined species | Basis | <i>L. budegassa</i> | | | Combined species | |
|----------------|-----------------|------------------|-------------------------------|---------------------|---------------------|-------------------------|---------------------------|--------------------------------|
| | Landings (2013) | Landings (2013) | | F(2013) / F_{MSY} | B(2014) / B_{MSY} | %B change ¹⁾ | %TAC change ²⁾ | %Landings change ³⁾ |
| MSY framework | 0.73 | 2.05 | $F_{sq} * 0.79^{4)}$ | 0.48 | 1.12 | 3% | -38% | -16% |
| MSY transition | 0.74 | 2.09 | $F_{sq} * 0.81^{4)}$ | 0.49 | 1.12 | 3% | -37% | -15% |
| Zero catch | 0.0 | 0.0 | F=0 | 0.00 | 1.15 | 6% | -100% | -100% |
| Other options | 1.0 | 2.80 | -15% TAC ($F_{sq} * 1.15$) | 0.64 | 1.11 | 2% | -15% | +15% |
| | 1.14 | 3.30 | Equal TAC ($F_{sq} * 1.38$) | 0.76 | 1.10 | 1% | 0% | 0% |
| | 1.34 | 3.80 | +15% TAC ($F_{sq} * 1.62$) | 0.89 | 1.09 | 0% | +15% | +55% |
| | 0.90 | 2.54 | $F_{sq} * 1$ | 0.60 | 1.11 | 2% | -23% | -4% |
| | 1.49 | - | $F_{sq} * 1.81^{5)}$ | 1.00 | 1.08 | -1% | - | - |

Weights in thousand tonnes.

¹⁾ Biomass 2014 relative to biomass 2013.

²⁾ Landings of combined anglerfish species in 2013 relative to TAC 2012 (3300 t).

³⁾ Landings 2013 relative to landings 2012 (both species combined).

⁴⁾ 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 multiplicative factor is applied to the current fishing mortality (F_{sq}) for both species. This year the *L. piscatorius* multiplier is used.

⁵⁾ Single-species F_{MSY} value.

MSY approach

The stock is below F_{MSY} and above MSY $B_{trigger}$. Following the ICES MSY framework implies a fishing mortality equal to F_{MSY} . However, the *L. piscatorius* F-multiplier should be applied, since *L. piscatorius* is the stock exploited with an F higher than F_{MSY} . This will result in maximum landings in 2013 of 730 t and is expected to lead to a 3% biomass increase.

Applying the F-multiplier of the transition to the ICES MSY approach of *L. piscatorius* will correspond to landings of 740 tonnes in 2013, and is expected to lead to a 3% biomass increase.

Additional considerations

As anglerfish are taken in mixed trawl fisheries, this stock is also affected by the southern hake and *Nephrops* recovery plan ([Council Regulation \(EC\) No. 2166/2005](#)) effort limitation.

The two anglerfish species are managed under a common TAC. They are usually caught and recorded together in the landing statistics. It is impossible to manage adequately each species separately under a common TAC.

Data and methods

The lack of a validated age-reading criterion precludes the use of assessment models based on age data.

It was not possible to include Spanish commercial data for 2011 in the assessment. Therefore, the stock status is based on the assessment done in the benchmark in March 2012 with data up to 2010.

During the benchmark (WKFLAT; ICES, 2012a) the same model (SS3) applied to the white anglerfish was tested for the black anglerfish with some promising results but needs to be tested more carefully before its application. SS3 is a length-based model, so length sampling is key information for this stock. Due to the wide size range of the species the length sampling should be increased to ensure adequate data for future development of improved assessment methods.

Comparison with previous assessment and advice

As in previous years, a stock-production model was used to determine the stocks status. The main difference is the inclusion of the Spanish “A Coruña” cpue series as input data. This series represents a greater proportion of the catches and covers most of the assessment period. The revised assessment considerably changed the perception of stock size and historical development. Historically F/F_{MSY} has changed.

The basis for this year’s advice is the transition to the MSY approach. Last year the advice was based on the MSY approach.

Sources

- Landa, J., Duarte, R., and Quincoces, I. 2008. Growth of white anglerfish (*Lophius piscatorius*) tagged in the Northeast Atlantic and a review of age studies on anglerfish. *ICES Journal of Marine Science*, 65: 72–80.
- ICES. 2012a. Report of the Benchmark Workshop on the Flatfish Species and Anglerfish (WKFLAT), 1–8 March 2012, Bilbao, Spain. ICES CM 2012/ACOM: 46.
- ICES. 2012b. Report of the Working Group on the Assessment of Southern Shelf Stocks of Hake, Monk, and Megrim (WGHMM), 10–16 May 2012, ICES Headquarters, Copenhagen. ICES CM 2012/ACOM:11.

Table 7.4.5.1 Black-bellied anglerfish (*Lophius budegassa*) in Divisions VIIIc and IXa. ICES advice, management, and landings.

| Year | ICES Advice ¹ | Predicted landings corresp. to advice for combined species | Predicted landings corresp. to advice for <i>L. budegassa</i> | Agreed TAC ^{1,2} | ICES landings for combined species | ICES landings <i>L. budegassa</i> |
|------|---------------------------------------|--|---|---------------------------|------------------------------------|-----------------------------------|
| 1987 | Not dealt with | - | | 12.0 | 8.9 | 3.8 |
| 1988 | Not dealt with | - | | 12.0 | 10.0 | 3.7 |
| 1989 | Not dealt with | - | | 12.0 | 7.6 | 2.6 |
| 1990 | Not dealt with | - | | 12.0 | 6.1 | 2.3 |
| 1991 | No advice | - | | 12.0 | 5.8 | 2.2 |
| 1992 | No advice | - | | 12.0 | 4.2 | 2.1 |
| 1993 | No long-term gain in increasing F | - | | 13.0 | 4.5 | 2.2 |
| 1994 | No advice | - | | 13.0 | 3.6 | 1.6 |
| 1995 | If required a precautionary TAC | - | | 13.0 | 3.6 | 1.8 |
| 1996 | If required a precautionary TAC | - | | 13.0 | 4.6 | 1.6 |
| 1997 | If required a precautionary TAC | - | | 13.0 | 5.5 | 1.8 |
| 1998 | Restrict catch to < 80% recent levels | | | 10.0 | 5.1 | 2.1 |
| 1999 | Reduce F to F _{pa} | 4.2 | | 8.5 | 3.8 | 1.9 |
| 2000 | 60% reduction in F | 1.6 | | 6.8 | 2.6 | 1.4 |
| 2001 | 50% reduction in F | 2.8 | | 6.0 | 1.8 | 1.0 |
| 2002 | 30% reduction in F | 3.5 | | 4.8 | 1.8 | 0.8 |
| 2003 | 5% reduction in F | 3.2 | | 4.0 | 3.2 | 0.9 |
| 2004 | F = 0 or recovery plan ³ | 0 ³ | | 2.3 | 4.1 | 1.0 |
| 2005 | F = 0 or recovery plan | 0 | | 2.0 | 4.5 | 0.9 |
| 2006 | F = 0 or recovery plan | 0 | | 2.0 | 4.1 | 1.1 |
| 2007 | F = 0 or recovery plan | 0 | | 2.0 | 3.6 | 1.3 |
| 2008 | F = 0 or recovery plan | 0 | | 2.0 | 3.3 | 1.0 |
| 2009 | Same advice as last year | 0 | | 1.8 | 3.0 | 0.8 |
| 2010 | F = 0 or management plan | 0 | | 1.5 | 2.4 | 0.8 |
| 2011 | MSY framework | 1.5 | 0.48 | 1.6 | 0.3 ⁴ | 0.2 ⁴ |
| 2012 | MSY framework | 3.3 | 1.1 | 3.3 | | |
| 2013 | MSY transition | 2.09 | 0.74 | | | |

Weights in thousand tonnes.

¹⁾ For *Lophius piscatorius* and *L. budegassa* combined.

²⁾ For Division VIIIc and Subareas IX and X; EU waters of CECAF 34.1.1.

³⁾ Single-stock boundary and the exploitation of this stock should be conducted in the context of mixed fisheries protecting stocks outside safe biological limits.

⁴⁾ Without Spanish landings.

Table 7.4.5.2

Black-bellied anglerfish (*Lophius budegassa*) in Divisions VIIIc and IXa. Landings (in tonnes) by country and main fishing fleets, as estimated by the working group.

| Year | Div. VIIIc | | | Div. IXa | | | Div. VIIIc+IXa |
|------|------------|---------|-------|----------|-----------|-------|----------------|
| | SPAIN | | | PORTUGAL | | | |
| | Trawl | Gillnet | TOTAL | Trawl | Artisanal | TOTAL | |
| 1978 | n/a | n/a | n/a | 248 | n/a | 107 | 355 |
| 1979 | n/a | n/a | n/a | 306 | n/a | 210 | 516 |
| 1980 | 1203 | 207 | 1409 | 385 | n/a | 315 | 700 |
| 1981 | 1159 | 309 | 1468 | 505 | n/a | 327 | 832 |
| 1982 | 827 | 413 | 1240 | 841 | n/a | 288 | 1129 |
| 1983 | 1064 | 188 | 1252 | 699 | n/a | 428 | 1127 |
| 1984 | 514 | 176 | 690 | 558 | 223 | 458 | 1239 |
| 1985 | 366 | 123 | 489 | 437 | 254 | 653 | 1344 |
| 1986 | 553 | 585 | 1138 | 379 | 200 | 847 | 1425 |
| 1987 | 1094 | 888 | 1982 | 813 | 232 | 804 | 1849 |
| 1988 | 1058 | 1010 | 2068 | 684 | 188 | 760 | 1632 |
| 1989 | 648 | 351 | 999 | 764 | 272 | 542 | 1579 |
| 1990 | 491 | 142 | 633 | 689 | 387 | 625 | 1701 |
| 1991 | 503 | 76 | 579 | 559 | 309 | 716 | 1584 |
| 1992 | 451 | 57 | 508 | 485 | 287 | 832 | 1603 |
| 1993 | 516 | 292 | 809 | 627 | 196 | 596 | 1418 |
| 1994 | 542 | 201 | 743 | 475 | 79 | 283 | 837 |
| 1995 | 924 | 104 | 1029 | 615 | 68 | 131 | 814 |
| 1996 | 840 | 105 | 945 | 342 | 133 | 210 | 684 |
| 1997 | 800 | 198 | 998 | 524 | 81 | 210 | 815 |
| 1998 | 748 | 148 | 896 | 681 | 181 | 332 | 1194 |
| 1999 | 565 | 127 | 692 | 671 | 110 | 406 | 1187 |
| 2000 | 441 | 73 | 514 | 377 | 142 | 336 | 855 |
| 2001 | 383 | 69 | 452 | 190 | 101 | 269 | 560 |
| 2002 | 173 | 74 | 248 | 234 | 75 | 213 | 522 |
| 2003 | 279 | 49 | 329 | 305 | 68 | 224 | 597 |
| 2004 | 250 | 120 | 370 | 285 | 50 | 267 | 603 |
| 2005 | 273 | 97 | 370 | 283 | 31 | 214 | 527 |
| 2006 | 323 | 124 | 447 | 541 | 39 | 121 | 701 |
| 2007 | 372 | 68 | 440 | 684 | 66 | 111 | 861 |
| 2008 | 386 | 70 | 456 | 336 | 40 | 119 | 495 |
| 2009 | 301 | 148 | 449 | 172 | 34 | 114 | 320 |
| 2010 | 352 | 81 | 432 | 197 | 70 | 84 | 351 |
| 2011 | n/a | n/a | n/a | n/a | 75 | 119 | n/a |

n/a: not available

Table 7.4.5.3

Black-bellied anglerfish (*Lophius budegassa*) in Divisions VIIIc and IXa. Summary of the assessment.

| Year | F/F_{msy} | Landings tonnes | B/B_{msy} |
|-------------|--------------------------|----------------------------|--------------------------|
| 1980 | 0.84 | 2110 | 1.86 |
| 1981 | 0.96 | 2300 | 1.78 |
| 1982 | 1.03 | 2369 | 1.71 |
| 1983 | 1.08 | 2379 | 1.63 |
| 1984 | 0.91 | 1929 | 1.57 |
| 1985 | 0.89 | 1833 | 1.52 |
| 1986 | 1.28 | 2563 | 1.49 |
| 1987 | 2.05 | 3832 | 1.42 |
| 1988 | 2.17 | 3700 | 1.30 |
| 1989 | 1.62 | 2578 | 1.19 |
| 1990 | 1.53 | 2334 | 1.13 |
| 1991 | 1.47 | 2162 | 1.09 |
| 1992 | 1.48 | 2111 | 1.05 |
| 1993 | 1.62 | 2227 | 1.02 |
| 1994 | 1.21 | 1580 | 0.98 |
| 1995 | 1.40 | 1843 | 0.97 |
| 1996 | 1.26 | 1629 | 0.95 |
| 1997 | 1.42 | 1813 | 0.94 |
| 1998 | 1.69 | 2089 | 0.92 |
| 1999 | 1.57 | 1879 | 0.88 |
| 2000 | 1.16 | 1369 | 0.86 |
| 2001 | 0.85 | 1013 | 0.86 |
| 2002 | 0.63 | 770 | 0.87 |
| 2003 | 0.74 | 926 | 0.90 |
| 2004 | 0.76 | 973 | 0.92 |
| 2005 | 0.69 | 897 | 0.94 |
| 2006 | 0.87 | 1148 | 0.96 |
| 2007 | 0.97 | 1301 | 0.97 |
| 2008 | 0.71 | 951 | 0.97 |
| 2009 | 0.56 | 769 | 0.99 |
| 2010 | 0.55 | 784 | 1.02 |
| 2011 | - | - | 1.05 |

ECOREGION Bay of Biscay and Atlantic Iberian waters
STOCK Horse mackerel (*Trachurus trachurus*) in Division IXa (Southern stock)

Advice for 2013

ICES advises on the basis of precautionary considerations that landings in 2013 should be no more than 26 000 tonnes.

Stock status

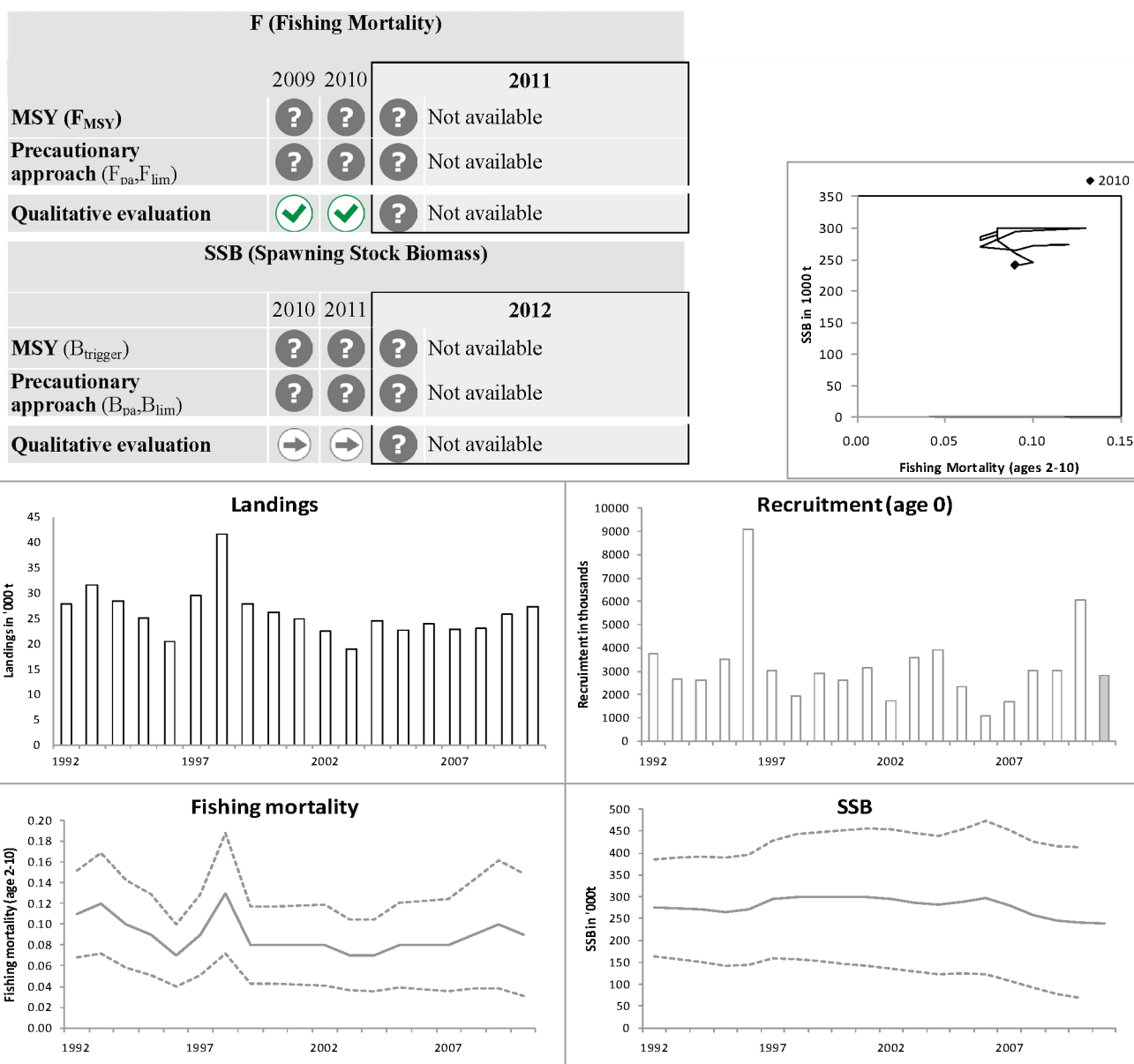


Figure 7.4.6.1 Horse mackerel in Division IXa. Summary of stock assessment 2011 (weights in '000 tonnes) with 95% confidence intervals included for F and SSB. Top right: SSB and F over the time-series used in the assessment. Estimates are shaded.

No assessment has been carried out in 2012. The stock status is based on last year's assessment. Catches and fishing mortality have been relatively stable since 1999. Biomass has been stable during the assessment period. Recruitment is variable with occasional large peaks.

Management plans

No specific management objectives are known to ICES.

Biology

The distribution pattern of southern horse mackerel is linked to the size of the fish. Most of the older fish are found in the waters off Galicia and northern Portugal, while the distribution of juveniles extends further south.

Environmental influence on the stock

This stock shows a relatively stable recruitment with occasional large peaks which may be driven by environmental factors.

The fisheries

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.

Other species of horse mackerel are caught together with *T. trachurus* in Division IXa, in particular *T. picturatus* of which 300–800 t have been caught annually in the past. The advice for Southern horse mackerel applies to the Southern stock of *Trachurus trachurus* only.

| | |
|---------------------------|--|
| Catch distribution | Catches reported in 2011 were not considered reliable for assessment. Total catch (2010) = 27 kt (19% PT trawl; 8% PT purse-seine; 15% PT-artisanal; 40% SP-trawl; 17% SP-purse-seine; 1% SP-artisanal). |
|---------------------------|--|

Quality considerations

It was not possible to include Spanish commercial data for 2011 in the assessment. Therefore, the assessment model could not be updated this year. Projections for catch options and management advice for 2013 were based on the assessment conducted in 2011. This implies that assumptions on mean recruitment were made for 2010-2013 and on fishing mortality for two intermediate years (2011 and 2012) instead of one (2012). This has resulted in a larger uncertainty in the results of the forecast for 2013 and 2014. The proportion of 2013 landings that depends on average recruitment assumptions (year classes 2010–2013) is 45%. Confidence intervals for the assessment estimates are very wide, indicating a high uncertainty in F, SSB, and recruitment in the most recent years.

Scientific basis

| | |
|-----------------------------|--|
| Assessment type | Analytical assessment (AMISH model), with data up to 2010 (not updated this year). |
| Input data | One survey index (combined PT and SP-IBTS-Q4). No commercial indices. |
| Discards and bycatch | Not included in the assessment, and are believed to be low. |
| Indicators | None. |
| Other information | This stock was benchmarked in 2011 (WKBENCH). |
| Working group report | WGHANSA |

ECOREGION Bay of Biscay and Atlantic Iberian waters
STOCK Horse mackerel (*Trachurus trachurus*) in Division IXa (Southern stock)

Reference points

No MSY and precautionary reference points have been defined for this stock. Historical fishing mortalities have on average (0.09) been below any candidate reference points (e.g. $F_{0.1}=0.14$)

Yield and spawning biomass per Recruit F-reference points 2011:

| | Fish Mort Ages 2–10 | Yield/R | SSB/R |
|----------------------|------------------------|---------|-------|
| Average last 3 years | 0.09 | 0.01 | 0.08 |
| $F_{0.1}$ | 0.14 | 0.01 | 0.06 |
| $F_{35\%SPR}$ | 0.11 | 0.01 | 0.07 |
| F_{med} | 0.16 | 0.01 | 0.05 |

Outlook for 2013

Basis: $F(2012) = F(2011) = F(2010) = 0.09$; $SSB(2012) = 233$; Landings (2011) = 26.1; $SSB(2013) = 242$; Landings (2012) = 26.4; $R(2010-13) = \text{Geom. Mean}(1992-2009) = 2806$ millions.

| Rationale | Landings (2013) | Basis | F (2013) | SSB (2014) | %SSB change ¹⁾ | % TAC change ²⁾ |
|------------------------------|--------------------|--------------------------------|-------------|---------------|------------------------------|-------------------------------|
| Precautionary considerations | 26 | F_{2012} | 0.09 | 240 | 2 % | -17 % |
| Zero catch | 0.0 | 0 | 0 | 270 | 13 % | -100 % |
| Other options | 5.3 | $F_{2012} * 0.2$ | 0.02 | 260 | 10 % | -83 % |
| | 11 | $F_{2012} * 0.4$ | 0.04 | 260 | 8 % | -66 % |
| | 16 | $F_{2012} * 0.6$ | 0.05 | 250 | 6 % | -49 % |
| | 21 | $F_{2012} * 0.8$ | 0.07 | 250 | 4 % | -33 % |
| | 30 | $F_{2012} * 1.2$ (TAC 2012) | 0.11 | 240 | 0 % | -2 % |
| | 35 | $F_{2012} * 1.4$ | 0.12 | 230 | -2 % | 14 % |
| | 40 | $F_{2012} * 1.6$ | 0.14 | 230 | -4 % | 29 % |
| | 44 | $F_{2012} * 1.8$ | 0.16 | 230 | -6 % | 43 % |
| 49 | $F_{2012} * 2$ | 0.18 | 220 | -7 % | 58 % | |

Weights in thousand tonnes.

¹⁾ SSB 2014 relative to SSB 2011 (last assessment).

²⁾ Landings 2013 relative to TAC 2012.

Precautionary considerations

In absence of precautionary reference points the stock status cannot be evaluated in reference to those. The current fishing mortality does not seem to be detrimental to the stock.

The wide confidence intervals indicate high uncertainty in the assessment estimates and particularly in the current trends of the stock. Therefore, based on precautionary considerations, ICES recommends that fishing mortality should not be allowed to increase from the present level. This would imply landings of less than 26 000 t.

Additional considerations

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.

Comparison with previous assessment and advice

No assessment has been carried out in 2012. The advice this year is based on last year's assessment (ICES, 2011). Short-term forecasts with two intermediate years, based on F status-quo (F_{2010}) were performed, based on the assessment performed in 2011. Given that recent catches have been below the TAC, and catches in 2011 are unreliable, this

option seemed more adequate than catch constrained forecasts. The advice is based on precautionary considerations, as before.

Assessment and management area

Since 2010 the management area and advice area have been identical.

Source

ICES. 2011. Report of the Working Group on Anchovy and Sardine (WGANSA), 24–28 June 2011, Vigo, Spain. ICES CM 2011/ACOM:16.

ICES. 2012. Report of the Working Group on Anchovy, Sardine and Horse Mackerel Assessments (WGHANSA), 22–28 June 2012, Horta, Azores, Portugal. ICES CM 2012/ACOM:16

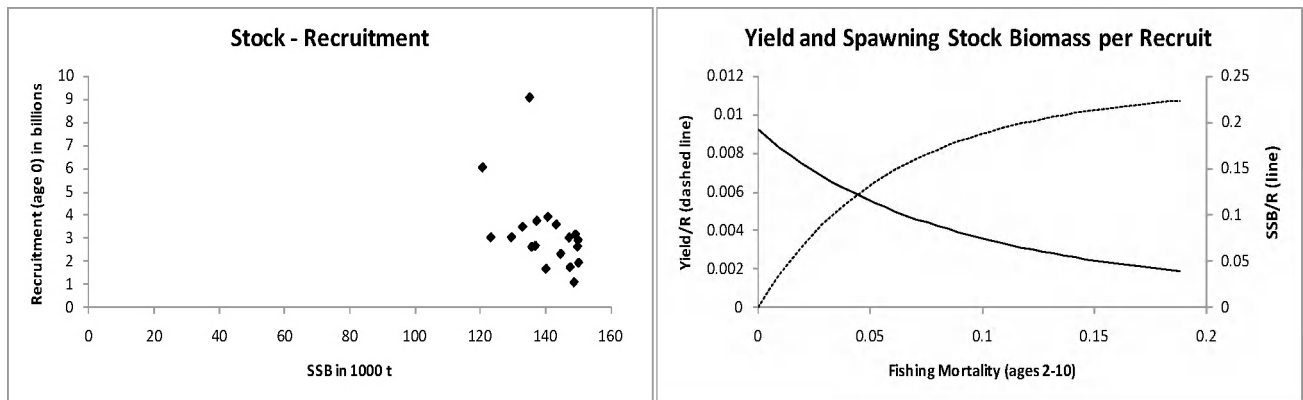


Figure 7.4.6.2 Horse mackerel in Division IXa. 2011 Stock–recruitment plot and yield-per-recruit analysis.

Table 7.4.6.1 Horse mackerel in Division IXa. ICES advice, management, and landings.

| Year | ICES Advice | Predicted catch corresp. to advice ² | Agreed TAC ¹ | ICES landings ^{2,7} |
|------|---|---|-------------------------|------------------------------|
| 1987 | Not assessed | - | 72.5 ³ | 55 ⁴ |
| 1988 | Mesh size increase | - | 82.0 ³ | 56 ⁴ |
| 1989 | No increase in F; TAC | 72.5 | 73.0 ³ | 56 ⁴ |
| 1990 | F at F _{0.1} ; TAC | 38 | 55.0 ⁴ | 49 ⁴ |
| 1991 | Precautionary TAC | 61 | 73.0 ⁴ | 22 |
| 1992 | If required, precautionary TAC | 61 | 73.0 ⁴ | 26 |
| 1993 | No advice | - | 73.0 ⁴ | 32 |
| 1994 | <i>Status quo</i> prediction | 55 ⁵ | 73.0 ⁴ | 26 |
| 1995 | No long-term gains in increasing F | 63 ⁵ | 73.0 ⁴ | 25 |
| 1996 | No long-term gains in increasing F | 60 ⁵ | 73.0 ⁴ | 23 |
| 1997 | No advice | - | 73.0 ⁴ | 28 |
| 1998 | F should not exceed the F(94–96) | 59 | 73.0 ⁴ | 42 |
| 1999 | No increase in F | 58 | 73.0 ⁴ | 28 |
| 2000 | F <F _{pa} | <59 | 68.0 ⁴ | 27 |
| 2001 | F <F _{pa} | <54 | 68.0 ⁴ | 25 |
| 2002 | F <0.113 | <34 | 57.5 ⁴ | 24 |
| 2003 | Average of last 3 years | <49 | 55.2 ⁴ | 20 |
| 2004 | Should not exceed the recent average (2000–2002) ⁶ | <47 | 55.0 ⁴ | 24 |
| 2005 | Should not exceed the recent average (2000–2002) | <25 ⁷ | 55.0 ⁴ | 23 |
| 2006 | Should not exceed the recent average (2000–2004, excluding 2003) ⁶ | <25 | 55.0 ⁴ | 24 |
| 2007 | Should not exceed the recent average (2000–2004, excluding 2003) ⁶ | <25 | 55.0 ⁴ | 23 |
| 2008 | Should not exceed the recent average (2000–2004, excluding 2003) | <25 | 57.8 ⁴ | 22 |
| 2009 | Should not exceed the recent average (2000–2004, excluding 2003) | <25 | 57.8 ⁴ | 26 |
| 2010 | Should not exceed the recent average (2000–2004, excluding 2003) | <25 | 31.1 ⁸ | 27 |
| 2011 | Should not exceed 25 000 (average 2000–2004, excluding 2003) | <25 | 29.585 ⁸ | * |
| 2012 | No increase in F | <30.8 | 30.800 ⁸ | |
| 2013 | No increase in F | <26 | | |

Weights in thousand tonnes.t.

¹ Includes all *Trachurus* spp.

² Includes only *Trachurus trachurus* L.

³ Division VIIIc, Subareas IX and X, and CECAF Division 34.1.1 (EC waters only).

⁴ Division VIIIc and Subarea IX.

⁵ Catch at *status quo* F.

⁶ Single-stock boundary and the exploitation of this stock should be conducted in the context of mixed fisheries protecting stocks outside safe biological limits.

⁷ Figures for Division IXa only from 1991 onwards, following the revision of stock boundaries in 2004.

⁸ Subarea IX.

* Catches for 2011 were considered inconsistent with those from previous years.

Table 7.4.6.2 Horse mackerel in Division IXa. ICES estimated landings and official catch statistics (tonnes).

| Year | Official Catch | Estimated Catch |
|------|----------------|---------------------|
| 1991 | 17 497 | 21 772 |
| 1992 | 22 654 | 28 411 ¹ |
| 1993 | 25 747 | 31 945 |
| 1994 | 19 061 | 28 441 ¹ |
| 1995 | 17 698 | 25 147 |
| 1996 | 14 053 | 20 400 ¹ |
| 1997 | 16 736 | 27 642 |
| 1998 | 21 334 | 41 564 |
| 1999 | 14 420 | 27 733 |
| 2000 | 15 348 | 27 160 |
| 2001 | 13 760 | 24 910 |
| 2002 | 14 270 | 22 506 // (23 663)* |
| 2003 | 11 242 | 18 887 // (19 566)* |
| 2004 | 11 875 | 23 252 // (23 577)* |
| 2005 | 13 307 | 22 695 // (23 111)* |
| 2006 | 19 426 | 23 902 // (24 558)* |
| 2007 | 10 381 | 22 790 // (23 424)* |
| 2008 | 9 290 | 22 993 // (23 593)* |
| 2009 | 10 841 | 25 727 // (24 967)* |
| 2010 | 11 726 | 27 216 // (26 556)* |
| 2011 | 18 130 | ** |

(*) In parenthesis: the Spanish catches from Subdivision IXa South are also included. These catches have only been available since 2002 and they will not be considered in the assessment data until the rest of the time-series is complete.

(**) Due to inconsistencies in the Spanish official landings, catch data in 2011 were not considered suitable for advice.

(1) These figures have been revised in 2008.

Table 7.4.6.3 Horse mackerel in Division IXa. Summary of the 2011 stock assessment. 95% Confidence intervals included around SSB and F (± 2 standard deviations).

| Year | Recruits('000) | SSB - 2SD | SSB (tonnes) | SSB +2SD | F-2SD | mean F(2-10) | F+2SD | Landings |
|------|----------------|-----------|--------------|----------|-------|--------------|-------|----------|
| 1992 | 3749400 | 163612 | 274520 | 385428 | 0.068 | 0.11 | 0.152 | 27858 |
| 1993 | 2667100 | 157364 | 273680 | 389996 | 0.071 | 0.12 | 0.169 | 31521 |
| 1994 | 2633700 | 150884 | 271540 | 392196 | 0.058 | 0.10 | 0.142 | 28450 |
| 1995 | 3492900 | 143100 | 265840 | 388580 | 0.051 | 0.09 | 0.129 | 25132 |
| 1996 | 9075200 | 144960 | 270180 | 395400 | 0.040 | 0.07 | 0.100 | 20360 |
| 1997 | 3027600 | 160216 | 294400 | 428584 | 0.051 | 0.09 | 0.129 | 29491 |
| 1998 | 1941100 | 157128 | 300180 | 443232 | 0.072 | 0.13 | 0.188 | 41661 |
| 1999 | 2907900 | 152452 | 299860 | 447268 | 0.043 | 0.08 | 0.117 | 27768 |
| 2000 | 2641600 | 146752 | 299580 | 452408 | 0.043 | 0.08 | 0.117 | 26160 |
| 2001 | 3163500 | 141184 | 298260 | 455336 | 0.042 | 0.08 | 0.118 | 24911 |
| 2002 | 1750800 | 135612 | 294960 | 454308 | 0.041 | 0.08 | 0.119 | 22506 |
| 2003 | 3591500 | 128536 | 286480 | 444424 | 0.036 | 0.07 | 0.104 | 18887 |
| 2004 | 3921200 | 123408 | 281340 | 439272 | 0.035 | 0.07 | 0.105 | 24485 |
| 2005 | 2326400 | 124864 | 289240 | 453616 | 0.039 | 0.08 | 0.121 | 22689 |
| 2006 | 1097500 | 122416 | 297380 | 472344 | 0.037 | 0.08 | 0.123 | 23895 |
| 2007 | 1678400 | 108048 | 280220 | 452392 | 0.036 | 0.08 | 0.124 | 22787 |
| 2008 | 3043400 | 91772 | 259100 | 426428 | 0.038 | 0.09 | 0.142 | 22993 |
| 2009 | 3037400 | 78592 | 246420 | 414248 | 0.038 | 0.10 | 0.162 | 25726 |
| 2010 | 6057700 | 69240 | 241400 | 413560 | 0.031 | 0.09 | 0.149 | 27217 |
| 2011 | 2806204* | | 238339 | | | | | |

* Geometric Mean recruitment over all years except 2010.

ECOREGION Bay of Biscay and Atlantic Iberian waters
STOCK Sardine in Divisions VIIIc and IXa

Advice for 2013

ICES advises on the basis of precautionary considerations that landings in 2013 should be no more than 55 000 tonnes.

Stock status

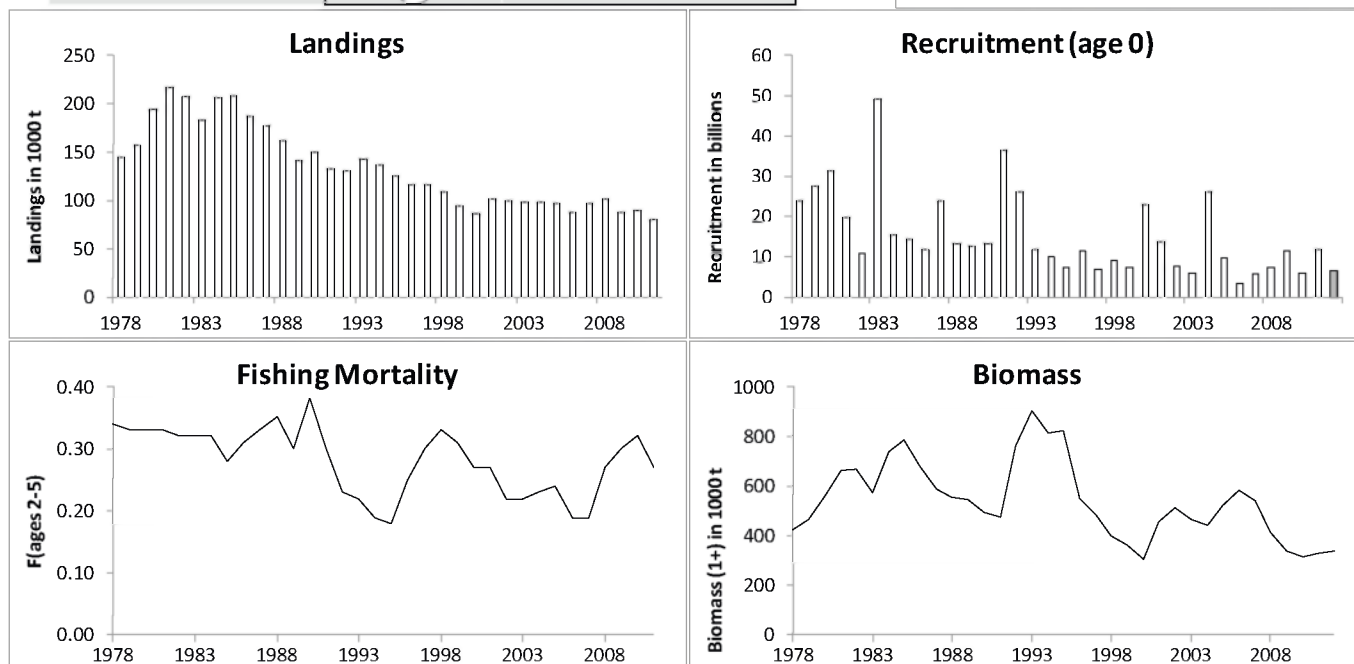
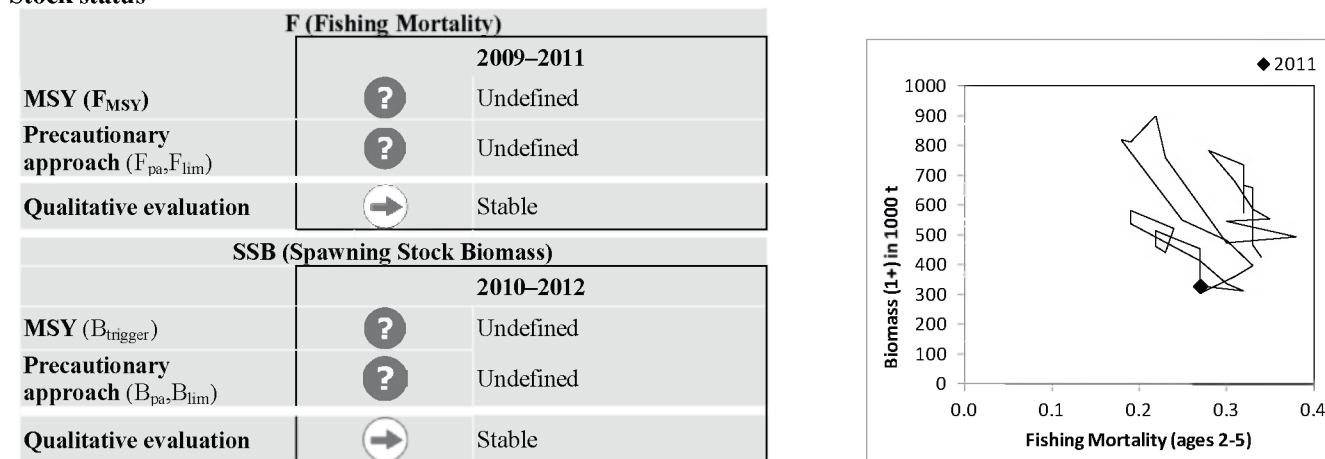


Figure 7.4.7.1 Sardine in Divisions VIIIc and IXa. Summary of stock assessment (weights in '000 tonnes, biomass expressed in weight of age 1 and older fish). Top right: Biomass 1+ and F over the years. Predicted values on recruitment are shaded.

The biomass of age 1 and older fish has been at stable at a historical low since 2009, 37% below the long term average. Recruitment has been below the long term average since 2005. Fishing mortality fluctuated without a clear trend. In 2008-2011 fishing mortality was higher than in preceding years and it currently around the long term average.

Management plans

No specific management objectives are known to ICES.

Biology

Sardine is prey for a range of fish and marine mammal species. Sardine is an omnivorous predator able to feed on both phytoplankton and zooplankton. In addition, sardines have been found to ingest their own eggs (and probably those of other species) and this cannibalism might act as a density control mechanism.

Environmental influence on the stock

Proposed environmental drivers include several global to local scale environmental variables, integrated over the time periods identified as the most critical to ensure egg and larval survival by reducing the transport of eggs and larvae offshore. Indirect effects, e.g. on growth and condition through variations in food supply or water temperature have been given less attention. Results from different studies show that environmental effects, although present, are often weak, and in some cases findings have been contradictory.

The 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.

Catch distribution Total landings (2011) = 80 kt, where 100% are landings (99% purse seine and 1% other gear types)..

Effects of the fisheries on the ecosystem

Purse seines have low bycatch of non-target species: when targeting sardine, the catches are virtually monospecific. Observer data and interview surveys of fishers also indicate a low impact on megafauna such as cetaceans, seabirds, and turtles. Because purse-seiners operate in open waters, there is little impact on the seabed. The overall effect of the sardine fishery on the pelagic ecosystem of the Atlantic Iberian waters has not been evaluated. The most likely impacts will take place in alterations of prey-predator relationships via modification of sardine abundance, size structure, and behaviour.

Quality considerations

The main uncertainties in the assessment relate to the discrepant signals about the stock trends provided by the daily egg production method (DEPM) and acoustic surveys. Uncertainty continues regarding the extent of sardine movement across the northern stock boundary, on the comparability of Portuguese and Spanish acoustic surveys, on survey and fishery selection patterns and on the weighting of the different data sources in the assessment. The estimate of recruitment in the last year of the assessment (2011) is more uncertain this year due to the lack of the 2012 Portuguese acoustic survey index. Changes in assessment method and input data (e.g. natural mortality) decided during the benchmark lead to a revision in historical SSB, fishing mortality and recruitment.

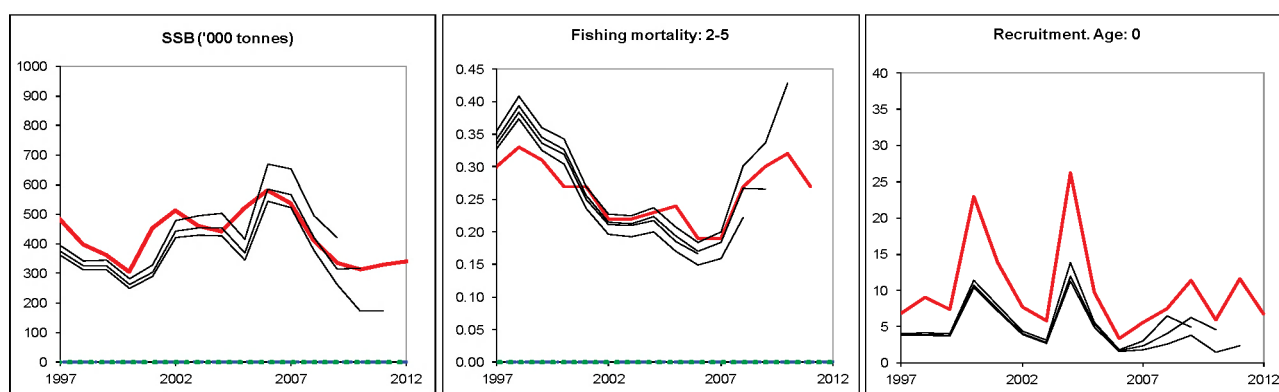


Figure 7.4.7.2 Sardine in Divisions VIIIc and IXa. Historical assessment results (final year recruitment and Biomass estimates included).

Scientific basis

| | |
|-----------------------------|--|
| Assessment type | Age-based analytical assessment (SS3). |
| Input data | One acoustic survey index (joint SP-PELACUS and PT-PELAGO surveys), one SSB survey index (joint SP and PT DEPM surveys), and catch-at-age data |
| Discards and bycatch | Bycatch, discards, and slippage may occur but are considered to be low. Not taken into account in the assessment |
| Indicators | None. |
| Other information | Benchmarked in February 2012 (WKPELA) |
| Working group report | WGHANSA |

ECOREGION Bay of Biscay and Atlantic Iberian waters
STOCK Sardine in Divisions VIIIc and IXa

Reference points

No reference points are defined for this stock.

Outlook for 2013

Basis: $F(2012) = \text{average } F(09-11) \text{ unscaled} = 0.29$; $B1+(2013) = 276$; Landings (2012) = 78; $R(2011)$, $R(2012)$ and $R(2013) = GM(2005-2010) = 6720$ million.

| Rationale | Landings (2013) | Basis | F (2013) | B1+ (2014) | %B1+ change ¹⁾ |
|------------------------------|-----------------|-----------------------------------|----------|------------|---------------------------|
| Precautionary considerations | 55 | $F = \text{average } 2002 - 2007$ | 0.22 | 278 | 0% |
| Zero catch | 0 | $F=0$ | 0 | 318 | +15% |
| Other options | 59 | $F_{2012} * 0.8$ | 0.23 | 275 | 0% |
| | 65 | $F_{2012} * 0.9$ | 0.26 | 270 | -2% |
| | 72 | F_{2012} | 0.29 | 266 | -4% |
| | 78 | $F_{2012} * 1.1$ | 0.32 | 261 | -5% |
| | 84 | $F_{2012} * 1.2$ | 0.35 | 257 | -7% |

Weights in '000 t.

¹⁾ SSB 2014 relative to SSB 2013.

Precautionary considerations

Fishing mortality has increased and SSB has decreased in the most recent years despite advice not to increase F since 2002. F should be brought back to where it was before the start of this increase, i.e. the 2002–2007 average, which is 0.22. This corresponds to landings of no more than 55 000 t in 2013.

Additional considerations

No management objectives for these fisheries are known to ICES and there is no international TAC. Almost all catches are taken by Spanish and Portuguese purse-seiners in a directed human consumption fishery. The fisheries are managed by Portugal and Spain through minimum landing size, maximum daily catch, days fishing limitations, and closed areas.

Since 2010, annual catch limits are set for the Portuguese fishery by the Portuguese authorities. Catch limits are set for the civil year and allow for an in-year revision following the publication of the ICES Advice. In 2010 and 2011, the catch limit was 55 thousand t and landings were 63 and 57 thousand t, respectively. In 2012 a catch limit of 9 thousand t for January–May and a fishing ban of 45 days during the first quarter of the year were regulated and have been complied. The 2012 initial catch limit was set at 36 thousand t, but may be revised in the middle of the year. Fishing at 0.22 this year given the current stock estimates corresponds to catch of 61 thousand tonnes.

Sardine is distributed in the Iberian region, to the north in Subareas VII and VIII and in the North Sea, and to the south on the Moroccan shelf. The information presented here assumes that sardine in Divisions VIIIc and IXa is a unit stock, based on biological characteristics. However, some movement of fish between Divisions VIIIb and VIIIc is known to occur. The effect of this movement is uncertain but is presently considered to have little influence on the estimation of the stock in the assessed area (Divisions VIIIc and IXa).

The MSY reference points have not been established so far. Candidate reference points have been outlined this year but require further evaluation in light of the recruitment dynamics observed in the stock.

A long-term plan should take into account the spatial distribution of the stock and poor relationship between stock biomass and future recruitment. A long-term management plan would be useful if stability of catches is desired. Such a strategy should be sufficiently flexible with respect to catch limitation to protect the stock under periods of poor recruitment, but also avoid unnecessary fluctuations in the catches when the stock biomass is higher.

The effects of regulations

Different management measures have been enacted by Spain and Portugal since 1997. In Spain, management measures include a maximum allowable catch of 7000 kg per fishing day and a 5-fishing-days week limitation. In Portugal, management measures include an overall limitation in the number of fishing days (180 days per year and a weekend ban). The effects of these fishery regulations are uncertain but may have contributed to the decline in fishing mortality observed between 1998 and 2007.

The environment

Sardine recruitment is considered to be influenced at both the local- and global-scale by environmental variables that may reduce the transportation of eggs and larvae offshore which are critical to ensuring egg and larval survival. Indirect effects, e.g. on growth and condition through variations in food supply or water temperature have been given less attention. Results from such studies show that environmental effects, although present, are often weak and in some cases findings have been contradictory. For example, upwelling intensity has been found to affect recruitment both positively and negatively.

The Iberian sardine is considered a forage fish, i.e. a fish that provides food for predatory fish as well as marine mammals and birds. Sardine is one of the most abundant small pelagic species in western Iberian waters and has been found to be important in the diet of several species of fish and marine mammals. Forage fish such as sardine may exert bottom-up control of their predators or top-down control on their zooplanktonic prey, or they may control both prey and predators (wasp-waist control).

Uncertainties in assessment and forecast

The DEPM and the acoustic survey show discrepant signals in the past but from 2008 to 2011, both surveys agree in a decrease of the stock. The assessment tends to accommodate the signals from the two surveys by providing broadly an average perspective. This year's assessment is affected by the lack of the 2012 Iberian acoustic survey index (the PT survey was not conducted). The DEPM surveys estimates for 2011 are provisional.

Uncertainty regarding the extent of sardine movement across the northern stock boundary, the intercalibration of Portuguese and Spanish acoustic surveys, survey and fishery selection patterns and the weighting of the surveys in the assessment still applies.

Comparison with previous assessment and advice

Compared to last years assessment SSB in 2010 is revised upwards by 71% and F2010 downwards by 26%. This is due to changes in assessment methodology, new values for natural mortality and the new 2011 DEPM survey index.

The basis for the advice is the same as last year.

Sources

ICES. 2012. Report of the Working Group on Anchovy and Sardine (WGANSAs), 23–28 June 2012, Horta, Azores Portugal. ICES CM 2012/ACOM:16.

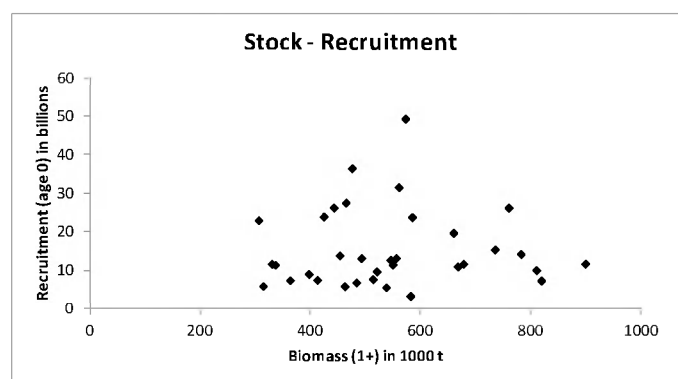


Figure 7.4.7.3 Sardine in Divisions VIIIc and IXa: Stock–recruitment plot.

Table 7.4.7.1 Sardine in Divisions VIIIc and IXa. Single-stock exploitation boundaries (advice), management, and landings.

| Year | ICES Advice | Predicted catch corresp. to advice | Agreed TAC | Official landings VIII & IX | ICES landings ² |
|------|------------------------------------|------------------------------------|------------|-----------------------------|----------------------------|
| 1987 | No increase in F; TAC | 140 | - | | 178 |
| 1988 | No increase in F; TAC | 150 | - | 167 | 162 |
| 1989 | No increase in F; TAC | 212 | - | 146 | 141 |
| 1990 | Room for increased F | 227 ² | - | 150 | 149 |
| 1991 | Precautionary TAC | 176 | - | 135 | 133 |
| 1992 | No advice | - | - | 139 | 130 |
| 1993 | Precautionary TAC | 135 | - | 153 | 142 |
| 1994 | No advice | 118 ¹ | - | 147 | 137 |
| 1995 | No advice; apparently stable stock | - | - | 137 | 125 |
| 1996 | Lowest possible level | - | - | 134 | 117 |
| 1997 | Lowest possible level | - | - | n/a | 116 |
| 1998 | Significant reduction | - | - | n/a | 109 |
| 1999 | Reduce F to 0.2 | 38 | - | n/a | 94 |
| 2000 | F below 0.2 | <81 | - | n/a | 86 |
| 2001 | F below 0.2 | <88 | - | n/a | 102 |
| 2002 | F below 0.25 | <95 | - | n/a | 100 |
| 2003 | No increase in F | 100 | - | n/a | 98 |
| 2004 | No increase in F | 128 | - | 10 | 98 |
| 2005 | No increase in F | 106 | - | 51 | 97 |
| 2006 | No increase in F | 96 | - | 50 | 87 |
| 2007 | No increase in F | 114 | - | 120 | 96 |
| 2008 | No increase in F | 92 | - | 103 | 101 |
| 2009 | No increase in F | 71 | - | 88 | 88 |
| 2010 | No increase in F | 75 | - | 90 | 90 |
| 2011 | Maintain F at 2002–2007 level | 75 | - | 77 | 80 |
| 2012 | Reduce F to the 2002–2007 level | 36 | | | |
| 2013 | Reduce F to the 2002–2007 level | < 55 | | | |

Weights in '000 t.

n/a=not available.

¹Estimated catch at *status quo* F.

²Includes only Divisions VIIIc and IXa.

Table 7.4.7.2 Sardine in Divisions VIIIc and IXa. ICES estimates of landings (tonnes) by subarea and country.

| Year | Sub-area | | | | | | All sub-areas | Div. IXa | Portugal | Spain (excl.Cadiz) | Spain (incl.Cadiz) |
|------|----------|-----------|-------------------|-------------------|-------------------|-----------------|---------------|----------|----------|--------------------|--------------------|
| | VIIIc | IXa North | IXa Central North | IXa Central South | IXa South Algarve | IXa South Cadiz | | | | | |
| 1940 | 66816 | | 42132 | 33275 | 23724 | | 165947 | 99131 | 99131 | 66816 | 66816 |
| 1941 | 27801 | | 26599 | 34423 | 9391 | | 98214 | 70413 | 70413 | 27801 | 27801 |
| 1942 | 47208 | | 40969 | 31957 | 8739 | | 128873 | 81665 | 81665 | 47208 | 47208 |
| 1943 | 46348 | | 85692 | 31362 | 15871 | | 179273 | 132925 | 132925 | 46348 | 46348 |
| 1944 | 76147 | | 88643 | 31135 | 8450 | | 204375 | 128228 | 128228 | 76147 | 76147 |
| 1945 | 67998 | | 64313 | 37289 | 7426 | | 177026 | 109028 | 109028 | 67998 | 67998 |
| 1946 | 32280 | | 68787 | 26430 | 12237 | | 139734 | 107454 | 107454 | 32280 | 32280 |
| 1947 | 43459 | 21855 | 55407 | 25003 | 15667 | | 161391 | 117932 | 96077 | 65314 | 65314 |
| 1948 | 10945 | 17320 | 50288 | 17060 | 10674 | | 106287 | 95342 | 78022 | 28265 | 28265 |
| 1949 | 11519 | 19504 | 37868 | 12077 | 8952 | | 89920 | 78401 | 58897 | 31023 | 31023 |
| 1950 | 13201 | 27121 | 47388 | 17025 | 17963 | | 122698 | 109497 | 82376 | 40322 | 40322 |
| 1951 | 12713 | 27959 | 43906 | 15056 | 19269 | | 118903 | 106190 | 78231 | 40672 | 40672 |
| 1952 | 7765 | 30485 | 40938 | 22687 | 25331 | | 127206 | 119441 | 88956 | 38250 | 38250 |
| 1953 | 4969 | 27569 | 68145 | 16969 | 12051 | | 129703 | 124734 | 97165 | 32538 | 32538 |
| 1954 | 8836 | 28816 | 62467 | 25736 | 24084 | | 149939 | 141103 | 112287 | 37652 | 37652 |
| 1955 | 6851 | 30804 | 55618 | 15191 | 21150 | | 129614 | 122763 | 91959 | 37655 | 37655 |
| 1956 | 12074 | 29614 | 58128 | 24069 | 14475 | | 138360 | 126286 | 96672 | 41688 | 41688 |
| 1957 | 15624 | 37170 | 75896 | 20231 | 15010 | | 163931 | 148307 | 111137 | 52794 | 52794 |
| 1958 | 29743 | 41143 | 92790 | 33937 | 12554 | | 210167 | 180424 | 139281 | 70886 | 70886 |
| 1959 | 42005 | 36055 | 87845 | 23754 | 11680 | | 201339 | 159334 | 123279 | 78060 | 78060 |
| 1960 | 38244 | 60713 | 83331 | 24384 | 24062 | | 230734 | 192490 | 131777 | 98957 | 98957 |
| 1961 | 51212 | 59570 | 96105 | 22872 | 16528 | | 246287 | 195075 | 135505 | 110782 | 110782 |
| 1962 | 28891 | 46381 | 77701 | 29643 | 23528 | | 206144 | 177253 | 130872 | 75272 | 75272 |
| 1963 | 33796 | 51979 | 86859 | 17595 | 12397 | | 202626 | 168830 | 116851 | 85775 | 85775 |
| 1964 | 36390 | 40897 | 108065 | 27636 | 22035 | | 235023 | 198633 | 157736 | 77287 | 77287 |
| 1965 | 31732 | 47036 | 82354 | 35003 | 18797 | | 214922 | 183190 | 136154 | 78768 | 78768 |
| 1966 | 32196 | 44154 | 66929 | 34153 | 20855 | | 198287 | 166091 | 121937 | 76350 | 76350 |
| 1967 | 23480 | 45595 | 64210 | 31576 | 16635 | | 181496 | 158016 | 112421 | 69075 | 69075 |
| 1968 | 24690 | 51828 | 46215 | 16671 | 14993 | | 154397 | 129707 | 77879 | 76518 | 76518 |
| 1969 | 38254 | 40732 | 37782 | 13852 | 9350 | | 139970 | 101716 | 60984 | 78986 | 78986 |
| 1970 | 28934 | 32306 | 37608 | 12989 | 14257 | | 126094 | 97160 | 64854 | 61240 | 61240 |
| 1971 | 41691 | 48637 | 36728 | 16917 | 16534 | | 160507 | 118816 | 70179 | 90328 | 90328 |
| 1972 | 33800 | 45275 | 34889 | 18007 | 19200 | | 151171 | 117371 | 72096 | 79075 | 79075 |
| 1973 | 44768 | 18523 | 46984 | 27688 | 19570 | | 157533 | 112765 | 94242 | 63291 | 63291 |
| 1974 | 34536 | 13894 | 36339 | 18717 | 14244 | | 117730 | 83194 | 69300 | 48430 | 48430 |
| 1975 | 50260 | 12236 | 54819 | 19295 | 16714 | | 153324 | 103064 | 90828 | 62496 | 62496 |
| 1976 | 51901 | 10140 | 43435 | 16548 | 12538 | | 134562 | 82661 | 72521 | 62041 | 62041 |
| 1977 | 36149 | 9782 | 37064 | 17496 | 20745 | | 121236 | 85087 | 75305 | 45931 | 45931 |
| 1978 | 43522 | 12915 | 34246 | 25974 | 23333 | 5619 | 145609 | 102087 | 83553 | 56437 | 62056 |
| 1979 | 18271 | 43876 | 39651 | 27532 | 24111 | 3800 | 157241 | 138970 | 91294 | 62147 | 65947 |
| 1980 | 35787 | 49593 | 59290 | 29433 | 17579 | 3120 | 194802 | 159015 | 106302 | 85380 | 88500 |
| 1981 | 35550 | 65330 | 61150 | 37054 | 15048 | 2384 | 216517 | 180967 | 113253 | 100880 | 103264 |
| 1982 | 31756 | 71889 | 45865 | 38082 | 16912 | 2442 | 206946 | 175190 | 100859 | 103645 | 106087 |
| 1983 | 32374 | 62843 | 33163 | 31163 | 21607 | 2688 | 183837 | 151463 | 85932 | 95217 | 97905 |
| 1984 | 27970 | 79606 | 42798 | 35032 | 17280 | 3319 | 206005 | 178035 | 95110 | 107576 | 110895 |
| 1985 | 25907 | 66491 | 61755 | 31535 | 18418 | 4333 | 208439 | 182532 | 111709 | 92398 | 96731 |
| 1986 | 39195 | 37960 | 57360 | 31737 | 14354 | 6757 | 187363 | 148168 | 103451 | 77155 | 83912 |
| 1987 | 36377 | 42234 | 44806 | 27795 | 17613 | 8870 | 177696 | 141319 | 90214 | 78611 | 87481 |
| 1988 | 40944 | 24005 | 52779 | 27420 | 13393 | 2990 | 161531 | 120587 | 93591 | 64949 | 67939 |
| 1989 | 29856 | 16179 | 52585 | 26783 | 11723 | 3835 | 140961 | 111105 | 91091 | 46035 | 49870 |
| 1990 | 27500 | 19253 | 52212 | 24723 | 19238 | 6503 | 149429 | 121929 | 96173 | 46753 | 53256 |
| 1991 | 20735 | 14383 | 44379 | 26150 | 22106 | 4834 | 132587 | 111852 | 92635 | 35118 | 39952 |
| 1992 | 26160 | 16579 | 41681 | 29968 | 11666 | 4196 | 130250 | 104090 | 83315 | 42739 | 46935 |
| 1993 | 24486 | 23905 | 47284 | 29995 | 13160 | 3664 | 142495 | 118009 | 90440 | 48391 | 52055 |
| 1994 | 22181 | 16151 | 49136 | 30390 | 14942 | 3782 | 136582 | 114401 | 94468 | 38332 | 42114 |
| 1995 | 19538 | 13928 | 41444 | 27270 | 19104 | 3996 | 125280 | 105742 | 87818 | 33466 | 37462 |
| 1996 | 14423 | 11251 | 34761 | 31117 | 19880 | 5304 | 116736 | 102313 | 85758 | 25674 | 30978 |
| 1997 | 15587 | 12291 | 34156 | 25863 | 21137 | 6780 | 115814 | 100227 | 81156 | 27878 | 34658 |
| 1998 | 16177 | 3263 | 32584 | 29564 | 20743 | 6594 | 108924 | 92747 | 82890 | 19440 | 26034 |
| 1999 | 11862 | 2563 | 31574 | 21747 | 18499 | 7846 | 94091 | 82229 | 71820 | 14425 | 22271 |
| 2000 | 11697 | 2866 | 23311 | 23701 | 19129 | 5081 | 85786 | 74089 | 66141 | 14563 | 19644 |
| 2001 | 16798 | 8398 | 32726 | 25619 | 13350 | 5066 | 101957 | 85159 | 71695 | 25196 | 30262 |
| 2002 | 15885 | 4562 | 33585 | 22969 | 10982 | 11689 | 99673 | 83787 | 67536 | 20448 | 32136 |
| 2003 | 16436 | 6383 | 33293 | 24635 | 8600 | 8484 | 97831 | 81395 | 66528 | 22819 | 31303 |
| 2004 | 18306 | 8573 | 29488 | 24370 | 8107 | 9176 | 98020 | 79714 | 61965 | 26879 | 36055 |
| 2005 | 19800 | 11663 | 25696 | 24619 | 7175 | 8391 | 97345 | 77545 | 57490 | 31464 | 39855 |
| 2006 | 15377 | 10856 | 30152 | 19061 | 5798 | 5779 | 87023 | 71646 | 55011 | 26233 | 32012 |
| 2007 | 13380 | 12402 | 41090 | 19142 | 4266 | 6188 | 96469 | 83088 | 64499 | 25782 | 31970 |
| 2008 | 13636 | 9409 | 45210 | 20858 | 4928 | 7423 | 101464 | 87828 | 70997 | 23045 | 30468 |
| 2009 | 11963 | 7226 | 36212 | 20838 | 4785 | 6716 | 87140 | 75777 | 61835 | 19189 | 25905 |
| 2010 | 13772 | 7409 | 40923 | 17623 | 5181 | 4662 | 89571 | 75798 | 63727 | 21181 | 25843 |
| 2011 | 8536 | 5621 | 37152 | 13685 | 6387 | 9023 | 80403 | 71867 | 57223 | 14157 | 23180 |

Div. IXa = IXa North + IXa Central-North + IXa Central-South + IXa South-Algarve + IXa South-Cadiz

Table 7.4.7.3 Sardine in Divisions VIIIc and IXa. Summary of stock assessment.

| Year | Recruitment Age 0 thousands | Biomass 1+ Age 1 and older tonnes | Landings tonnes | Mean F Ages 2-5 |
|---------|-----------------------------------|--|--------------------|--------------------|
| 1978 | 23921000 | 424000 | 145609 | 0.34 |
| 1979 | 27481000 | 464000 | 157241 | 0.33 |
| 1980 | 31471000 | 560000 | 194802 | 0.33 |
| 1981 | 19690000 | 659000 | 216517 | 0.33 |
| 1982 | 10956000 | 667000 | 206946 | 0.32 |
| 1983 | 49222000 | 572000 | 183837 | 0.32 |
| 1984 | 15381000 | 734000 | 206005 | 0.32 |
| 1985 | 14228000 | 781000 | 208439 | 0.28 |
| 1986 | 11676000 | 677000 | 187363 | 0.31 |
| 1987 | 23745000 | 584000 | 177696 | 0.33 |
| 1988 | 13148000 | 555000 | 161531 | 0.35 |
| 1989 | 12676000 | 545000 | 140961 | 0.30 |
| 1990 | 13119000 | 492000 | 149429 | 0.38 |
| 1991 | 36404000 | 475000 | 132587 | 0.30 |
| 1992 | 26193000 | 759000 | 130250 | 0.23 |
| 1993 | 11694000 | 898000 | 142495 | 0.22 |
| 1994 | 10038000 | 809000 | 136582 | 0.19 |
| 1995 | 7366000 | 818000 | 125280 | 0.18 |
| 1996 | 11478000 | 549000 | 116736 | 0.25 |
| 1997 | 6864000 | 483000 | 115814 | 0.30 |
| 1998 | 9057000 | 397000 | 108924 | 0.33 |
| 1999 | 7427000 | 363000 | 94091 | 0.31 |
| 2000 | 22968000 | 306000 | 85786 | 0.27 |
| 2001 | 13861000 | 453000 | 101957 | 0.27 |
| 2002 | 7685000 | 513000 | 99673 | 0.22 |
| 2003 | 5871000 | 462000 | 97831 | 0.22 |
| 2004 | 26221000 | 442000 | 98020 | 0.23 |
| 2005 | 9707000 | 520000 | 97345 | 0.24 |
| 2006 | 3341000 | 581000 | 87023 | 0.19 |
| 2007 | 5594000 | 537000 | 96469 | 0.19 |
| 2008 | 7511000 | 412000 | 101464 | 0.27 |
| 2009 | 11431000 | 336000 | 87740 | 0.30 |
| 2010 | 5910000 | 314000 | 89571 | 0.32 |
| 2011 | 11627000 | 330000 | 80403 | 0.27 |
| 2012 | 6720000* | 340000 | | |
| Average | 15190914 | 537457 | 134189 | 0.28 |

*Geometric mean (2005–2010).

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Advice for the period 1 July 2012–30 June 2013

ICES advises on the basis of the precautionary approach that catches from 1 July 2012 to 30 June 2013 should be no more than 28 000 tonnes.

Stock status

| F (Fishing Mortality) | | | |
|--|------|------|------------------------------|
| | 2009 | 2010 | 2011 |
| MSY (F_{MSY}) | ? | ? | Undefined |
| SSB (Spawning-Stock Biomass) | | | |
| | 2010 | 2011 | 2012 |
| MSY ($B_{trigger}$) | ✓ | ✓ | ✓ Above trigger |
| Precautionary approach (B_{pa}, B_{lim}) | ✓ | ✓ | ✓ Full reproductive capacity |

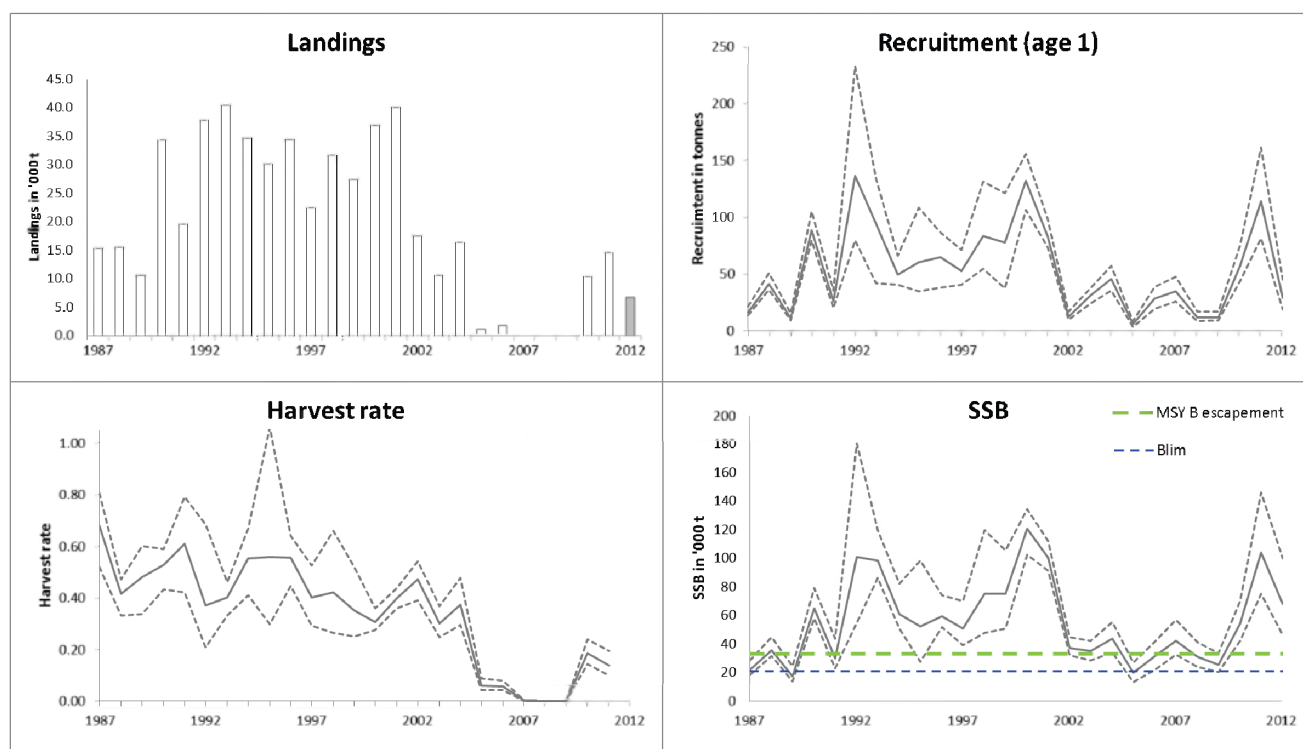


Figure 7.4.8.1 Anchovy in Subarea VIII (Bay of Biscay). Trends in landings, recruitment (age 1 biomass in January), harvest rates (catch/SSB), and spawning-stock biomass. Solid lines – posterior median; dashed lines – 95% probability intervals. The 2012 landings are until the end of May.

The spawning stock biomass has been above the limit reference point since 2006 and above the MSY Bescapement since 2010. Recruitment in 2012 is around the 30th percentile of the historical series. The harvest rate in 2011 was below the average of the historical series from 1987 to 2011 (2005–2009 were excluded due to fishery closures).

Management plans

No specific management objectives are known to ICES. A draft management plan is proposed by EC in 2009 (COM/2009/399 final). In the last two years the EU Council of fisheries used the proposed HCR to set the TAC for July to June. ICES has not evaluated this proposal.

Biology

Anchovy is a short-lived species, with the fishable stock consisting primarily of one-year-old fish.

Environmental influence on the stock

Anchovy is a prey species for other pelagic and demersal species, and also for cetaceans and birds. Recruitment depends strongly on environmental factors, and several recruitment predictions have been proposed in the past based on environmental variables. Work on their use for management purposes is ongoing.

The 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.

Catch distribution Total catch (2011) 14 530 t where 100% landings, 0% discards, 0% industrial bycatch, 0% unaccounted removals

Quality considerations

The current assessment is mainly driven by inputs provided by two spring surveys (Daily egg production method (DEPM) and acoustics (PELGAS)). This year the two surveys indicate very different estimates of abundance (DEPM is 80% lower than PELGAS). This results in a larger uncertainty associated to the 2012 biomass estimate. The DEPM estimate is preliminary. The 2011 DEPM index has been revised upwards by 25%.

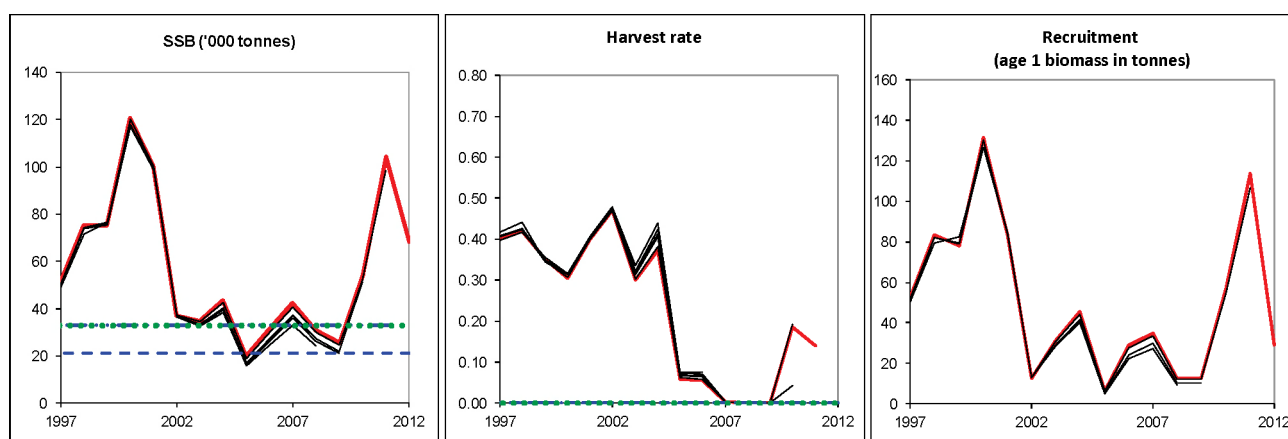


Figure 7.4.8.2 Anchovy in Subarea VIII (Bay of Biscay). Historical assessment results for median SSB (final year estimate included).

Scientific basis

| | |
|-----------------------------|--|
| Assessment type | Two-stage Bayesian biomass dynamic model (BBM) assessment |
| Input data | Two survey indices: Daily Egg Production Method survey (BIOMAN) and acoustic survey (PELGAS); Commercial catch information. |
| Discards and bycatch | Not included in the assessment and assumed to be negligible. |
| Indicators | None. |
| Other information | The assessment was benchmarked in 2009 (WKSHORT). |
| Working group report | WGHANSA (former WGANSA) |

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Reference points

| | Type | Value | Technical basis |
|------------------------|-----------------------------|--------------|---|
| MSY Approach | MSY $B_{\text{escapement}}$ | 33 000 t | Provisional value based on B_{pa} . |
| | F_{MSY} | Not defined. | |
| Precautionary approach | B_{lim} | 21 000 t | $B_{\text{lim}} \cdot B_{\text{loss}} = 21\,000\text{ t}$ (1989 SSB). |
| | B_{pa} | 33 000 t | $B_{\text{pa}} = B_{\text{loss}} \times \exp(1.645\sigma)$. |
| | F_{lim} | | Not defined. |
| | F_{pa} | 1.0–1.2 | $F_{\text{pa}} = F$ for 50% spawning potential ratio, i.e. the F at which the SSB/R is half of what it would have been in the absence of fishing. |

(unchanged since 2010)

Because the assessment provides the probability distributions for the SSB, it is possible to estimate directly the risk of the SSB falling below B_{lim} . B_{pa} and F_{pa} reference points may become unnecessary.

Outlook for the period 1 July 2012–30 June 2013

Basis: $R(2013)$ drawn randomly from distribution of recruitment at age 1 in biomass (1987–2012). Total catch: 30% allocated to second half of 2012 and 70% to first half of 2013.

| Catch (t) (July 2012–June 2013) | Probability $SSB_{2013} < B_{\text{lim}}$ | Median SSB 2013 |
|------------------------------------|--|-----------------|
| 0 | 0% | 69 |
| 5 | 0% | 67 |
| 10 | 0% | 64 |
| 15 | 0% | 61 |
| 20 | 2% | 58 |
| 25 | 4% | 55 |
| 28 | 5% | 53 |
| 30 | 6% | 52 |
| 65 | 34% | 33 |

Weights in thousand tonnes.

MSY approach

If the objective is to maintain the spawning-stock biomass above the provisional MSY $B_{\text{escapement}}$ in 2013, a catch of less than 65 000 t can be taken in the period 1 July 2012 to 30 June 2013. However, such a catch is not considered precautionary as it leads to a 34% probability of SSB being less than B_{lim} by 2013.

Precautionary approach

To reduce the risk to less than 5% of the SSB in 2013 falling below B_{lim} , catches in the period 1 July 2012–30 June 2013 should be less than 28 000 t.

Proposed management plan

Following the management plan proposed by the European Commission, the TAC for the fishing season running from 1 July 2012 to 30 June 2013 should be established at 20 700 tonnes (as stated in Annex 1 of the proposal for an SSB in the range 68 001–69 000 t).

Additional considerations

In the past, a TAC was set independently of the state of the stock in the range of 30 000–33 000 t, and the TAC had limited impact on regulating catches in the fishery.

Recent developments in management have been moving towards an in-year monitoring regime, as recommended previously by ICES. The assessment of anchovy is based on the survey results in the spring and catch data. Hence, the most up-to-date assessment can be obtained in June as done in this assessment. TACs may be set for the whole period July–June.

Harvest control rules (HCR) for anchovy have been tested outside ICES, for the EC proposal of a long-term management plan for this fishery. A draft management plan has been proposed by the EC in cooperation between STECF and the South Western RAC. This plan has not yet been formally adopted by the EU. The plan is based on a constant harvest rate (30%), and sets a TAC as a percentage of the point estimate of the SSB as assessed at the start of the TAC period which runs from 1st July to 30th June, but with an upper bound on the TAC (of 33 000 t), and with a minimum TAC level (of 7000 t) applicable at SSB estimates between 24 000 t and 33 000 t. ICES notes that the criterion for accepting the HCR as precautionary would include rules that imply a low risk of reducing the SSB to a level which may imply further reduction in recruitment. Supplementary measures (area closures, minimum landing size) may be considered in addition to TACs.

Catch options for the next year depends very much on the next coming recruitment for which there is no information yet. The autumn JUVENA survey has now been conducted for nine years. Although the nature of the relationship between the juvenile abundance index and the resulting recruitment is still unclear, ICES considers that the JUVENA acoustic index of juveniles is a valid indicator of the strength of the incoming recruitment and hence useful improving the forecast of the population and potentially its assessment. The use of this index as a tool to forecast the population in next year, could serve to either review the TAC set currently from July to June, or to generate preliminary advice for a TAC going from January to December based on the autumn acoustic survey.

Data and methods

A two-stage Bayesian biomass dynamic model (BBM) assessment was used based on the Daily Egg Production Method (DEPM) BIOMAN surveys (since 1987), acoustic PELGAS surveys (since 1989), and catches from the French and Spanish fisheries. The assessment method is consistent with that used last year.

Uncertainties in assessment and forecast

The current assessment is mainly driven by inputs provided by the surveys (SSB and proportion of 1-group in mass). For the DEPM survey, uncertainties include the assumed spawning frequency (which is under revision). The DEPM estimates for 2012 used in the assessment are preliminary, as the adult samples have not been fully processed. For the acoustic estimate, uncertainties in some years concern the possible underestimation of 1-year-olds in the coastal area. This year the results from the Acoustic (PELGAS) and DEPM (BIOMAN) spring surveys diverge largely from one another. While the former estimates a biomass around 183 000 t with 40% of the biomass being 1 year old, the latter estimates 36 200 t with 30% of the biomass being at age 1 (Figures 7.8.4.6 and 7.8.4.7). Much of the discrepancies arose in a coastal area close to the Garonne where the acoustic surveys in 2012 detected a larger amount of small 1 year old anchovies than the BIOMAN survey implied from egg abundance.

The BIOMAN and PELGAS surveys usually follow similar trends, however discrepancies between the two surveys have historically been observed, e.g. in 1991, 1998, 2000 and in 2002. In these years, the final estimate from the assessment has been either in between the two estimates (e.g. 1998), closer to DEPM estimate (e.g. 2002) or closer to the acoustic estimate (2000). As there was no *a priori* reason to exclude either survey, both were used in the assessment. The estimated decline in biomass in 2012 compared to 2011 would be expected given the relatively low proportion of age 1 in the stock in the two surveys (30% in DEPM and 40% in PELGAS, Figure 7.8.4.7).

The main uncertainties of the model lie in the growth and natural mortality of anchovy which are assumed independent of age. Similarly, there is no age structured catchability in the surveys. The assumption that DEPM survey data measures the spawning biomass in absolute terms might also increase uncertainty. The assessment results do not reflect the additional uncertainty arising from potentially incorrect assumptions on the conditioning of the stock assessment model.

The current Bayesian model provides a formal statistical estimate of the precision of the results and these are translated into risk that can be included in harvest rules. The 95% probability intervals indicate that SSB in 2012 is between 46 300 and 99 800 t, with a median at 68 200 t.

Comparison with previous assessment and advice

Estimates of SSB in 2011 and harvest rate in 2010 are very similar to those estimated in last year's assessment. The basis for the assessment and advice is the same as last year.

Source

ICES. 2012. Report of the Working Group on Anchovy and Sardine (WGANSA), 23–28 June 2012, Vigo, Spain. ICES CM 2012/ACOM:16.

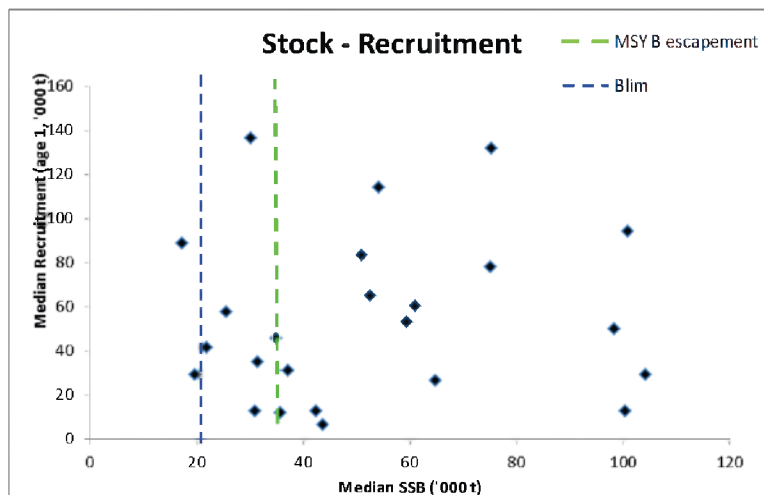


Figure 7.4.8.3 Anchovy in Subarea VIII (Bay of Biscay). Stock–recruitment plot based on median values.

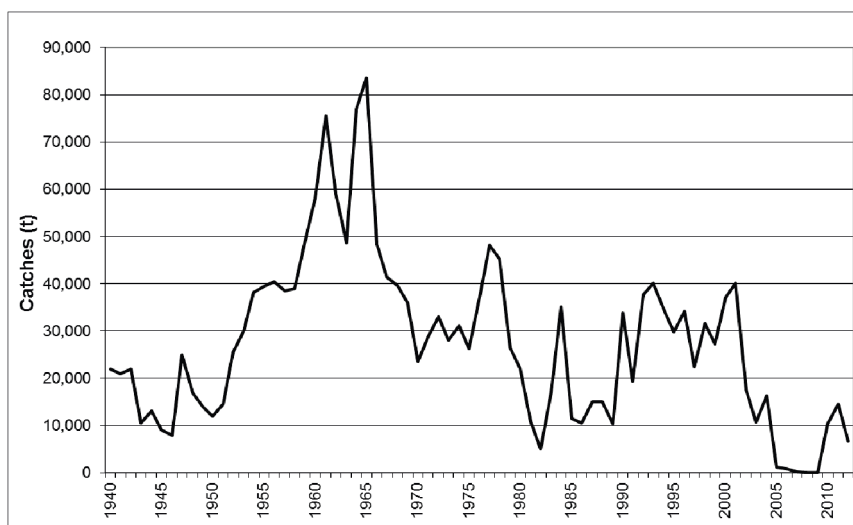


Figure 7.4.8.4 Anchovy in Subarea VIII (Bay of Biscay). Catches (in tonnes) from the beginning of the time-series. Catches in 2012 are until the end of May.

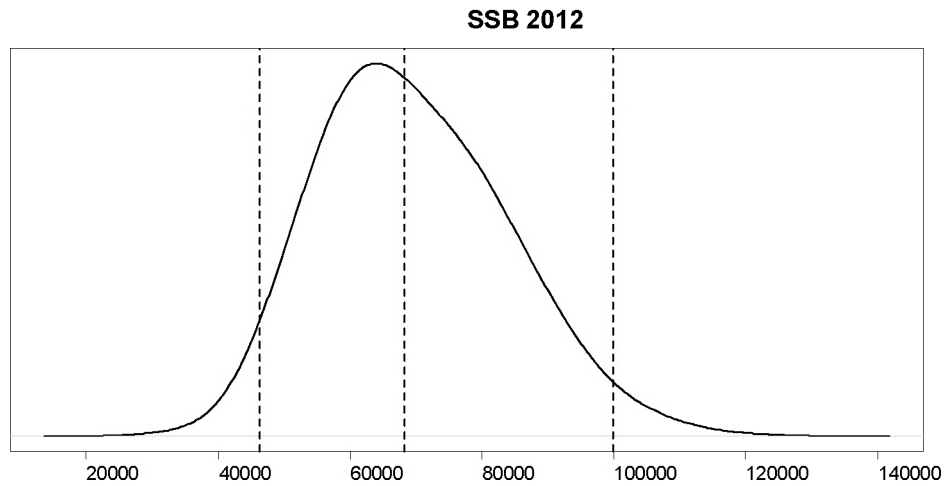


Figure 7.4.8.5 Anchovy in Subarea VIII (Bay of Biscay). Posterior distribution of spawning biomass in 2012. Vertical dashed lines correspond to posterior median and 95% probability intervals.

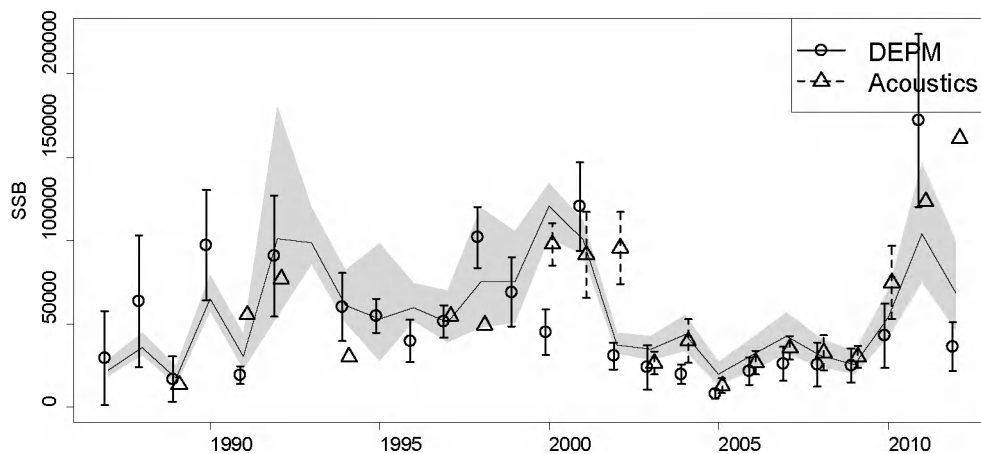


Figure 7.8.4.6 Anchovy in Subarea VIII (Bay of Biscay). Comparison of the SSB posterior 95% probability intervals from the assessment (grey area) and the SSB indices corrected by their catchability with the corresponding confidence intervals from DEPM (open circle and solid line) and Acoustics (triangle and dashed line).

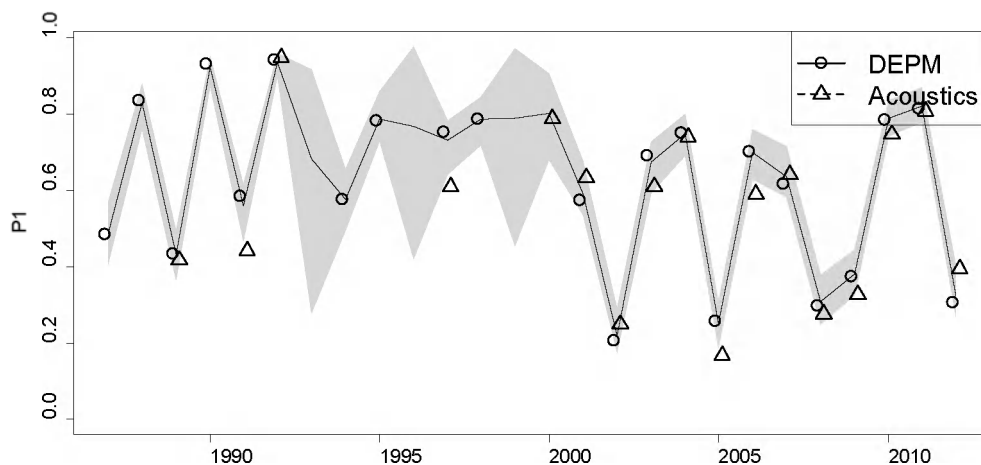


Figure 7.8.4.7 Anchovy in Subarea VIII (Bay of Biscay). Comparison of the proportion of age 1 in biomass posterior 95% probability intervals from the BBM (grey area) and the point estimates from DEPM (open circle) and Acoustics (triangle).

Table 7.4.8.1 Anchovy in Subarea VIII (Bay of Biscay). Advice, management, and landings.

| Year | ICES Advice | Predicted catch corresp. to advice | Agreed TAC | Official catch | ICES catch |
|------------------------|---|---------------------------------------|---------------|----------------|-------------------|
| 1987 | Not assessed | - | 32 | 14 | 15 |
| 1988 | Not assessed | - | 32 | 14 | 16 |
| 1989 | Increase SSB; TAC | 10.0 ¹ | 32 | 6 | 11 |
| 1990 | Precautionary TAC | 12.3 | 30 | 22 | 34 |
| 1991 | Precautionary TAC | 14.0 | 30 | 12 | 20 |
| 1992 | No advice | - | 30 | 25 | 38 |
| 1993 | Reduced F on juveniles; closed area | - | 30 | 29 | 40 |
| 1994 | Reduced F on juveniles; closed area | - | 30 | 28 | 35 |
| 1995 | Reduced F on juveniles; closed area | - | 33 | 29 | 30 |
| 1996 | Reduced F on juveniles; closed area | - | 33 | 25 | 34 |
| 1997 | Reduced F on juveniles; closed area | - | 33 | 18 | 22 |
| 1998 | Reduced F on juveniles; closed area | - | 33 | 27 | 32 |
| 1999 | Reduced F on juveniles, closed area | - | 33 | 16 | 27 |
| 2000 | Closure of the fishery | 0 | 33 | 35 | 37 |
| 2001 | Preliminary TAC at recent exploitation | 18 | 33 | 37 | 40 |
| 2002 | Preliminary TAC at recent exploitation | 33 | 33 | 19 | 18 |
| 2003 | Preliminary TAC at recent exploitation | 12.5 | 33 | 10 | 11 |
| 2004 | Preliminary TAC at recent exploitation | 11 | 33 | 16 | 16 |
| 2005 | Rebuilding SSB | 5 | 30 | n/a | 1 |
| 2006 | Closure of the fishery | 0 | 5 | 2 | 2 |
| 2007 | Closure of the fishery | 0 | 0 | 0.1 | 0.1 ² |
| 2008 | Closure of the fishery | 0 | 0 | 0 | 0 |
| 2009 | Closure of the fishery | 0 | 0 | 0.1 | 0 |
| 2010 | Closure of the fishery | 0 | 7 | 11 | 6.1 ³ |
| 2010/2011 ⁴ | See scenarios | - | 15.6 | - | 15.1 |
| 2011/2012 | Risk of SSB falling below $B_{lim} < 5\%$ | < 47 | 29.7 | - | 10.3 ⁵ |
| 2012/2013 | Risk of SSB falling below $B_{lim} < 5\%$ | < 28 | | | |

Weights in thousand tonnes.

¹ Mean catch of 1986–1988.² Experimental fisheries.³ Catch from January 2010 to June 2010.⁴ From 2010 onwards, advice, TAC and landings are valid from 1 July to 30 June.

n/a: not available.

⁵ Provisional catch from 1st July 2011 to 31st May 2012.

Table 7.4.8.2 Anchovy in Subarea VIII (Bay of Biscay). Official and ICES estimates of catches (in tonnes).

| Year | Official catch | ICES catch |
|------|----------------|------------|
| 1960 | 80947 | 58085 |
| 1961 | 89969 | 75494 |
| 1962 | 65295 | 59123 |
| 1963 | 51956 | 48652 |
| 1964 | 80381 | 76973 |
| 1965 | 85296 | 83615 |
| 1966 | 48909 | 48358 |
| 1967 | 41460 | 41175 |
| 1968 | 38429 | 39619 |
| 1969 | 33098 | 36083 |
| 1970 | 23637 | 23485 |
| 1971 | 29086 | 28612 |
| 1972 | 32927 | 33067 |
| 1973 | 28196 | 28009 |
| 1974 | 31312 | 31117 |
| 1975 | 26426 | 26302 |
| 1976 | 36166 | 37261 |
| 1977 | 48319 | 48191 |
| 1978 | 45367 | 45219 |
| 1979 | 22673 | 26349 |
| 1980 | 22256 | 22102 |
| 1981 | 10876 | 10815 |
| 1982 | 4712 | 4991 |
| 1983 | 15699 | 14153 |
| 1984 | 28423 | 35179 |
| 1985 | 10816 | 11486 |
| 1986 | 7698 | 7923 |
| 1987 | 14188 | 15308 |
| 1988 | 14045 | 15581 |
| 1989 | 5898 | 10614 |
| 1990 | 22053 | 34272 |
| 1991 | 11581 | 19634 |
| 1992 | 25370 | 37885 |
| 1993 | 29266 | 40393 |
| 1994 | 28474 | 34631 |
| 1995 | 28626 | 30115 |
| 1996 | 25452 | 34373 |
| 1997 | 18179 | 22337 |
| 1998 | 27026 | 31617 |
| 1999 | 15757 | 27259 |
| 2000 | 34567 | 36994 |
| 2001 | 37086 | 40149 |
| 2002 | 19118 | 17507 |
| 2003 | 9964 | 10595 |
| 2004 | 15528 | 16361 |
| 2005 | 1086 | 1128 |
| 2006 | 1807 | 1753 |
| 2007 | 141** | 141** |
| 2008 | 0 | 0 |
| 2009 | 190 | 0 |
| 2010 | 10664 | 10317 |
| 2011 | 14130 | 14530 |

n/a = not available.

** Experimental fisheries.

Table 7.4.8.3 Anchovy in Subarea VIII (Bay of Biscay). Summary of the assessment. Median and 95% probability intervals for recruitment (age 1 in January), spawning-stock biomass, harvest rates (Catch/SSB), and the ratio of SSB with respect to SSB in 1989 as derived from the BBM.

| Year | R (tonnes) | | | SSB (tonnes) | | | Harvest rate | | | SSB/SSB ₁₉₈₉ | | |
|------|------------|--------|--------|--------------|--------|--------|--------------|--------|--------|-------------------------|--------|--------|
| | 2.50% | Median | 97.50% | 2.50% | Median | 97.50% | 2.50% | Median | 97.50% | 2.50% | Median | 97.50% |
| 1987 | 14300 | 17020 | 21900 | 18430 | 21860 | 28600 | 0.520 | 0.680 | 0.806 | 0.937 | 1.269 | 1.596 |
| 1988 | 36250 | 41385 | 51020 | 31430 | 35700 | 44530 | 0.333 | 0.415 | 0.471 | 1.754 | 2.066 | 2.327 |
| 1989 | 9485 | 11730 | 16220 | 13860 | 17280 | 24630 | 0.338 | 0.481 | 0.600 | 1.000 | 1.000 | 1.000 |
| 1990 | 79710 | 88570 | 105003 | 57840 | 64825 | 79100 | 0.432 | 0.527 | 0.590 | 2.759 | 3.752 | 4.782 |
| 1991 | 20510 | 26250 | 35670 | 23210 | 30230 | 43670 | 0.421 | 0.608 | 0.792 | 1.190 | 1.742 | 2.458 |
| 1992 | 79879 | 136200 | 231900 | 54710 | 100900 | 180300 | 0.207 | 0.371 | 0.683 | 2.965 | 5.818 | 10.459 |
| 1993 | 42180 | 94060 | 133300 | 85990 | 98410 | 119500 | 0.331 | 0.402 | 0.461 | 3.851 | 5.700 | 7.621 |
| 1994 | 40740 | 50050 | 66470 | 50620 | 61060 | 82020 | 0.412 | 0.553 | 0.667 | 2.344 | 3.504 | 5.097 |
| 1995 | 35100 | 60415 | 108303 | 27720 | 52580 | 98391 | 0.298 | 0.558 | 1.059 | 1.505 | 2.962 | 5.749 |
| 1996 | 38269 | 64740 | 86783 | 51710 | 59490 | 74252 | 0.445 | 0.556 | 0.640 | 2.460 | 3.423 | 4.547 |
| 1997 | 40680 | 52900 | 71391 | 39100 | 50990 | 69920 | 0.293 | 0.402 | 0.524 | 1.926 | 2.916 | 4.255 |
| 1998 | 54560 | 83240 | 131200 | 47960 | 75130 | 119700 | 0.264 | 0.420 | 0.658 | 2.540 | 4.304 | 6.991 |
| 1999 | 37889 | 77960 | 120603 | 50759 | 75340 | 105400 | 0.251 | 0.350 | 0.520 | 2.624 | 4.281 | 6.689 |
| 2000 | 106300 | 131600 | 154900 | 102300 | 120600 | 134300 | 0.275 | 0.306 | 0.361 | 4.617 | 6.951 | 8.894 |
| 2001 | 74120 | 83535 | 98601 | 91520 | 100400 | 111900 | 0.359 | 0.400 | 0.439 | 4.031 | 5.828 | 7.386 |
| 2002 | 10440 | 12780 | 17160 | 32200 | 37170 | 44680 | 0.391 | 0.471 | 0.543 | 1.487 | 2.154 | 2.808 |
| 2003 | 24370 | 31130 | 37700 | 28560 | 34910 | 42340 | 0.248 | 0.300 | 0.367 | 1.328 | 2.021 | 2.657 |
| 2004 | 35510 | 45660 | 57090 | 34000 | 43660 | 55160 | 0.295 | 0.373 | 0.479 | 1.593 | 2.517 | 3.410 |
| 2005 | 3941 | 6523 | 9038 | 13160 | 19690 | 27010 | 0.043 | 0.059 | 0.088 | 0.650 | 1.131 | 1.647 |
| 2006 | 20120 | 28960 | 38811 | 21910 | 31455 | 41800 | 0.042 | 0.056 | 0.080 | 1.060 | 1.808 | 2.596 |
| 2007 | 26040 | 34925 | 47841 | 32400 | 42390 | 56680 | 0.002 | 0.003 | 0.004 | 1.552 | 2.440 | 3.444 |
| 2008 | 8921 | 12440 | 17510 | 24160 | 31010 | 41201 | 0.000 | 0.000 | 0.000 | 1.153 | 1.789 | 2.515 |
| 2009 | 9464 | 12580 | 17210 | 20220 | 25475 | 33420 | 0.000 | 0.000 | 0.000 | 0.968 | 1.471 | 2.049 |
| 2010 | 44320 | 57370 | 75021 | 42340 | 54180 | 70170 | 0.144 | 0.186 | 0.239 | 2.067 | 3.110 | 4.331 |
| 2011 | 81570 | 113900 | 161203 | 74990 | 104200 | 146200 | 0.099 | 0.139 | 0.193 | 3.843 | 5.918 | 8.903 |
| 2012 | 19010 | 29280 | 45400 | 46310 | 68180 | 99841 | NA | NA | NA | 2.475 | 3.865 | 6.041 |

ECOREGION Bay of Biscay and Atlantic Iberian waters
STOCK Anchovy in Division IXa

Advice for 2013

ICES cannot give catch advice for 2013. This is due to the lack of available data on year classes that constitute the bulk of the biomass and catches. ICES notes, however, that the historic fisheries and management measures seem to have been sustainable.

Stock status

| | |
|-------------------------------------|---|
| F (Fishing Mortality) | |
| Qualitative evaluation | 2009-2011 ? Insufficient information |
| SSB (Spawning Stock Biomass) | |
| Qualitative evaluation | 2009-2011 North ↗ North: 10 fold increase South → South: Variable without trend |

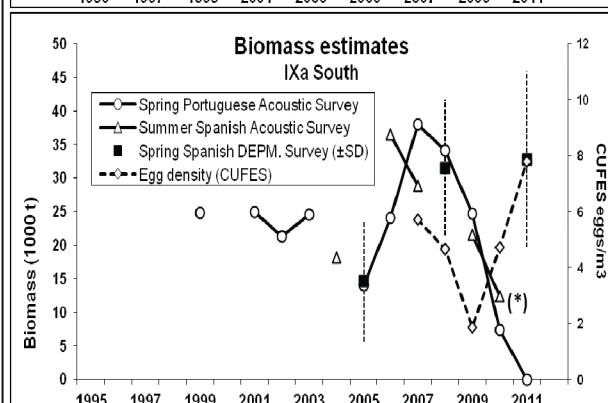
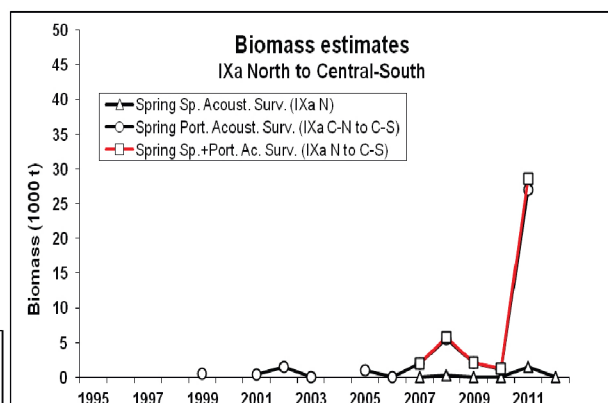
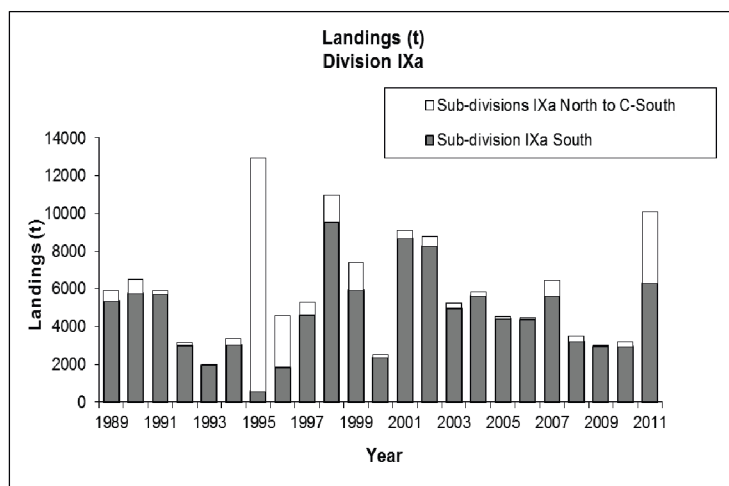


Figure 7.4.9.1 Anchovy in Division IXa. Left: landings (t). Right: survey biomass estimates; Top –Subdivision IXa North and Central (north-western area). Below – IXa South, where (*) denotes a partial estimate in 2010 for only the Spanish part of the Subdivision IXa South during the Spanish survey. The figure includes anchovy egg densities sampled by CUFES in the last Portuguese surveys PELAGO, which contradicts the null detection of anchovy in 2011 by this survey.

Survey results demonstrate independent dynamics of the anchovy in the north-western part of Division IXa from the dynamics of the stock in Division IXa South. For anchovy in Division IXa South (where the main part of the catch is taken), survey biomass indices show no clear long term trends and fishery seems to have been sustainable over the period. For anchovy in the north-western area the biomass index shows a more than ten-fold increase, with an acoustic estimate of 29 000 t in 2011. The situation in 2012 is unknown as no survey index was available.

Management plans

No specific management objectives are known to ICES.

Biology

Anchovy is a short-lived species, with the fishable population consisting primarily of one-year-old fish. The anchovy stock in Division IXa South appears to be well established and relatively independent of stocks in more northern parts of Division IXa. The stock in Subdivision IXa North and Central seem to be abundant sporadically only when suitable environmental conditions occur. Recent studies on genetics indicate that the stock inhabiting the Subdivision IXa South (Algarve and Cadiz) is different genetically from the one inhabiting remaining Subdivisions of IXa.

Environmental influence on the stock

The recruitment depends strongly on environmental factors. Anchovy is a prey species for other pelagic and demersal species, and for cetaceans and birds.

The 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 north-western part of Division IXa, which target sardine, occasionally target anchovy when abundant, as occurred in 1995.

| | |
|-----------------------|---|
| Catch by fleet | Total catch (2011) = 10 076 t, where 100% are landings (99% purse-seiners and less than 1% other gear types). |
|-----------------------|---|

Quality considerations

No survey estimates in IXa South were available in 2012. There is insufficient information on the year classes that constitute the bulk of the biomass and catches. Therefore ICES cannot provide quantitative catch advice for 2013. Besides maintaining the current monitoring system, an abundance survey of juveniles that constitute the bulk of the spawning biomass and catch may improve the quality of the assessment and advice.

Scientific basis

| | |
|-----------------------------|--|
| Assessment type | Trends-based assessment. |
| Input data | Three acoustic surveys: spring <i>PELACUS</i> (IXa North); spring <i>SAR Q2/PELAGO</i> (IXa C-North, C-South and South), and summer <i>ECOCÁDIZ</i> (IXa South), and one DEPM survey: <i>BOCADEVA</i> (IXa South), triennial. Size composition in landings and landings-at-age (Division IXa South), and species-specific standardized effort and lpue of the Spanish purse-seine fleet in the Gulf of Cádiz. |
| Discards and bycatch | Not included and assumed to be negligible. |
| Indicators | None. |
| Other information | None. |
| Working group report | WGHANSA |

ECOREGION **Bay of Biscay and Atlantic Iberian waters**
STOCK **Anchovy in Division IXa**

Reference points

No reference points have been set for the IXa South stock. The observed harvest on the southern stock has been in the range of 10–40% which has not resulted in a detrimental effect on the productivity of the stock. These harvest rates correspond to approximately 90–66% spawning biomass per recruit (SBPR). Harvest rate in 2011 of the north-western stock was around 14%.

Outlook for 2013

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

Precautionary considerations

The available information for anchovy in this area shows different trends by region:

- There is no long term stock trend for anchovy in the southern area. The historical fishery seems to have been sustainable.
- The biomass in the north-western area shows sporadic population explosions, the last one in 2011.

Concluding, historic management seems to have been sustainable, but this cannot be translated into catch advice for 2013 because of lack of available data on the year classes that will constitute the bulk of the biomass and catches.

Additional considerations

Advice for this stock has traditionally concentrated on the anchovy in Division IXa South, where the majority of the catches were taken (with the exception of 1995/1996). The perception of the anchovy in the north-western areas of Division IXa is that they are marginal populations with dynamics independent of the anchovy stock in Division IXa South. As such the advice was based solely on the information coming from the anchovy in Division IXa South (Algarve and Cádiz).

Survey results demonstrate that the dynamics of the anchovy in the northwestern part of Division IXa are independent of the dynamics of the stock in Division IXa South (for example in the period 1995/96 and in 2011). Furthermore, genetics indicates that the stocks in the southern and north-western regions are genetically differentiated. Therefore, one management advice for the anchovy in the whole of Division IXa may be inadequate, since both the fishery and the exploited populations are spatially separated and have independent dynamics. In future, ICES therefore could accordingly provide advice for the stock in Division IXa South separately from the rest of the anchovy in the division (occupying the western waters of the Iberian peninsula: Division IXa North, Central–North, and Central–South). This might imply separate management in these two regions of Division IXa.

The state of the stock in the southern area is derived from trends in survey indices, landings, effort and l_{pue} as well as age distribution from landings and surveys. The main indicators are shown in Figures 7.4.9.1–3. Commercial l_{pue} has been relatively stable in recent years; however, l_{pue} for a schooling species like anchovy is a weak indicator for stock abundance. The age group 0 constitutes a significant component of the catches. Scientific surveys do not show any clear trend in the series. The acoustic survey (PELAGO) showed a declining trend between 2007–2010 and a further decline to 0 in 2011. But this estimate in 2011 was, however, contradicted by the high CUFES egg abundance from this survey which showed an increase from past year. New indications about the state of the anchovy biomass were made available through the anchovy DEPM survey carried out in late July 2011 which pointed towards the same biomass levels as in 2008.

The state of the stock in the north-western area changed in 2011. According to the Portuguese acoustic survey in 2011 an anchovy outburst happened in the northernmost area of the region, with a biomass estimate of 29 000 t (Figure 7.4.9.1). This is the highest recorded biomass in the area, four times higher than the second highest recorded in 2008. A former outburst of biomass might also have happened in the mid-nineties, as record high catches appeared in 1995, but this cannot be confirmed from acoustic surveys. However, similar outbursts in the past have not been sustained in the following year. Length samples of the anchovy this year indicate that the outburst is due to recruitment from the area.

Data considerations

It is important that surveys are continued, both acoustic surveys and the recently initiated DEPM survey. It has not been possible to provide a reliable analytic assessment for this stock as a basis for management. A better alternative would be to consider management rules based directly on survey observations.

As this stock experiences high natural mortality and is highly dependent upon recruitment, an in-season management or alternative management measures could be considered. Such measures should, however, take into account the data limitations on that stock and the need for a reliable index of recruitment strength.

The data for the stock used for the assessment cover Subdivision IXa South (Algarve (Portuguese waters) and Gulf of Cádiz (Spanish waters)), where the main population in this division is found. However both the PELAGO Portuguese spring acoustic survey (which used to cover this area in March–April) and the ECOCÁDIZ Spanish summer survey (carried out in July) did not take place in 2012, so no recent information of the stock for the interim year 2012 is available.

The assessment needs regular updates of the Spanish acoustic survey ECOCÁDIZ (planned annually but running every 2 out of 3 years) and the DEPM BOCADEVA surveys (running every third year). At present, the Portuguese and Spanish Spring acoustic surveys (PELAGO and PELACUS04) are the only annual source of abundance indices that cover the Subdivisions IXaN, IXaCN and IXaCS, that correspond to the western component of anchovy in Division IXa.

Factors affecting the fisheries and the stock

TACs have not been restrictive to the fishery. Most of the fishery for this anchovy stock takes place in Division IXa South. The fleets in the northern part of Division IXa (targeting sardine) occasionally target anchovy when abundant, as occurred in 1995 or 2011. The anchovy stock in Division IXa South appears to be well established and relatively independent of stocks in other parts of Division IXa. These other stocks seem to be abundant only when suitable environmental conditions occur.

The effects of regulations

While the effects of both fishery closures and other regulations in the purse-seine fishery operated by Spain in Division IXa South have not been formally evaluated, it appears that they have limited a further expansion of the effort.

Comparison with previous assessment and advice

The basis for the assessment is the same as last year. Last year, the advice was based on precautionary considerations, this year the advice is based on the ICES approach for data limited stocks.

Sources

ICES. 2012. Report of the Working Group on Anchovy and Sardine (WGANSAs), 23–28 June 2012, Horta, Azores Portugal. ICES CM 2012/ACOM:16.

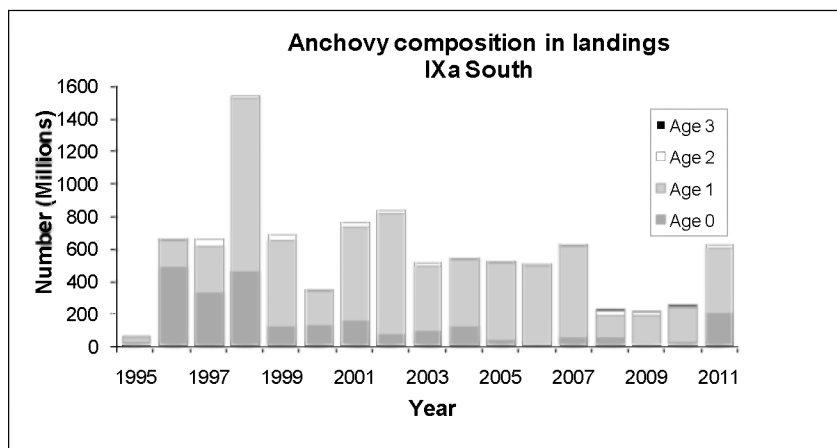


Figure 7.4.9.2 Anchovy in Division IXa. Subdivision IXa South. Age composition in landings (in numbers, millions).

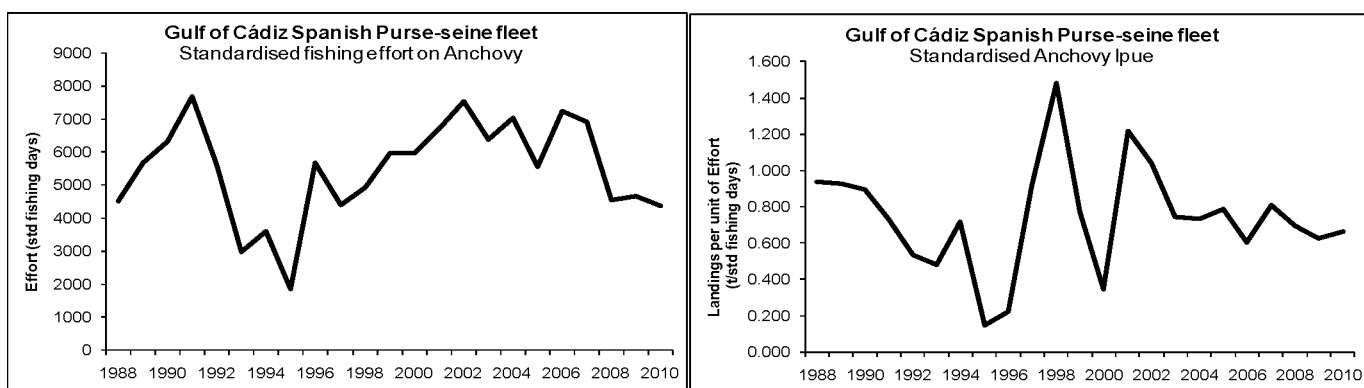


Figure 7.4.9.3 Anchovy in Division IXa. Subdivision IXa South. Anchovy specific standardized effort (fishing days) and landings per unit effort (t/fishing day) for the Gulf of Cádiz Spanish purse-seine fleet.

Table 7.4.9.1 Anchovy in Division IXa. Single stock exploitation boundaries (advice), management and landings.

| Year | ICES Advice | Predicted catch corresp. to advice | Agreed TAC ¹ | Official Catches | ICES landings |
|------|--|------------------------------------|-------------------------|------------------|---------------|
| 1987 | Not assessed | - | 4.6 | 3.9 | n/a |
| 1988 | Not assessed | - | 6 | 3.3 | 4.7 |
| 1989 | Not assessed | - | 6 | 4.4 | 6.0 |
| 1990 | Not assessed | - | 9 | 2.2 | 6.5 |
| 1991 | Not assessed | - | 9 | 3.5 | 5.9 |
| 1992 | Not assessed | - | 12 | 2.2 | 3.2 |
| 1993 | If required, precautionary TAC | - | 12 | 1.1 | 2.0 |
| 1994 | If required, precautionary TAC | - | 12 | 1.4 | 3.4 |
| 1995 | If required, precautionary TAC | - | 12 | 7.6 | 13.0 |
| 1996 | If required, precautionary TAC | - | 12 | 3.5 | 4.6 |
| 1997 | If required, TAC at pre-95 catch level | - | 12 | 4.0 | 5.3 |
| 1998 | No advice | - | 12 | 7.1 | 11.0 |
| 1999 | If required, TAC at pre-95 catch level | 4.6 | 13 | 6.1 | 7.4 |
| 2000 | Fishery less than pre-95 level and develop and implement management plan | 4.6 | 10 | 2.5 | 2.5 |
| 2001 | Average catch excl. 95 and 98 | 4.9 | 10 | 5.2 | 9.1 |
| 2002 | Average catch excl. 95 and 98 | 4.9 | 8 | 4.7 | 8.8 |
| 2003 | Average catch excl. 95, 98, and 01 | 4.7 | 8 | 5.6 | 5.3 |
| 2004 | Average catch excl. 95, 98, 01, and 02 | 4.7 | 8 | 6.0 | 5.8 |
| 2005 | Average catch excl. 95, 98, 01, and 02 | 4.7 | 8 | 4.5 | 4.5 |
| 2006 | Average catch excl. 95, 98, 01, and 02 | 4.7 | 8 | 4.0 | 4.5 |
| 2007 | Average catch 1988–2005 excl. 95, 98, 01, 02 | 4.8 | 8 | 5.4 | 6.5 |
| 2008 | Average catch 1988–2006 excl. 95, 98, 01, 02 | 4.8 | 8 | 2.9 | 3.5 |
| 2009 | Same advice as last year | 4.8 | 8 | 2.3 | 3.0 |
| 2010 | Same advice as last year | 4.8 | 8 | 3.2 | 3.2 |
| 2011 | See scenarios | - | 7.6 | 9.7 | 10.1 |
| 2012 | Reduce catches | - | 8.6 | | |
| 2013 | Historic fishery appears sustainable | - | | | |

Weights in thousand tonnes.

¹TAC for Subareas IX and X and CECAF 34.1.1.

n/a=not available.

Table 7.4.9.2

Anchovy in Division IXa. Official landings (tonnes) per country and ICES estimates of landings by subdivision.

| Year | Official landings | | | ICES landings | | | | | | | | |
|------|-------------------|-----------|-------|---------------|---------|-------|-------|-------|-------|-------|-------|-------|
| | Portugal | Spain | TOTAL | Portugal | | | | Spain | | | Total | TOTAL |
| | Total IXa | Total IXa | IXa | IXa C-N | IXa C-S | IXa S | Total | IXa N | IXa S | Total | IXa S | IXa |
| 1943 | - | - | - | 7121 | 355 | 2499 | 9975 | - | - | - | - | - |
| 1944 | - | - | - | 1220 | 55 | 5376 | 6651 | - | - | - | - | - |
| 1945 | - | - | - | 781 | 15 | 7983 | 8779 | - | - | - | - | - |
| 1946 | - | - | - | 0 | 335 | 5515 | 5850 | - | - | - | - | - |
| 1947 | - | - | - | 0 | 79 | 3313 | 3392 | - | - | - | - | - |
| 1948 | - | - | - | 0 | 75 | 4863 | 4938 | - | - | - | - | - |
| 1949 | - | - | - | 0 | 34 | 2684 | 2718 | - | - | - | - | - |
| 1950 | 4145 | 11645 | 15790 | 31 | 30 | 3316 | 3377 | - | - | - | - | - |
| 1951 | 4145 | 13784 | 17929 | 21 | 6 | 3567 | 3594 | - | - | - | - | - |
| 1952 | 3619 | 13243 | 16862 | 1537 | 1 | 2877 | 4415 | - | - | - | - | - |
| 1953 | 4656 | 17103 | 21759 | 1627 | 15 | 2710 | 4352 | - | - | - | - | - |
| 1954 | 1550 | 16959 | 18509 | 328 | 18 | 3573 | 3919 | - | - | - | - | - |
| 1955 | 5031 | 27290 | 32321 | 83 | 53 | 4387 | 4523 | - | - | - | - | - |
| 1956 | 5574 | 23699 | 29273 | 12 | 164 | 7722 | 7898 | - | - | - | - | - |
| 1957 | 7810 | 23921 | 31731 | 96 | 13 | 12501 | 12610 | - | - | - | - | - |
| 1958 | 13562 | 28807 | 42369 | 1858 | 63 | 1109 | 3030 | - | - | - | - | - |
| 1959 | 3132 | 22808 | 25940 | 12 | 1 | 3775 | 3788 | - | - | - | - | - |
| 1960 | 6815 | 32992 | 39807 | 990 | 129 | 8384 | 9503 | - | - | - | - | - |
| 1961 | 9890 | 30098 | 39988 | 1351 | 81 | 1060 | 2492 | - | - | - | - | - |
| 1962 | 3557 | 37718 | 41275 | 542 | 137 | 3767 | 4446 | - | - | - | - | - |
| 1963 | 4638 | 22493 | 27131 | 140 | 9 | 5565 | 5714 | - | - | - | - | - |
| 1964 | 5714 | 27337 | 33051 | 0 | 0 | 4118 | 4118 | - | - | - | - | - |
| 1965 | 7610 | 44581 | 52191 | 7 | 0 | 4452 | 4460 | - | - | - | - | - |
| 1966 | 4461 | 41226 | 45687 | 23 | 35 | 4402 | 4460 | - | - | - | - | - |
| 1967 | 3824 | 36754 | 40578 | 153 | 34 | 3631 | 3818 | - | - | - | - | - |
| 1968 | 1161 | 14078 | 15239 | 518 | 5 | 447 | 970 | - | - | - | - | - |
| 1969 | 1364 | 12636 | 14000 | 782 | 10 | 582 | 1375 | - | - | - | - | - |
| 1970 | 1193 | 23127 | 24320 | 323 | 0 | 839 | 1162 | - | - | - | - | - |
| 1971 | 0 | 91 | 91 | 257 | 2 | 67 | 326 | - | - | - | - | - |
| 1972 | 0 | 1563 | 1563 | - | - | - | - | - | - | - | - | - |
| 1973 | 126 | 2458 | 2584 | 6 | 0 | 120 | 126 | - | - | - | - | - |
| 1974 | 437 | 2845 | 3282 | 113 | 1 | 124 | 238 | - | - | - | - | - |
| 1975 | 372 | 3114 | 3486 | 8 | 24 | 340 | 372 | - | - | - | - | - |
| 1976 | 88 | 8703 | 8791 | 32 | 38 | 18 | 88 | - | - | - | - | - |
| 1977 | 3261 | 11306 | 14567 | 3027 | 1 | 233 | 3261 | - | - | - | - | - |
| 1978 | 1022 | 9023 | 10045 | 640 | 17 | 354 | 1011 | - | - | - | - | - |
| 1979 | 790 | 20879 | 21669 | 194 | 8 | 453 | 655 | - | - | - | - | - |
| 1980 | 994 | 994 | 1988 | 21 | 24 | 935 | 980 | - | - | - | - | - |
| 1981 | 1370 | 1370 | 2740 | 426 | 117 | 435 | 978 | - | - | - | - | - |
| 1982 | 699 | 715 | 1414 | 48 | 96 | 512 | 656 | - | - | - | - | - |
| 1983 | 1015 | 1115 | 2130 | 283 | 58 | 332 | 673 | - | - | - | - | - |
| 1984 | 461 | 463 | 924 | 214 | 94 | 84 | 392 | - | - | - | - | - |
| 1985 | 2435 | 2487 | 4922 | 1893 | 146 | 83 | 2122 | - | - | - | - | - |
| 1986 | 2152 | 3223 | 5375 | 1892 | 194 | 95 | 2181 | - | - | - | - | - |
| 1987 | 1621 | 3895 | 5516 | 84 | 17 | 11 | 112 | - | - | - | - | - |
| 1988 | 892 | 3281 | 4173 | 338 | 77 | 43 | 458 | - | 4263 | 4263 | 4306 | 4721 |
| 1989 | 824 | 4435 | 5259 | 389 | 85 | 22 | 496 | 118 | 5330 | 5448 | 5352 | 5944 |
| 1990 | 644 | 2245 | 2889 | 424 | 93 | 24 | 541 | 220 | 5726 | 5946 | 5750 | 6487 |
| 1991 | 222 | 3531 | 3753 | 187 | 3 | 20 | 210 | 15 | 5697 | 5712 | 5717 | 5922 |
| 1992 | 138 | 2213 | 2351 | 92 | 46 | 0 | 138 | 33 | 2995 | 3028 | 2995 | 3166 |
| 1993 | 28 | 1102 | 1130 | 20 | 3 | 0 | 23 | 1 | 1960 | 1961 | 1960 | 1984 |
| 1994 | 236 | 1383 | 1619 | 231 | 5 | 0 | 236 | 117 | 3035 | 3152 | 3035 | 3388 |
| 1995 | 2530 | 7576 | 10106 | 6724 | 332 | 0 | 7056 | 5329 | 571 | 5900 | 571 | 12956 |
| 1996 | 2775 | 3481 | 6256 | 2707 | 13 | 51 | 2771 | 44 | 1780 | 1824 | 1831 | 4595 |
| 1997 | 632 | 3982 | 4614 | 610 | 8 | 13 | 632 | 63 | 4600 | 4664 | 4613 | 5295 |
| 1998 | 1613 | 7104 | 8717 | 894 | 153 | 566 | 1613 | 371 | 8977 | 9349 | 9543 | 10962 |
| 1999 | 1374 | 6112 | 7486 | 957 | 96 | 355 | 1408 | 413 | 5587 | 6000 | 5942 | 7409 |
| 2000 | 265 | 2452 | 2717 | 71 | 61 | 178 | 310 | 10 | 2182 | 2191 | 2360 | 2502 |
| 2001 | 748 | 5159 | 5907 | 397 | 19 | 439 | 855 | 27 | 8216 | 8244 | 8655 | 9098 |
| 2002 | 916 | 4720 | 5636 | 433 | 90 | 393 | 915 | 21 | 7870 | 7891 | 8262 | 8806 |
| 2003 | 519 | 5627 | 6146 | 211 | 67 | 200 | 478 | 23 | 4768 | 4791 | 4968 | 5269 |
| 2004 | 663 | 5981 | 6644 | 83 | 139 | 434 | 657 | 4 | 5183 | 5187 | 5617 | 5844 |
| 2005 | 129 | 4467 | 4596 | 82 | 6 | 38 | 126 | 4 | 4385 | 4389 | 4423 | 4515 |
| 2006 | 111 | 4020 | 4131 | 79 | 15 | 14 | 108 | 15 | 4368 | 4383 | 4381 | 4491 |
| 2007 | 871 | 5411 | 6282 | 833 | 7 | 34 | 874 | 4 | 5576 | 5580 | 5610 | 6454 |
| 2008 | 335 | 2909 | 3244 | 211 | 87 | 37 | 335 | 5 | 3168 | 3173 | 3204 | 3508 |
| 2009 | 72 | 2277 | 2349 | 35 | 5 | 32 | 72 | 19 | 2922 | 2941 | 2954 | 3013 |
| 2010 | 130 | 3161 | 3291 | 100 | 2 | 28 | 130 | 179 | 2901 | 3080 | 2929 | 3210 |
| 2011 | 3318 | 6816 | 10134 | 3239 | 1 | 78 | 3318 | 541 | 6216 | 6758 | 6294 | 10076 |

(-) Not available

(0) Less than 1 tonne

ECOREGION Bay of Biscay and Western Iberian Seas
STOCK *Nephrops* in in Division VIIIab (Bay of Biscay, FUs 23–24)

Advice for 2013 and 2014

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 (see Quality considerations).

Stock status

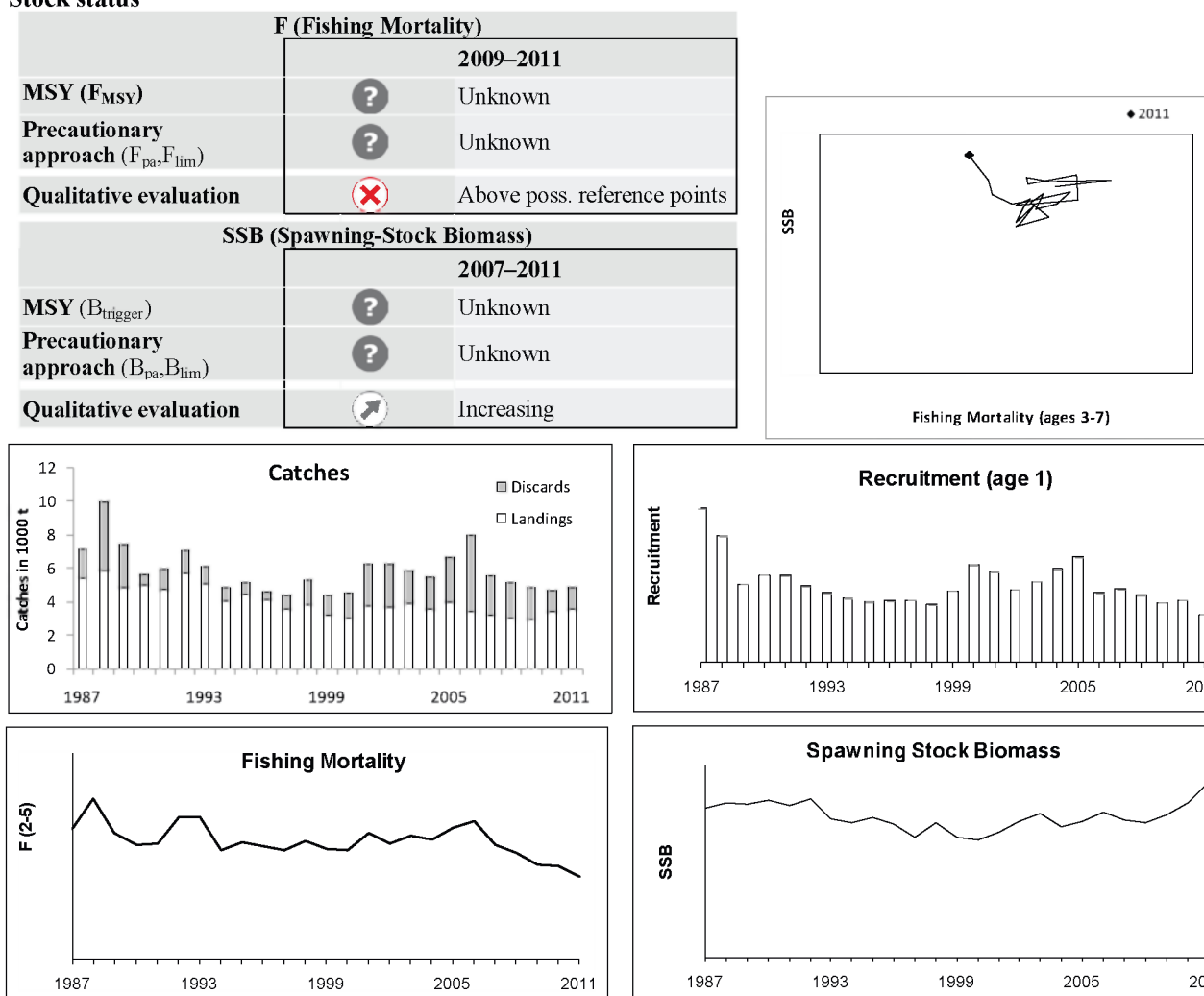


Figure 7.4.10.1 *Nephrops* in Division VIIIab (Bay of Biscay, FUs 23–24): Summary of stock assessment. Top right: SSB/F for the time-series used in the assessment.

The analytical assessment should only be considered as indicative of trends. 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 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.

Management plans

No specific management objectives are known to ICES.

Biology

Nephrops is a burrowing species and inhabits muddy sea beds on the continental shelf and upper slope. This means that the distribution of suitable sediment defines the species distribution. After reaching sexual maturity, males molt more frequently than females, consequently growing faster. Egg-bearing females stay most of the time inside their burrows, resulting in a different exploitation pattern and fishing pressure for each sex.

Environmental influence on the stock

Some coastal areas of the central muddy bank in the Bay of Biscay are periodically dredged for gravel, but there is currently no significant operation.

The fisheries

Nephrops in FUs 23–24 are almost exclusively exploited by French trawlers; the number of these has declined notably in the past fifteen years after conflicts in 1993–1994 and implementation of various decommissioning schemes. Currently a fleet of 220 vessels (*numerus clausus* licence system) of 15 m length are operating in the area, typically with a crew of three members spending an average of 193 days at sea per year.

| | |
|-----------------------|--|
| Catch by fleet | Total removals (2011) were 4.44 kt, of which 3.56 kt were landings and 1.26 kt discards (almost 100% by trawling). |
|-----------------------|--|

Effects of the fisheries on the ecosystem

Recent analysis emphasized that the intensive trawling for *Nephrops* trawls has significant impacts on the fine sedimentary configuration of the sea bottom. This can contribute to the reduction of the surface area of traditional compact mud bottom, which is gradually replaced by less muddy sediments similar to those on the outer edge of the central mud bank. This depletion may affect the carrying capacity for *Nephrops* burrows (the size of the burrows depends on the compactness of the sediment).

The trawling activities on *Nephrops* cause very high discard rate on species such as northern hake and, seasonally, blue whiting and horse mackerel.

Quality considerations

Despite the improvements in the assessment this year due to the revision of the discards series and the inclusion of the survey data, the assessment is still considered reliable to indicate trends only, mainly due to the uncertainties in the conversion from length to age.

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 the stock overfished.

Scientific basis

| | |
|-----------------------------|---|
| Assessment type | Exploratory age-based assessment (XSA). |
| Input data | LANGOLF survey (years 2006–2011) included for the first time; commercial indices (lpue from Q2 Le Guilvinec) (years 1987–2011). |
| Discards and bycatch | Included in the assessment. |
| Indicators | None. |
| Other information | None. |
| Working group report | <u>WGHMM</u> |

ECOREGION Bay of Biscay and Western Iberian Seas
STOCK *Nephrops* in in Division VIIIab (Bay of Biscay, FUs 23–24)

Reference points

No reference points are defined for this stock.

Outlook for 2013 and 2014

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.

Additional considerations

Management considerations

Although the stock seems to have been relatively stable there is an opportunity to greatly increase the long-term yield from this fishery as well as the SSB. This can be achieved by lowering the fishing mortality and improving the selection pattern. Since the present fishing mortality is likely above the fishing mortality related to high long-term yield, a goal should be set to gradually reduce fishing mortality and also to improve the selection pattern.

The license system since 2004 and the restrictions applied by the French Producers' Organisations since 2006 (no activity allowed during week-ends, individual quotas) further contributed to regulating the fishing time.

The central mud bank of the Bay of Biscay is a nursery for the northern stock of hake, which is the major bycatch species in this fishery.

Changes in fishing technology and fishing patterns

The fishing pattern implies high mortality of small *Nephrops*. The increased minimum landing size (MLS) in 2006 is not yet associated with improvements in trawl selectivity. New rules for trawling activities targeting *Nephrops* throughout Divisions VIIIa and VIIIb have been applied since 1 April 2008. All vessels catching more than 50 kg of *Nephrops* per day must use a selective device with at least one of the following: (1) a ventral panel of 60 mm square mesh; (2) a flexible grid; and (3) an 80 mm codend mesh size. It would be useful to examine the impact of the rules recently adopted concerning these selective devices to ensure that they are consistent with the recent (end 2005) increase of the MLS.

A decrease in discard rate is observed for the last two years.

Regulations and their effects

The average weight of discards per year in the period 1987–2011 is about 1790 t, whereas discards in the recent sampled years (2003–2011) were higher (2230 t, corresponding to 45–79% in number; the highest discard rate occurred in 2006 after the MLS change) even if the discarded catches were reduced in 2010 and 2011. The increase in discards in the middle of the 2000s could be due to both the strength of the recruitments and the change in the MLS.

Information from the fishery industry

Fishery representatives commented on the application of one tuning series covering the northern part of the fishery and its extrapolation to the southern part. They underlined the heterogeneous feature of the whole area of the stock and emphasized the necessity of applying additional tuning information for the southern part of the fishery. They considered as an improvement the integration of the new tuning time-series of the scientific survey LANGOLF which covers the whole stock area. The perception of the stock trends by the industry generally reflects the signals given by the data used during the recent assessments of the stock.

Data and methods

Probabilistic estimations of discards for years with no sampling on board were included in the stock assessment. The new method was considered more reliable and the new values have replaced the previous data.

The assessment this year includes fishery-independent data for the first time (LANGOLF survey), which provides information for the southern part of the fishery.

Uncertainties in the assessment

The main source of uncertainty in the assessment is the method used to convert length to age.

The continuation of the on-board sampling programme of catches from French *Nephrops* trawlers will ensure annual data in the future.

Comparison with last year's advice

The advice for the past two years was based on the precautionary considerations. The advice this year is based on the ICES approach to data-limited stocks.

Assessment and management area

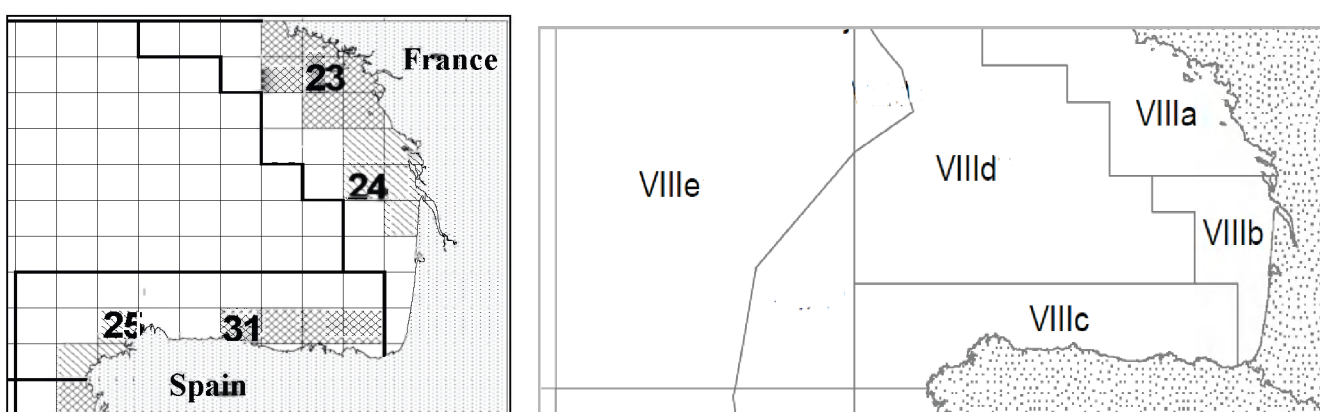


Figure 7.4.10.2 *Nephrops* in the Bay of Biscay: (left) the assessment areas for FUs 23–24, and (right) the TAC areas in Divisions VIIIabde.

Sources

ICES. 2012. Report of the Working Group on the Assessment of Southern Shelf Stocks of Hake, Monk, and Megrim (WGHMM), 10–16 May 2012, Copenhagen, Denmark, ICES CM 2012/ACOM:11.

Table 7.4.10.1 *Nephrops* in Divisions VIIIab (Bay of Biscay, FUs 23–24). ICES advice, management, and landings.

| Year | ICES advice | Recommended TAC | Agreed TAC | ICES catches | ICES landings (discards not included) |
|------|--|-----------------|------------|--------------|---------------------------------------|
| 1987 | | | | 6.6 | 5.5 |
| 1988 | | | | 8.8 | 5.9 |
| 1989 | | | | 6.7 | 5.2 |
| 1990 | | | | 5.4 | 5.1 |
| 1991 | | | | 5.6 | 4.8 |
| 1992 | | ~6.8 | 6.8 | 6.6 | 5.7 |
| 1993 | | 6.8 | 6.8 | 5.8 | 5.2 |
| 1994 | | 6.8 | 6.8 | 4.6 | 4.1 |
| 1995 | | 6.8 | 6.8 | 4.9 | 4.5 |
| 1996 | | 6.8 | 6.8 | 4.5 | 4.1 |
| 1997 | | 6.8 | 6.8 | 4.2 | 3.6 |
| 1998 | | 4.2 | 5.5 | 4.9 | 3.3 |
| 1999 | | 4.2 | 5.5 | 4.0 | 3.2 |
| 2000 | | 4.2 | 4.44 | 4.1 | 3.1 |
| 2001 | | 4.2 | 4.0 | 5.5 | 3.8 |
| 2002 | 40% reduction of current exploitation rate | 2.0 | 3.2 | 5.5 | 3.7 |
| 2003 | 50% reduction of current exploitation rate | 2.2 | 3.0 | 5.3 | 3.8 |
| 2004 | 20% reduction of current exploitation rate | 3.3 | 3.15 | 4.9 | 3.3 |
| 2005 | 20% reduction of current exploitation rate | 3.1 | 3.1 | 5.9 | 3.7 |
| 2006 | Maintain recent catch | 3.5 | 4.0 | 6.6 | 3.4 |
| 2007 | Maintain recent catch | 3.6 | 4.32 | 4.9 | 3.2 |
| 2008 | Maintain recent catch | 3.6 | 4.32 | 4.5 | 3.0 |
| 2009 | Maintain recent catch (average 2005–2007) | 3.4 | 4.1 | 4.3 | 3.0 |
| 2010 | No new advice, same as for 2009 | 3.4 | 3.9 | 4.3 | 3.4 |
| 2011 | See scenarios | | 3.9 | 4.4 | 3.6 |
| 2012 | Reduce catch | | 3.9 | | |
| 2013 | Decrease landings by 5% (19% increase, followed by 20% PA reduction) | 3.2 | | | |
| 2014 | Same landings advice as in 2013 | 3.2 | | | |

Weights in thousand tonnes.

Table 7.4.10.2 *Nephrops* in Divisions VIIIab (Bay of Biscay, FUs 23–24). Estimates of the catches (t) by FU.

| Year | FU 23–24 ² VIIIa,b | FU 23 VIIIa | Landings ¹ | | Total VIIIa,b used by WG | Total Discards | | Catches Total VIIIa,b |
|------|----------------------------------|----------------|-----------------------|---------------------------------|-----------------------------|---------------------|---|-----------------------------|
| | | | FU 24 VIIIb | Unallocated (MA N) ³ | | FU 23–24 VIIIa,b | | |
| 1960 | 3524 | - | - | - | 3524 | - | - | 3524 |
| 1961 | 3607 | - | - | - | 3607 | - | - | 3607 |
| 1962 | 3042 | - | - | - | 3042 | - | - | 3042 |
| 1963 | 4040 | - | - | - | 4040 | - | - | 4040 |
| 1964 | 4596 | - | - | - | 4596 | - | - | 4596 |
| 1965 | 3441 | - | - | - | 3441 | - | - | 3441 |
| 1966 | 3857 | - | - | - | 3857 | - | - | 3857 |
| 1967 | 3245 | - | - | - | 3245 | - | - | 3245 |
| 1968 | 3859 | - | - | - | 3859 | - | - | 3859 |
| 1969 | 4810 | - | - | - | 4810 | - | - | 4810 |
| 1970 | 5454 | - | - | - | 5454 | - | - | 5454 |
| 1971 | 3990 | - | - | - | 3990 | - | - | 3990 |
| 1972 | 5525 | - | - | - | 5525 | - | - | 5525 |
| 1973 | 7040 | - | - | - | 7040 | - | - | 7040 |
| 1974 | 7100 | - | - | - | 7100 | - | - | 7100 |
| 1975 | - | 6460 | 322 | - | 6782 | - | - | 6782 |
| 1976 | - | 6012 | 300 | - | 6312 | - | - | 6312 |
| 1977 | - | 5069 | 222 | - | 5291 | - | - | 5291 |
| 1978 | - | 4554 | 162 | - | 4716 | - | - | 4716 |
| 1979 | - | 4758 | 36 | - | 4794 | - | - | 4794 |
| 1980 | - | 6036 | 71 | - | 6107 | - | - | 6107 |
| 1981 | - | 5908 | 182 | - | 6090 | - | - | 6090 |
| 1982 | - | 4392 | 298 | - | 4690 | - | - | 4690 |
| 1983 | - | 5566 | 342 | - | 5908 | - | - | 5908 |
| 1984 | - | 4485 | 198 | - | 4683 | - | - | 4683 |
| 1985 | - | 4281 | 312 | - | 4593 | - | - | 4593 |
| 1986 | - | 3968 | 367 | 99 | 4335 | - | - | 4335 |
| 1987 | - | 4937 | 460 | 64 | 5397 | 1767 | * | 7164 |
| 1988 | - | 5281 | 594 | 69 | 5875 | 4138 | - | 10013 |
| 1989 | - | 4253 | 582 | 77 | 4835 | 3007 | - | 7842 |
| 1990 | 1 | 4613 | 359 | 87 | 4972 | 644 | - | 5616 |
| 1991 | 1 | 4353 | 401 | 55 | 4754 | 1213 | * | 5967 |
| 1992 | 0 | 5123 | 558 | 47 | 5681 | 1217 | - | 6897 |
| 1993 | 0 | 4577 | 532 | 49 | 5109 | 974 | - | 6084 |
| 1994 | 0 | 3721 | 371 | 27 | 4092 | 717 | - | 4809 |
| 1995 | 0 | 4073 | 380 | 14 | 4452 | 687 | - | 5139 |
| 1996 | 0 | 4034 | 84 | 15 | 4118 | 487 | - | 4606 |
| 1997 | 2 | 3450 | 147 | 41 | 3610 | 914 | - | 4523 |
| 1998 | 2 | 3565 | 300 | 40 | 3865 | 1453 | * | 5318 |
| 1999 | 2 | 2873 | 337 | 26 | 3209 | 1092 | - | 4301 |
| 2000 | 0 | 2848 | 221 | 36 | 3069 | 1337 | - | 4406 |
| 2001 | 1 | 3421 | 309 | 22 | 3730 | 2628 | - | 6358 |
| 2002 | 2 | 3323 | 356 | 36 | 3679 | 2535 | - | 6214 |
| 2003 | 1 | 3564 | 322 | 49 | 3886 | 1977 | * | 5863 |
| 2004 | na | 3223 | 348 | 5 | 3571 | 1932 | * | 5503 |
| 2005 | na | 3619 | 372 | na | 3991 | 2698 | * | 6689 |
| 2006 | na | 3026 | 420 | na | 3447 | 4544 | * | 7990 |
| 2007 | na | 2881 | 292 | na | 3176 | 2411 | * | 5587 |
| 2008 | na | 2774 | 256 | na | 3030 | 2123 | * | 5154 |
| 2009 | na | 2816 | 212 | na | 2987 | 1833 | * | 4820 |
| 2010 | na | 3153 | 245 | na | 3398 | 1275 | * | 4673 |
| 2011 | na | 3240 | 319 | na | 3559 | 1263 | * | 4822 |

(1) WG estimates.

(2) Landings from Divisions VIIIa and VIIIb aggregated until 1974.

(3) Outside FUs 23–24.

* Discards sampled on board.

Table 7.4.10.3 *Nephrops* in Divisions VIIIab (Bay of Biscay, FUs 23–24). Standardize to mean 1987–2011 SSB.

| Year | SSB/ SSB mean (1987-2011) |
|------|------------------------------|
| 1987 | 1.060 |
| 1988 | 1.092 |
| 1989 | 1.090 |
| 1990 | 1.111 |
| 1991 | 1.075 |
| 1992 | 1.124 |
| 1993 | 0.986 |
| 1994 | 0.956 |
| 1995 | 0.994 |
| 1996 | 0.942 |
| 1997 | 0.854 |
| 1998 | 0.952 |
| 1999 | 0.851 |
| 2000 | 0.834 |
| 2001 | 0.885 |
| 2002 | 0.967 |
| 2003 | 1.021 |
| 2004 | 0.928 |
| 2005 | 0.963 |
| 2006 | 1.031 |
| 2007 | 0.978 |
| 2008 | 0.959 |
| 2009 | 1.010 |
| 2010 | 1.098 |
| 2011 | 1.238 |

ECOREGION Bay of Biscay and Atlantic Iberian waters
STOCK *Nephrops* in Division VIIIc (North Galicia and Cantabrian Sea, FUs 25 and 31)

Nephrops are limited to a muddy habitat. This means that the distribution of suitable sediment defines the species distribution and the stocks are therefore assessed as two separate functional units (FUs) (Figure 7.4.11.1):

| Section | FU no. | Name | ICES area | Statistical rectangles |
|----------|--------|----------------|-----------|------------------------|
| 7.4.11.1 | 25 | North Galicia | VIIIc | 15 E0–E1; 16 E1 |
| 7.4.11.2 | 31 | Cantabrian Sea | VIIIc | 16 E4–E7 |

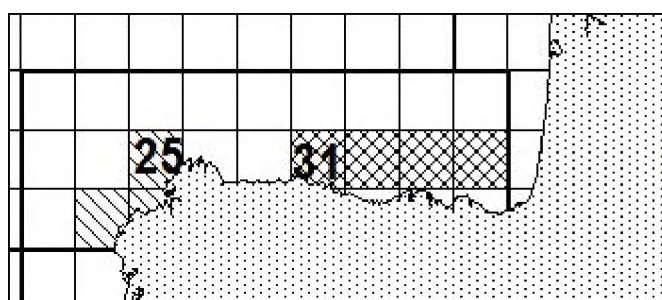


Figure 7.4.11.1 *Nephrops* functional units in Division VIIIc.

Advice for 2013 and 2014

The advice for these *Nephrops* stocks is biennial and valid for 2013 and 2014. 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 VIIIc does not provide adequate safeguards to ensure that local effort is sufficiently limited to avoid depletion of resources in functional units. In the current situation vessels are free to move between grounds, allowing effort to develop on some grounds in a largely uncontrolled way and this has historically resulted in inappropriate harvest rates from some parts.

The advice is presented by functional unit in Sections 7.4.11.1 and 7.4.11.2. A summary can be found in Table 7.4.11.1.

General considerations

Since the landings are well below the 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.

Table 7.4.11.1 *Nephrops* advice in Division VIIIc. Summary of ICES advice by functional unit.

| Year | North Galicia (FU 25) | Cantabrian Sea (FU 31) | Total advice ¹⁾ | Agreed TAC ²⁾ | ICES landings |
|------|--------------------------|---------------------------|----------------------------|-----------------------------|------------------|
| 1992 | | | 0.51 | 0.8 | 0.52 |
| 1993 | | | 0.51 | 1.0 | 0.37 |
| 1994 | | | 0.51 | 1.0 | 0.39 |
| 1995 | | | 0.51 | 1.0 | 0.37 |
| 1996 | | | 0.51 | 1.0 | 0.34 |
| 1997 | | | 0.51 | 1.0 | 0.32 |
| 1998 | | | 0.51 | 1.0 | 0.18 |
| 1999 | | | 0.51 | 1.0 | 0.17 |
| 2000 | | | 0.51 | 0.8 | 0.12 |
| 2001 | | | 0.51 | 0.72 | 0.17 |
| 2002 | 0 | 0 | 0 | 0.36 | 0.17 |
| 2003 | 0 | 0 | 0 | 0.18 | 0.11 |
| 2004 | 0 | 0 | 0 | 0.18 | 0.09 |
| 2005 | 0 | 0 | 0 | 0.16 | 0.08 |
| 2006 | 0 | 0 | 0 | 0.146 | 0.08 |
| 2007 | 0 | 0 | 0 | 0.131 | 0.09 |
| 2008 | 0 | 0 | 0 | 0.124 | 0.058 |
| 2009 | 0 | 0 | 0 | 0.112 | 0.027 |
| 2010 | 0 | 0 | 0 | 0.101 | 0.043 |
| 2011 | 0 | 0 | 0 | 0.091 | na |
| 2012 | 0 | 0 | 0 | 0.082 | |
| 2013 | 0 | 0 | 0 | | |
| 2014 | 0 | 0 | 0 | | |

Weights in thousand tonnes.

¹⁾ ICES does not advise an overall TAC for these stocks.

²⁾ For the whole of Division VIIIc.

na – not available.

Table 7.4.11.2 *Nephrops* in Division VIIIc. ICES landings by FU (tonnes).

| Year | FU 25 | FU 31 | DIVISION VIIIc |
|------|-------|-------|----------------|
| 1975 | 731 | | 731 |
| 1976 | 559 | | 559 |
| 1977 | 667 | | 667 |
| 1978 | 690 | | 690 |
| 1979 | 475 | | 475 |
| 1980 | 412 | | 412 |
| 1981 | 318 | | 318 |
| 1982 | 431 | | 431 |
| 1983 | 433 | 63 | 496 |
| 1984 | 515 | 100 | 615 |
| 1985 | 477 | 128 | 605 |
| 1986 | 364 | 127 | 491 |
| 1987 | 412 | 118 | 530 |
| 1988 | 445 | 151 | 596 |
| 1989 | 376 | 177 | 553 |
| 1990 | 285 | 174 | 459 |
| 1991 | 453 | 109 | 562 |
| 1992 | 428 | 94 | 522 |
| 1993 | 274 | 101 | 375 |
| 1994 | 245 | 148 | 393 |
| 1995 | 273 | 94 | 367 |
| 1996 | 209 | 129 | 338 |
| 1997 | 219 | 98 | 317 |
| 1998 | 103 | 72 | 175 |
| 1999 | 124 | 48 | 172 |
| 2000 | 81 | 34 | 115 |
| 2001 | 147 | 27 | 174 |
| 2002 | 143 | 26 | 169 |
| 2003 | 89 | 22 | 111 |
| 2004 | 75 | 17 | 92 |
| 2005 | 63 | 14 | 77 |
| 2006 | 62 | 15 | 77 |
| 2007 | 67 | 19 | 86 |
| 2008 | 39 | 19 | 58 |
| 2009 | 21 | 6 | 27 |
| 2010 | 34 | 8 | 42 |
| 2011 | na | na | na |

na – not available.

ECOREGION Bay of Biscay and Atlantic Iberian waters
STOCK *Nephrops* in North Galicia (FU 25)

Advice for 2013 and 2014

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.

Stock status

| F (Fishing Mortality) | | |
|--|-----------|------|
| | 1975–2010 | 2011 |
| MSY (F_{MSY}) | ? | ? |
| Precautionary approach (F_{pa}, F_{lim}) | ? | ? |
| Qualitative evaluation | ↘ | ? |
| SSB (Spawning-Stock Biomass) | | |
| | 1975–2010 | 2011 |
| MSY ($B_{trigger}$) | ? | ? |
| Precautionary approach (B_{pa}, B_{lim}) | ? | ? |
| Qualitative evaluation | ↘ | ↘ |

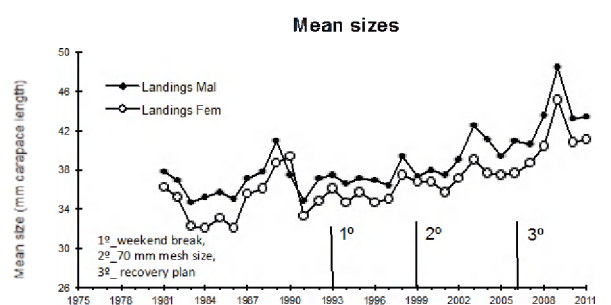
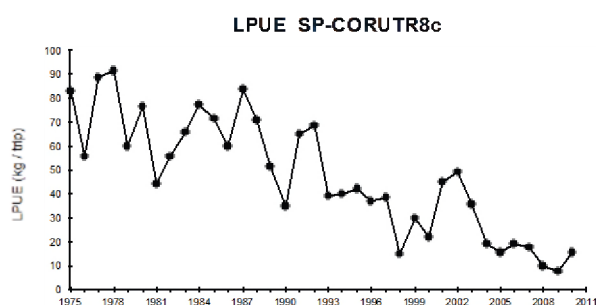
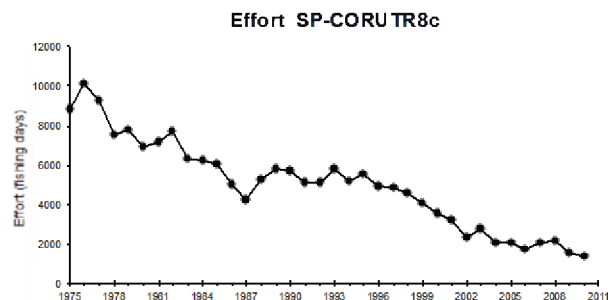
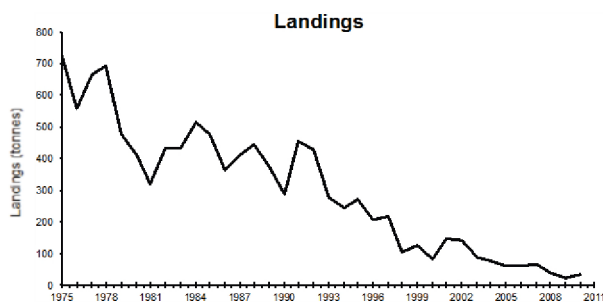


Figure 7.4.11.1.1 *Nephrops* in North Galicia (FU 25). Long-term trends in landings for FU 25, effort and lpue for main fishing fleet, and mean sizes.

No assessment has been carried out in 2012. 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 lpue 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.

Management plans

A recovery plan for southern hake and Iberian *Nephrops* was agreed by the EC in 2006 (Council Regulation (EC) [2166/2005](#)). The aim of the recovery plan is to rebuild the stocks within ten 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.

Biology

Nephrops is a burrowing species and inhabits muddy sea beds on the continental shelf and upper slope. This means that the distribution of suitable sediment defines the species distribution. After reaching sexual maturity, males molt more frequently than females, consequently growing faster. Egg-bearing females stay most of the time inside their burrows, resulting in a different exploitation pattern and fishing pressure for each sex.

Environmental influence on the stock

Nephrops distribution is more determined by ground type and sea temperature than depth. In the north Galicia, this species occurs between 90 and 600 m of depth in a patchy distribution where the substrate is suitable.

The fisheries

Nephrops are caught in the mixed bottom trawl fishery. The fishery takes place throughout the year, with the highest landings in spring and summer. *Nephrops* are taken together with hake, anglerfish, megrim, horse mackerel, mackerel, and blue whiting. Due to the mixed nature of the demersal fisheries in this area, management measures for finfish species influence the exploitation of *Nephrops*. Discarding of *Nephrops* in this fishery is considered minimal.

| | |
|-----------------------|---|
| Catch by fleet | Total catch (2010) was 34 t, where 34 t were landings (100% bottom trawl) and no discards. Data were insufficient to update this information for 2011; however, values for 2010 are still considered appropriate. |
|-----------------------|---|

Quality considerations

It was not possible to include Spanish commercial data for 2011 in the assessment. Therefore, the assessment could not be updated this year. The assessment in 2011 was conducted by using the available *Ipue* time-series.

No fishery-independent information is available for this stock.

Advice for this stock is based on *Ipue* trends derived from the mixed demersal fishery where *Nephrops* is a minor component.

Scientific basis

| | |
|-----------------------------|--|
| Assessment type | Trends-based on <i>Ipue</i> information and mean sizes in the catches. |
| Input data | One commercial index (SP-CORUTR8c). |
| Discards and bycatch | No discards in this fishery. |
| Indicators | None. |
| Other information | None. |
| Working group report | WGHMM |

ECOREGION Bay of Biscay and Western Iberian Seas
STOCK *Nephrops* in North Galicia (FU 25)

Reference points

No reference points are defined for *Nephrops* in FU 25.

Outlook for 2013 and 2014

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 considerations

Since 2006 there has been an annual reduction of fishing days by 10% in response to the recovery plan.

The advice for the past two years was based on the precautionary considerations. This year's advice is on the same basis.

Sources

- ICES. 2010. Report of the Working Group on the Assessment of Southern Shelf Stocks of Hake, Monk, and Megrin (WGHMM), 5–11 May 2010, Bilbao, Spain. ICES CM 2010/ACOM:11.
- ICES. 2011. Report of the Working Group on the Assessment of Southern Shelf Stocks of Hake, Monk, and Megrin (WGHMM), 5–11 May 2011, ICES Headquarters, Copenhagen. ICES CM 2011/ACOM:11.
- ICES. 2012. Report of the Working Group on the Assessment of Southern Shelf Stocks of Hake, Monk, and Megrin (WGHMM), 10–16 May 2012, ICES Headquarters, Copenhagen. ICES CM 2012/ACOM:11.

Table 7.4.11.1.1 *Nephrops* in North Galicia (FU 25). ICES advice, management, and landings.

| Year | ICES advice | Predicted landings correspond. to advice | Agreed TAC ¹⁾ | ICES landings |
|------|-----------------------------|--|--------------------------|---------------|
| 1987 | | | | 0.41 |
| 1988 | | | | 0.45 |
| 1989 | | | | 0.38 |
| 1990 | | | | 0.29 |
| 1991 | | | | 0.45 |
| 1992 | | 0.51 | 0.8 | 0.43 |
| 1993 | | 0.51 | 1.0 | 0.27 |
| 1994 | | 0.51 | 1.0 | 0.25 |
| 1995 | | 0.51 | 1.0 | 0.27 |
| 1996 | | 0.51 | 1.0 | 0.21 |
| 1997 | | 0.51 | 1.0 | 0.22 |
| 1998 | | 0.51 | 1.0 | 0.10 |
| 1999 | | 0.51 | 1.0 | 0.12 |
| 2000 | | 0.51 | 0.8 | 0.08 |
| 2001 | | 0.51 | 0.72 | 0.15 |
| 2002 | Reduce catches to zero | 0 | 0.36 | 0.14 |
| 2003 | Reduce catches to zero | 0 | 0.18 | 0.09 |
| 2004 | Reduce catches to zero | 0 | 0.18 | 0.08 |
| 2005 | Reduce catches to zero | 0 | 0.16 | 0.063 |
| 2006 | Reduce catches to zero | 0 | 0.146 | 0.062 |
| 2007 | Reduce catches to zero | 0 | 0.131 | 0.067 |
| 2008 | Reduce catches to zero | 0 | 0.124 | 0.039 |
| 2009 | Reduce catches to zero | 0 | 0.112 | 0.021 |
| 2010 | No new advice, same as 2009 | 0 | 0.101 | 0.034 |
| 2011 | Reduce catches to zero | 0 | 0.091 | na |
| 2012 | No new advice, same as 2011 | 0 | 0.082 | |
| 2013 | Reduce catch to zero | 0 | | |
| 2014 | No new advice, same as 2013 | 0 | | |

Weights in thousand tonnes.

¹⁾ For the whole of Division VIIIc.

na – not available.

Table 7.4.11.1.2 *Nephrops* in North Galicia (FU 25). Total landings in FU 25 (tonnes) (only exploited by the Spanish fleet).

| Year | Trawl |
|------|-------|
| 1975 | 731 |
| 1976 | 559 |
| 1977 | 667 |
| 1978 | 690 |
| 1979 | 475 |
| 1980 | 412 |
| 1981 | 318 |
| 1982 | 431 |
| 1983 | 433 |
| 1984 | 515 |
| 1985 | 477 |
| 1986 | 364 |
| 1987 | 412 |
| 1988 | 445 |
| 1989 | 376 |
| 1990 | 285 |
| 1991 | 453 |
| 1992 | 428 |
| 1993 | 274 |
| 1994 | 245 |
| 1995 | 273 |
| 1996 | 209 |
| 1997 | 219 |
| 1998 | 103 |
| 1999 | 124 |
| 2000 | 81 |
| 2001 | 147 |
| 2002 | 143 |
| 2003 | 89 |
| 2004 | 75 |
| 2005 | 63 |
| 2006 | 62 |
| 2007 | 67 |
| 2008 | 39 |
| 2009 | 21 |
| 2010 | 34 |
| 2011 | na |

na – not available.

Table 7.4.11.1.3 *Nephrops* in North Galicia (FU 25). Landings for FU 25, effort of La Coruña fleet, lpue of La Coruña fleet, and mean sizes.

| | Landings (tonnes) | SPCORUÑA-8c Effort (Trips) | LPUE SPCORUÑA-8c Effort (Kg/Trips) | Mean sizes in landings (mm CL) | |
|------|----------------------|-------------------------------|--|--------------------------------|---------|
| | | | | Males | Females |
| 1975 | 731 | 8823 | 82.8 | | |
| 1976 | 559 | 10159 | 56.1 | | |
| 1977 | 667 | 9232 | 88.4 | | |
| 1978 | 690 | 7561 | 91.3 | | |
| 1979 | 475 | 7766 | 60.2 | | |
| 1980 | 412 | 6942 | 76.4 | | |
| 1981 | 318 | 7147 | 44.5 | 37.8 | 36.3 |
| 1982 | 431 | 7698 | 56.0 | 36.9 | 35.2 |
| 1983 | 433 | 6343 | 65.8 | 34.7 | 32.2 |
| 1984 | 515 | 6260 | 77.4 | 35.2 | 32.0 |
| 1985 | 477 | 6015 | 71.7 | 35.8 | 33.1 |
| 1986 | 364 | 5017 | 60.1 | 35.1 | 32.1 |
| 1987 | 412 | 4266 | 83.5 | 37.2 | 35.6 |
| 1988 | 445 | 5246 | 70.7 | 37.9 | 36.0 |
| 1989 | 376 | 5753 | 51.7 | 40.9 | 38.7 |
| 1990 | 285 | 5710 | 34.9 | 37.5 | 39.4 |
| 1991 | 453 | 5135 | 65.1 | 34.8 | 33.3 |
| 1992 | 428 | 5127 | 68.5 | 37.1 | 34.9 |
| 1993 | 274 | 5829 | 39.2 | 37.4 | 36.0 |
| 1994 | 245 | 5216 | 39.6 | 36.6 | 34.7 |
| 1995 | 273 | 5538 | 42.0 | 37.1 | 35.8 |
| 1996 | 209 | 4911 | 37.0 | 37.0 | 34.7 |
| 1997 | 219 | 4858 | 38.5 | 36.5 | 35.1 |
| 1998 | 103 | 4560 | 14.7 | 39.4 | 37.5 |
| 1999 | 124 | 4023 | 30.2 | 37.3 | 36.8 |
| 2000 | 81 | 3547 | 21.7 | 38.0 | 36.7 |
| 2001 | 147 | 3239 | 44.8 | 37.4 | 35.8 |
| 2002 | 143 | 2333 | 49.5 | 39.0 | 37.1 |
| 2003 | 89 | 2804 | 35.9 | 42.5 | 39.1 |
| 2004 | 75 | 2091 | 18.9 | 41.1 | 37.7 |
| 2005 | 63 | 2063 | 15.5 | 39.4 | 37.4 |
| 2006 | 62 | 1699 | 19.4 | 41.0 | 37.7 |
| 2007 | 67 | 2075 | 17.8 | 40.6 | 38.7 |
| 2008 | 39 | 2128 | 9.9 | 43.7 | 40.4 |
| 2009 | 21 | 1552 | 7.3 | 48.5 | 45.1 |
| 2010 | 34 | 1386 | 15.6 | 43.2 | 40.8 |
| 2011 | na | na | na | 43.4 | 41.1 |

na - not available

ECOREGION Bay of Biscay and Atlantic Iberian waters
STOCK *Nephrops* in the Cantabrian Sea (FU 31)

Advice for 2013 and 2014

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.

Stock status

| | | F (Fishing Mortality) | |
|---|---|------------------------------|---------------|
| | | 1982–2010 | 2011 |
| MSY (F_{MSY}) | ? | ? | Not available |
| Precautionary approach (F_{pa}, F_{lim}) | ? | ? | Not available |
| Qualitative evaluation | ↘ | ? | Not available |
| | | SSB (Spawning-Stock Biomass) | |
| | | 1982–2010 | 2011 |
| MSY ($B_{trigger}$) | ? | ? | Not available |
| Precautionary approach (B_{pa}, B_{lim}) | ? | ? | Not available |
| Qualitative evaluation | ↘ | ↘ | Decreasing |

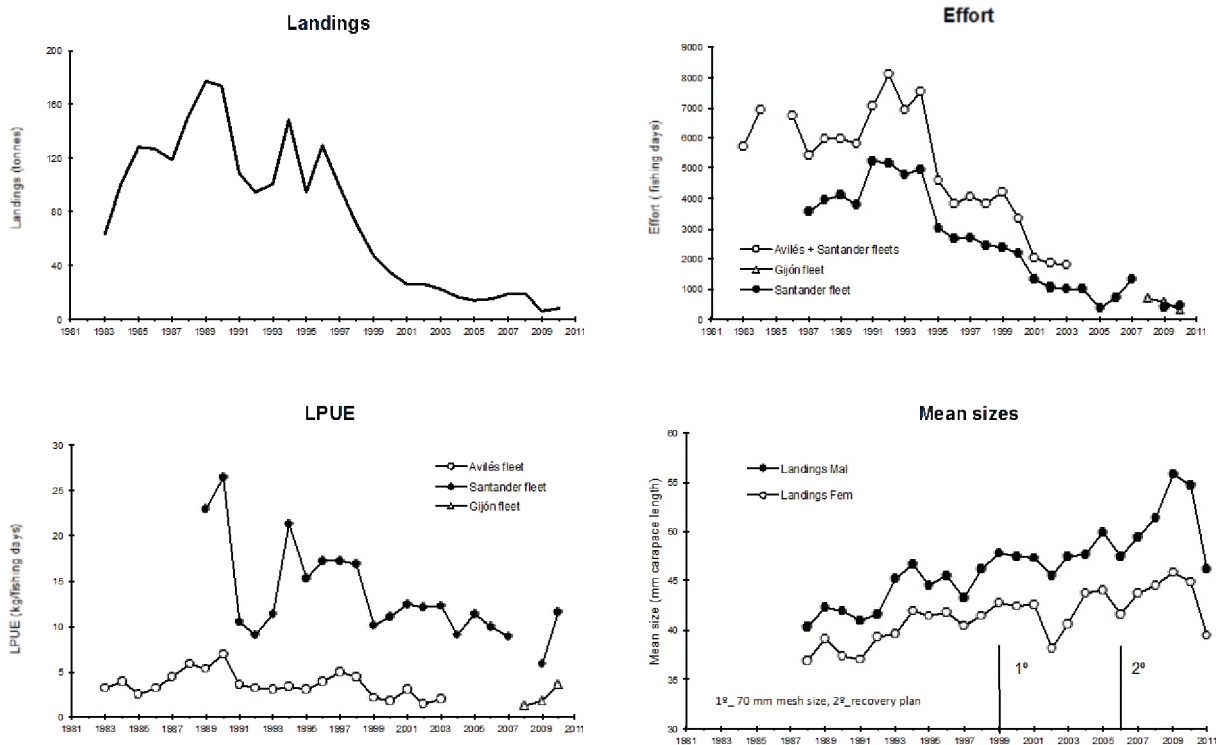


Figure 7.4.11.2.1 *Nephrops* in the Cantabrian Sea (FU 31): Long-term trends in landings (in tonnes), effort, lpue, and mean sizes in landings (mm of carapace length).

No assessment has been carried out in 2012. The stock status is based on the time-series of available data. All information indicates that the stock size is at a very low level. Landings and lpue have fluctuated in a continuous downward trend and are currently very low. Mean sizes in the landings have shown a continuous increasing trend over the time-series (although a sharp decrease is observed in 2011), which may reflect poor recruitment.

Management plans

A recovery plan for southern hake and Iberian *Nephrops* was agreed by the EC in 2006 (Council Regulation (EC) [2166/2005](#)). The aim of the recovery plan is to rebuild the stocks within ten 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.

Biology

Nephrops is a burrowing species and inhabits muddy sea beds on the continental shelf and upper slope. This means that the distribution of suitable sediment defines the species distribution. After reaching sexual maturity, males molt more frequently than females, consequently growing faster. Egg-bearing females stay most of the time inside their burrows, resulting in a different exploitation pattern and fishing pressure for each sex.

Environmental influence on the stock

Nephrops distribution is more determined by ground type and sea temperature than depth. In the Cantabrian Sea, this species occurs between 90 and 600 m of depth in a patchy distribution where the substrate is suitable.

The fisheries

Nephrops are caught in the mixed bottom trawl fishery. The fishery takes place throughout the year, with the highest landings in spring and summer. *Nephrops* are taken together with hake, anglerfish, megrim, horse mackerel, mackerel, and blue whiting. Due to the mixed nature of the demersal fisheries in this area, management measures for finfish species influence the exploitation of *Nephrops*. Discarding of *Nephrops* in this fishery is considered minimal.

| | |
|-----------------------|---|
| Catch by fleet | Total catch (2010) was 8 t, where 8 t were landings (100% bottom trawl) and no discards. Data were insufficient to update this information for 2011; however, values for 2010 are still considered appropriate. |
|-----------------------|---|

Quality considerations

It was not possible to include Spanish commercial data for 2011 in the assessment. Therefore, the assessment could not be updated this year. The assessment in 2011 was conducted using the available *Ipue* time-series.

No fishery-independent information is available for this stock. Advice for this stock is based on *Ipue* trends derived for the mixed demersal fishery where *Nephrops* is a minor component.

Scientific basis

| | |
|-----------------------------|---|
| Assessment type | Trends-based on <i>Ipue</i> information and mean sizes in the landings. |
| Input data | Three commercial indices (SP-AVILESTR, Santander trawl fleet, Gijon trawl fleet). |
| Discards and bycatch | No discards in this fishery. |
| Indicators | None. |
| Other information | None. |
| Working group report | WGHMM |

ECOREGION Bay of Biscay and Western Iberian Seas
STOCK *Nephrops* in the Cantabrian Sea (FU 31)

Reference points

No reference points are defined for *Nephrops* in FU 31.

Outlook for 2013 and 2014

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 FU 25 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 considerations

Since 2006 there has been an annual reduction of fishing days by 10% in response to the recovery plan.

The advice for the past two years was based on the precautionary considerations. This year's advice is on the same basis.

Sources

- ICES. 2011. Report of the Working Group on the Assessment of Southern Shelf Stocks of Hake, Monk, and Megrim (WGHMM), 5–11 May 2011, ICES Headquarters, Copenhagen. ICES CM 2011/ACOM:11.
- ICES. 2012. Report of the Working Group on the Assessment of Southern Shelf Stocks of Hake, Monk, and Megrim (WGHMM), 10–16 May 2012, ICES Headquarters, Copenhagen. ICES CM 2012/ACOM:11.

Table 7.4.11.2.1 *Nephrops* in the Cantabrian Sea (FU 31). ICES advice, management, and landings.

| Year | ICES advice | Predicted landings correspond. to advice | Agreed TAC ¹⁾ | ICES landings |
|------|-----------------------------|--|--------------------------|---------------|
| 1987 | | | | 0.118 |
| 1988 | | | | 0.151 |
| 1989 | | | | 0.177 |
| 1990 | | | | 0.174 |
| 1991 | | | | 0.109 |
| 1992 | | 0.51 | 0.8 | 0.094 |
| 1993 | | 0.51 | 1.0 | 0.101 |
| 1994 | | 0.51 | 1.0 | 0.148 |
| 1995 | | 0.51 | 1.0 | 0.094 |
| 1996 | | 0.51 | 1.0 | 0.129 |
| 1997 | | 0.51 | 1.0 | 0.098 |
| 1998 | | 0.51 | 1.0 | 0.072 |
| 1999 | | 0.51 | 1.0 | 0.048 |
| 2000 | | 0.51 | 0.8 | 0.034 |
| 2001 | | 0.51 | 0.72 | 0.027 |
| 2002 | Reduce catches to zero | 0 | 0.36 | 0.026 |
| 2003 | Reduce catches to zero | 0 | 0.18 | 0.022 |
| 2004 | Reduce catches to zero | 0 | 0.18 | 0.017 |
| 2005 | Reduce catches to zero | 0 | 0.16 | 0.014 |
| 2006 | Reduce catches to zero | 0 | 0.146 | 0.015 |
| 2007 | Reduce catches to zero | 0 | 0.131 | 0.019 |
| 2008 | Reduce catches to zero | 0 | 0.124 | 0.019 |
| 2009 | Reduce catches to zero | 0 | 0.112 | 0.006 |
| 2010 | No new advice, same as 2009 | 0 | 0.101 | 0.008 |
| 2011 | Reduce catches to zero | 0 | 0.091 | na |
| 2012 | No new advice, same as 2011 | 0 | 0.082 | |
| 2013 | Reduce catches to zero | 0 | | |
| 2014 | No new advice, same as 2013 | 0 | | |

Weights in thousand tonnes.

¹⁾ For the whole of Division VIIIc.

na – not available.

Table 7.4.11.2.2 *Nephrops* in the Cantabrian Sea (FU 31). Total landings per fleet (tonnes) (only exploited by the Spanish fleet).

| Year | Trawl | Creel | Total |
|------|-------|-------|-------|
| 1983 | 63 | | 63 |
| 1984 | 100 | | 100 |
| 1985 | 128 | | 128 |
| 1986 | 127 | | 127 |
| 1987 | 118 | | 118 |
| 1988 | 151 | | 151 |
| 1989 | 177 | | 177 |
| 1990 | 174 | | 174 |
| 1991 | 105 | 4 | 109 |
| 1992 | 92 | 2 | 94 |
| 1993 | 95 | 6 | 101 |
| 1994 | 146 | 2 | 148 |
| 1995 | 90 | 4 | 94 |
| 1996 | 120 | 9 | 129 |
| 1997 | 97 | 1 | 98 |
| 1998 | 69 | 3 | 72 |
| 1999 | 46 | 2 | 48 |
| 2000 | 33 | 1 | 34 |
| 2001 | 26 | 1 | 27 |
| 2002 | 25 | 1 | 26 |
| 2003 | 21 | 1 | 22 |
| 2004 | 17 | 0 | 17 |
| 2005 | 14 | 0 | 14 |
| 2006 | 15 | 0 | 15 |
| 2007 | 19 | 0 | 19 |
| 2008 | 19 | 0 | 19 |
| 2009 | 6 | 0 | 6 |
| 2010 | 8 | 0 | 9 |
| 2011 | na | na | na |

Table 7.4.11.2.3 *Nephrops* in the Cantabrian Sea (FU 31). Landings, effort, lpue, and mean sizes.

| | Landings (tonnes) | Effort | | | LPUE | | | Mean size in landings (mm CL) | |
|------|----------------------|------------------------------------|-----------------------------|-------------------------|-----------------------------|--------------------------------|----------------------------|-------------------------------|---------|
| | | Avilés+Santander (fishing days) | Santander (Fishing days) | Gijón (Fishing days) | Avilés (Kg/fishing days) | Santander (Kg/fishing days) | Gijón (Kg/fishing days) | Males | Females |
| 1983 | 63 | 5696 | | | 3.1 | | | | |
| 1984 | 100 | 6922 | | | 3.9 | | | | |
| 1985 | 128 | | | | 2.4 | | | | |
| 1986 | 127 | 6715 | | | 3.1 | | | | |
| 1987 | 118 | 5457 | 3588 | | 4.5 | | | | |
| 1988 | 151 | 5997 | 3920 | | 5.9 | | | 40.3 | 36.9 |
| 1989 | 177 | 5963 | 4128 | | 5.3 | 22.9 | | 42.3 | 39.2 |
| 1990 | 174 | 5808 | 3795 | | 6.9 | 26.5 | | 42.0 | 37.4 |
| 1991 | 109 | 7045 | 5250 | | 3.6 | 10.5 | | 40.9 | 37.1 |
| 1992 | 94 | 8110 | 5190 | | 3.2 | 9.0 | | 41.6 | 39.3 |
| 1993 | 101 | 6948 | 4800 | | 3.0 | 11.4 | | 45.2 | 39.6 |
| 1994 | 148 | 7505 | 4960 | | 3.4 | 21.3 | | 46.6 | 42.0 |
| 1995 | 94 | 4608 | 3060 | | 3.0 | 15.2 | | 44.6 | 41.5 |
| 1996 | 129 | 3809 | 2640 | | 3.8 | 17.1 | | 45.6 | 41.8 |
| 1997 | 98 | 4049 | 2735 | | 5.0 | 17.2 | | 43.2 | 40.5 |
| 1998 | 72 | 3845 | 2444 | | 4.5 | 16.8 | | 46.2 | 41.5 |
| 1999 | 48 | 4232 | 2376 | | 2.1 | 10.2 | | 47.8 | 42.7 |
| 2000 | 34 | 3367 | 2168 | | 1.8 | 11.0 | | 47.5 | 42.4 |
| 2001 | 26 | 2031 | 1312 | | 2.9 | 12.4 | | 47.3 | 42.6 |
| 2002 | 26 | 1871 | 1052 | | 1.3 | 12.1 | | 45.6 | 38.1 |
| 2003 | 22 | 1787 | 1016 | | 2.0 | 12.2 | | 47.5 | 40.6 |
| 2004 | 17 | na | 1004 | | na | 9.1 | | 47.6 | 43.7 |
| 2005 | 14 | na | 364 | | na | 11.3 | | 49.9 | 44.1 |
| 2006 | 15 | na | 734 | | na | 10.0 | | 47.5 | 41.6 |
| 2007 | 19 | na | 1304 | | na | 8.8 | | 49.4 | 43.7 |
| 2008 | 19 | na | na | 688 | na | na | 1.2 | 51.3 | 44.6 |
| 2009 | 6 | na | 393 | 580 | na | 5.8 | 1.8 | 55.8 | 45.9 |
| 2010 | 9 | na | 444 | 289 | na | 11.6 | 3.5 | 54.6 | 44.8 |
| 2011 | na | na | na | na | na | na | na | 46.1 | 39.4 |

na- not available

ECOREGION Bay of Biscay and Atlantic Iberian waters
STOCK *Nephrops* in Division IXa

Nephrops are limited to a muddy habitat. This means that the distribution of suitable sediment defines the species distribution and the stocks are therefore assessed as five separate functional units (FUs) (Figure 7.4.12.1):

| Section | FU no. | Name | ICES area | Statistical rectangles |
|----------|--------|-------------------------------------|-----------|------------------------|
| 7.4.12.1 | 26 | West Galicia | IXa | 13–14 E0–E1 |
| | 27 | North Portugal (N of Cape Espichel) | IXa | 6–12 E0; 9–12 E1 |
| 7.4.12.2 | 28 | Southwest Portugal (Alentejo) | IXa | 3–5 E0–E1 |
| | 29 | South Portugal (Algarve) | IXa | 2 E0–E2 |
| 7.4.12.3 | 30 | Gulf of Cadiz | IXa | 2–3 E2–E3 |

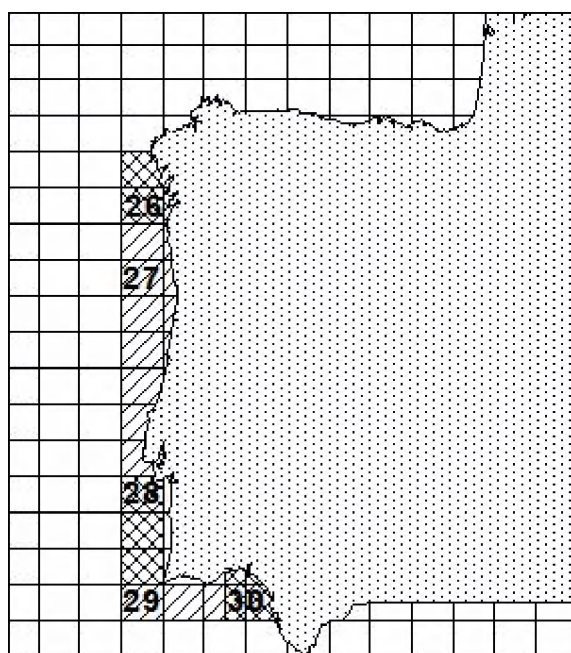


Figure 7.4.12.1 *Nephrops* functional units in ICES Division IXa.

Advice for 2013 and 2014

The 2012 advice for these *Nephrops* stocks is biennial and valid for 2013 and 2014. Management should be implemented at the functional unit level. This is presented by functional unit in Sections 7.4.12.1–7.4.12.3. A summary can be found in Table 7.4.12.1.

General considerations

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.

Source

ICES. 2012. Report of the Working Group on the Assessment of Southern Shelf Stocks of Hake, Monk, and Megrim (WGMM), 10–16 May 2012, ICES Headquarters, Copenhagen. ICES CM 2012/ACOM:11.

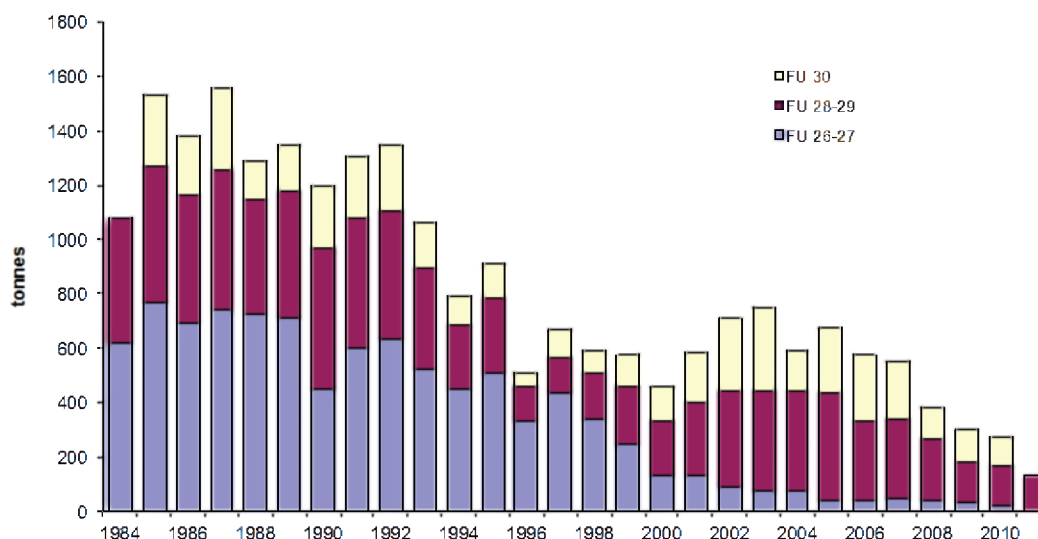


Figure 7.4.12.2 *Nephrops* in Division IXa. Total landings by functional unit (tonnes).
* In 2011, only Portuguese landings are shown. Spanish landings are not available.

Table 7.4.12.1 *Nephrops* in Division IXa. Summary of ICES advice by functional unit.

| Year | West Galicia & North Portugal (FUs 26–27) | Southwest & South Portugal (FUs 28–29) | Gulf of Cadiz (FU 30) | Agreed TAC ¹⁾ | ICES landings |
|------|---|--|-----------------------|--------------------------|---------------------|
| 2003 | 0 | 0 | 0.05 | 0.600 | 0.718 |
| 2004 | 0 | 0 | 0.05 | 0.600 | 0.650 |
| 2005 | 0 | 0 | 0.05 | 0.540 | 0.690 |
| 2006 | 0 | 0.20 | 0.05 | 0.486 | 0.539 |
| 2007 | 0 | 0.20 | 0.05 | 0.437 | 0.496 |
| 2008 | 0 | 0.20 | 0.05 | 0.415 | 0.363 |
| 2009 | 0 | 0.20 | 0.20 | 0.374 | 0.267 |
| 2010 | 0 | 0.20 | 0.20 | 0.337 | 0.250 |
| 2011 | 0 | See scenarios | See scenarios | 0.303 | 0.140 ²⁾ |
| 2012 | 0 | Reduce catch | Reduce catch | 0.273 | |
| 2013 | 0 | 0.11 | 0.09 | | |
| 2014 | 0 | 0.11 | 0.09 | | |

Weights in thousand tonnes.

¹⁾ Subareas IX and X; EU waters of CECAF 34.1.1.

²⁾ Without Spanish landings.

Table 7.4.12.2 *Nephrops* in Division IXa. Landings (tonnes) by functional unit.

| Years | FU 26-27 | FU 28-29 | FU 30 | Total |
|-------|----------|----------|-------|-------|
| 1975 | 622 | 1681 | | 2303 |
| 1976 | 603 | 1914 | | 2517 |
| 1977 | 620 | 1874 | | 2494 |
| 1978 | 575 | 2144 | | 2719 |
| 1979 | 580 | 1730 | | 2310 |
| 1980 | 599 | 1640 | | 2239 |
| 1981 | 823 | 1431 | | 2254 |
| 1982 | 736 | 1393 | | 2129 |
| 1983 | 786 | 244 | | 1030 |
| 1984 | 618 | 461 | | 1079 |
| 1985 | 765 | 509 | 257 | 1531 |
| 1986 | 694 | 465 | 221 | 1380 |
| 1987 | 742 | 509 | 302 | 1553 |
| 1988 | 727 | 420 | 139 | 1286 |
| 1989 | 708 | 469 | 174 | 1351 |
| 1990 | 449 | 524 | 220 | 1193 |
| 1991 | 603 | 478 | 226 | 1307 |
| 1992 | 636 | 470 | 243 | 1349 |
| 1993 | 522 | 377 | 160 | 1059 |
| 1994 | 448 | 237 | 108 | 793 |
| 1995 | 511 | 273 | 131 | 915 |
| 1996 | 331 | 132 | 49 | 512 |
| 1997 | 433 | 136 | 97 | 666 |
| 1998 | 345 | 161 | 85 | 591 |
| 1999 | 248 | 211 | 120 | 578 |
| 2000 | 132 | 201 | 129 | 462 |
| 2001 | 132 | 271 | 178 | 582 |
| 2002 | 87 | 359 | 262 | 708 |
| 2003 | 73 | 370 | 307 | 749 |
| 2004 | 71 | 375 | 147 | 593 |
| 2005 | 43 | 391 | 246 | 679 |
| 2006 | 44 | 291 | 245 | 580 |
| 2007 | 47 | 291 | 214 | 552 |
| 2008 | 42 | 223 | 120 | 384 |
| 2009 | 31 | 151 | 120 | 301 |
| 2010 | 21 | 147 | 107 | 275 |
| 2011* | 4 | 133 | 3 | 140 |

* Without Spanish landings

Table 7.4.12.3 *Nephrops* in Division IXa. ICES landings (tonnes) by country.

| Years | Spain | Portugal | Total |
|-------|-------|----------|-------|
| 1975 | 2269 | 34 | 2303 |
| 1976 | 2487 | 30 | 2517 |
| 1977 | 2479 | 15 | 2494 |
| 1978 | 2674 | 45 | 2719 |
| 1979 | 2208 | 102 | 2310 |
| 1980 | 2092 | 147 | 2239 |
| 1981 | 2126 | 128 | 2254 |
| 1982 | 2043 | 86 | 2129 |
| 1983 | 786 | 244 | 1030 |
| 1984 | 604 | 475 | 1079 |
| 1985 | 1007 | 524 | 1531 |
| 1986 | 878 | 502 | 1380 |
| 1987 | 973 | 580 | 1553 |
| 1988 | 770 | 516 | 1286 |
| 1989 | 794 | 557 | 1351 |
| 1990 | 621 | 572 | 1193 |
| 1991 | 775 | 532 | 1307 |
| 1992 | 827 | 522 | 1349 |
| 1993 | 632 | 427 | 1059 |
| 1994 | 534 | 259 | 793 |
| 1995 | 632 | 283 | 915 |
| 1996 | 363 | 149 | 512 |
| 1997 | 524 | 142 | 666 |
| 1998 | 422 | 169 | 591 |
| 1999 | 362 | 216 | 578 |
| 2000 | 252 | 210 | 462 |
| 2001 | 304 | 278 | 582 |
| 2002 | 345 | 363 | 708 |
| 2003 | 368 | 382 | 749 |
| 2004 | 205 | 388 | 593 |
| 2005 | 275 | 404 | 679 |
| 2006 | 274 | 306 | 580 |
| 2007 | 248 | 305 | 553 |
| 2008 | 146 | 238 | 384 |
| 2009 | 138 | 163 | 301 |
| 2010 | 123 | 152 | 275 |
| 2011* | na | 140 | 140 |

* Without Spanish landings

ECOREGION Bay of Biscay and Atlantic Iberian waters
STOCK *Nephrops* in West Galicia and North Portugal (FUs 26–27)

Advice for 2013 and 2014

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.

Stock status

| | F (Fishing Mortality) | |
|---|------------------------------|------|
| | 1984–2010 | 2011 |
| MSY (F_{MSY}) | ? | ? |
| Precautionary approach (F_{pa}, F_{lim}) | ? | ? |
| Qualitative evaluation | ↘ | ? |
| | SSB (Spawning-Stock Biomass) | |
| | 1984–2010 | 2011 |
| MSY ($B_{trigger}$) | ? | ? |
| Precautionary approach (B_{pa}, B_{lim}) | ? | ? |
| Qualitative evaluation | ↘ | ↘ |

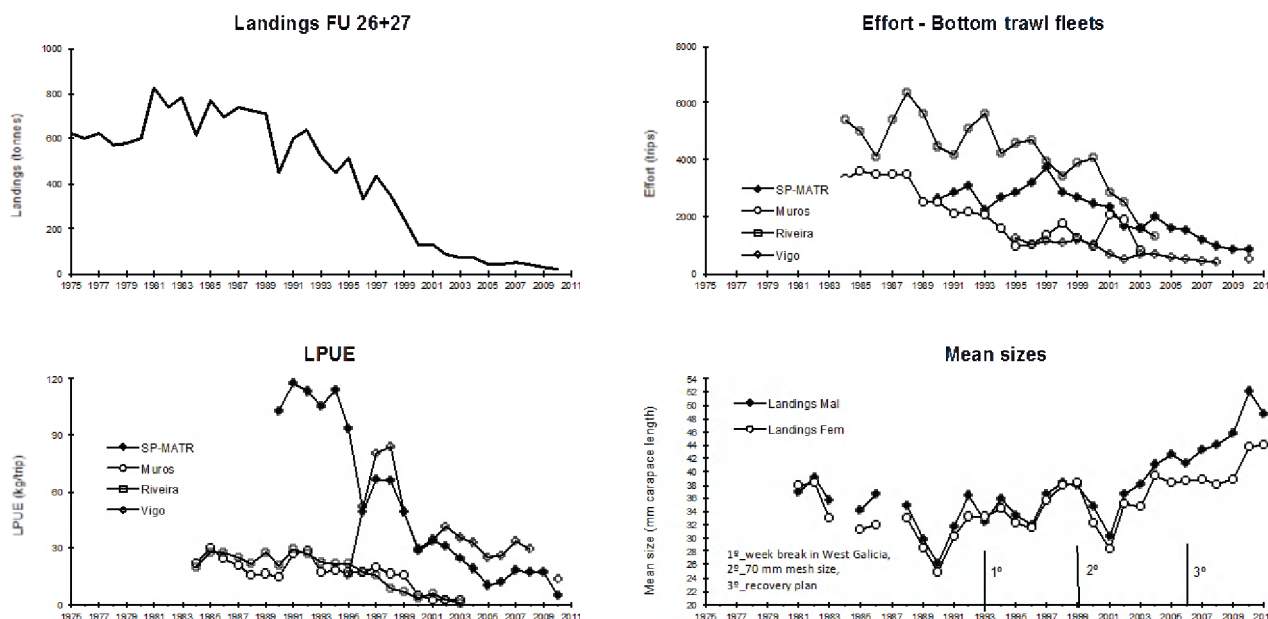


Figure 7.4.12.1.1 *Nephrops* in West Galicia and North Portugal (FUs 26–27). Long-term trends in landings (in tonnes), effort, lpue, and mean sizes in landings (mm carapace length).

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.

Management plans

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 ten 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.

Biology

Nephrops is a burrowing species and inhabits muddy sea beds on the continental shelf and upper slope. This means that the distribution of suitable sediment defines the species distribution. After reaching sexual maturity, males molt more frequently than females, consequently growing faster. Egg-bearing females stay most of the time inside their burrows, resulting in a different exploitation pattern and fishing pressure for each sex.

Environmental influence on the stock

Nephrops distribution is more determined by bottom type and sea temperature than depth. Off the west coast of Galicia (Spain) and in northern Portugal, this species occurs between 90 and 500 m of depth in a patchy distribution where the substrate is suitable.

The fisheries

Nephrops is caught in a mixed bottom trawl fishery, which takes place throughout the year, with the highest *Nephrops* landings in spring and summer. Targeted species include hake, anglerfish, megrim, horse mackerel, mackerel, and a variety of other fish and cephalopods. The catches are taken by Spanish fleets fishing on the Galicia (FU 26) and North Portugal (FU 27) fishing grounds and by the Portuguese artisanal fleet fishing with traps in FU 27.

Discarding of *Nephrops* is minimal in these fisheries.

| | |
|-----------------------|---|
| Catch by fleet | Total catch (2010) were 21 t, where 100% were landings (81% bottom trawl fleet, 19% trap fleet) and no discards. Data were insufficient to update this information for 2011; however, values for 2010 are still considered appropriate. |
|-----------------------|---|

Quality considerations

It was not possible to include Spanish commercial data for 2011 in the assessment, therefore the assessment could not be updated this year. The advice is based on the information available last year.

Scientific basis

| | |
|-----------------------------|--|
| Assessment type | Trends based on lpuie information and mean sizes in the catches. |
| Input data | Four commercial indices (SP-MATR, VIGO trawl, RIVEIRA trawl, and MUROS trawl). |
| Discards and bycatch | No discards in this fishery. |
| Indicators | None. |
| Other information | None. |
| Working group report | WGHMM |

ECOREGION Bay of Biscay and Western Iberian Seas
STOCK *Nephrops* in West Galicia and North Portugal (FUs 26–27)

Reference points

No reference points are defined for *Nephrops* in FUs 26–27.

Outlook for 2013 and 2014

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.

Additional considerations

The advice for the past two years has been based on the precautionary considerations. This year's advice is on the same basis.

Sources

ICES. 2011. Report of the Working Group on the Assessment of Southern Shelf Stocks of Hake, Monk, and Megrim (WGHMM), 5–11 May 2011, ICES Headquarters, Copenhagen. ICES CM 2011/ACOM:11.

ICES. 2012. Report of the Working Group on the Assessment of Southern Shelf Stocks of Hake, Monk, and Megrim (WGHMM), 10–16 May 2012, ICES Headquarters, Copenhagen. ICES CM 2012/ACOM:11.

Table 7.4.12.1.1 *Nephrops* in West Galicia and North Portugal (FUs 26–27). ICES advice, management, and landings.

| Year | ICES advice | Predicted catches correspond. to advice | Agreed TAC ¹⁾ | ICES landings |
|------|---------------------------------|---|--------------------------|---------------------|
| 2003 | Zero catches | 0 | 0.600 | 0.072 |
| 2004 | Zero catches | 0 | 0.600 | 0.070 |
| 2005 | Zero catches | 0 | 0.540 | 0.042 |
| 2006 | Zero catches | 0 | 0.486 | 0.044 |
| 2007 | Zero catches | 0 | 0.437 | 0.046 |
| 2008 | Zero catches | 0 | 0.415 | 0.036 |
| 2009 | Zero catches | 0 | 0.374 | 0.025 |
| 2010 | No new advice, same as for 2009 | 0 | 0.337 | 0.019 |
| 2011 | Zero catches | 0 | 0.303 | 0.004 ²⁾ |
| 2012 | No new advice, same as for 2011 | 0 | 0.273 | |
| 2013 | Zero catches | 0 | | |
| 2014 | No new advice, same as for 2013 | 0 | | |

Weights in thousand tonnes.

¹⁾ For Subareas IX and X; EU waters of CECAF 34.1.1.

²⁾ Without Spanish landings.

Table 7.4.12.1.2 *Nephrops* in West Galicia and North Portugal (FUs 26–27). Total landings per country (tonnes).

| Year | Spain | | Portugal | Total |
|--------|--------|-------|----------|----------|
| | FU 26* | FU 27 | FU 27 | FU 26-27 |
| 1975 | 622 | | | 622 |
| 1976 | 603 | | | 603 |
| 1977 | 620 | | | 620 |
| 1978 | 575 | | | 575 |
| 1979 | 580 | | | 580 |
| 1980 | 599 | | | 599 |
| 1981 | 823 | | | 823 |
| 1982 | 736 | | | 736 |
| 1983 | 786 | | | 786 |
| 1984 | 604 | | 14 | 618 |
| 1985 | 750 | | 15 | 765 |
| 1986 | 657 | | 37 | 694 |
| 1987 | 671 | | 71 | 742 |
| 1988 | 631 | | 96 | 727 |
| 1989 | 620 | | 88 | 708 |
| 1990 | 401 | | 48 | 449 |
| 1991 | 549 | | 54 | 603 |
| 1992 | 584 | | 52 | 636 |
| 1993 | 472 | | 50 | 522 |
| 1994 | 426 | | 22 | 448 |
| 1995 | 501 | | 10 | 511 |
| 1996 | 264 | 50 | 17 | 331 |
| 1997 | 359 | 68 | 6 | 433 |
| 1998 | 295 | 42 | 8 | 345 |
| 1999 | 194 | 48 | 6 | 248 |
| 2000 | 102 | 21 | 9 | 132 |
| 2001 | 105 | 21 | 6 | 132 |
| 2002 | 59 | 24 | 4 | 87 |
| 2003 | 39 | 26 | 8 | 73 |
| 2004 | 38 | 24 | 9 | 71 |
| 2005 | 16 | 16 | 11 | 43 |
| 2006 | 15 | 17 | 12 | 44 |
| 2007 | 20 | 17 | 10 | 47 |
| 2008 | 17 | 12 | 13 | 42 |
| 2009 | 16 | 5 | 10 | 31 |
| 2010 | 3 | 14 | 4 | 21 |
| 2011** | na | na | 4 | 4 |

* 1996 landings of Spain from FU26 include catches of FU27

** Without Spanish landings

Table 7.4.12.1.3 *Nephrops* in West Galicia and North Portugal (FUs 26–27). Landings, effort, lpue, and mean sizes.

| | Landings FU26-27 | Effort SP- | Effort SP- | Effort SP- | Effort SP- | LPUE SP- | LPUE SP- | LPUE SP- | LPUE SP- | Mean size in landings (mm CL) | |
|-------|---------------------|------------------|------------------|--------------------|-----------------|--------------------|--------------------|----------------------|-------------------|-------------------------------|---------|
| | | MARTR (Trips) | Muros (Trips) | Riveira (Trips) | Vigo (Trips) | MARTR (Kg/trip) | Muros (Kg/trip) | Riveira (Kg/trip) | Vigo (Kg/trip) | Males | Females |
| 1975 | 622 | | | | | | | | | | |
| 1976 | 603 | | | | | | | | | | |
| 1977 | 620 | | | | | | | | | | |
| 1978 | 575 | | | | | | | | | | |
| 1979 | 580 | | | | | | | | | | |
| 1980 | 599 | | | | | | | | | | |
| 1981 | 823 | | | | | | | | | 36.9 | 37.8 |
| 1982 | 736 | | | | | | | | | 39.0 | 38.3 |
| 1983 | 786 | | | | | | | | | 35.8 | 33.1 |
| 1984 | 618 | | 3331 | 5413 | | | 21.3 | 20.2 | | | |
| 1985 | 765 | | 3628 | 4973 | | | 30.5 | 27.3 | | 34.3 | 31.3 |
| 1986 | 694 | | 3478 | 4149 | | | 23.9 | 28.0 | | 36.6 | 31.9 |
| 1987 | 742 | | 3512 | 5417 | | | 20.3 | 25.3 | | | |
| 1988 | 727 | | 3485 | 6362 | | | 15.4 | 22.0 | | 35.0 | 32.9 |
| 1989 | 708 | | 2527 | 5643 | | | 16.4 | 27.4 | | 29.9 | 28.5 |
| 1990 | 449 | 2645 | 2515 | 4472 | | 103.3 | 14.5 | 20.6 | | 26.0 | 24.8 |
| 1991 | 603 | 2855 | 2144 | 4170 | | 117.5 | 26.4 | 29.6 | | 31.7 | 30.4 |
| 1992 | 636 | 3092 | 2191 | 5132 | | 113.0 | 28.9 | 26.5 | | 36.4 | 33.3 |
| 1993 | 522 | 2256 | 2042 | 5642 | | 105.4 | 17.3 | 22.4 | | 32.4 | 33.3 |
| 1994 | 448 | 2692 | 1590 | 4268 | | 113.9 | 17.8 | 21.5 | | 36.0 | 34.4 |
| 1995 | 511 | 2859 | 984 | 4565 | 1235 | 93.3 | 17.2 | 22.0 | 15.6 | 33.4 | 32.2 |
| 1996 | 331 | 3191 | 1049 | 4686 | 1018 | 49.5 | 17.5 | 17.6 | 51.6 | 32.1 | 31.4 |
| 1997 | 433 | 3702 | 1385 | 3971 | 1160 | 66.3 | 19.7 | 15.2 | 80.6 | 36.7 | 35.6 |
| 1998 | 345 | 2857 | 1797 | 3469 | 1072 | 66.0 | 16.3 | 8.2 | 84.2 | 38.4 | 37.8 |
| 1999 | 248 | 2714 | 1273 | 3912 | 1207 | 49.5 | 15.5 | 6.7 | 49.6 | 37.8 | 38.3 |
| 2000 | 132 | 2479 | 983 | 4100 | 1036 | 28.9 | 5.3 | 3.7 | 29.4 | 34.8 | 32.2 |
| 2001 | 132 | 2374 | 2091 | 2895 | 696 | 33.6 | 2.3 | 5.9 | 35.0 | 30.3 | 28.4 |
| 2002 | 87 | 1671 | 1902 | 2546 | 491 | 31.2 | 2.2 | 2.3 | 41.6 | 36.6 | 35.3 |
| 2003 | 73 | 1597 | 785 | 1608 | 664 | 24.0 | 2.2 | 0.5 | 35.1 | 38.1 | 34.8 |
| 2004 | 71 | 1980 | na | 1325 | 662 | 19.3 | na | na | 32.7 | 41.1 | 39.3 |
| 2005 | 43 | 1629 | na | na | 569 | 10.3 | na | na | 25.2 | 42.6 | 38.3 |
| 2006 | 44 | 1547 | na | na | 507 | 11.9 | na | na | 26.1 | 41.3 | 38.6 |
| 2007 | 47 | 1196 | na | na | 437 | 18.0 | na | na | 33.9 | 43.2 | 38.8 |
| 2008 | 42 | 980 | na | na | 378 | 17.3 | na | na | 29.3 | 44.0 | 38.1 |
| 2009 | 31 | 854 | na | na | na | 17.6 | na | na | na | 45.8 | 38.9 |
| 2010 | 21 | 867 | na | na | 509 | 5.3 | na | na | 14.0 | 52.0 | 43.7 |
| 2011* | 4 | na | na | na | na | na | na | na | na | 48.7 | 43.9 |

* Without Spanish landings

ECOREGION Bay of Biscay and Atlantic Iberian waters
STOCK *Nephrops* in Southwest and South Portugal (FUs 28–29)

Advice for 2013 and 2014

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.

Stock status

| F (Fishing Mortality) | | |
|--|---|------------|
| 2001–2011 | | |
| MSY (F_{MSY}) | ? | Unknown |
| Precautionary approach (F_{pa}, F_{lim}) | ? | Unknown |
| Qualitative evaluation | ↘ | Decreasing |
| SSB (Spawning-Stock Biomass) | | |
| 2007–2011 | | |
| MSY ($B_{trigger}$) | ? | Unknown |
| Precautionary approach (B_{pa}, B_{lim}) | ? | Unknown |
| Qualitative evaluation | ↘ | Decreasing |

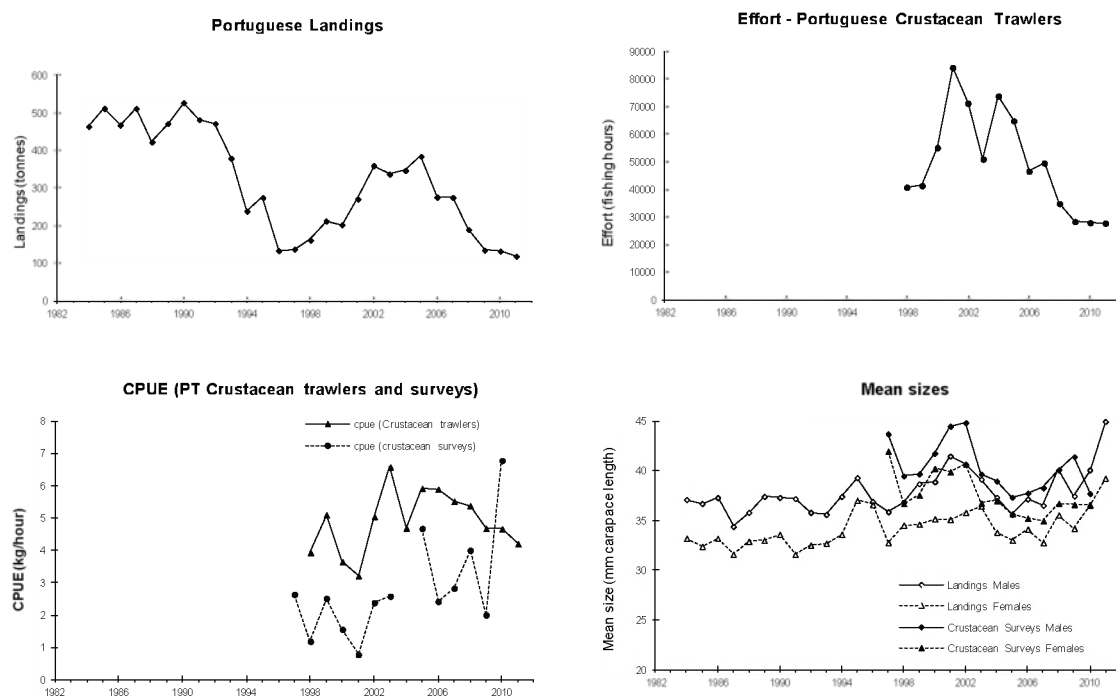


Figure 7.4.12.2.1 *Nephrops* in Southwest and South Portugal (FUs 28–29): Landings (tonnes), standardized fishing effort (hours), biomass survey index and standardized cpue (kg/hour), and mean sizes in landings and surveys (mm carapace length).

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).

Management plans

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 ten 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.

Biology

Nephrops is a burrowing species and inhabits muddy sea beds on the continental shelf and upper slope. This means that the distribution of suitable sediment defines the species distribution. After reaching sexual maturity, males molt more frequently than females, consequently growing faster. Egg-bearing females stay most of the time inside their burrows, resulting in a different exploitation pattern and fishing pressure for each sex.

Environmental influence on the stock

In this area, *Nephrops* occurs along the continental slope at depths ranging from 200 to 800 m. Its distribution is limited to muddy sediments, with a silt and clay content to excavate its burrows, meaning that the distribution of suitable sediment defines the species distribution.

The fisheries

Nephrops represents a small, but valuable bycatch in fisheries targeting mainly demersal fish species. FUs 28–29 have a crustacean trawl fishery that mainly targets deep-water crustaceans. These vessels are licensed to take *Nephrops* with 70-mm mesh and shrimps with 55-mm mesh codends. Discarding of *Nephrops* is minimal in this fishery.

Portugal and Spain have bilateral agreements for fishing in each other's waters. The last agreement was signed in 2003 for the next 10-year period. Under this agreement a number of Spanish trawlers are licensed to fish crustaceans in Portuguese waters.

| | |
|-----------------------|--|
| Catch by fleet | Catch (2011) was 133 t, where 100% are landings (88% trawl and 12% polyvalent, mostly traps), and no discards. |
|-----------------------|--|

Quality considerations

There are uncertainties related to the use of growth parameters and the estimation of age groups. Due to these uncertainties and a retrospective pattern in the age-based assessment, no analytical assessment was performed this year.

The crustacean fishery in these FUs has two main target species, the rose shrimp (*Parapenaeus longirostris*) and the Norway lobster (*Nephrops norvegicus*), which have different market values. Depending on their abundance, the effort is directed at one species or the other but usually rose shrimp is the main target species and *Nephrops* is an alternative. Therefore, the total effort does not reflect targeted *Nephrops* fishing effort. The advice is based on commercial standardized cpue information, where the standardization takes into account the catch composition, the spatial distribution, and the fleet component.

The survey indices are highly variable between years. The survey biomass index was three times greater in 2010 than in 2009; however, the 2010 survey did not cover the entire survey area and the resulting index is unlikely to reflect the stock dynamics. No 2011 survey index was calculated.

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 the stock overfished.

Scientific basis

| | |
|-----------------------------|--|
| Assessment type | Trends of cpue information. |
| Input data | One commercial index (P-TR). |
| Discards and bycatch | No discards in this fishery. |
| Indicators | One survey index (P-CTS) and mean sizes in the landings. |
| Other information | None. |
| Working group report | WGHMM |

ECOREGION Bay of Biscay and Western Iberian Seas
STOCK *Nephrops* in Southwest and South Portugal (FUs 28–29)

Reference points

No reference points are defined for *Nephrops* in FUs 28–29.

Outlook for 2013 and 2014

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 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.

Additional considerations*Management considerations*

The crustacean fleet is targeting two main species, rose shrimp and Norway lobster. Rose shrimp has a higher market value and the fishing grounds are less deep. In periods of high abundance of rose shrimp, the vessels reduce the fishing pressure on *Nephrops* and redirect the effort to the rose shrimp, getting higher revenue with low costs. This seems to be the case in 1998–2003 and 2006–2011.

Data and methods

In 2011, due to engine failure of the research vessel, the crustacean trawl survey (P-CTS) did not cover the whole area of *Nephrops* distribution and the biomass index was not available.

Regulations and their effects

Since 2006 there has been an annual reduction of fishing days by 10% in response to the recovery plan. There was an effective reduction in fishing effort either by effort regulations or by the shift of the target species.

Comparison with previous assessment and advice

This year the assessment is based on trends from standardized cpues; previously the assessment was based on trends from an age-based assessment.

Previous advice was based on precautionary considerations, this year the ICES approach to data-limited stock has been used.

Source

ICES. 2012. Report of the Working Group on the Assessment of Southern Shelf Stocks of Hake, Monk, and Megrim (WGHMM), 10–16 May 2012, ICES Headquarters, Copenhagen. ICES CM 2012/ACOM:11.

Table 7.4.12.2.1 *Nephrops* in Southwest and South Portugal (FUs 28–29). ICES advice, management, and landings.

| Year | ICES advice | Predicted landings correspond. to advice | Agreed TAC ¹⁾ | ICES landings |
|------|---|--|--------------------------|---------------|
| 2003 | Zero catches | 0 | 0.600 | 0.362 |
| 2004 | Zero catches | 0 | 0.600 | 0.445 |
| 2005 | Zero catches | 0 | 0.540 | 0.413 |
| 2006 | Average landings in times when stock was recovering (1996–2002) | < 0.2 | 0.486 | 0.229 |
| 2007 | Average landings in times when stock was recovering (1996–2002) | < 0.2 | 0.437 | 0.236 |
| 2008 | Average landings in times when stock was recovering (1996–2002) | < 0.2 | 0.415 | 0.208 |
| 2009 | Average landings in times when stock was recovering (1996–2002) | < 0.2 | 0.374 | 0.122 |
| 2010 | No new advice, same as for 2009 | < 0.2 | 0.337 | 0.124 |
| 2011 | See scenarios | - | 0.303 | 0.133 |
| 2012 | Reduce catch | - | 0.273 | |
| 2013 | Reduce catch by 14% | 0.11 | | |
| 2014 | No new advice, same as for 2013 | 0.11 | | |

Weights in thousand tonnes.

¹⁾ For Subareas IX and X; EU waters of CECAF 34.1.1.

Table 7.4.12.2.2 *Nephrops* in Southwest and South Portugal (FUs 28–29). Total landings per country (tonnes).

| Years | FU 28 | FU 29 | FU 28-29 | | | Total |
|-------|-------|-------|-----------|-------|-------|-------|
| | Spain | Spain | Portugal | | | |
| | Trawl | Trawl | Artisanal | Trawl | Total | |
| 1975 | 137 | 1510 | | 34 | 34 | 1681 |
| 1976 | 132 | 1752 | | 30 | 30 | 1914 |
| 1977 | 95 | 1764 | | 15 | 15 | 1874 |
| 1978 | 120 | 1979 | | 45 | 45 | 2144 |
| 1979 | 96 | 1532 | | 102 | 102 | 1730 |
| 1980 | 193 | 1300 | | 147 | 147 | 1640 |
| 1981 | 270 | 1033 | | 128 | 128 | 1431 |
| 1982 | 130 | 1177 | | 86 | 86 | 1393 |
| 1983 | | | | 244 | 244 | 244 |
| 1984 | | | | 461 | 461 | 461 |
| 1985 | | | | 509 | 509 | 509 |
| 1986 | | | | 465 | 465 | 465 |
| 1987 | | | 11 | 498 | 509 | 509 |
| 1988 | | | 15 | 405 | 420 | 420 |
| 1989 | | | 6 | 463 | 469 | 469 |
| 1990 | | | 4 | 520 | 524 | 524 |
| 1991 | | | 5 | 473 | 478 | 478 |
| 1992 | | | 1 | 469 | 470 | 470 |
| 1993 | | | 1 | 376 | 377 | 377 |
| 1994 | | | | 237 | 237 | 237 |
| 1995 | | | 1 | 272 | 273 | 273 |
| 1996 | | | 4 | 128 | 132 | 132 |
| 1997 | | | 2 | 134 | 136 | 136 |
| 1998 | | | 2 | 159 | 161 | 161 |
| 1999 | | | 5 | 206 | 211 | 211 |
| 2000 | | | 4 | 197 | 201 | 201 |
| 2001 | | | 2 | 269 | 271 | 271 |
| 2002 | | | 1 | 358 | 359 | 359 |
| 2003 | | | 35 | 335 | 370 | 370 |
| 2004 | | | 31 | 345 | 375 | 375 |
| 2005 | | | 31 | 360 | 391 | 391 |
| 2006 | | | 17 | 274 | 291 | 291 |
| 2007 | | | 18 | 274 | 291 | 291 |
| 2008 | | | 35 | 188 | 223 | 223 |
| 2009 | | | 17 | 133 | 151 | 151 |
| 2010 | | | 16 | 131 | 147 | 147 |
| 2011* | | | 16 | 117 | 133 | 133 |

* Provisional

Table 7.4.12.2.3 *Nephrops* in Southwest and South Portugal (FUs 28–29). Landings, standardized fishing effort, biomass survey index, standardized cpue, and mean sizes in landings and surveys.

| Year | Landings (t) | Standardized Trawl Effort (hours) | Std CPUE (kg/h) | Crustacean Survey CPUE (kg/h) | Mean size in landings (mm CL) | | Mean size in Crust Survey (mm CL) | |
|------|--------------|-----------------------------------|-----------------|-------------------------------|-------------------------------|---------|-----------------------------------|---------|
| | | | | | Males | Females | Males | Females |
| 1984 | 461 | | | | 37.1 | 33.2 | | |
| 1985 | 509 | | | | 36.7 | 32.4 | | |
| 1986 | 465 | | | | 37.3 | 33.2 | | |
| 1987 | 509 | | | | 34.4 | 31.6 | | |
| 1988 | 420 | | | | 35.8 | 32.9 | | |
| 1989 | 469 | | | | 37.4 | 33.0 | | |
| 1990 | 524 | | | | 37.3 | 33.6 | | |
| 1991 | 479 | | | | 37.2 | 31.6 | | |
| 1992 | 469 | | | | 35.8 | 32.5 | | |
| 1993 | 377 | | | | 35.6 | 32.7 | | |
| 1994 | 237 | | | | 37.4 | 33.6 | | |
| 1995 | 273 | | | | 39.3 | 37.0 | | |
| 1996 | 132 | | | | 36.9 | 36.6 | | |
| 1997 | 136 | | | 2.6 | 35.9 | 32.8 | 43.7 | 41.9 |
| 1998 | 161 | 40,808 | 3.9 | 1.2 | 36.8 | 34.5 | 39.5 | 36.7 |
| 1999 | 211 | 41,414 | 5.1 | 2.5 | 38.7 | 34.6 | 39.7 | 37.5 |
| 2000 | 201 | 55,043 | 3.6 | 1.6 | 38.9 | 35.2 | 41.7 | 40.2 |
| 2001 | 271 | 83,840 | 3.2 | 0.8 | 41.5 | 35.1 | 44.5 | 39.9 |
| 2002 | 359 | 71,018 | 5.0 | 2.4 | 40.6 | 35.8 | 44.8 | 40.7 |
| 2003 | 370 | 50,955 | 6.6 | 2.6 | 39.1 | 36.4 | 39.7 | 36.7 |
| 2004 | 375 | 73,593 | 4.7 | | 37.3 | 33.8 | 39.0 | 37.0 |
| 2005 | 391 | 64,669 | 5.9 | 4.7 | 35.6 | 33.0 | 37.3 | 35.7 |
| 2006 | 291 | 46,576 | 5.9 | 2.4 | 37.1 | 34.1 | 37.7 | 35.2 |
| 2007 | 291 | 49,614 | 5.5 | 2.8 | 36.5 | 32.8 | 38.3 | 35.0 |
| 2008 | 223 | 34,948 | 5.4 | 4.0 | 40.1 | 35.5 | 40.1 | 36.7 |
| 2009 | 151 | 28,495 | 4.7 | 2.0 | 37.4 | 34.2 | 41.4 | 36.6 |
| 2010 | 147 | 28,074 | 4.7 | 6.8 | 40.1 | 36.5 | 37.7 | 36.6 |
| 2011 | 133 | 27,917 | 4.2 | | 45.0 | 39.2 | | |

ECOREGION Bay of Biscay and Atlantic Iberian waters
STOCK *Nephrops* in the Gulf of Cadiz (FU 30)

Advice for 2013 and 2014

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.

Stock status

| F (Fishing Mortality) | | | |
|--|-----------|------|---------------|
| | 2005–2010 | 2011 | |
| MSY (F_{MSY}) | ? | ? | Not available |
| Precautionary approach (F_{pa}, F_{lim}) | ? | ? | Not available |
| Qualitative evaluation | ↘ | ? | Not available |
| SSB (Spawning-Stock Biomass) | | | |
| | 2006–2010 | 2011 | |
| MSY ($B_{trigger}$) | ? | ? | Not available |
| Precautionary approach (B_{pa}, B_{lim}) | ? | ? | Not available |
| Qualitative evaluation | ↘ | ↘ | Decreasing |

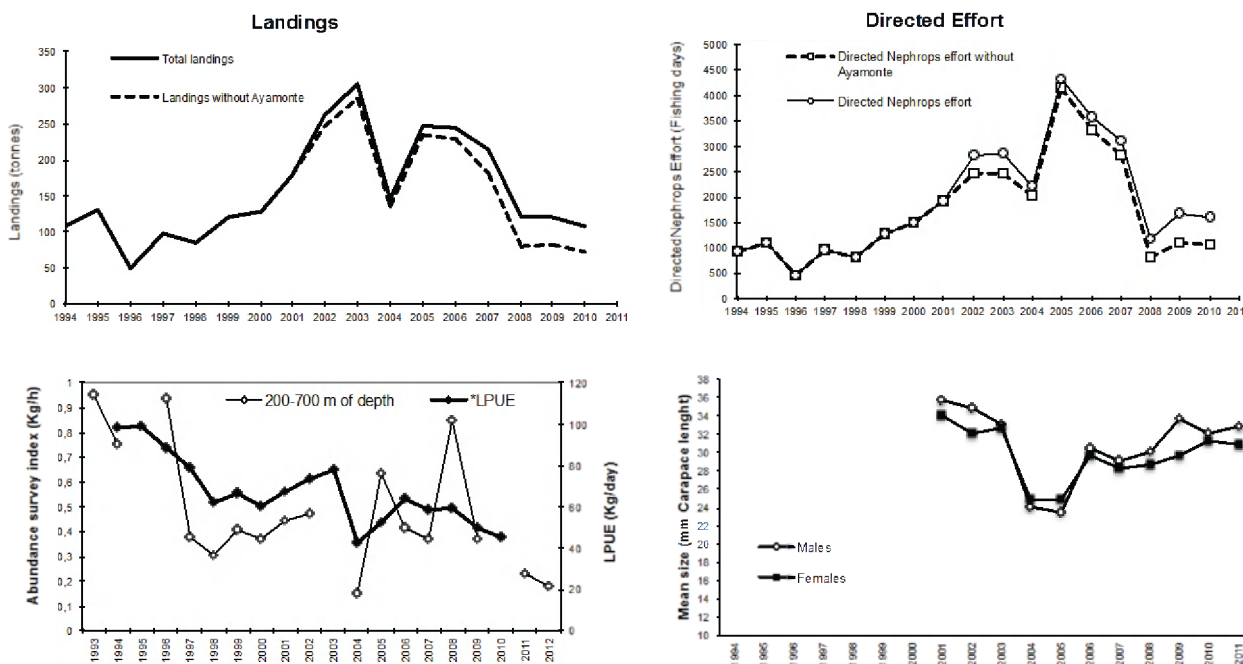


Figure 7.4.12.3.1 *Nephrops* in Gulf of Cadiz (FU 30). Landings (upper left), directed fishing effort (days) (upper right), survey abundance (kg/hour) and lpue (kg/day) (lower left), and mean sizes (mm, carapace length) (lower right). Directed effort and lpue were estimated based on landings of at least 10% *Nephrops* per trip.

No assessment has been carried out in 2012. The stock status is based on time-series of data available until 2010. The stock appears to be low compared to historical levels. Landings and effort decreased substantially between 2005 and 2008, and have remained stable since then. The average lpue of the last two years with information (2009–2010) is 29% lower than the average of the three preceding years (2006–2008).

Management plans

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 ten years, with a reduction of 10% in F relative

to the previous year and the TAC set accordingly. The effort reductions set annually in accordance with the recovery plan do not apply to the Gulf of Cadiz, where a different method of effort management is used.

Biology

Nephrops is a burrowing species and inhabits muddy sea beds on the continental shelf and upper slope. This means that the distribution of suitable sediment defines the species distribution. After reaching sexual maturity, males molt more frequently than females, consequently growing faster. Egg-bearing females stay most of the time inside their burrows, resulting in a different exploitation pattern and fishing pressure for each sex.

Environmental influence on the stock

In general, *Nephrops* distribution is more determined by ground type and sea temperature than depth. In the Gulf of Cadiz, it occurs between 200 and 800 m of depth in a patchy distribution where the substrate is suitable.

The fisheries

Nephrops in FU 30 is mostly exploited by Spanish trawlers. The bottom trawl fleet of the Gulf of Cadiz is characterized by the diversity of its landings, with a mixture of target species (fishes, cephalopods, and crustaceans). *Nephrops* landings are clearly seasonal with high values from April to September. Discarding of *Nephrops* is minimal in these fisheries, around 1% in weight.

| | |
|-----------------------|---|
| Catch by fleet | Total catch (2010) was 107 t, where 106 t were landings (bottom trawl fleet) and 1 t discards. Data were insufficient to update this information for 2011; however, values for 2010 are still considered appropriate. |
|-----------------------|---|

Quality considerations

It was not possible to include Spanish commercial data for 2011 in the assessment. Therefore, the assessment could not be updated this year. The advice is based on the information available last year, which results in larger uncertainty.

Changes in fishing technology and exploitation pattern, including those resulting from technical measures, cause uncertainty in *l*_{pue} data.

The survey from which an index is available (SPS-CFC-cspr) is not designed to monitor *Nephrops* in particular, but is rather a general groundfish survey. Therefore, the survey indices are considered less appropriate as biomass indicators for *Nephrops*.

The advice is based on commercial *l*_{pue} information used as an indicator of stock size. The uncertainty associated with the index values is not available.

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 the stock overfished.

Since 2009, annual length distributions in landings are obtained by concurrent samplings on board. Fishery in the Gulf of Cadiz shows a unique and highly multi-specific *metier* for the bottom trawl fleet, with vessels behaving in a very flexible and adaptable way regarding the species they target during fishing trips. Therefore, it is not possible to carry out length samplings in some months, mainly outside of the *Nephrops* fishing season. It is suggested that sampling on board is complemented with *Nephrops* samplings in port.

Scientific basis

| | |
|-----------------------------|--|
| Assessment type | Trends-based on <i>l</i> _{pue} information. |
| Input data | One commercial index (Gulf of Cadiz bottom trawl fleet). |
| Discards and bycatch | Not included in the assessment. |
| Indicators | One survey index (SPS-CFC-cspr) and mean sizes in the catches. |
| Other information | Landings were revised to include Ayamonte port. |
| Working group report | WGHMM |

ECOREGION Bay of Biscay and Western Iberian Seas
STOCK *Nephrops* in Gulf of Cadiz (FU 30)

Reference points

No reference points are defined for *Nephrops* in FU 30.

Outlook for 2013 and 2014

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 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.

Additional considerations

Nephrops is caught in a multispecies bottom-trawl fishery. The increases in the abundance of other valuable commercial species in this fishery, such as the rose shrimp (*Parapenaeus longirostris*) are believed to have led to a change in the objectives of the fishery, as rose shrimp achieves a higher market value and its fishing grounds, less deep (90–380 m) and closer to the coast, are easier to reach.

The effects of regulations

By derogation, the southern hake and *Nephrops* recovery plan excludes the Gulf of Cadiz from the same effort-related management regime. Instead, various fishing plans have been established since 2004 to reduce the fishing effort of the bottom trawl fleet in the Gulf of Cadiz. These plans restrict the daily fishing hours, and also establish two days per week of no fishing and a single landing event per vessel per day. The reduction of the daily fishing hours has had a direct effect on *Nephrops*-directed effort because the trawl fleet does not have enough time to access the *Nephrops* fishing grounds, which are located far away from the fishing port.

New regulations have been established since 2008 by the Regional Administration with the aim of distributing the fishing effort throughout the year by controlling the days and time when the Gulf of Cadiz bottom trawl fleet can enter or leave fishing ports. A continuous period from Monday 3 am to Thursday 9 pm in May–August was established in 2011 (Resolution 24 September 2010, BOJA nº 209), increasing the fishing hours in this period, which is the main *Nephrops* fishing season.

The mesh size was increased to 55 mm in September 2009 (Orden ARM/2515/2009) for the bottom trawl fleet.

Comparison with previous assessment and advice

This year's assessment is based on trends from lpues, as previously. The ICES approach to data-limited stocks has been used as the basis for advice. Previous advice was based on precautionary considerations.

Sources

ICES. 2011. Report of the Working Group on the Assessment of Southern Shelf Stocks of Hake, Monk, and Megrim (WGHMM), 5–11 May 2011, ICES Headquarters, Copenhagen. ICES CM 2011/ACOM:11.

ICES. 2012. Report of the Working Group on the Assessment of Southern Shelf Stocks of Hake, Monk, and Megrim (WGHMM), 10–16 May 2012, ICES Headquarters, Copenhagen. ICES CM 2012/ACOM:11.

Table 7.4.12.3.1 *Nephrops* in Gulf of Cadiz (FU 30). ICES advice, management, and landings.

| Year | ICES advice | Predicted landings correspond. to advice | Agreed TAC ¹⁾ | ICES landings |
|------|------------------------------------|--|--------------------------|---------------------|
| 2003 | Catch at the lowest recent level | < 0.05 | 0.600 | 0.307 |
| 2004 | Catch at the lowest recent level | < 0.05 | 0.600 | 0.147 |
| 2005 | Catch at the lowest recent level | < 0.05 | 0.540 | 0.246 |
| 2006 | Catch at the lowest recent level | < 0.05 | 0.486 | 0.246 |
| 2007 | Catch at the lowest recent level | < 0.05 | 0.437 | 0.215 |
| 2008 | Catch at the lowest recent level | < 0.05 | 0.415 | 0.120 |
| 2009 | Recent average catches (2005–2007) | < 0.20 | 0.374 | 0.119 |
| 2010 | No new advice, same as for 2009 | < 0.20 | 0.337 | 0.107 |
| 2011 | See scenarios | - | 0.303 | 0.003 ²⁾ |
| 2012 | Reduce catch | - | 0.273 | |
| 2013 | Reduce catch by 20% | 0.09 | | |
| 2014 | No new advice, same as for 2013 | 0.09 | | |

Weights in thousand tonnes.

¹⁾ For Subareas IX and X; EU waters of CECAF 34.1.1.

²⁾ Without Spanish landings.

Table 7.4.12.3.2 *Nephrops* in Gulf of Cadiz (FU 30). Total landings per country (tonnes).

| FU30 | | | |
|--------|-------|----------|-------|
| Year | Spain | Portugal | Total |
| 1994 | 108 | | 108 |
| 1995 | 131 | | 131 |
| 1996 | 49 | | 49 |
| 1997 | 97 | | 97 |
| 1998 | 85 | | 85 |
| 1999 | 120 | | 120 |
| 2000 | 129 | | 129 |
| 2001 | 178 | | 178 |
| 2002 | 262 | | 262 |
| 2003 | 303 | 4 | 307 |
| 2004 | 143 | 4 | 147 |
| 2005 | 243 | 3 | 246 |
| 2006 | 242 | 4 | 246 |
| 2007 | 211 | 4 | 215 |
| 2008 | 117 | 3 | 120 |
| 2009 | 117 | 2 | 119 |
| 2010 | 106 | 1 | 107 |
| 2011 * | na | 3 | 3 |

* Without Spanish landings

Table 7.4.12.3.3 *Nephrops* in Gulf of Cadiz (FU 30). Landings, directed fishing effort, abundance survey index, and mean sizes.

| | Landings (tonnes) | <i>Nephrops</i> directed effort (fishing days) | <i>Nephrops</i> directed effort (kg/fishing days) | Abundance survey index (kg/h) | Mean size in landings (mm CL) | |
|-------|----------------------|--|---|-------------------------------------|----------------------------------|---------|
| | | | | | Males | Females |
| 1994 | 108 | 915 | 98.6 | 0.76 | | |
| 1995 | 131 | 1079 | 99.4 | na** | | |
| 1996 | 49 | 458 | 88.2 | 0.93 | | |
| 1997 | 97 | 943 | 79.2 | 0.38 | | |
| 1998 | 85 | 811 | 62.3 | 0.30 | | |
| 1999 | 120 | 1259 | 66.2 | 0.41 | | |
| 2000 | 129 | 1484 | 60.6 | 0.37 | | |
| 2001 | 178 | 1924 | 67.7 | 0.44 | 35.6 | 34.0 |
| 2002 | 262 | 2827 | 69.4 | 0.47 | 34.9 | 32.0 |
| 2003 | 307 | 2840 | 75.4 | ns*** | 33.1 | 32.6 |
| 2004 | 147 | 2206 | 44.3 | 0.15 | 24.2 | 24.8 |
| 2005 | 246 | 4336 | 52.7 | 0.64 | 23.5 | 24.9 |
| 2006 | 245 | 3555 | 64.0 | 0.42 | 30.5 | 29.7 |
| 2007 | 214 | 3105 | 63.7 | 0.37 | 29.1 | 28.2 |
| 2008 | 120 | 1150 | 72.9 | 0.85 | 30.0 | 28.6 |
| 2009 | 119 | 1653 | 50.0 | 0.37 | 33.6 | 29.7 |
| 2010 | 107 | 1603 | 45.6 | na** | 32.0 | 31.3 |
| 2011* | 3 | na | na | 0.23 | 32.9 | 30.9 |
| 2012 | | | | 0.18 | | |

* Without Spanish landings
 ** Some strata not sampled
 *** No survey

Table 7.4.12.3.4 *Nephrops* in Gulf of Cadiz (FU 30). Landings per unit effort (lpue).

| Year | *LPUE (kg/day) |
|--------|-------------------|
| 1994 | 98.6 |
| 1995 | 99.4 |
| 1996 | 88.2 |
| 1997 | 79.2 |
| 1998 | 62.3 |
| 1999 | 66.2 |
| 2000 | 60.6 |
| 2001 | 67.7 |
| 2002 | 69.4 |
| 2003 | 75.4 |
| 2004 | 44.3 |
| 2005 | 52.7 |
| 2006 | 64.0 |
| 2007 | 63.7 |
| 2008 | 72.9 |
| 2009 | 50.0 |
| 2010 | 45.5 |
| 2011** | na |

*Landings, lpue, and fishing effort from fishing trips with at least 10% *Nephrops*.
 ** Ayamonte landings are included since 2002.

ECOREGION Bay of Biscay and Atlantic Iberian waters
STOCK Sole in Divisions VIIIa, b (Bay of Biscay)

Advice for 2013

ICES advises on the basis of the transition to the MSY approach that landings in 2013 should be no more than 3500 t.

Stock status

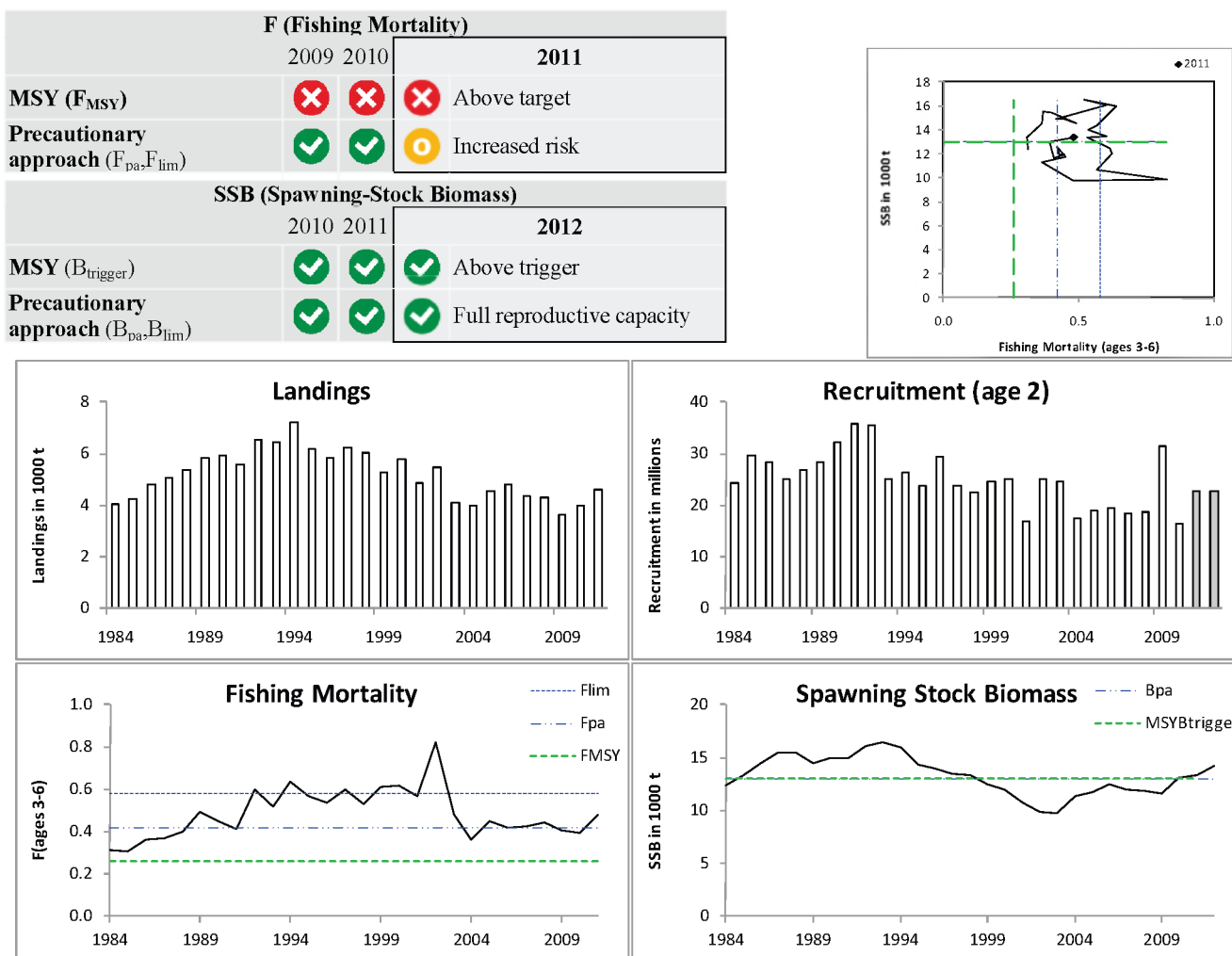


Figure 7.4.13.1 Sole in Divisions VIIIa, b. Summary of stock assessment (weights in thousand tonnes). Assumed recruitment values are shaded Top right: SSB and F over the years for the time-series used in the assessment.

The most recent estimates of SSB are above the MSY $B_{trigger}$ and B_{pa} . Fishing mortality, since 2003, has been around F_{pa} and above F_{MSY} . The fishing mortality for 2011 has increased. Recruitment values since 2004 are among the lowest in the time-series, with the exception of the 2009 recruitment which is the highest since 1993.

Management plans

A multiannual plan has been agreed by EU in 2006 ([EC Reg. No. 388/2006](#)). The aim of the plan was first to bring the spawning-stock biomass above 13 000 tonnes in 2008 and thereafter to ensure the sustainable exploitation of the stock. ICES has not evaluated the plan.

Biology

Sole is present on nearly all of the Bay of Biscay continental shelf, from the coast to a depth of about 150 m. Adult fish gather in deeper areas to spawn in the first quarter of the year, becoming more vulnerable to exploitation during this

period. Juveniles spend their first two years of life on nursery grounds which are located in estuaries and semi-closed coastal areas. The quality of these habitats is consequently essential for sole survival.

Environmental influence on the stock

Environmental conditions have a large influence on catches of the fixed-net fishery. Those conditions were especially favourable in 2002. Studies in Vilaine Bay showed a significant positive relationship between the fluvial discharges in winter–spring and the size of the local nursery. This localized effect is not apparent for the whole of the Divisions VIIIa,b stock and the impact of this relationship was therefore not taken into account in stock projections.

The 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.

Catch distribution Total landings (2011) = 4.6 kt (inshore trawlers 7%, offshore otter trawlers 17%, offshore beam-trawlers 8%, and fixed nets 67%).

Effects of the fisheries on the ecosystem

A large part of the French fishery is a fixed-net fishery directed on sole. Bycatch of non-commercial species and discards are estimated to be limited in this fishery.

Quality considerations

There is a need to incorporate fisheries-independent data to improve the stock assessment and the estimation of recruitment, when the existing survey (ORHAGO) time-series is long enough. The present assessment relies on time-series of commercial fleets. The catch and SSB in the forecast are dominated by year classes for which geometric mean recruitment is assumed.

Since discarding is known to occur in the fishery, the inclusion of the discards in the assessment might improve the quality of the assessment. In addition, the update of the maturity ogive will improve the assessment quality. Both require a specific at-sea sampling plan.

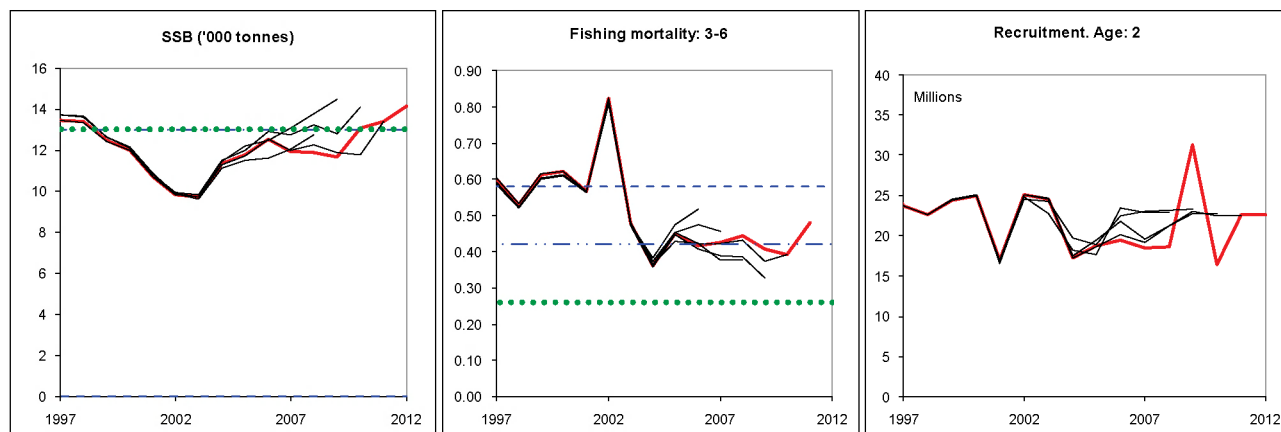


Figure 7.4.13.2 Sole in Divisions VIIIa,b. Historical assessment results (final-year recruitment estimates included).

Scientific basis

Assessment type

Age-analytical assessment (XSA).

Input data

Two commercial indices (FR-SABLES and FR-ROCHELLE) (1991 to 2009); and two commercial indices (FR-BB-IN-Q4 and FR-BB-OFF-Q2) (since 2000).

Discards and bycatch

Not included in the assessment.

Indicators

None.

Other information

This stock was benchmarked in 2011 ([WKFLAT](#)).

Working group report

[WGHMM](#)

ECOREGION Bay of Biscay and Atlantic Iberian waters
STOCK Sole in Divisions VIIIa, b (Bay of Biscay)

Reference points

| | <i>Type</i> | <i>Value</i> | <i>Technical basis</i> |
|------------------------|-------------------|--------------|---|
| MSY Approach | MSY $B_{trigger}$ | 13 000 t | B_{pa} (provisional estimate.) |
| | F_{MSY} | 0.26 | F_{max} (ICES, 2010) because stock–recruitment relationship, limited variations of recruitment, and fishing mortality pattern are known with low uncertainty. |
| Precautionary Approach | B_{lim} | Not defined. | |
| | B_{pa} | 13 000 t | The probability of reduced recruitment increases when SSB is below 13 000 t, based on the historical development of the stock. |
| | F_{lim} | 0.58 | Based on the historical response of the stock. |
| | F_{pa} | 0.42 | $F_{lim} * 0.72$ |

(unchanged since: 2010)

Outlook for 2013

Basis: $F(2012) = F_{sq} = \text{mean } F(2009–2011) = 0.43$; $SSB(2013) = 14.7$; Landings (2012) = 4.2; $R(\text{age } 2) = GM(1993–2009) = 22.6$ million.

| Rationale | Landings (2013) | Basis | F Total (2013) | SSB (2014) | %SSB change¹⁾ | %TAC change²⁾ |
|------------------------|------------------------|--|-----------------------|-------------------|---------------------------------|---------------------------------|
| MSY framework | 3 | $F_{MSY} (F_{sq} * 0.6)$ | 0.26 | 17 | +14% | –30% |
| MSY transition | 3.5 | $[0.4 * F_{2010} + 0.6 * F_{MSY}] (F_{sq} * 0.73)$ | 0.31 | 16 | +10% | –18% |
| Precautionary approach | 4.5 | $F_{pa} (F_{sq} * 0.98)$ | 0.42 | 15 | +2% | +5% |
| Zero catch | 0 | $F = 0$ | 0 | 20 | +38% | –100% |
| Other options | 0.5 | $F_{sq} * 0.1$ | 0.04 | 20 | +34% | –87% |
| | 1.3 | $F_{sq} * 0.25$ | 0.11 | 19 | +28% | –69% |
| | 2.5 | $F_{sq} * 0.5$ | 0.21 | 17 | +18% | –41% |
| | 3.6 | $F_{sq} * 0.75$ | 0.32 | 16 | +10% | –16% |
| | 3.6 | –15% TAC ($F_{sq} * 0.76$) | 0.32 | 16 | +9% | –15% |
| | 4.2 | 0% TAC ($F_{sq} * 0.92$) | 0.39 | 15 | +4% | 0% |
| | 4.5 | $F_{sq} * 1$ | 0.43 | 15 | +2% | +7% |
| | 4.9 | +15% TAC ($F_{sq} * 1.09$) | 0.46 | 15 | –1% | +15% |

Weights in thousand tonnes.

¹⁾ SSB 2014 relative to SSB 2013.

²⁾ Landings 2013 relative to TAC 2012.

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 2013. 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 that should apply until the target fishing mortality rate decided under (a) has been reached. The EC has not yet defined the values for items (a) and (b). ICES has not evaluated this plan.

MSY approach

To follow the ICES MSY framework the fishing mortality must be reduced to 0.26, resulting in landings of no more than 3000 t in 2013. This is expected to lead to an SSB of 17 000 t in 2014, corresponding to a 14% increase compared with the 2013 SSB.

To follow the transition scheme towards the ICES MSY framework the fishing mortality must be reduced to 0.31, resulting in landings of 3500 t in 2013. This is expected to lead to an SSB of 16 000 t in 2014, corresponding to a 10% increase compared with the 2013 SSB.

Precautionary approach

The fishing mortality in 2013 should be no more than F_{pa} , corresponding to landings of less than 4500 t in 2013. This is expected to keep SSB above B_{pa} in 2014.

Additional considerations

Uncertainty in the assessment and forecast

The recruitment estimate in the terminal assessment year is considered to be uncertain; it was consequently replaced with an average geometric mean (GM) estimate, as in previous years. This GM estimate has a very large contribution in the predicted landings in 2013 (66%) and SSB in 2014 (64%). Furthermore, it is worth noting that the use of a GM estimate has on several occasions led to forecasting an increase in SSB larger than the one observed in the following years. The ORHAGO survey, which started in 2007, is expected to provide better information on the abundance of age 2 in future assessments. The high 2009 recruitment value estimated by the assessment model is also seen in the ORHAGO survey.

The 2012 assessment shows an increase in the fishing mortality in 2011 which is largely supported by the catch increase, but there are concerns that incorrect age reading in 2011 may have amplified this increase.

Information from the industry

The French fishing industry agreed with the data used in the assessment but suggested that the use of the discards might improve the assessment because of the development of high-grading in some areas.

Comparison with previous assessment

The assessment this year is consistent with last year's assessment. SSB in 2011 was revised 3% upwards and F in 2010 is almost the same as in 2011. Recruitment in 2009 (2007 year class) has been revised upwards by 36%. The basis for the advice is the same as last year, the MSY transition.

Sources

- ICES. 2010. Report of the Working Group on the Assessment of Southern Shelf Stocks of Hake, Monk, and Megrin (WGHMM), 5–11 May 2010, Bilbao, Spain. ICES CM 2010/ACOM:11.
- ICES. 2011. Report of the Working Group on the Assessment of Southern Shelf Stocks of Hake, Monk, and Megrin (WGHMM), 5–11 May 2011, ICES Headquarters, Copenhagen. ICES CM 2011/ACOM:11.
- ICES. 2012. Report of the Working Group on the Assessment of Southern Shelf Stocks of Hake, Monk, and Megrin (WGHMM), 10–16 May 2012, ICES Headquarters, Copenhagen. ICES CM 2012/ACOM:11.

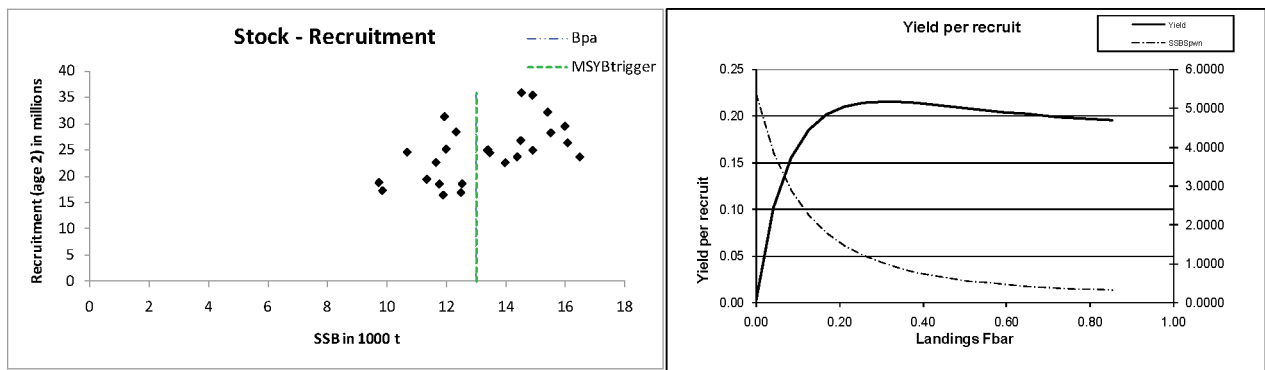


Figure 7.4.13.3 Sole in Divisions VIIIa,b. Stock–recruitment relationship (left panel) and yield and spawning-stock biomass per recruit (right panel).

Table 7.4.13.1 Sole in Divisions VIIIa,b. ICES advice management and landings, discards, and catches.

| Year | ICES Advice | Predicted landings corresp. to advice | Agreed TAC | Official landings | ICES landings | Discards | ICES Catch |
|------|--|---------------------------------------|------------|-------------------|------------------|------------------|------------|
| 1987 | Not assessed | - | 4.4 | 4.4 | 5.1 | 0.2 ³ | 5.3 |
| 1988 | Precautionary TAC | 3.7 | 4.0 | 4.4 | 5.4 | 0.3 ³ | 5.6 |
| 1989 | No increase in effort; TAC | 4.5 | 4.8 | 5.8 ¹ | 5.8 | 0.4 ³ | 6.2 |
| 1990 | No increase in F; TAC | 5.1 | 5.2 | 5.5 ¹ | 5.9 | 0.3 ³ | 6.2 |
| 1991 | Precautionary TAC | 4.7 | 5.3 | 4.7 ¹ | 5.6 | 0.2 ³ | 5.8 |
| 1992 | F = F(90) | 5.0 | 5.3 | 6.4 ¹ | 6.6 | 0.1 ³ | 6.7 |
| 1993 | No long-term gain in increasing F | - | 5.7 | 6.5 | 6.4 | 0.1 ³ | 6.5 |
| 1994 | No long-term gain in increasing F | - | 6.6 | 7.1 | 7.2 | 0.2 ³ | 7.4 |
| 1995 | No long-term gain in increasing F | 5.4 ² | 6.6 | 5.9 | 6.2 | 0.1 ³ | 6.3 |
| 1996 | No increase in F | 5.0 | 6.6 | 4.3 | 5.9 | 0.1 ³ | 6.0 |
| 1997 | 40% reduction in F | 3.1 | 5.4 | 5.0 | 6.3 | 0.1 | 6.4 |
| 1998 | No increase in F | 7.6 | 6.0 | 4.3 ⁴ | 6.0 | 0.1 | 6.1 |
| 1999 | Reduce F below F _{pa} | < 5.0 | 5.4 | 3.8 ⁴ | 5.2 | 0.2 | 5.4 |
| 2000 | F at F _{pa} | < 5.8 | 5.8 | 5.7 ⁴ | 5.7 | 0.1 | 5.8 |
| 2001 | TAC 2001, at most TAC 2000 | < 5.8 | 6.3 | 4.9 ⁴ | 4.8 | 0.0 | 4.9 |
| 2002 | Establish rebuilding plan or no fishing | - | 4.0 | 4.0 | 5.5 | 0.0 | 5.5 |
| 2003 | Establish rebuilding plan or no fishing | - | 3.8 | 4.1 | 4.1 | 0.0 | 4.0 |
| 2004 | 65% reduction in F or recovery plan ⁵ | <2.0 | 3.6 | 4.1 | 4.0 | - | - |
| 2005 | F at F _{pa} | <4.1 | 4.14 | 4.4 | 4.5 | - | - |
| 2006 | F at F _{pa} | <4.2 or management plan | 4.1 | 4.4 | 4.8 | - | - |
| 2007 | Management plan: 10% reduction in F | 4.54 | 4.54 | 4.1 | 4.4 | - | - |
| 2008 | Reach B _{pa} in 2009 | 3.85 | 4.58 | 3.3 | 4.3 | - | - |
| 2009 | F at F _{pa} | <4.43 | 4.39 | 4.8 | 3.6 | - | - |
| 2010 | F at F _{status quo} | <4.9 | 4.83 | 4.7 | 4.0 | - | - |
| 2011 | See scenarios | - | 4.25 | 4.6 ⁶ | 4.6 ⁶ | - | - |
| 2012 | MSY transition | 4.0 | 4.25 | - | - | - | - |
| 2013 | MSY transition | 3.5 | - | - | - | - | - |

Weights in thousand tonnes.

¹Not reported for all countries.

²Landings assuming current discarding practise.

³Discards revised in 1998.

⁴Preliminary. TAC in 2001 increased from 5.8 to 6.3 in November.

⁵Single-stock boundaries and the exploitation of this stock should be conducted in the context of mixed fisheries.

⁶A carry-over of 10% for the French quota was decided in 2010.

Table 7.4.13.2 Sole in Divisions VIIIa, b. Landings by country (tonnes).

| Years | Official landings | | | | | Total | WG landings | Discards ² | WG catches |
|-------|-------------------|---------------------|---------|-------|--------|-------|-------------|-----------------------|------------|
| | Belgium | France ¹ | Nether. | Spain | Others | | | | |
| 1979 | 0 | 2376 | | 62* | | 2443 | 2619 | - | - |
| 1980 | 33* | 2549 | | 107* | | 2689 | 2986 | - | - |
| 1981 | 4* | 2581* | 13* | 96* | | 2694 | 2936 | - | - |
| 1982 | 19* | 1618* | 52* | 57* | | 1746 | 3813 | - | - |
| 1983 | 9* | 2590 | 32* | 38* | | 2669 | 3628 | - | - |
| 1984 | na | 2968 | 175* | 40* | | 3183 | 4038 | 99 | 4137 |
| 1985 | 25* | 3424 | 169* | 308* | | 3925 | 4251 | 64 | 4315 |
| 1986 | 52* | 4228 | 213* | 75* | | 4567 | 4805 | 27 | 4832 |
| 1987 | 124* | 4009 | 145* | 101* | | 4379 | 5086 | 198 | 5284 |
| 1988 | 135* | 4308 | | 0 | | 4443 | 5382 | 254 | 5636 |
| 1989 | 311* | 5471 | | 0 | | 5782 | 5845 | 356 | 6201 |
| 1990 | 301* | 5231 | | 0 | | 5532 | 5916 | 303 | 6219 |
| 1991 | 389* | 4315 | | 3 | | 4707 | 5569 | 198 | 5767 |
| 1992 | 440* | 5928 | | 0 | | 6359 | 6550 | 123 | 6673 |
| 1993 | 400* | 6096 | | 13 | | 6496 | 6420 | 104 | 6524 |
| 1994 | 466* | 6627 | | 2*** | | 7095 | 7229 | 184 | 7413 |
| 1995 | 546* | 5326 | | 0 | | 5872 | 6205 | 130 | 6335 |
| 1996 | 460* | 3842 | | 0 | | 4302 | 5854 | 142 | 5996 |
| 1997 | 435* | 4526 | | 0 | | 4961 | 6259 | 118 | 6377 |
| 1998 | 469* | 3821 | 44 | 0 | | 4334 | 6027 | 127 | 6154 |
| 1999 | 504 | 3280 | | 0 | | 3784 | 5249 | 110 | 5359 |
| 2000 | 451 | 5293 | | 5*** | | 5749 | 5760 | 51 | 5811 |
| 2001 | 361 | 4350 | 201 | 0 | | 4912 | 4836 | 39 | 4875 |
| 2002 | 303 | 3680 | | 2*** | | 3985 | 5486 | 21 | 5507 |
| 2003 | 296 | 3805 | | 4*** | | 4105 | 4108 | 20 | 4128 |
| 2004 | 324 | 3739 | | 9*** | | 4072 | 4002 | - | - |
| 2005 | 358 | 4003 | | 10 | | 4371 | 4539 | - | - |
| 2006 | 393 | 4030 | | 9 | | 4432 | 4793 | - | - |
| 2007 | 401 | 3707 | | 9 | | 4117 | 4363 | - | - |
| 2008 | 305 | 3018 | | 11 | 2* | 3336 | 4299 | - | - |
| 2009 | 364 | 4391 | | | | 4755 | 3650 | - | - |
| 2010 | 451 | 4248 | | | | 4699 | 3966 | - | - |
| 2011 | 386 | 4201 | | | | 4587 | 4626** | - | - |

¹ including reported in VIII or VIIfc,d

* reported in VIII

** Preliminary

² Discards = Partial estimates for the French offshore trawlers fleet*** reported as *Solea* spp (*Solea lascaris* and *solea solea*) in VIII

Table 7.4.13.3 Sole in Divisions VIIIa,b. Summary of the assessment.

| Year | Recruitment Age 2 thousands | SSB tonnes | Landings tonnes | Mean F Ages 3-6 |
|----------------|--|-----------------------|----------------------------|----------------------------|
| 1984 | 24185 | 12331 | 4038 | 0.3112 |
| 1985 | 29558 | 13382 | 4251 | 0.3063 |
| 1986 | 28423 | 14504 | 4805 | 0.3642 |
| 1987 | 24984 | 15519 | 5086 | 0.3693 |
| 1988 | 26781 | 15412 | 5382 | 0.3977 |
| 1989 | 28253 | 14529 | 5845 | 0.4923 |
| 1990 | 32179 | 14907 | 5916 | 0.4489 |
| 1991 | 35858 | 14908 | 5569 | 0.4152 |
| 1992 | 35409 | 16085 | 6550 | 0.6007 |
| 1993 | 24965 | 16491 | 6420 | 0.5186 |
| 1994 | 26343 | 15988 | 7229 | 0.6389 |
| 1995 | 23696 | 14386 | 6205 | 0.5677 |
| 1996 | 29513 | 13979 | 5854 | 0.536 |
| 1997 | 23726 | 13466 | 6259 | 0.6009 |
| 1998 | 22586 | 13394 | 6027 | 0.5311 |
| 1999 | 24445 | 12486 | 5249 | 0.6136 |
| 2000 | 25007 | 11991 | 5760 | 0.6205 |
| 2001 | 16935 | 10675 | 4836 | 0.5669 |
| 2002 | 25151 | 9845 | 5486 | 0.8238 |
| 2003 | 24601 | 9725 | 4108 | 0.4785 |
| 2004 | 17306 | 11338 | 4002 | 0.3621 |
| 2005 | 18822 | 11759 | 4539 | 0.4508 |
| 2006 | 19426 | 12529 | 4793 | 0.4179 |
| 2007 | 18533 | 11932 | 4363 | 0.4256 |
| 2008 | 18572 | 11890 | 4299 | 0.4454 |
| 2009 | 31353 | 11644 | 3650 | 0.4067 |
| 2010 | 16457 | 13038 | 3966 | 0.3908 |
| 2011 | 22639* | 13377 | 4626 | 0.4819 |
| 2012 | 22639* | 14163 | | |
| Average | 24928 | 13264 | 5183 | 0.4898 |

*GM(1993–2009).

ECOREGION Bay of Biscay and Atlantic Iberian waters
STOCK Rays and skates in Subareas VIII and IX (Bay of Biscay and Atlantic Iberian waters)

Introduction

More than 30 species of demersal elasmobranch occur in the shelf seas of the Bay of Biscay and Atlantic Iberian waters ecoregion.

| Section | Stock |
|----------|---|
| 7.4.14.1 | Thornback ray (<i>Raja clavata</i>) in Subarea VIII (Bay of Biscay and Cantabrian Sea) |
| 7.4.14.2 | Cuckoo ray (<i>Leucoraja naevus</i>) in Subarea VIII (Bay of Biscay and Cantabrian Sea) |
| 7.4.14.3 | Spotted ray (<i>Raja montagui</i>) in Subarea VIII (Bay of Biscay and Cantabrian Sea) |
| 7.4.14.4 | Spotted ray (<i>Raja montagui</i>) in Division IXa (west of Galicia, Portugal, and Gulf of Cadiz) |
| 7.4.14.5 | Cuckoo ray (<i>Leucoraja naevus</i>) in Division IXa (west of Galicia, Portugal, and Gulf of Cadiz) |
| 7.4.14.6 | Thornback ray (<i>Raja clavata</i>) in Division IXa (west of Galicia, Portugal, and Gulf of Cadiz) |
| 7.4.14.7 | Blonde ray (<i>Raja brachyura</i>) in Division IXa (west of Galicia, Portugal, and Gulf of Cadiz) |
| 7.4.14.8 | Common skate (<i>Dipturus batis</i>) complex (flapper skate <i>Dipturus</i> cf. <i>flossada</i> and blue skate <i>Dipturus</i> cf. <i>intermedia</i>) in Subarea VIII and Division IXa (Bay of Biscay and Atlantic Iberian waters) |
| 7.4.14.9 | Other skates and rays in Subarea VIII and Division IXa (Bay of Biscay and Atlantic Iberian waters) |

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.

Advice for 2013 and 2014

ICES provides advice on the overall exploitation (landings and discards) of the ray and skates species assemblage, and also individual species (Table 7.4.14.1). 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.

Stock status

The skate species of greatest commercial importance (in particular *Raja clavata*, *R. brachyura*, and *L. naevus*) all show a favourable stock status both from fishery data and research vessel surveys. The stock status for less frequent skate species (which may be of local or minor commercial importance) is unknown.

ICES advises that angel shark (*Squatina squatina*), guitar fish (*Rhinobatus spp*), and white skate (*Rostroraja alba*) should remain on the Prohibited species list.

Despite the ongoing Portuguese and Spanish dedicated studies under the EU Data Collection Framework (DCF) to monitor fisheries catching skates, species-specific catch data for all the species are not fully available. Biological reference points have not yet been defined.

The advice provided is based on the stock status of the main commercial species in the ecoregion, with species-specific advice for the main nominal stocks provided below. Fishing effort has been decreasing both in ICES Subarea VIII and Division IXa.

Landings of rays and skates have been stable in this ecoregion and are presented in Figure 7.4.14.1 and Tables 7.4.14.2a–e. Species-specific landings are available from 2011.

Table 7.4.14.1 Rays and skates in the Bay of Biscay and Atlantic Iberian waters. ICES advice, management, and landings.

| Year | Advised percentage change in catch | | | | | | | | | | General advice | Agreed TAC ¹ | ICES landings |
|---------|------------------------------------|------------|-------------|-------------|------------|---------------|------------|--------------|---------------|--------------------|---|-------------------------|---------------|
| Area | VIII | VIII | VIII | IXa | IXa | IXa | IXa | VIII, IXa | VIII, IXa | | | | |
| | Thornback ray | Cuckoo ray | Spotted ray | Spotted ray | Cuckoo ray | Thornback ray | Blonde ray | Common skate | Other species | Total advice | | | |
| Section | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | | | | |
| 2002 | | | | | | | | | | | Reduce exploitation | | 3.7 |
| 2003 | | | | | | | | | | | No advice | | 4.4 |
| 2004 | | | | | | | | | | | No advice | | 4.3 |
| 2005 | | | | | | | | | | | No advice | | 4.4 |
| 2006 | | | | | | | | | | | No advice | | 4.0 |
| 2007 | | | | | | | | | | | No advice | | 4.4 |
| 2008 | | | | | | | | | | | No advice | | 4.3 |
| 2009 | | | | | | | | | | < 3.9 | Average landings 2002–2006 | 6.2 | 4.3 |
| 2010 | | | | | | | | | | < 3.9 | No new advice, same as for 2009 | 5.5 | 4.1 |
| 2011 | | | | | | | | | | < 4.2 ² | Average landings 2006–2008 | 4.6 | 4.0 |
| 2012 | | | | | | | | | | < 4.2 | No new advice, same as for 2011 | 4.2 | |
| 2013 | 0% | +6% | -20% | -20% | -20% | -20% | -20% | D | -20% | - | No TAC + species-specific measures ³ | | |
| 2014 | | | | | | | | | | - | No new advice, same as for 2013. | | |

Weights in thousand tonnes.

D = Depleted stock – no targeted fisheries and minimize bycatch.

¹ EU only.² Does not apply to undulate ray (*Raja undulata*), common skate (*Dipturus batis*), Norwegian skate (*Raja (Dipturus) nidarosiensis*), and white skate (*Rostroraja alba*).³ Additional species-specific measures should be applied (see main text).

Assessment methodology

The assessment is based on ICES approach to data-limited stocks, where change in survey catch rates is the main indicator. In each case the survey index used was (average of last two years)/(average of previous five years). An average of the previous five years was chosen over the default average of the previous three years. This is to allow time for changes in abundance to become visible, as generation times in these species are longer than those of many bony fishes.

A recommended change in catch is applied according to change in survey indices, with a $\pm 20\%$ uncertainty cap applied in each case (Category 3.2). Where there is no suitable survey index available, a precautionary reduction of 20% decrease was applied to the stock (Category 5.2) unless ancillary information indicated that the current level of exploitation is appropriate for the stock (ICES, 2012b).

For Division IXa, where survey data are not considered appropriate, catch per unit effort (cpue), as calculated through the Data Collection Framework, is used as the primary indicator.

Management plans

No specific management objectives are known to ICES.

Biology

Many elasmobranchs are slow growing, have a late age-at-maturity, a low reproductive capacity, a large size, and can form large aggregations. Because of this they are considered to be highly vulnerable to over-exploitation. Skates (Rajidae) are oviparous, and often produce more young than live-bearing species. Some species of demersal elasmobranchs may be locally common and found in discrete areas.

Resource competition and species interactions between the various skate species is poorly understood. Historically, common skate have been known to predate on individuals of smaller skate species, and the longer-term decline in the larger skates may have benefited populations of smaller skate species.

The fisheries

Most catches of elasmobranchs in the Bay of Biscay are from trawler fleets operating in Divisions VIIIa, 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.

Effects of the fisheries on the ecosystem

Elasmobranchs in the Bay of Biscay are mainly caught in trawling. Such gears can affect seafloor communities, including deep-water coral communities and other biogenic features.

Experiments using four 100 m lengths of both monofilament gillnets and trammelnets in Portuguese waters conclude that lost nets become completely destroyed or heavily colonized by algae after 8 to 11 months, then become incorporated into the seabed.

Quality considerations

The information regarding commercial landings per unit effort (lpue) data has been extended to Division IXa. Since legal obligations to declare most demersal elasmobranchs to species level were introduced, a greater proportion of data are reported to this level. This information covers too short a time period to influence advice at the present time.

In general surveys in this ecoregion are not specifically designed for elasmobranch sampling.

Management considerations

Council Regulation (EC) No. 23/2010 established a TAC of 4640 t in 2011 for Rajidae in Divisions VIII and IX. Quotas in 2011 were only fully utilized by Portugal. On 29 December 2011 the Portuguese Administration adopted a national legislation (Portaria no. 315/2011), covering the whole continental Portuguese EEZ during the whole month of May, prohibiting the catching, keeping on board, and landing of any skate species belonging to the genera *Raja* spp. or *Leucoraja* spp. In addition, for each fishing trip a maximum 5% bycatch, in weight, of those species is allowed to be kept on board or landed.

TACs only regulate the landings, and a low TAC on a low-value bycatch species could induce more discards. Because the elasmobranch species are usually caught as a bycatch in demersal fisheries, they would benefit from a reduction in the overall demersal fishing effort.

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 likely to be very strong.

Comparison with previous assessment and 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.

Scientific basis

| | |
|-----------------------------|---|
| Assessment type | Survey and lpuue trends, Category 3, Category 5. |
| Input data | Survey indices (WIBTS Q4, SpGFS-WIBTS-Q4, PtGFS-WIBTS-Q4). Commercial lpuue. |
| Discards and bycatch | Not yet included in the assessment. Improved knowledge of discard survival is required. |
| Indicators | None. |
| Other information | Life history. |
| Working group report | WGEF |

Sources

ICES. 2012a. Report of the Working Group on Elasmobranch Fishes (WGEF), 19–26 June 2012, Lisbon, Portugal. ICES CM 2012/ACOM:19.

ICES. 2012b. ICES implementation of advice for data-limited stocks in 2012. Report in support of ICES advice. ICES CM 2012/ACOM:68.

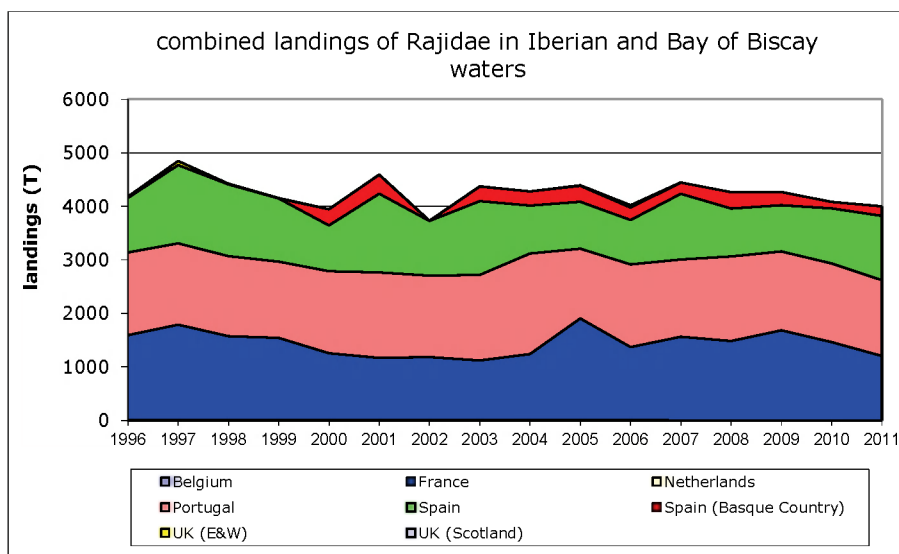


Figure 7.4.14.1 Rays and skates in the Bay of Biscay and Atlantic Iberian waters. Combined landings by country (in tonnes).

Table 7.4.14.2a Rays and skates in the Bay of Biscay and Atlantic Iberian waters. Nominal landings (tonnes) of skates and rays by division and country (Source: ICES). Total landings (t) of Rajidae in Divisions VIIIa, b.

| | 1996 | 1997 | 1998 | 1999 | 2000 | 2001 | 2002 | 2003 | 2004 | 2005 | 2006 | 2007 | 2008 | 2009 | 2010 | 2011 |
|------------------------|------|------|------|------|-------|-------|------|------|------|------|------|------|------|------|------|------|
| Belgium | 12 | 6 | 11 | 11 | 6 | 11 | 14 | 11 | 8 | 12 | 14 | . | . | 11 | 4 | 7 |
| France | 1535 | 1733 | 1503 | 1479 | 1206 | 1091 | 1106 | 1037 | 1170 | 1797 | 1296 | 1505 | 1395 | 1615 | 1393 | 1147 |
| Netherlands | . | . | . | . | . | 1 | . | . | . | . | .. | . | 0 | 0 | . | 0 |
| Spain | 872 | 906 | 724 | 677 | 146 | 76 | 323 | 27 | 20 | 9 | 12 | . | 17 | 16 | 26 | 24 |
| Spain (Basque Country) | * | * | * | * | 296,9 | 336,8 | * | 252 | 242 | 278 | 218 | 199 | 283 | 224 | 100 | 154 |
| UK (E&W) | 22 | 76 | 13 | 7 | 2 | 3 | 4 | 4 | . | 8 | 40 | 0 | 0 | 0 | 0 | 0 |
| UK (Scotland) | . | . | . | . | . | . | . | . | . | 1 | . | 3 | 2 | 0 | . | 0 |
| Total | 2442 | 2721 | 2251 | 2174 | 1657 | 1518 | 1447 | 1331 | 1440 | 2106 | 1581 | 1707 | 1697 | 1867 | 1524 | 1332 |

* Included in Spanish landings.

Table 7.4.14.2b Total landings (t) of Rajidae in Division VIIIId.

| | 1996 | 1997 | 1998 | 1999 | 2000 | 2001 | 2002 | 2003 | 2004 | 2005 | 2006 | 2007 | 2008 | 2009 | 2010 | 2011 |
|------------------------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|
| Belgium | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | 0 |
| France | 46 | 50 | 60 | 52 | 43 | 66 | 64 | 73 | 63 | 97 | 61 | 58 | 89 | 68 | 70 | 57 |
| Spain | 89 | 92 | 74 | 2 | 1 | 1 | 9 | 5 | 40 | 21 | 23 | 20 | 17 | 16 | 32 | 0 |
| Spain (Basque Country) | * | * | * | * | 0 | 2 | * | 0 | 1 | 0 | 1 | 2 | 0 | 0 | 0 | 0 |
| UK (E&W) | . | . | . | . | . | . | . | . | . | . | 3 | . | 0 | 0 | 0 | 0 |
| UK (Scotland) | . | . | . | . | . | . | . | . | . | . | . | 1 | 0 | 0 | 0 | 0 |
| Total | 135 | 143 | 134 | 54 | 44 | 69 | 73 | 78 | 104 | 118 | 87 | 81 | 107 | 84 | 102 | 57 |

* Included in Spanish landings.

Table 7.4.14.2c Total landings (t) of Rajidae in Division VIIIc.

| | 1996 | 1997 | 1998 | 1999 | 2000 | 2001 | 2002 | 2003 | 2004 | 2005 | 2006 | 2007 | 2008 | 2009 | 2010 | 2011 |
|------------------------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|
| Belgium | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . |
| France | 0 | 0 | 1 | 1 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 1 | 0 | 0 |
| Netherlands | . | . | . | . | . | . | . | . | . | . | . | . | 0 | . | . | . |
| Portugal | 11 | 7 | 10 | 4 | 4 | 5 | . | . | 264 | 0 | . | 0 | 0 | . | . | . |
| Spain | 0 | 321 | 345 | 226 | 424 | 978 | 352 | 1004 | 511 | 546 | 430 | 862 | 485 | 489 | 514 | 628 |
| Spain (Basque Country) | * | * | * | * | 5 | 16 | * | 21 | 21 | 20 | 14 | 9 | 23 | 22 | 21 | 25 |
| UK (E&W) | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . |
| UK (Scotland) | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . |
| Total | 11 | 328 | 356 | 231 | 434 | 999 | 352 | 1025 | 796 | 567 | 444 | 872 | 508 | 512 | 536 | 653 |

* Included in Spanish landings.

Table 7.4.14.2d Total landings (t) of Rajidae in Division IXa.

| | 1996 | 1997 | 1998 | 1999 | 2000 | 2001 | 2002 | 2003 | 2004 | 2005 | 2006 | 2007 | 2008 | 2009 | 2010 | 2011 |
|----------|------|------|------|------|------|------|------|-------|------|------|------|------|------|------|------|------|
| France | n.a. | n.a. | n.a. | n.a. | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Portugal | 1534 | 1512 | 1485 | 1420 | 1528 | 1591 | 1521 | 1598 | 1614 | 1303 | 1544 | 1443 | 1443 | 1473 | 1469 | 1417 |
| Spain | 58 | 143 | 197 | 276 | 285 | 416 | 339 | 342,1 | 325 | 300 | 364 | 345 | 375 | 342 | 457 | 549 |
| Total | 1592 | 1655 | 1682 | 1696 | 1813 | 2007 | 1860 | 1940 | 1939 | 1602 | 1908 | 1788 | 1819 | 1815 | 1926 | 1965 |

Table 7.4.14.2e Combined landings (t) of Rajidae in Biscay and Iberian waters.

| | 1996 | 1997 | 1998 | 1999 | 2000 | 2001 | 2002 | 2003 | 2004 | 2005 | 2006 | 2007 | 2008 | 2009 | 2010 | 2011 |
|-------------------------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|
| Belgium | 12 | 6 | 11 | 11 | 6 | 11 | 14 | 11 | 8 | 12 | 14 | 0 | 0 | 11 | 4 | 7 |
| France | 1581 | 1784 | 1564 | 1532 | 1250 | 1157 | 1170 | 1110 | 1233 | 1894 | 1357 | 1564 | 1484 | 1684 | 1464 | 1204 |
| Netherlands | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Portugal | 1545 | 1519 | 1495 | 1424 | 1532 | 1596 | 1521 | 1598 | 1878 | 1303 | 1544 | 1443 | 1580 | 1473 | 1469 | 1417 |
| Spain | 1019 | 1462 | 1340 | 1181 | 855 | 1471 | 1022 | 1378 | 895 | 876 | 829 | 1227 | 895 | 864 | 1029 | 1201 |
| Spain (Basque Country) | 0 | 0 | 0 | 0 | 302 | 354 | 0 | 273 | 264 | 298 | 233 | 210 | 306 | 246 | 121 | 178 |
| UK (E&W) | 22 | 76 | 13 | 7 | 2 | 3 | 4 | 4 | 0 | 8 | 43 | 0 | 0 | 0 | 0 | 0 |
| UK (Scotland) | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 4 | 2 | 0 | 0 | 0 |
| Total of submitted data | 4179 | 4846 | 4423 | 4155 | 3947 | 4593 | 3732 | 4374 | 4279 | 4393 | 4020 | 4448 | 4267 | 4279 | 4087 | 4007 |

ECOREGION Bay of Biscay and Atlantic Iberian waters
STOCK Thornback ray (*Raja clavata*) in Subarea VIII (Bay of Biscay and Cantabrian Sea)

Advice for 2013 and 2014

Based on ICES approach to data-limited stocks, ICES advises that catches should not increase. However, as species-specific landings data are not complete, it is not possible to quantify the current catch. ICES does not advise that an individual TAC be set for this stock, at present.

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 target fisheries. Such measures should be developed by stakeholder consultations, considering the overall mixed fisheries context.

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

Stock status

| | |
|-------------------------------|-------------------------------------|
| | F (Fishing Mortality) |
| Qualitative evaluation | 2009–2011 Unknown |
| | SSB (Spawning-Stock Biomass) |
| Qualitative evaluation | 2005–2011 Stable/increasing |

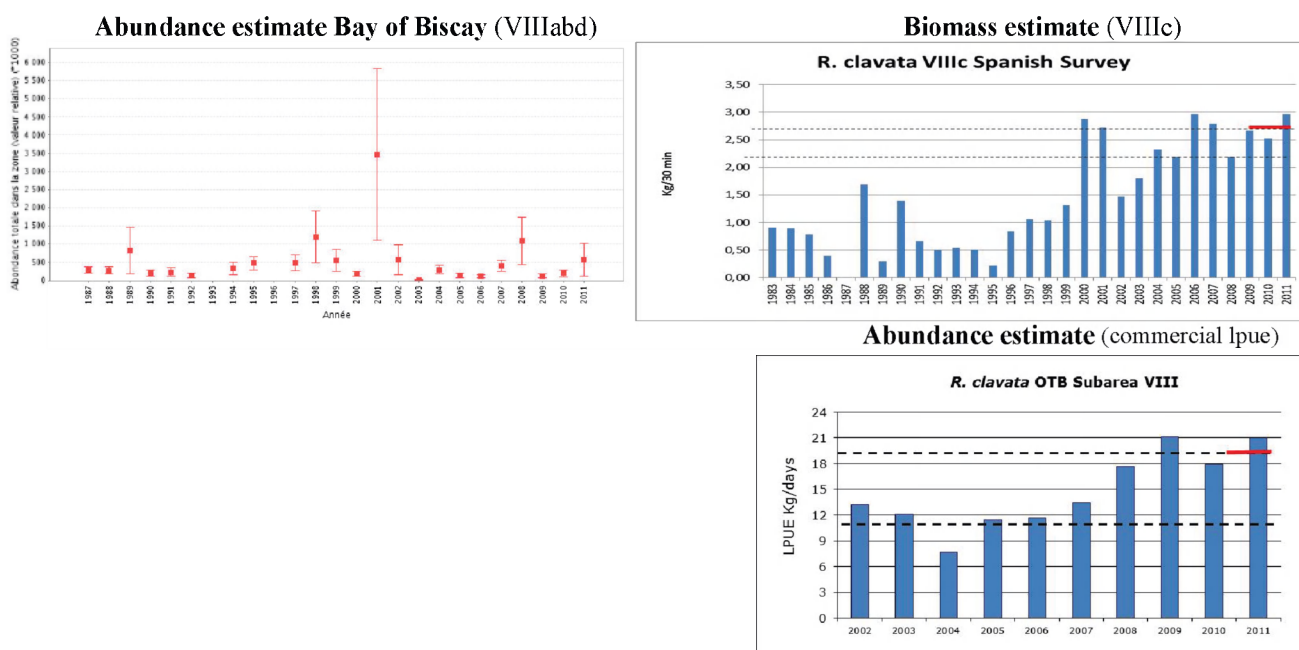


Figure 7.4.14.1.1 Thornback ray *Raja clavata* in Subarea VIII. Left: Relative abundance estimate for Divisions VIIIa,b,d (French EVHOE), right: biomass estimate for Division VIIIc (SpGFS–WIBTS-Q4, kg/30 min haul). Bottom. Subarea VIII (OTB Basque fleet, commercial landings per unit effort). Dashed lines give mean annual cpue \pm std. dev. for 2005–2009, red line shows mean annual cpue for 2010–2011.

There is insufficient information to present trends in species-specific landings for this stock. Abundance estimates are stable or increasing in this area.

Management plans

No specific management objectives are known to ICES.

Biology

Raja clavata is a medium-bodied skate.

The fisheries

This species is usually caught as a bycatch in demersal fisheries.

Effects of the fisheries on the ecosystem

Some rays may benefit from scavenging on trawl-damaged organisms and discards.

Quality considerations

Since legal obligations to declare most demersal elasmobranchs to species level were introduced, a greater proportion of data are reported to this level. This information covers too short a time period to influence advice at the present time.

Fishery-independent trawl surveys provide the longest time-series of species-specific information, although these surveys do not sample all the size classes and habitats for the various species.

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.

| | |
|-----------------------------|--|
| Assessment type | Survey-based trends. |
| Input data | Surveys: SpGFS-WIBTS-Q4 in VIIIc and EVHOE-WIBTS-Q4 (in VIIIa.b.d) Commercial landings from Basque OTB fleet. |
| Discards and bycatch | Data not examined. Improved knowledge of discard rates and discard survival is required. |
| Indicators | None. |
| Other information | Life history. |
| Working group report | WGEF |

ECOREGION Bay of Biscay and Atlantic Iberian waters
STOCK Thornback ray (*Raja clavata*) in Subarea VIII (Bay of Biscay and Cantabrian Sea)

Reference points

No reference points are defined for this stock

Outlook for 2013 and 2014

No reliable assessment can be presented for this stock. Survey trends provide limited information. Stock identity needs to be better described.

ICES approach to data-limited stocks

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

Following this approach the biomass in Division VIIIc is estimated to have increased by 18% between 2005 and 2009 (average of the five years) and 2010–2011 (average of the two years). Abundance estimates in Divisions VIIIA,b,d do not show this increase. Therefore, ICES recommends no increase in catches compared to recent catches. However, as species-specific landings data are not complete, it is not possible to quantify the current catch.

A precautionary buffer has not been applied, considering the stability of abundance in Divisions VIIIA,b,d over an extended period and the increasing trend in Division VIIIc. Lpue from the Basque otter trawl indicate an increasing trend.

ICES does not advise that an individual TAC be set for this stock, at present. 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 target fisheries. Such measures should be developed by stakeholder consultations, considering the overall mixed fisheries context.

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

Additional considerations

The distribution and relative abundance of *R. clavata* appears stable, but the surveys do not cover the whole stock area (Figure 7.4.14.1.2, below).

Management considerations

TACs only regulate the landings, and a low TAC on a low-value bycatch species could induce more discards. Because this species are usually caught as a bycatch in demersal fisheries, it would benefit from a reduction in the overall demersal fishing effort.

Comparison with previous assessment and advice

No species-specific advice has previously been provided for thornback ray in VIII. The advice is based on category 3. of ICES approach to advice provision in data-limited situations.

Sources

ICES. 2012. Report of the Working Group on Elasmobranch Fishes (WGEF), 19–26 June 2012, Lisbon, Portugal. ICES CM 2012/ACOM:19.

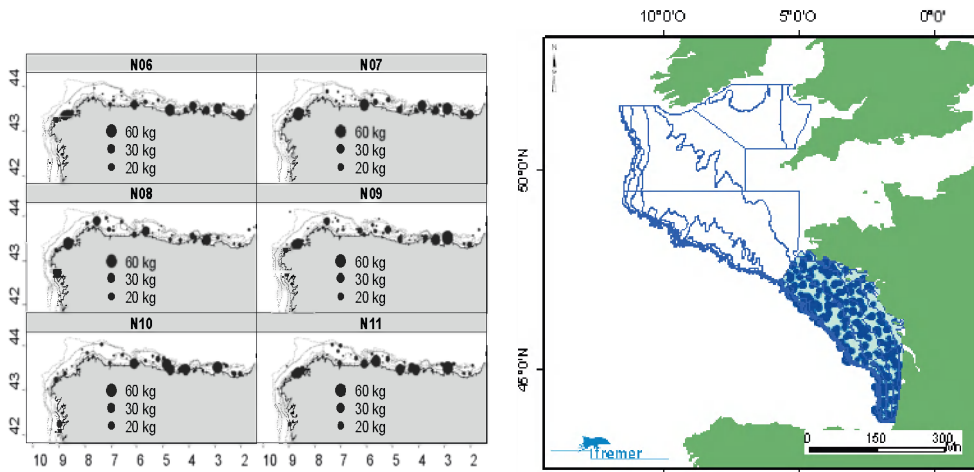


Figure 7.4.14.1.2 Thornback ray in the Subarea VIII. Distribution and relative abundance of *Raja clavata* in survey area. Left, SpGFS-WIBTS-Q4. Right, EVHOE-WIBTS-Q4 survey.

Table 7.4.14.1.1 Thornback ray in Subarea VIII. ICES advice and landings.

| Year | ICES advice | Predicted catch corresp. to advice | ICES Species-specific landings:– minimum estimate based on reported landings |
|------|---|---------------------------------------|---|
| 2011 | No specific advice | | 141 |
| 2012 | No specific advice | | |
| 2013 | No TAC, species-specific measures needed, catch should not increase from recent average. | - | |
| 2014 | No new advice, same as 2013 | - | |

Weights in tonnes.

ECOREGION Bay of Biscay and Atlantic Iberian waters
STOCK Cuckoo ray (*Leucoraja naevus*) in Subarea VIII (Bay of Biscay and Cantabrian Sea)

Advice for 2013 and 2014

Based on ICES approach to data-limited stocks, ICES advises that catches could be increased by a maximum of 6%. However, as species-specific landings data are not complete, it is not possible to quantify the current catch. ICES does not advise that an individual TAC be set for this stock, at present.

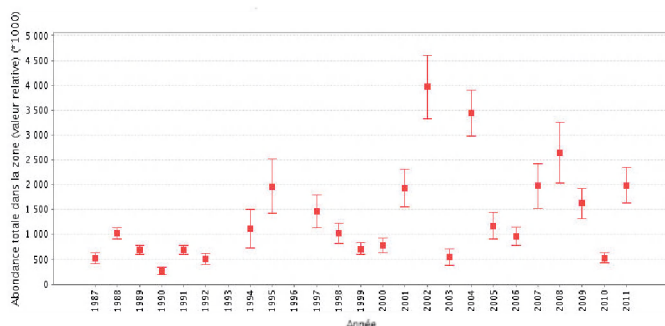
This is the first year ICES is providing quantitative advice for data-limited stocks.

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 target fisheries. Such measures should be developed by stakeholder consultations, considering the overall mixed fisheries context.

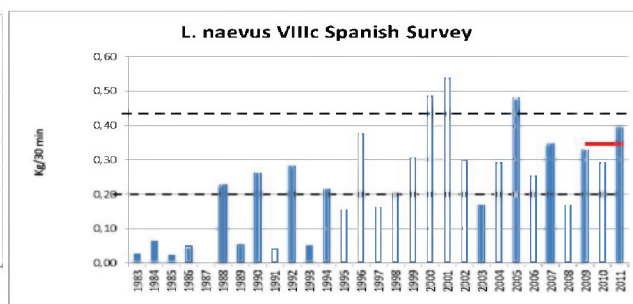
Stock status

| F (Fishing Mortality) | |
|------------------------------|--------------------------------|
| Qualitative evaluation | 2009-2011 Unknown |
| SSB (Spawning Stock Biomass) | |
| Qualitative evaluation | 2005-2011 Stable/Increasing |

Abundance estimate Bay of Biscay (VIIIabd)



Abundance estimate (VIIIc)



Abundance estimate (commercial Ipue)

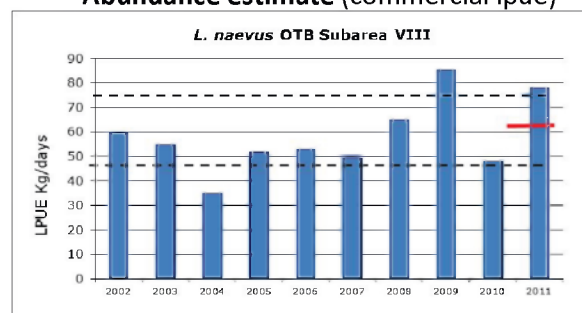


Figure 7.4.14.2.1 Cuckoo ray *Leucoraja naevus* in Subarea VIII. Left: Relative abundance estimate for VIIIa,b,d (EVHOE-WIBTS-Q4), right: biomass estimate for Division VIIIc (SpGFS-WIBTS-Q4, kg/30 min haul). Bottom: Subarea VIII (OTB Basque fleet, commercial landings per unit effort). Dashed lines give mean annual cpue \pm std. dev. for 2005-2009, red line shows mean annual cpue for 2010-2011.

There is insufficient information to present trends in species-specific landings for this stock. Abundance estimates are increasing in this area, and the biomass estimate for VIIIc in the last two years is 6% above the previous five year average.

Management plans

No specific management objectives are known to ICES.

Biology

Many elasmobranchs are slow growing, have a late age-at-maturity and a low reproductive capacity. *Leucorajidae* are considered to be more offshore species than the *Rajidae*. The large size and aggregating behaviour of elasmobranchs make them susceptible to over-exploitation.

Environmental influence on the stock

The degree of resource competition and species interactions between the various skate species is poorly understood. Historically, common skate were known to predate on smaller skate individuals, and the longer-term decline in the larger skates may have benefited populations of smaller skate species.

The fisheries

This species is usually caught as a bycatch in demersal fisheries.

Effects of the fisheries on the ecosystem

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

Quality considerations

Since legal obligations to declare most demersal elasmobranchs to species level were introduced, a greater proportion of data are reported to this level. This information covers too short a time period to influence advice at the present time, and in some instances there are data quality issues (e.g. the proportion of *R. brachyura* and *R. montagui*).

Fishery-independent trawl surveys provide the longest time-series of species-specific information, although these surveys do not sample all the size classes and habitats for the various species.

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.

| | |
|-----------------------------|---|
| Assessment type | Survey-based trends. |
| Input data | Surveys: SpGFS-WIBTS-Q4 and EVHOE-WIBTS-Q4 Commercial bycatch from Basque OTB fleet |
| Discards and bycatch | Data not examined. Improved knowledge of discard rates and discard survival is required |
| Indicators | None. |
| Other information | Life history |
| Working group report | WGEF |

ECOREGION Bay of Biscay and Atlantic Iberian waters
STOCK Cuckoo ray (*Leucoraja naevus*) in Subarea VIII (Bay of Biscay and Cantabrian Sea)

Reference points

No reference points are defined for this stock

Outlook for 2013 and 2014

No reliable forecast can be presented for this stock. Cuckoo ray in VIII is probably part of a large offshore population extending into VII and VI.

ICES approach to data-limited stocks

For data-limited stocks for which a biomass index is available, ICES uses as harvest control rule 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 biomass is estimated to have increased by 6% between 2005 and 2009 (average of the five years) and 2010–2011 (average of the two years). This implies catches could increase by 6% in relation to the last three years average landings. However, as species-specific landings data are not complete, it is not possible to quantify the current catch. ICES does not advise that an individual TAC be set for this stock, at present.

The precautionary buffer is not applied as the stock has been stable or increased over the longer term.

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 target fisheries. Such measures should be developed by stakeholder consultations, considering the overall mixed fisheries context.

Additional considerations

Management considerations

TACs only regulate the landings, and a low TAC on a low-value bycatch species could induce more discards. Because this species are usually caught as a bycatch in demersal fisheries, it would benefit from a reduction in the overall demersal fishing effort.

The distribution and relative abundance of cuckoo ray appears stable, but the surveys do not cover the whole stock area. The population of cuckoo ray in Subarea VIII probably extends to Subareas VII and IX.

Comparison with previous assessment and advice

No species-specific advice has previously been provided for cuckoo ray in Division VIII. The advice is based on category 3 of ICES approach to advice provision in data-limited situations.

Sources

ICES. 2012. Report of the Working Group on Elasmobranch Fishes (WGEF), 19–26 June 2012, Lisbon, Portugal. ICES CM 2012/ACOM:19.

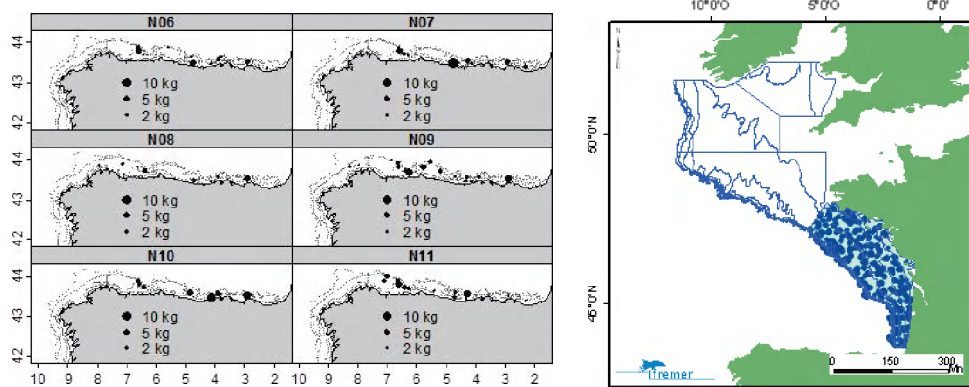


Figure 7.4.14.2.2 Cuckoo ray in Subarea VIII. Distribution and relative abundance of cuckoo ray in survey area. Left, Spanish survey (Sp-GFS-WIBTS-Q4), 1996-2011. Right, French EVHOE survey (EVHOE-WIBTS-Q4).

Table 7.4.14.2.1 Cuckoo ray in Subarea VIII. ICES advice and landings.

| Year | ICES advice | Predicted catch corresp. to advice | ICES Species-specific landings:– minimum estimate based on reported landings |
|------|---|---------------------------------------|---|
| 2011 | No specific advice | | 992 |
| 2012 | No specific advice | | |
| 2013 | No TAC, species-specific measures needed, catch could increase by maximum 6% | - | |
| 2014 | No new advice, same as 2013 | - | |

Weights in tonnes.

ECOREGION Bay of Biscay and Atlantic Iberian waters
STOCK Spotted ray (*Raja montagui*) in Subarea VIII (Bay of Biscay and Cantabrian Sea)

Advice for 2013 and 2014

Based on ICES approach to data-limited stocks, ICES advises that catches should be decreased by at least 20%. However, as species-specific landings data are not complete, it is not possible to quantify the current catch. ICES does not advise that an individual TAC be set for this stock, at present.

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 target fisheries. Such measures should be developed by stakeholder consultations, considering the overall mixed fisheries context.

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

Stock status

| F (Fishing Mortality) | |
|-------------------------------------|-----------|
| | 2009-2011 |
| Qualitative evaluation | Unknown |
| SSB (Spawning Stock Biomass) | |
| | 2009-2011 |
| Qualitative evaluation | Unknown |

The state of the stock is unknown and there is insufficient information to present trends in species-specific landings for this stock. There is no survey information to provide an accurate assessment of spotted ray in subarea VIII. This is due to the infrequency of occurrence of the species in the surveys.

Management plans

No specific management objectives are known to ICES.

Biology

Spotted ray is a medium-bodied skate species, of high-medium productivity.

The fisheries

Spotted ray is a bycatch species in this region. The proportion of this species in the landings is low.

Effects of the fisheries on the ecosystem

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

Quality considerations

There may be issues of misidentification of this species with blonde ray, *Raja. bachyura*. Fishery-independent trawl surveys provide the longest time-series of species-specific information, although these surveys do not sample all the size classes and habitats for the various species.

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.

| | |
|-----------------------------|---|
| Assessment type | No assessment |
| Discards and bycatch | Data not examined. Improved knowledge of discard rates and discard survival is required |
| Indicators | None. |
| Other information | Life history |
| Working group report | WGEEF |

ECOREGION Bay of Biscay and Atlantic Iberian waters
STOCK Spotted ray (*Raja montagui*) in Subarea VIII (Bay of Biscay and Cantabrian Sea)

Reference points

No reference points are defined for this stock

Outlook for 2013 and 2014

No reliable assessment can be presented for this stock. Therefore, 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.

Following this approach, ICES advises that catches should decrease by at least 20% in relation to the last three years average. However, as species-specific landings data are not complete, it is not possible to quantify the current catch. ICES does not advise that an individual TAC be set for this stock, at present.

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 target fisheries. Such measures should be developed by stakeholder consultations, considering the overall mixed fisheries context.

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

Additional considerations

Management considerations

TACs only regulate the landings, and a low TAC on a low-value bycatch species could induce more discards. Because this species are usually caught as a bycatch in demersal fisheries, it would benefit from a reduction in the overall demersal fishing effort.

Comparison with previous assessment and advice

No species-specific advice has previously been provided for spotted ray in VIII. This advice is based on Category 5 of ICES approach to data-limited stocks.

Sources

ICES. 2012. Report of the Working Group on Elasmobranch Fishes (WGEF), 19–26 June 2012, Lisbon, Portugal. ICES CM 2012/ACOM:19.

Table 7.4.14.3.1 Spotted ray in Subarea VIII. ICES advice and landings.

| Year | ICES advice | Predicted catch corresp. to advice | ICES Species-specific landings:– minimum estimate based on reported landings |
|------|--|---------------------------------------|---|
| 2011 | No specific advice | | 70 |
| 2012 | No specific advice | | |
| 2013 | No TAC, species-specific measures needed, catch to decrease by at least 20%. | - | |
| 2014 | No new advice, same as 2013 | - | |

Weights in tonnes.

ECOREGION Bay of Biscay and Atlantic Iberian waters
STOCK Spotted ray (*Raja montagui*) in Division IXa (west of Galicia, Portugal, and Gulf of Cadiz)

Advice for 2013 and 2014

Based on ICES approach to data-limited stocks, ICES advises that catches should be decreased by at least 20%. However, as species-specific landings data are not complete, it is not possible to quantify the current catch. ICES does not advise that an individual TAC be set for this stock, at present.

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 target fisheries. Such measures should be developed by stakeholder consultations, considering the overall mixed fisheries context.

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

Stock status

| F (Fishing Mortality) | |
|------------------------------|-----------|
| | 2009-2011 |
| Qualitative evaluation | Unknown |
| SSB (Spawning Stock Biomass) | |
| | 2009-2011 |
| Qualitative evaluation | Unknown |

The state of the stock is unknown and there is insufficient information to present trends in species-specific landings for this stock.

Management plans

No specific management objectives are known to ICES.

Biology

Spotted ray is a small-bodied, relatively fast growing productive species.

The fisheries

Most of the skate landings from the continental Portuguese coast are obtained from the polyvalent fleet segment. This segment includes vessels of different sizes, ranging from 5 to 27 m overall length. The vessels in this segment characteristically are also licensed to operate more than one fishing gear (trammel nets, gillnets, longline, trawl, traps and pots).

Effects of the fisheries on the ecosystem

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

Quality considerations

Since legal obligations to declare most demersal elasmobranchs to species level were introduced, a greater proportion of data are reported to this level. This information covers too short a time period to influence advice at the present time, and in some instances there are data quality issues.

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.

Fishery-independent trawl surveys provide the longest time-series of species-specific information, although these surveys do not sample all the size classes and habitats for the various species.

Scientific basis

| | |
|-----------------------------|---|
| Assessment type | No assessment. |
| Discards and bycatch | Data not examined. Improved knowledge of discard rates and discard survival is required |
| Indicators | PtGFS-WIBTS-Q4 Survey, Commercial lpue, Portuguese trammel net fleets |
| Other information | Life history |
| Working group report | WGEF |

ECOREGION Bay of Biscay and Atlantic Iberian waters
STOCK Spotted ray (*Raja montagui*) in Division IXa (west of Galicia, Portugal, and Gulf of Cadiz)

Reference points

No reference points are defined for this stock

Outlook for 2013 and 2014

No reliable assessment can be presented for this stock. Survey trends provide limited information. Stock identity needs to be better described.

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.

Following this approach, ICES advises that catches should be decreased by at least 20%. However, as species-specific landings data are not complete, it is not possible to quantify the current catch. ICES does not advise that an individual TAC be set for this stock, at present.

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 target fisheries. Such measures should be developed by stakeholder consultations, considering the overall mixed fisheries context.

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

Additional considerations

Limited survey data suggests an increase in the mean length. (Figure 7.4.14.4.1). Distribution and relative abundance time series is too short to infer trends (Figure 7.4.14.4.2 and 7.4.14.4.3).

Management considerations

TACs only regulate the landings, and a low TAC on a low-value bycatch species could induce more discards. Because this species are usually caught as a bycatch in demersal fisheries, it would benefit from a reduction in the overall demersal fishing effort.

Comparison with previous assessment and advice

No species-specific advice has previously been provided for spotted ray in IXa (Table 7.4.14.4.1). The advice is based on category 5 of ICES approach to advice provision in data-limited situations.

Sources

ICES. 2012. Report of the Working Group on Elasmobranch Fishes (WGEF), 19–26 June 2012, Lisbon, Portugal. ICES CM 2012/ACOM:19.

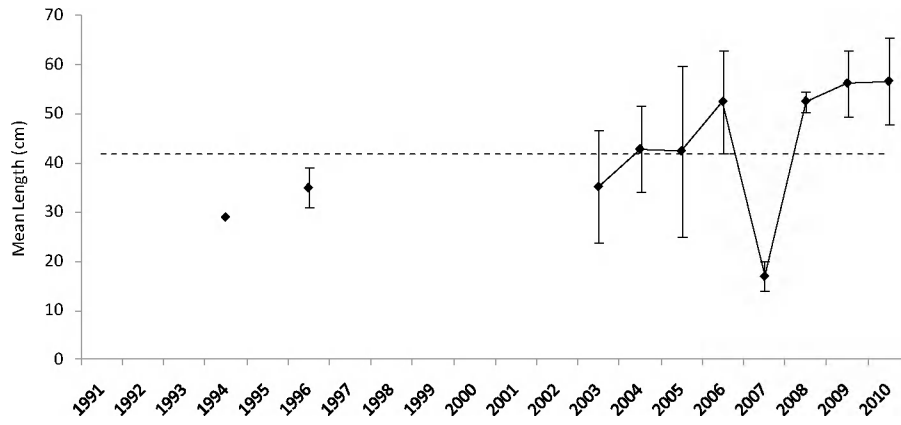


Figure 7.4.14.4.1 Spotted ray in Division IXa. Portuguese PtGFS-WIBTS-Q4 Survey mean length of spotted ray, during 1991-2010.

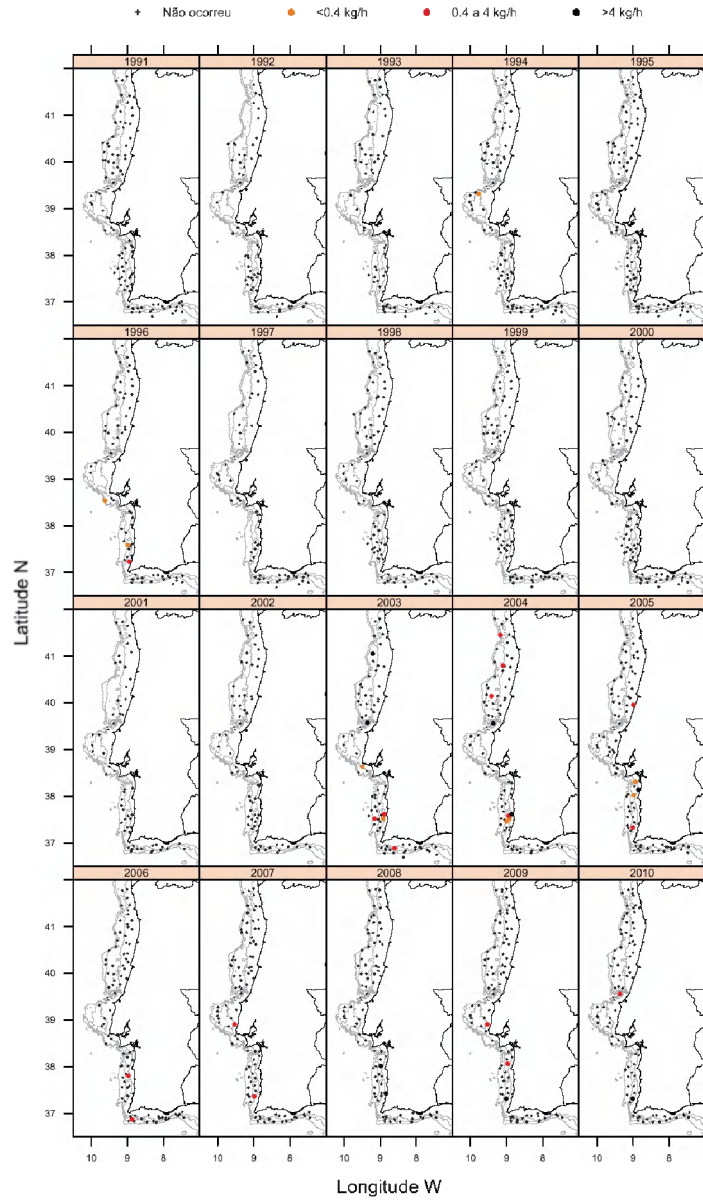


Figure 7.4.14.4.2 Spotted ray in Division IXa. PtGFS-WIBTS-Q4 Survey indices in IXa. Distribution and relative biomass.

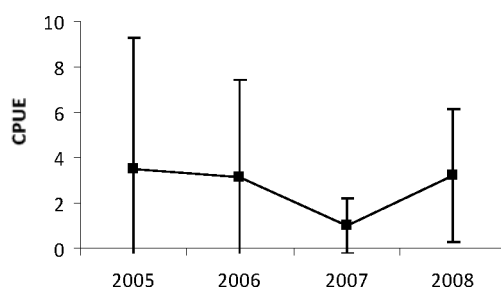


Figure 7.4.14.4.3 Spotted ray in Division IXa. Portuguese PtGFS-WIBTS-Q4 Survey Distribution and relative abundance of spotted ray in IXa.

Table 7.4.14.4.1 Spotted ray in Division IXa. ICES advice and landings.

| Year | ICES advice | Predicted catch corresp. to advice | ICES Species-specific landings:– minimum estimate based on reported landings |
|------|---|---------------------------------------|---|
| 2011 | No specific advice | | 78 |
| 2012 | No specific advice | | |
| 2013 | No TAC, species-specific measures needed, catch to decrease by at least 20%. | - | |
| 2014 | No new advice, same as 2013 | - | |

Weights in tonnes.

ECOREGION Bay of Biscay and Atlantic Iberian waters
STOCK Cuckoo ray (*Leucoraja naevus*) in Division IXa (west of Galicia, Portugal, and Gulf of Cadiz)

Advice for 2013 and 2014

Based on ICES approach to data-limited stocks, ICES advises that catches should be decreased by a at least 20%. However, as species-specific landings data are not complete, it is not possible to quantify the current catch. ICES does not advise that an individual TAC be set for this stock, at present.

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

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 target fisheries. Such measures should be developed by stakeholder consultations, considering the overall mixed fisheries context.

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

Stock status

| F (Fishing Mortality) | |
|------------------------------|-----------|
| | 2009-2011 |
| Qualitative evaluation | Unknown |
| | ? |
| SSB (Spawning Stock Biomass) | |
| | 2009-2011 |
| Qualitative evaluation | Unknown |
| | ? |

The state of the stock is unknown and there is insufficient information to present trends in species-specific landings for this stock.

Management plans

No specific management objectives are known to ICES.

Biology

Many elasmobranchs are slow growing, have a late age-at-maturity and a low reproductive capacity. *Leucorajidae* are considered to be more offshore species than the *Rajidae*. The large size and aggregating behaviour of elasmobranchs make them susceptible to over-exploitation.

Environmental influence on the stock

The degree of resource competition and species interactions between the various skate species is poorly understood. Historically, common skate were known to predate on smaller skate individuals, and the longer-term decline in the larger skates may have benefited populations of smaller skate species.

The fisheries

Most of the skates landings from the continental Portuguese coast are obtained by the polyvalent fleet segment. This segment includes vessels of different sizes, ranging from 5 to 27 m overall length. The vessels in this segment characteristically are also licensed to operate more than one fishing gear (trammel nets, gillnets, longline, trawl, traps and pots).

Effects of the fisheries on the ecosystem

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

Quality considerations

Since legal obligations to declare most demersal elasmobranchs to species level were introduced, a greater proportion of data are reported to this level. This information covers too short a time period to influence advice at the present time, and in some instances there are data quality issues.

Fishery-independent trawl surveys provide the longest time-series of species-specific information, although these surveys do not sample all the size classes and habitats for the various species.

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.

Scientific basis

| | |
|-----------------------------|--|
| Assessment type | No assessment. |
| Discards and bycatch | Data not examined. Improved knowledge of discard rates and discard survival is required |
| Indicators | PtGFS-WIBTS-Q4 Survey, Spanish SpGFS-WIBTS-Q4Survey– VIIIc and IXa, Commercial lpue, Portuguese trammel net fleets |
| Other information | Life history |
| Working group report | WGEEF |

ECOREGION Bay of Biscay and Atlantic Iberian waters
STOCK Cuckoo ray (*Leucoraja naevus*) in Division IXa (west of Galicia, Portugal, and Gulf of Cadiz)

Reference points

No reference points are defined for this stock

Outlook for 2013 and 2014

No reliable assessment can be presented for this stock. Survey trends provide limited information. Stock identity needs to be better described.

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.

Following this approach, ICES advises that catches should be decreased by at least 20%. However, as species-specific landings data are not complete, it is not possible to quantify the current catch. ICES does not advise that an individual TAC be set for this stock, at present.

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 target fisheries. Such measures should be developed by stakeholder consultations, considering the overall mixed fisheries context.

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

Additional considerations

The distribution and relative abundance of cuckoo ray only covers 2010 and 2011. Survey relative abundance is shown in Figure 7.4.14.5.1 below. The population of cuckoo ray in sub-Area IXa may extend into sub-Area VIII.

Management considerations

TACs only regulate the landings, and a low TAC on a low-value bycatch species could induce more discards. Because this species are usually caught as a bycatch in demersal fisheries, it would benefit from a reduction in the overall demersal fishing effort.

Comparison with previous assessment and advice

No species-specific advice has previously been provided for cuckoo ray in IXa (Table 7.4.14.5.1). The advice is based on category 5 of ICES approach to advice provision in data-limited situations.

Sources

ICES. 2012. Report of the Working Group on Elasmobranch Fishes (WGEF), 19–26 June 2012, Lisbon, Portugal. ICES CM 2012/ACOM:19.

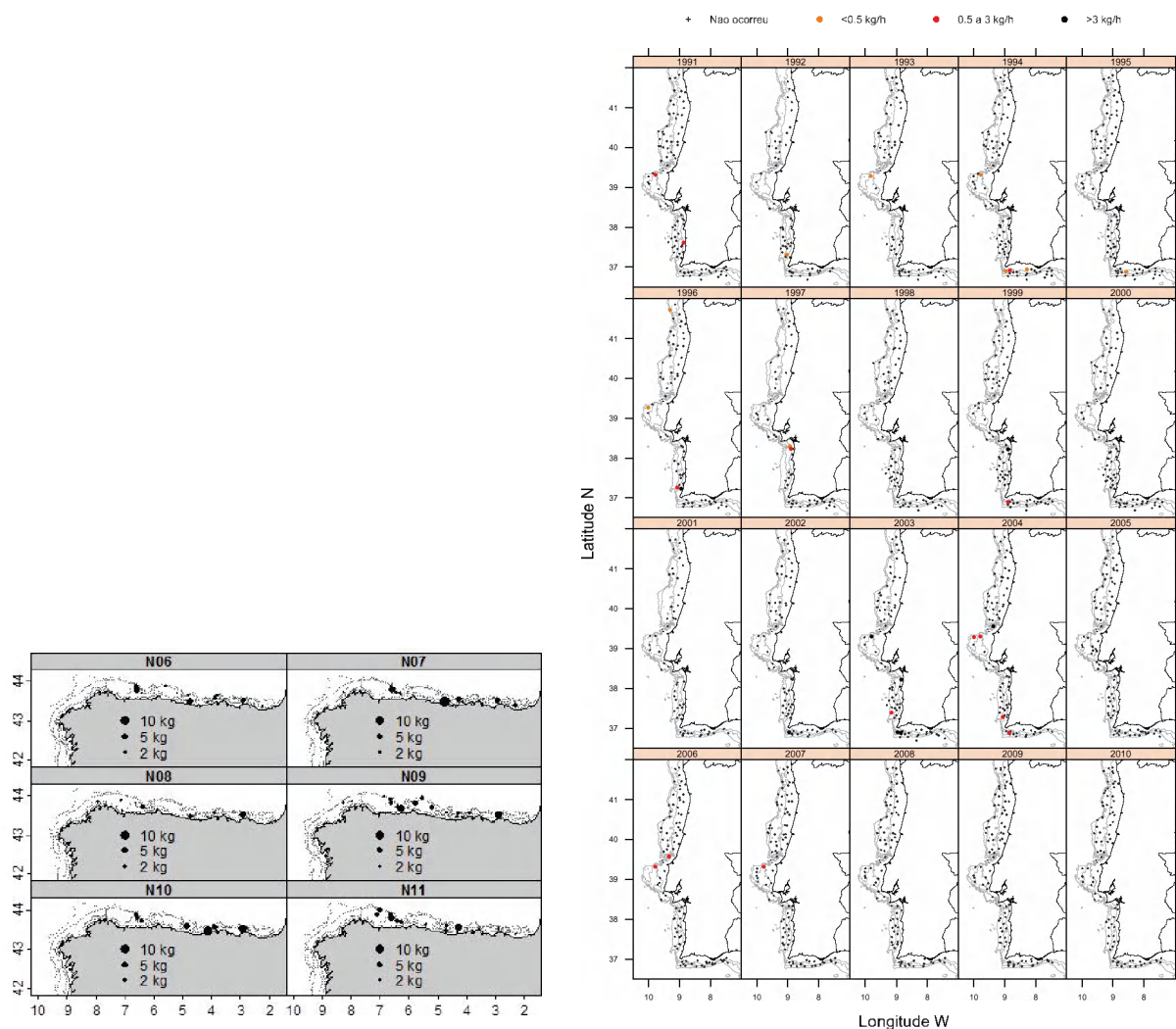


Figure 7.4.14.5.1 Cuckoo ray in Division IXa. Distribution and relative abundance of cuckoo ray in surveys: SpGFSWIBTS-Q4 in VIIIc and IXa 1996-2011 (left) and PtGFS-WIBTS-Q4 (1991-2010) (right).

Table 7.4.14.5.1 Cuckoo ray in Division IXa. ICES advice and landings.

| Year | ICES advice | Predicted catch corresp. to advice | ICES Species-specific landings:– minimum estimate based on reported landings |
|------|---|---------------------------------------|---|
| 2011 | No specific advice | | 67 |
| 2012 | No specific advice | | |
| 2013 | No TAC, species-specific measures needed, catch to decrease by at least 20%. | - | |
| 2014 | No new advice, same as 2013 | - | |

Weights in tonnes.

ECOREGION Bay of Biscay and Atlantic Iberian waters
STOCK Thornback ray (*Raja clavata*) in Division IXa (west of Galicia, Portugal, and Gulf of Cadiz)

Advice for 2013 and 2014

Based on ICES approach to data-limited stocks, ICES advises that catches should be reduced by at least 20% current levels. However, as species-specific landings data are not complete, it is not possible to quantify the current catch. ICES does not advise that an individual TAC be set for this stock, at present.

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 target fisheries. Such measures should be developed by stakeholder consultations, considering the overall mixed fisheries context.

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

Stock status

| | |
|-------------------------------------|----------------------|
| F (Fishing Mortality) | |
| Qualitative evaluation | 2009-2011 Unknown |
| SSB (Spawning Stock Biomass) | |
| Qualitative evaluation | 2009-2011 Stable |

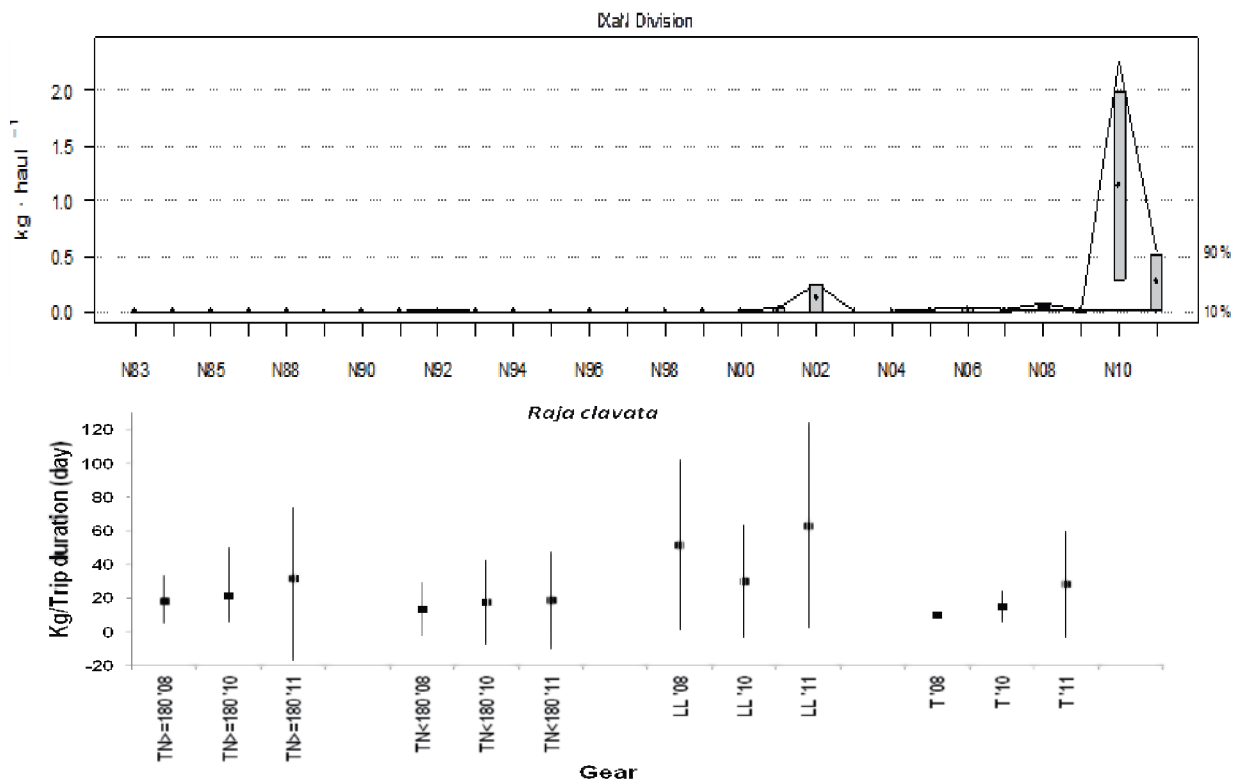
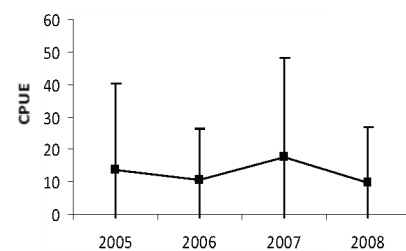


Figure 7.4.14.6.1 Thornback ray *Raja clavata* in Division IXa. Top: Relative biomass estimate for Division IXa (catch per unit effort, PtGFS-WIBTS-Q1). Middle: Biomass index (SpGFS-WIBTS-Q4 Kg/haul). Lower: landings per unit effort (lpue in kg/Fishing days) estimates for different gear categories in Subarea IXa for 2008, 2010 and 2011. Gear: TN>=180-Trammel nets with mesh size >=180mm; TN<180-trammel nets with mesh size <180mm; LL-Longline; T-Trawl.

There is insufficient information to present trends in species-specific landings for this stock. Biomass estimates remain stable at low numbers in the Spanish survey, with one exceptional year in 2010. The main indicator used here is the estimate from the Portuguese fleets, where all gears show a stable trend.

Management plans

No specific management objectives are known to ICES.

Biology

Thornback ray is a medium-bodied skate.

The fisheries

Most of the skates landings from the continental Portuguese coast are obtained from the polyvalent fleet segment. This segment includes vessels of different sizes, ranging from 5 to 27 m overall length. The vessels in this segment characteristically are also licensed to operate more than one fishing gear (trammel nets, gillnets, longline, trawl, traps and pots).

Effects of the fisheries on the ecosystem

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

Quality considerations

Since legal obligations to declare most demersal elasmobranchs to species level were introduced, a greater proportion of data are reported to this level. This information covers too short a time period to influence advice at the present time.

Fishery-independent trawl surveys provide the longest time-series of species-specific information, although these surveys do not sample all the size classes and habitats for the various species.

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.

| | |
|-----------------------------|---|
| Assessment type | Survey-based trends. |
| Input data | Survey: PtGFS-WIBTS-Q4 and SpGFS-WIBTS-Q4 Commercial lpue: Portuguese trammel net fleets |
| Discards and bycatch | Data not examined. Improved knowledge of discard rates and discard survival is required |
| Indicators | None. |
| Other information | Life history |
| Working group report | WGEF |

ECOREGION Bay of Biscay and Atlantic Iberian waters
STOCK Thornback ray (*Raja clavata*) in Division IXa (west of Galicia, Portugal, and Gulf of Cadiz)

Reference points

No reference points are defined for this stock

Outlook for 2013 and 2014

No reliable assessment can be presented for this stock. Survey trends provide limited information.

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.

Following this approach, ICES advises that catches should be reduced by at least 20% from current levels. However, as species-specific landings data are not complete, it is not possible to quantify the current catch. ICES does not advise that an individual TAC be set for this stock, at present.

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 target fisheries. Such measures should be developed by stakeholder consultations, considering the overall mixed fisheries context.

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

Additional considerations

The distribution and relative abundance of thornback ray appears stable, but the surveys do not cover the whole stock area (Figure 7.4.14.6.2).

Management considerations

TACs only regulate the landings, and a low TAC on a low-value bycatch species could induce more discards. Because this species are usually caught as a bycatch in demersal fisheries, it would benefit from a reduction in the overall demersal fishing effort.

Comparison with previous assessment and advice

No species-specific advice has previously been provided for thornback ray in IXa (Table 7.4.14.6.1). The advice is based on category 5. of ICES approach to advice provision in data-limited situations.

Sources

ICES. 2012. Report of the Working Group on Elasmobranch Fishes (WGEF), 19–26 June 2012, Lisbon, Portugal. ICES CM 2012/ACOM:19.

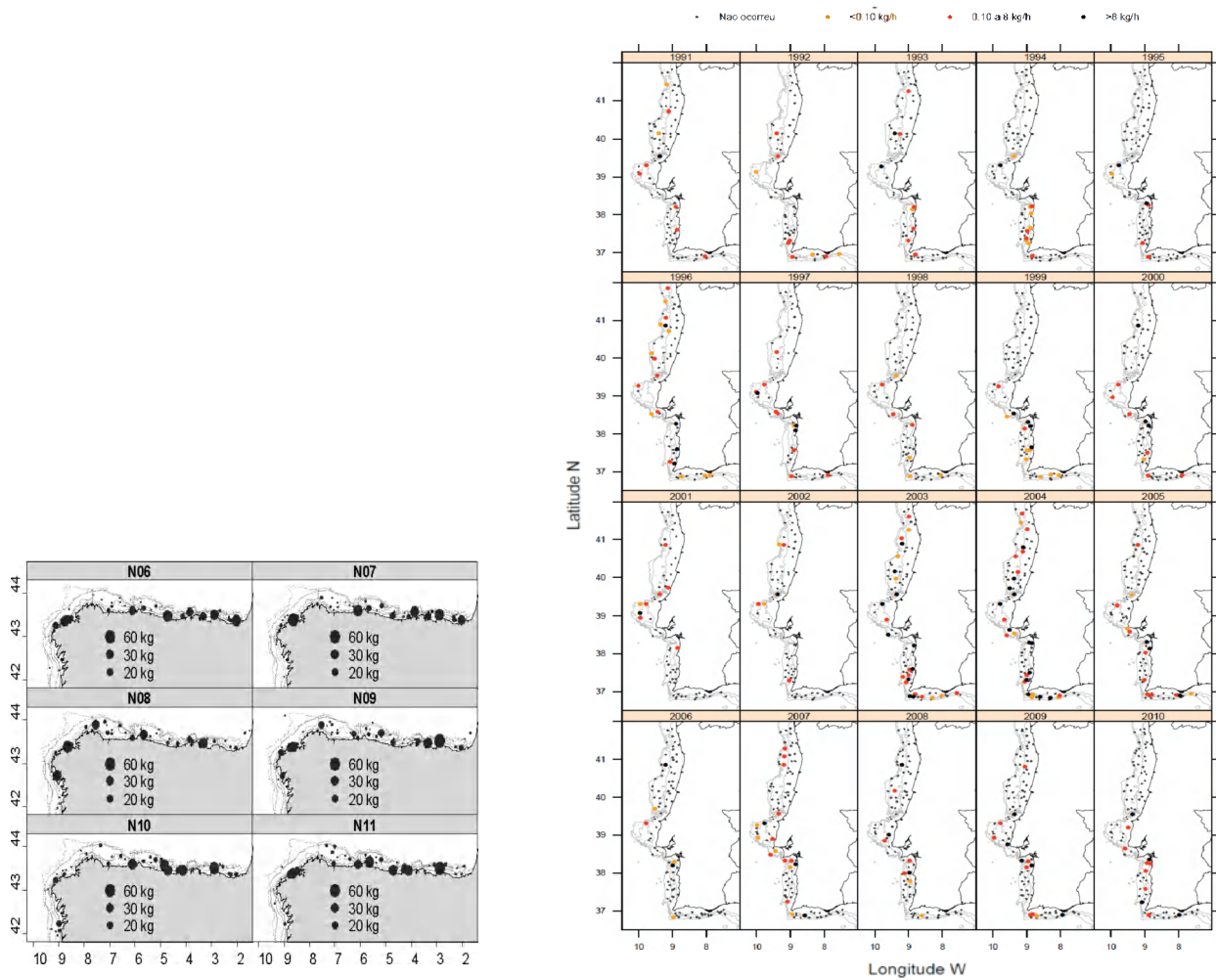


Figure 7.4.14.6.2 Thornback ray in Division IXa. Relative abundance of thornback ray in survey area: SpGFS-WIBTS-Q4(kg/30 min haul) (left) and PtGFS-WIBTS-Q4 (right).

Table 7.4.14.6.1 Thornback ray in Division IXa. ICES advice and landings.

| Year | ICES advice | Predicted catch corresp. to advice | ICES Species-specific landings:– minimum estimate based on reported landings |
|------|---|---------------------------------------|---|
| 2011 | No specific advice | | 814 |
| 2012 | No specific advice | | |
| 2013 | No TAC. species-specific measures needed. catch to decrease by at least 20%. | - | |
| 2014 | No new advice, same as 2013 | - | |

Weights in tonnes.

ECOREGION Bay of Biscay and Atlantic Iberian waters
STOCK Blonde ray (*Raja brachyuran*) in Division IXa (west of Galicia, Portugal, and Gulf of Cadiz)

Advice for 2013 and 2014

Based on ICES approach to data-limited stocks, ICES advises that catches should be decreased by at least 20%. However, as species-specific landings data are not complete, it is not possible to quantify the current catch. ICES does not advise that an individual TAC be set for this stock, at present.

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 target fisheries. Such measures should be developed by stakeholder consultations, considering the overall mixed fisheries context.

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

Stock status

| F (Fishing Mortality) | |
|------------------------------|-----------|
| | 2009-2011 |
| Qualitative evaluation | Unknown |
| SSB (Spawning Stock Biomass) | |
| | 2009-2011 |
| Qualitative evaluation | Unknown |

The state of the stock is unknown and there is insufficient information to present trends in species-specific landings for this stock.

Management plans

No specific management objectives are known to ICES.

Biology

Blonde ray is a moderately large-bodied skate.

The fisheries

Blonde ray is the second most abundant commercially exploited species in this area.

Most of the skate landings from the continental Portuguese coast are obtained from the polyvalent fleet segment. This segment includes vessels of different sizes, ranging from 5 to 27 m overall length. The vessels in this segment characteristically are also licensed to operate more than one fishing gear (trammel nets, gillnets, longline, trawl, traps and pots).

Quality considerations

Since legal obligations to declare most demersal elasmobranchs to species level were introduced, a greater proportion of data are reported to this level. This information covers too short a time period to influence advice at the present time.

Fishery-independent trawl surveys provide the longest time-series of species-specific information, although these surveys do not sample all the size classes and habitats for the various species.

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.

Scientific basis

| | |
|-----------------------------|--|
| Assessment type | Survey-based trends. |
| Input data | Surveys: PtGFS-WIBTS-Q4 and SpGFS-WIBTS-Q4 Commercial lpuue : Portuguese trammel net fleets |
| Discards and bycatch | Data not examined. Improved knowledge of discard rates and discard survival is required |
| Indicators | None. |
| Other information | Life history |
| Working group report | WGEF |

ECOREGION Bay of Biscay and Atlantic Iberian waters
STOCK Blonde ray (*Raja brachyuran*) in Division IXa (west of Galicia, Portugal, and Gulf of Cadiz)

Reference points

No reference points are defined for this stock.

Outlook for 2013 and 2014

No reliable assessment can be presented for this stock. Survey trends provide limited information. Stock identity needs to be better described.

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.

Following this approach, ICES advises that catches should be decreased by at least 20%. However, as species-specific landings data are not complete, it is not possible to quantify the current catch. ICES does not advise that an individual TAC be set for this stock, at present.

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 target fisheries. Such measures should be developed by stakeholder consultations, considering the overall mixed fisheries context.

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

Additional considerations

The distribution and relative abundance of blonde ray is unclear, but the surveys do not cover the whole stock area (Figure 7.4.14.7.1, below).

Management considerations

TACs only regulate the landings, and a low TAC on a low-value bycatch species could induce more discards. Because this species are usually caught as a bycatch in demersal fisheries, it would benefit from a reduction in the overall demersal fishing effort.

Comparison with previous assessment and advice

No species-specific advice has previously been provided for thornback ray in IXa (Table 7.4.14.7.1). The advice is based on category 5 of ICES approach to advice provision in data-limited situations.

Sources

ICES. 2012. Report of the Working Group on Elasmobranch Fishes (WGEF), 19–26 June 2012, Lisbon, Portugal. ICES CM 2012/ACOM:19.

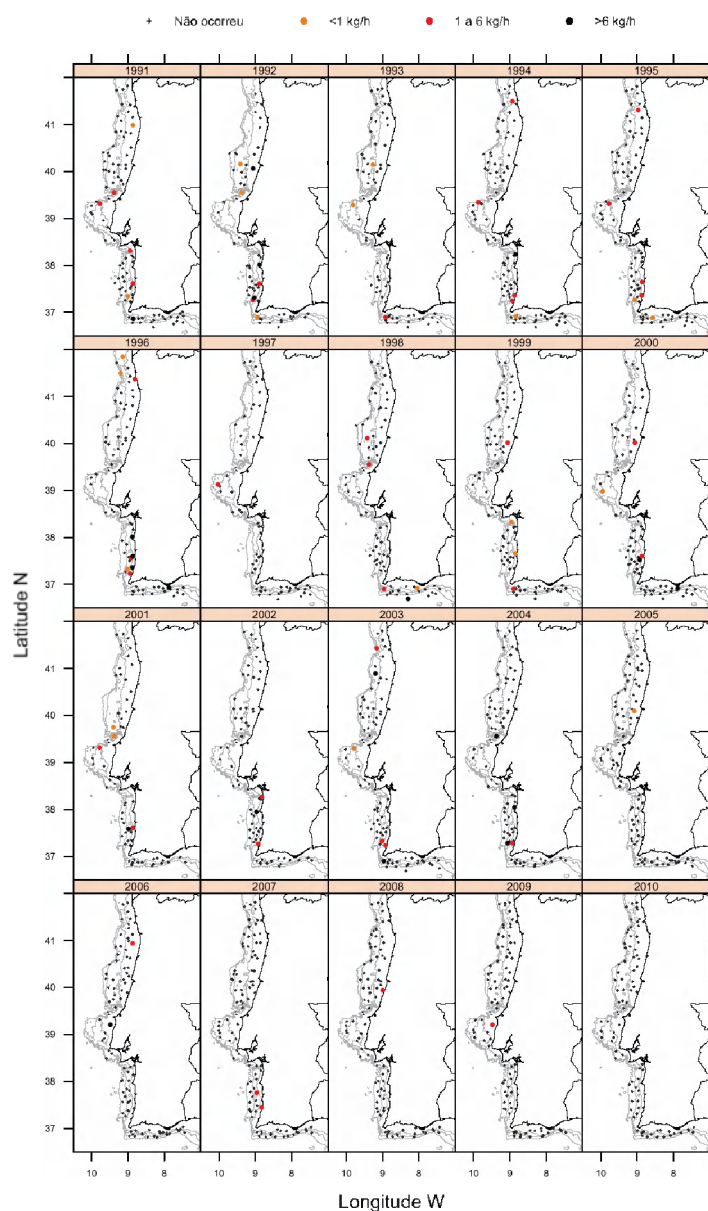


Figure 7.4.14.7.1 Blonde ray in Division IXa. Distribution and relative abundance of Thornback ray in survey area, PtGFS-WIBTS-Q4.

Table 7.4.14.7.1 Blonde ray in Division IXa. ICES advice and landings.

| Year | ICES advice | Predicted catch corresp. to advice | ICES Species-specific landings:– minimum estimate based on reported landings |
|------|---|---------------------------------------|---|
| 2011 | No specific advice | | 375 |
| 2012 | No specific advice | | |
| 2013 | No TAC, species-specific measures needed, catch to decrease by at least 20%. | - | |
| 2014 | No new advice, same as 2013 | - | |

Weights in tonnes.

ECOREGION Bay of Biscay and Atlantic Iberian waters
STOCK Common skate (*Dipturus batis*) complex (flapper skate (*Dipturus cf. flossada*) and blue skate (*Dipturus cf. intermedia*)) in Subarea VIII and Division IXa (Bay of Biscay and Atlantic Iberian waters)

Advice for 2013 and 2014

Based on the precautionary approach, ICES advises that there should be no targeted fishery for either *Dipturus cf. flossada* or *Dipturus cf. intermedia*, and measures should be taken to minimize bycatch.

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 target fisheries. Such measures should be developed by stakeholder consultations, considering the overall mixed fisheries context.

Stock status

| F (Fishing Mortality) | |
|------------------------------|-----------|
| | 2009-2011 |
| Qualitative evaluation | Unknown |
| | ? |
| SSB (Spawning Stock Biomass) | |
| | 2009-2011 |
| Qualitative evaluation | Depleted |
| | ✗ |

There is insufficient information to present trends in species-specific landings for this stock. Although the common skate-*Dipturus batis* complex is only rarely encountered in the Biscay and Iberian ecoregions, it is considered depleted in the Celtic Seas and North Sea ecoregions. Limited information suggest that both *D. cf. intermedia* and *D. cf. flossada* may be found towards the northern part of Biscay.

Management plans

The common skate, *Dipturus batis* complex is currently on the EU prohibited species list.

Biology

Common skate has a late age-at-maturity and a low reproductive capacity. They are considered to be particularly vulnerable due to their large size. The large skates are very large, slow-growing species, and as such are highly vulnerable to overfishing.

Environmental influence on the stock

The degree of resource competition and species interactions between the various skate species is poorly understood. Historically, common skate were known to predate on smaller skate individuals, and the longer-term decline in the larger skates may have benefited populations of smaller skate species.

The fisheries

The *Dipturus* family are very large, slow-growing species, and as such are highly vulnerable to overfishing. The *D. batis* complex may now be only found in the North of the ecoregion. The *D. batis* complex has been on the EU prohibited species list since 2009.

Quality considerations

Since legal obligations to declare most demersal elasmobranchs to species level were introduced, a greater proportion of data are reported to this level. This information covers too short a time period to influence advice at the present time.

Fishery-independent trawl surveys provide the longest time-series of species-specific information, although these surveys do not sample all the size classes and habitats for these species.

Scientific basis

| | |
|-----------------------------|---|
| Assessment type | No assessment |
| Discards and bycatch | Data not examined. Improved knowledge of discard rates and discard survival is required |
| Indicators | Survey indices, but not sufficiently reliable to serve as the advice basis. |
| Other information | Life history |
| Working group report | WGEF |

ECOREGION Bay of Biscay and Atlantic Iberian waters
STOCK Common skate (*Dipturus batis*) complex (flapper skate (*Dipturus cf. flossada*) and blue skate (*Dipturus cf. intermedia*)) in Subarea VIII and Division IXa (Bay of Biscay and Atlantic Iberian waters)

Reference points

No reference points are defined for this stock.

Outlook for 2013 and 2014

No reliable assessment can be presented for this stock. Survey trends provide limited information. Stock identity needs to be better described.

Precautionary Approach

ICES advises on the basis of the precautionary approach that there should be no be no targeted fishery for either *Dipturus cf. flossada* or *Dipturus cf. intermedia*. Measures should be taken to minimise bycatch.

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 target fisheries. Such measures should be developed by stakeholder consultations, considering the overall mixed fisheries context.

Additional considerations

Comparison with previous assessment and advice

The advice is as provided for 2011 and 2012 (Table 7.4.14.8.1). The basis of the advice is also the same, the precautionary approach.

Sources

ICES. 2012. Report of the Working Group on Elasmobranch Fishes (WGEF), 19–26 June 2012, Lisbon, Portugal. ICES CM 2012/ACOM:19.

Table 7.4.14.8.1 Common skate *Dipturus batis complex* (flapper skate *Dipturus cf. flossada* and blue skate *Dipturus cf. intermedia*) in VIII and IXa. ICES advice and landings.

| Year | ICES advice | Predicted catch corresp. to advice | ICES Species-specific landings:– minimum estimate based on reported landings |
|------|---------------------------------------|---------------------------------------|---|
| 2009 | No targeted fishery | 0 | - |
| 2010 | No new advice, same as 2009 | 0 | - |
| 2011 | Zero TAC | 0 | 0 |
| 2012 | No new advice, same as 2011 | 0 | |
| 2013 | No targeted fishery, minimize bycatch | 0 | |
| 2014 | No new advice, same as 2013 | 0 | |

Weights in tonnes.

ECOREGION Bay of Biscay and Atlantic Iberian waters
STOCK Other skates and rays in Subarea VIII and Division IXa (Bay of Biscay and Atlantic Iberian waters)

Advice for 2013 and 2014

Other species of skates and ray are also found in this ecoregions, and are found in small, variable, proportions in the landings. These include:

Dipturus oxyrinchus
Leuroraja circularis
Leucoraja fullonica
Raja microocellata
Raja undulata
Raja asterias
Raja miraletus
Amblyraja radiata

Based on ICES approach to data-limited stocks, ICES advises that catches should be decreased by at least 20%. However, as species-specific landings data are not complete, it is not possible to quantify the current catch. ICES does not advise that an individual TAC be set for these stocks, at present.

Additional measures should be identified that can regulate exploitation of these species. Such measures may include seasonal and/or area closures, technical measures, and tailored measures for target fisheries. Such measures should be developed by stakeholder consultations, considering the overall mixed fisheries context.

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

Stock status

| F (Fishing Mortality) | |
|-------------------------------------|-----------|
| | 2009-2011 |
| Qualitative evaluation | Unknown |
| SSB (Spawning Stock Biomass) | |
| | 2009-2011 |
| Qualitative evaluation | Unknown |

The state of the stocks is unknown and there is insufficient information to present trends in species-specific landings.

Management plans

No specific management objectives are known to ICES.

Biology

Most of these species are medium-large bodied skates and are therefore highly vulnerable to overexploitation.

The fisheries

These species are bycaught in small quantities in other fisheries.

Quality considerations

Since legal obligations to declare most demersal elasmobranchs to species level were introduced, a greater proportion of data are reported to this level. This information covers too short a time period to influence advice at the present time, and in some instances there are data quality issues.

Fishery-independent trawl surveys provide the longest time-series of species-specific information, although these surveys do not sample all the size classes and habitats for the various species.

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.

Scientific basis

| | |
|-----------------------------|---|
| Assessment type | No assessment |
| Discards and bycatch | Data not examined. Improved knowledge of discard rates and discard survival is required |
| Indicators | None. |
| Other information | Life history |
| Working group report | WGEF |

ECOREGION Bay of Biscay and Atlantic Iberian waters
STOCK Other skates and rays in Subarea VIII and Division IXa (Bay of Biscay and Atlantic Iberian waters)

Reference points

No reference points are defined for this stock.

Outlook for 2013 and 2014

No reliable assessment can be presented for this stock. Survey trends provide limited information. Stock identity needs to be better described.

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.

Following this approach, ICES advises that catches should be decreased by at least 20%. However, as species-specific landings data are not complete, it is not possible to quantify the current catch. ICES does not advise that an individual TAC be set for these stocks, at present.

Additional measures should be identified that can regulate exploitation of these species. Such measures may include seasonal and/or area closures, technical measures, and tailored measures for target fisheries. Such measures should be developed by stakeholder consultations, considering the overall mixed fisheries context.

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

Additional considerations*Management considerations*

TACs only regulate the landings, and a low TAC on a low-value bycatch species could induce more discards. Because this species are usually caught as a bycatch in demersal fisheries, it would benefit from a reduction in the overall demersal fishing effort.

Comparison with previous assessment and advice

No species-specific advice has previously been provided for thornback ray in IXa (Table 7.4.14.9.1). The advice is based on category 5 of ICES approach to advice provision in data-limited situations.

Sources

ICES. 2012. Report of the Working Group on Elasmobranch Fishes (WGEF), 19–26 June 2012, Lisbon, Portugal. ICES CM 2012/ACOM:19.

Table 7.4.14.9.1 Other skates and rays in subareas VIII and IX. ICES advice and landings.

| Year | ICES advice | Predicted catch corresp. to advice | ICES Species-specific landings:– minimum estimate based on reported landings |
|------|---|---------------------------------------|---|
| 2011 | No specific advice | | 48 |
| 2012 | No specific advice | | |
| 2013 | No TAC, species-specific measures needed, catch to decrease by at least 20%. | - | |
| 2014 | No new advice, same as 2013 | - | |

Weights in tonnes.

ECOREGION Bay of Biscay and Atlantic Iberian waters
STOCK Sole in Divisions VIIIc and IXa

Advice for 2013

Based on the ICES approach to data-limited stocks, ICES advises that catches should decrease by 20% in relation to the last three years average. Due to the uncertainty in the landings data, ICES is not able to quantify the resulting catch. This is the first year ICES is providing quantitative advice for data-limited stocks (see Quality considerations).

Stock status

| F (Fishing Mortality) | |
|------------------------------|--------------------------|
| | 1977–2011 |
| Qualitative evaluation | Insufficient information |
| SSB (Spawning-Stock Biomass) | |
| | 1977–2011 |
| Qualitative evaluation | Insufficient information |

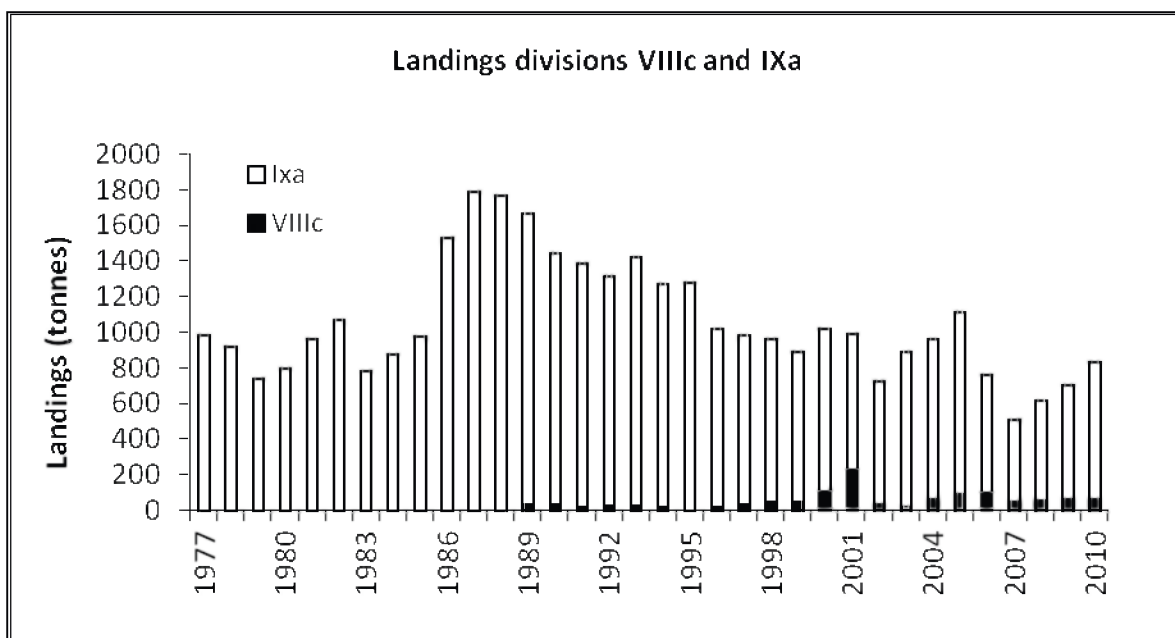


Figure 7.4.15.1 Sole in Divisions VIIIc and IXa. Total official landings (tonnes) of *Solea* species (*Solea solea*, *Solea senegalensis*, and *Pegusa lascaris*). Landings in Subarea IX are included, and assumed to be taken in Division IXa.

The available information is insufficient to evaluate stock trends and exploitation status. Therefore, the state of the sole in Divisions VIIIc and IXa is unknown. Landings are mainly taken in Division IXa.

Management plans

No specific management objectives are known to ICES.

Biology

Spawning takes place in winter/early spring and varies with latitude. Larvae migrate to estuaries where juveniles concentrate until they reach approximately 2 years of age and move to deeper waters. Specimens attain maturity at 4 years of age. Sole is a nocturnal predator and therefore more susceptible to be captured by fisheries at night than in daytime. It feeds on polychaetes, molluscs, and amphipods.

The fisheries

Sole is caught mainly in a small-scale multi-gear coastal mixed fisheries for *Solea* spp.

Quality considerations

Sole is seldom caught in the research surveys carried out in this area and therefore poorly suited for monitoring by those surveys. 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.

More information is needed on the contribution of individual *Solea* species to total landings, which are clearly incomplete and erratic. It was not possible to include Spanish commercial data for 2011.

The stock unit definition of sole in this area is not clear.

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.

Scientific basis

| | |
|-----------------------------|-------------------------------|
| Assessment type | No assessment. |
| Input data | Official landings statistics. |
| Discards and bycatch | Not included. |
| Indicators | None. |
| Other information | None. |
| Working group report | WGHMM |

ECOREGION Bay of Biscay and Atlantic Iberian waters
STOCK Sole in Divisions VIIIc and IXa**Reference points**

No reference points have been defined for sole in Divisions VIIIc and IXa.

Outlook for 2013

No reliable assessment can be presented for sole in Divisions VIIIc and IXa 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 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.

Additional considerations*Stock identity*

Stock identity of *Solea* species is poorly understood and further work is required.

Quality considerations

Presently only 2011 preliminary landings are available for the stock assessment. Therefore, landings statistics need to be confirmed and associated effort needs to be compiled to estimate proxies for the harvest rate.

Current bottom trawl surveys conducted in the area do not catch sole in sufficient quantity to serve as abundance indices. Therefore, other approaches could be initiated to obtain fishery-independent information.

Source

ICES. 2012. Report of the Working Group on the Assessment of Southern Shelf Stocks of Hake, Monk, and Megrin (WGHMM), 10–16 May 2012, ICES Headquarters, Copenhagen. ICES CM 2012/ACOM:11.

Table 7.4.15.1 Sole in Divisions VIIIc and IXa. ICES advice, management, and official landings.

| Year | ICES Advice | Predicted catch corresp. to advice | EU TAC ¹ | Official landings <i>S. solea</i> | Official landings <i>P. lascaris</i> | Official landings <i>Solea</i> spp. | Official landings ² Total |
|------|--------------------------|--|---------------------|---|---|---|--|
| 2000 | | - | 2000 | 159 | 117 | 741 | 1017 |
| 2001 | | - | 2000 | 189 | 142 | 653 | 984 |
| 2002 | | - | 2000 | 115 | 98 | 508 | 721 |
| 2003 | | - | 1600 | 116 | 99 | 670 | 884 |
| 2004 | | - | 1520 | 171 | 120 | 668 | 960 |
| 2005 | | - | 1216 | 520 | 139 | 446 | 1105 |
| 2006 | | - | - | 467 | 89 | 203 | 759 |
| 2007 | | - | 1216 | 269 | 55 | 180 | 504 |
| 2008 | | - | 1216 | 321 | 80 | 211 | 612 |
| 2009 | | - | 1216 | 363 | 138 | 199 | 699 |
| 2010 | | - | 1094 | 382 | 161 | 283 | 826 |
| 2011 | | - | 1072 | 435 | 176 | 86 | 698 ³ |
| 2012 | No increase in catch | - | 1072 | | | | |
| 2013 | 20% reduction in catches | - | | | | | |

Weights in tonnes.

¹⁾ For Divisions VIIIc, VIIIId, and VIIE, and Subareas IX and X; EU waters of CECAF 34.1.1.

²⁾ For *Solea* spp. (*S. solea*, *S. senegalensis*, and *P. lascaris*). 2011 data are preliminary.

³⁾ Preliminary.

Table 7.4.15.2 Sole in Divisions VIIIc and IXa. Official landings of *Solea* spp. (including the commercial categories for *Solea* spp., *S. solea* and *P. lascaris*), by country and division (in tonnes). Landings from Subarea IX correspond to Division IXa and Subarea IX (excluding landings specifically identified as Division IXb).

| | VIIIc | | | | IX | | | Total <i>Solea</i> spp |
|-------|-------|----------|--------|-------|-------|----------|-------|---------------------------|
| | Spain | Portugal | France | Total | Spain | Portugal | Total | |
| 1977 | - | - | - | - | - | 976 | 976 | 976 |
| 1978 | - | - | - | - | 310 | 606 | 916 | 916 |
| 1979 | - | - | - | - | 152 | 581 | 733 | 733 |
| 1980 | - | - | - | - | 166 | 628 | 794 | 794 |
| 1981 | - | - | - | - | 155 | 800 | 955 | 955 |
| 1982 | - | - | - | - | 275 | 789 | 1064 | 1064 |
| 1983 | - | - | - | - | 140 | 635 | 775 | 775 |
| 1984 | - | - | - | - | 242 | 626 | 868 | 868 |
| 1985 | - | - | 1 | 1 | 370 | 600 | 970 | 971 |
| 1986 | - | - | - | - | 444 | 1081 | 1525 | 1525 |
| 1987 | - | 3 | 1 | 4 | 609 | 1173 | 1782 | 1786 |
| 1988 | - | 7 | 1 | 8 | 479 | 1277 | 1756 | 1764 |
| 1989 | 22 | 8 | - | 30 | 194 | 1435 | 1629 | 1659 |
| 1990 | 22 | 5 | - | 27 | 192 | 1223 | 1415 | 1442 |
| 1991 | 10 | 3 | - | 13 | 290 | 1076 | 1366 | 1379 |
| 1992 | 19 | 1 | 1 | 21 | 171 | 1115 | 1286 | 1307 |
| 1993 | 15 | 3 | 1 | 19 | 75 | 1327 | 1402 | 1421 |
| 1994 | 15 | 2 | - | 17 | 35 | 1212 | 1247 | 1264 |
| 1995 | 6 | 3 | - | 9 | 33 | 1232 | 1265 | 1274 |
| 1996 | 13 | 4 | - | 17 | 61 | 938 | 999 | 1016 |
| 1997 | 23 | 4 | - | 27 | 155 | 800 | 955 | 982 |
| 1998 | 40 | 4 | - | 44 | 188 | 726 | 914 | 958 |
| 1999 | 40 | 2 | - | 42 | 206 | 639 | 846 | 888 |
| 2000 | 89 | 2 | 7 | 98 | 184 | 735 | 919 | 1017 |
| 2001 | 224 | 1 | - | 225 | - | 759 | 759 | 984 |
| 2002 | 25 | 1 | 1 | 27 | 115 | 579 | 694 | 721 |
| 2003 | 8 | 3 | 4 | 15 | 234 | 635 | 869 | 884 |
| 2004 | 45 | 12 | - | 57 | 120 | 783 | 903 | 960 |
| 2005 | 80 | 10 | - | 90 | 194 | 821 | 1015 | 1105 |
| 2006 | 81 | 10 | 1 | 92 | 73 | 594 | 667 | 759 |
| 2007 | 31 | 11 | 1 | 43 | 80 | 381 | 461 | 504 |
| 2008 | 36 | 11 | 1 | 48 | 97 | 467 | 564 | 612 |
| 2009 | 48 | 6 | 2 | 56 | 91 | 552 | 643 | 699 |
| 2010 | 49 | 7 | 2 | 58 | 152 | 616 | 768 | 826 |
| 2011* | | | | | | 698 | | 698 |

* Preliminary.

ECOREGION Bay of Biscay and Atlantic Iberian waters
STOCK Plaice in Subarea VIII and Division IXa

Advice for 2013 and 2014

Based on the ICES approach to data-limited stocks, ICES advises that catches should decrease by 20% in relation to the last three years average. Due to the uncertainty in the landings data, ICES is not able to quantify the resulting catch. This is the first year ICES is providing quantitative advice for data-limited stocks (see Quality considerations).

Stock status

| F (Fishing Mortality) | |
|------------------------------|----------------------------|
| | 2009–2011 |
| Qualitative evaluation | ⊛ Insufficient information |
| SSB (Spawning-Stock Biomass) | |
| | 2010–2011 |
| Qualitative evaluation | ⊛ Insufficient information |

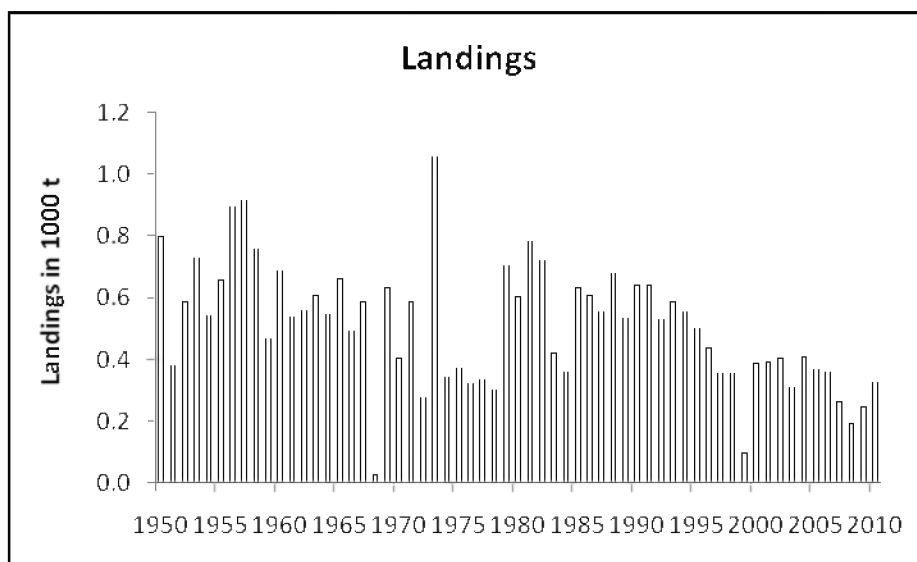


Figure 7.4.16.1 Plaice in Subarea VIII and Division IXa. Official landings (in tonnes). Landings in Division IXa correspond to official landings in Division IXa and Subarea IX (excluding landings specifically identified as Division IXb). Landings in 2011 are incomplete and not included.

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 plans

No specific management objectives are known to ICES.

Biology

Plaice populations in the North Atlantic aggregate at coastal spawning grounds in the first quarter of the year.

The fisheries

Plaice is caught as a bycatch by various fleets and gear types covering small-scale artisanal and trawl fisheries.

Quality considerations

Fishery statistics are currently being compiled. At present, only official landings are available, which are considered to be preliminary for the purpose of stock assessment. There are concerns about the reliability of the 2008-2009 French data. Landings statistics need to be quality-assured and confirmed for the region. Only preliminary 2011 landings are available at present.

The stock unit definition of plaice in this area is not clear.

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.

Scientific basis

| | |
|-----------------------------|---------------------------------|
| Assessment type | No assessment. |
| Input data | Landings statistics. |
| Discards and bycatch | Not included in the assessment. |
| Indicators | None. |
| Other information | None. |
| Working group report | WGHMM |

ECOREGION Bay of Biscay and Atlantic Iberian waters
STOCK Plaice in 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.

Outlook for 2013 and 2014

No assessment is presented for this species in the Bay of Biscay and Atlantic Iberian waters ecoregion. The main reason for this is lack of data. Therefore, 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, 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.

Additional considerations*Data requirements*

Presently only preliminary landings are available for the stock assessment. Therefore, landings statistics need to be confirmed and associated effort needs to be compiled in order to estimate proxies for harvest rate.

Current bottom trawl surveys conducted in the area do not catch plaice in sufficient quantity to serve as abundance indices. Therefore, other approaches could be initiated to obtain fishery-independent information.

Further work is required on stock identity.

Source

ICES. 2012. Report of the Working Group on the Assessment of Southern Shelf Stocks of Hake, Monk, and Megrim (WGHMM), 10–16 May 2012, ICES Headquarters, Copenhagen. ICES CM 2012/ACOM:11.

Table 7.4.16.1

Plaice in Subarea VIII and Division IXa. ICES advice, management, and official landings.

| Year | ICES Advice | Predicted catch corresp. to advice | EU TAC ¹⁾ | Official landings |
|------|----------------------------------|---------------------------------------|----------------------|----------------------|
| 2000 | | - | 700 | 387 |
| 2001 | | - | 560 | 393 |
| 2002 | | - | 560 | 404 |
| 2003 | | - | 448 | 307 |
| 2004 | | - | 448 | 407 |
| 2005 | | - | 448 | 368 |
| 2006 | | - | 448 | 359 |
| 2007 | | - | 448 | 264 |
| 2008 | | - | 448 | 193 |
| 2009 | | - | 448 | 247 |
| 2010 | | - | 403 | 325 |
| 2011 | | - | 395 | 266 ²⁾ |
| 2012 | No increase in catch | - | 395 | |
| 2013 | 20% reduction in catches | - | | |
| 2014 | Same catch advice as for 2013 | - | | |

Weights in tonnes.

¹⁾ For Subareas VIII, IX, and X; EU waters of CECAF 34.1.1.²⁾ Preliminary.

Table 7.4.16.2 Plaice in Subarea VIII and Division IXa. Official landings (in tonnes) by division. Landings in Subareas IX and VIII are also presented.

| | IX ¹⁾ | IX a | VIII ²⁾ | VIII a | VIII b | VIII c | VIII d | TOTAL |
|------|------------------|------|--------------------|--------|--------|--------|--------|-------|
| 1950 | 0 | 0 | 797 | 0 | 0 | 0 | 0 | 797 |
| 1951 | 0 | 0 | 378 | 0 | 0 | 0 | 0 | 378 |
| 1952 | 0 | 0 | 586 | 0 | 0 | 0 | 0 | 586 |
| 1953 | 0 | 0 | 727 | 0 | 0 | 0 | 0 | 727 |
| 1954 | 0 | 0 | 539 | 0 | 0 | 0 | 0 | 539 |
| 1955 | 0 | 0 | 657 | 0 | 0 | 0 | 0 | 657 |
| 1956 | 0 | 0 | 894 | 0 | 0 | 0 | 0 | 894 |
| 1957 | 0 | 0 | 915 | 0 | 0 | 0 | 0 | 915 |
| 1958 | 0 | 0 | 758 | 0 | 0 | 0 | 0 | 758 |
| 1959 | 0 | 0 | 465 | 0 | 0 | 0 | 0 | 465 |
| 1960 | 0 | 0 | 684 | 0 | 0 | 0 | 0 | 684 |
| 1961 | 0 | 0 | 535 | 0 | 0 | 0 | 0 | 535 |
| 1962 | 0 | 18 | 539 | 0 | 0 | 0 | 0 | 557 |
| 1963 | 0 | 0 | 606 | 0 | 0 | 0 | 0 | 606 |
| 1964 | 0 | 0 | 546 | 0 | 0 | 0 | 0 | 546 |
| 1965 | 1 | 0 | 661 | 0 | 0 | 0 | 0 | 662 |
| 1966 | 24 | 0 | 466 | 0 | 0 | 0 | 0 | 490 |
| 1967 | 25 | 0 | 562 | 0 | 0 | 0 | 0 | 587 |
| 1968 | 26 | 0 | 0 | 0 | 0 | 0 | 0 | 26 |
| 1969 | 25 | 0 | 607 | 0 | 0 | 0 | 0 | 632 |
| 1970 | 0 | 0 | 404 | 0 | 0 | 0 | 0 | 404 |
| 1971 | 0 | 0 | 585 | 0 | 0 | 0 | 0 | 585 |
| 1972 | 0 | 0 | 276 | 0 | 0 | 0 | 0 | 276 |
| 1973 | 146 | 0 | 910 | 0 | 0 | 0 | 0 | 1056 |
| 1974 | 143 | 0 | 200 | 0 | 0 | 0 | 0 | 343 |
| 1975 | 133 | 0 | 236 | 0 | 0 | 0 | 0 | 369 |
| 1976 | 134 | 0 | 5 | 139 | 45 | 0 | 0 | 323 |
| 1977 | 89 | 0 | 0 | 162 | 84 | 0 | 0 | 335 |
| 1978 | 80 | 0 | 6 | 167 | 48 | 0 | 0 | 301 |
| 1979 | 474 | 0 | 7 | 183 | 37 | 0 | 0 | 701 |
| 1980 | 358 | 0 | 9 | 200 | 35 | 0 | 0 | 602 |
| 1981 | 685 | 0 | 95 | 0 | 0 | 0 | 0 | 780 |
| 1982 | 373 | 0 | 346 | 0 | 0 | 0 | 0 | 719 |
| 1983 | 133 | 0 | 19 | 245 | 23 | 0 | 0 | 420 |
| 1984 | 119 | 0 | 0 | 216 | 22 | 0 | 0 | 357 |
| 1985 | 101 | 0 | 58 | 408 | 64 | 0 | 0 | 631 |
| 1986 | 216 | 0 | 22 | 299 | 70 | 0 | 0 | 607 |
| 1987 | 248 | 0 | 13 | 253 | 41 | 0 | 0 | 555 |
| 1988 | 225 | 0 | 18 | 395 | 41 | 0 | 0 | 679 |
| 1989 | 184 | 0 | 30 | 317 | 2 | 0 | 0 | 533 |
| 1990 | 208 | 0 | 29 | 402 | 0 | 0 | 0 | 639 |

¹⁾ Landings not specified by division. Assumed to be Division IXa.

²⁾ Landings not specified by division.

Table 7.4.16.2 Continued.

| | IX ¹⁾ | IX a | VIII ²⁾ | VIII a | VIII b | VIII c | VIII d | TOTAL |
|----------------------|------------------|------|--------------------|--------|--------|--------|--------|-------|
| 1991 | 223 | 0 | 15 | 403 | 0 | 0 | 0 | 641 |
| 1992 | 198 | 2 | 4 | 270 | 38 | 15 | 0 | 527 |
| 1993 | 222 | 0 | 8 | 329 | 25 | 2 | 1 | 587 |
| 1994 | 148 | 0 | 5 | 334 | 31 | 34 | 0 | 552 |
| 1995 | 147 | 0 | 22 | 293 | 26 | 12 | 0 | 500 |
| 1996 | 137 | 0 | 37 | 223 | 25 | 14 | 0 | 436 |
| 1997 | 89 | 0 | 7 | 235 | 20 | 3 | 0 | 354 |
| 1998 | 114 | 0 | 16 | 198 | 21 | 6 | 0 | 355 |
| 1999 | 95 | 0 | 0 | 0 | 1 | 3 | 0 | 99 |
| 2000 | 124 | 5 | 33 | 172 | 36 | 17 | 0 | 387 |
| 2001 | 140 | 9 | 30 | 181 | 20 | 13 | 0 | 393 |
| 2002 | 184 | 0 | 41 | 148 | 21 | 10 | 0 | 404 |
| 2003 | 84 | 1 | 0 | 202 | 11 | 4 | 5 | 307 |
| 2004 | 8 | 165 | 0 | 214 | 12 | 5 | 3 | 407 |
| 2005 | 142 | 20 | 2 | 166 | 21 | 13 | 4 | 368 |
| 2006 | 104 | 3 | 2 | 222 | 24 | 2 | 2 | 359 |
| 2007 | 0 | 43 | 0 | 203 | 16 | 2 | 0 | 264 |
| 2008 | 0 | 90 | 0 | 96 | 4 | 3 | 0 | 193 |
| 2009 | 0 | 105 | 0 | 126 | 11 | 5 | 0 | 247 |
| 2010 | 0 | 119 | 0 | 183 | 16 | 5 | 2 | 325 |
| 2011 ³⁾⁴⁾ | 66 | 0 | <0.5 | 189 | 9 | <0.5 | 2 | 266 |

¹⁾ Landings not specified by division. Assumed to be Division IXa.

²⁾ Landings not specified by division.

³⁾ Preliminary.

⁴⁾ Without Spanish landings.

ECOREGION Bay of Biscay and Atlantic Iberian waters
STOCK Pollack (*Pollachius pollachius*) in Subarea VIII and Division IXa

Advice for 2013 and 2014

Based on the ICES approach to data-limited stocks, ICES advises that catches should decrease by 20% in relation to the last three years average. Due to the uncertainty in the landings data, ICES is not able to quantify the resulting catch.

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

Stock status

| F (Fishing Mortality) | |
|------------------------------|----------------------------|
| | 1977–2011 |
| Qualitative evaluation | ? Insufficient information |
| SSB (Spawning-Stock Biomass) | |
| | 1977–2011 |
| Qualitative evaluation | ? Insufficient information |

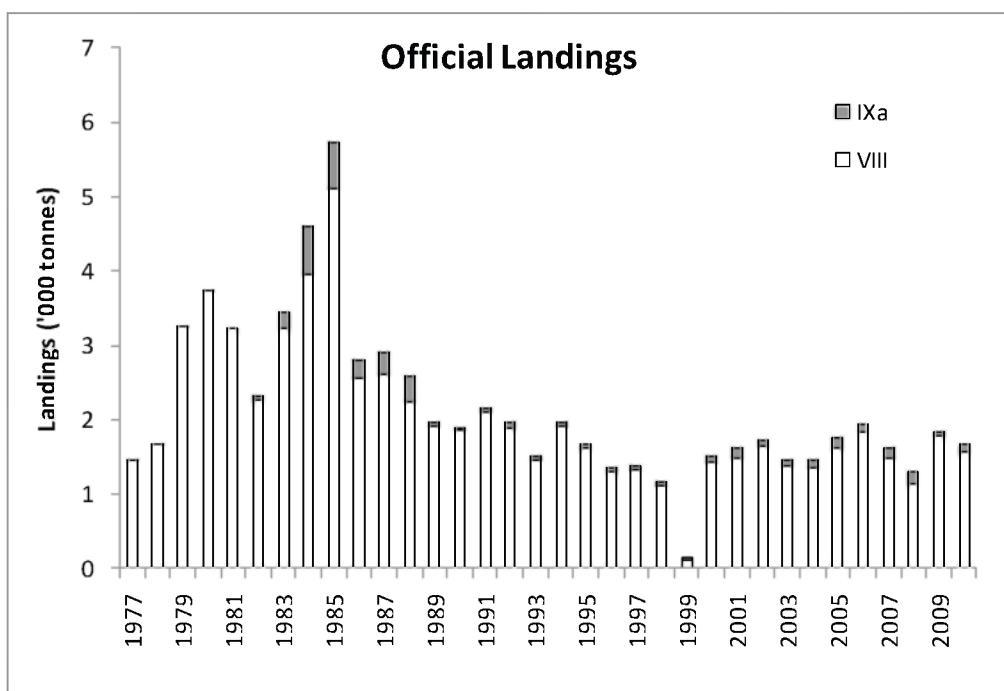


Figure 7.4.17.1 Pollack in Subarea VIII and Division IXa. Official landings (in thousand tonnes) 1977–2010. Landings in Subarea IX (excluding landings specifically identified as Division IXb) are included. Landings in 2011 are very incomplete and not included.

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 plans

No specific management objectives are known to ICES.

Biology

Pollack (*Pollachius pollachius*) is a benthopelagic species, found mostly close to the shore over hard bottom. It usually occurs at 40–100 m depth, but is found down to 200 m. A maximum size of 130 cm, a maximum weight of 18.1 kg, and a maximum age of 15 years are reported. Growth is fairly rapid, approaching 10 cm per year. Pollack in the 0-group are found in shallow coastal waters, and move to deeper waters as they grow. Maturity occurs at approximately age 3 and spawning occurs mainly in the first half of the year, with the exact timing varying along the latitudes. Pollack in this area is probably close to the southern stock boundary.

The 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.

Quality considerations

Pollack has a preference for wrecks and rocky bottom, making it difficult to catch with trawls and therefore poorly suited for monitoring by research surveys. Area-specific data on life history parameters and length composition are missing and should be collected on surveys and through market sampling.

Fishery statistics are currently being compiled. At present, only official landings are available, which are considered to be preliminary for the purpose of stock assessment. There are concerns about the reliability of the 2008-2009 French data. Landings statistics need to be quality-assured and confirmed for the region.

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.

Scientific basis

| | |
|-----------------------------|---|
| Assessment type | No assessment. |
| Input data | Catch statistics. |
| Discards and bycatch | Not included. |
| Indicators | None. |
| Other information | None. |
| Working group report | WGNEW , WGHMM |

ECOREGION Bay of Biscay and Atlantic Iberian waters
STOCK Pollack in Subarea VIII and Division IXa

Reference points

No reference points have been defined for pollack in Subarea VIII and Division IXa.

Outlook for 2013 and 2014

Due to lack of data no assessment can be presented for this assessment unit; therefore, 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, 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.

Additional considerations

Stock identity

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.

Quality considerations

Current bottom trawl surveys conducted in the area do not catch pollack in sufficient quantity to serve as abundance indices. Therefore, other approaches could be initiated to obtain fishery-independent information.

Recreational fisheries are an important component of the catch. Therefore, more information on recreational fisheries is required.

Sources

ICES. 2012a. Report on the Working Group on New MoU Species (WGNEW), 5–9 March 2012, ICES Headquarters, Copenhagen. ICES CM 2012/ACOM:22.

ICES. 2012b. Report of the Working Group on the Assessment of Southern Shelf Stocks of Hake, Monk, and Megrim (WGHMM), 10–16 May 2012, ICES Headquarters, Copenhagen. ICES CM 2012/ACOM:11.

Table 7.4.17.1 Pollack in Subarea VIII and Division IXa. ICES advice, management, and official landings.

| Year | ICES Advice | Predicted catch corresp. to advice | TAC in VIIIa,b,d,e | TAC in VIIIc | TAC in IX and X | Sum TAC | Official landings |
|------|----------------------------------|--|-----------------------|-----------------|--------------------|---------|----------------------|
| 2000 | | - | 2600 | 800 | 450 | 3850 | 1500 |
| 2001 | | - | 2600 | 800 | 450 | 3850 | 1610 |
| 2002 | | - | 2100 | 640 | 450 | 3190 | 1717 |
| 2003 | | - | 1680 | 512 | 360 | 2552 | 1458 |
| 2004 | | - | 1680 | 410 | 360 | 2450 | 1458 |
| 2005 | | - | 1680 | 328 | 288 | 2296 | 1755 |
| 2006 | | - | 1680 | 262 | 288 | 2230 | 1949 |
| 2007 | | - | 1680 | 262 | 288 | 2230 | 1606 |
| 2008 | | - | 1680 | 262 | 288 | 2230 | 1302 |
| 2009 | | - | 1680 | 262 | 288 | 2230 | 1831 |
| 2010 | | - | 1512 | 236 | 288 | 2036 | 1671 |
| 2011 | | - | 1482 | 231 | 282 | 1995 | 28 ¹⁾ |
| 2012 | No increase in catch | - | 1482 | 231 | 282 | 1995 | |
| 2013 | 20% reduction in catches | - | | | | | |
| 2014 | Same catch advice as for 2013 | - | | | | | |

Weights in tonnes.

¹⁾ Preliminary.**Table 7.4.17.2** Pollack in Subarea VIII and Division IXa. Official landings (in tonnes) by division. Landings in Subareas IX and VIII are also presented.

| Year | VIIIa | VIIIb | VIIIc | VIIId | VIIIe | VIII ^{1,2} | IXa | IX ¹ | TOTAL |
|------|-------|-------|-------|-------|-------|---------------------|-----|-----------------|-------|
| 1950 | | 0 | 0 | 0 | 0 | 3966 | 0 | | 3966 |
| 1951 | | 0 | 0 | 0 | 0 | 5390 | 1 | | 5391 |
| 1952 | | 0 | 0 | 0 | 0 | 781 | 0 | | 781 |
| 1953 | | 0 | 0 | 0 | 0 | 1198 | 0 | | 1198 |
| 1954 | | 0 | 0 | 0 | 0 | 1208 | 0 | | 1208 |
| 1955 | | 0 | 0 | 0 | 0 | 6962 | 0 | | 6962 |
| 1956 | | 0 | 0 | 0 | 0 | 1005 | 0 | | 1005 |
| 1957 | | 0 | 0 | 0 | 0 | 865 | 1 | | 866 |
| 1958 | | 0 | 0 | 0 | 0 | 978 | 0 | | 978 |
| 1959 | | 0 | 0 | 0 | 0 | 805 | 0 | | 805 |
| 1960 | | 0 | 0 | 0 | 0 | 558 | 0 | | 558 |
| 1961 | | 0 | 0 | 0 | 0 | 907 | 9 | | 916 |
| 1962 | | 0 | 0 | 0 | 0 | 954 | 3 | | 957 |
| 1963 | | 0 | 0 | 0 | 0 | 1219 | 0 | | 1219 |
| 1964 | | 0 | 0 | 0 | 0 | 1501 | 0 | | 1501 |
| 1965 | | 0 | 0 | 0 | 0 | 1808 | 0 | | 1808 |
| 1966 | | 0 | 0 | 0 | 0 | 1951 | 0 | | 1951 |
| 1967 | | 0 | 0 | 0 | 0 | 2230 | 0 | | 2230 |
| 1968 | | 0 | 0 | 0 | 0 | 1960 | 0 | | 1960 |
| 1969 | | 0 | 0 | 0 | 0 | 1484 | 0 | | 1484 |

¹ Until 1977 landings were not specified by division.² Landings not specified by division. Assumed to be Division IXa.

Table 7.4.17.2 Continued

| Year | VIIIa | VIIIb | VIIIc | VIII d | VIIIe | VIII ^{1,2} | IXa | IX ¹ | TOTAL |
|-------------------|-------|-------|-------|--------|-------|---------------------|-----|-----------------|-------|
| 1970 | | 0 | 0 | 0 | 0 | 1953 | 0 | | 1953 |
| 1971 | | 0 | 0 | 0 | 0 | 0 | 0 | | 0 |
| 1972 | | 0 | 0 | 0 | 0 | 0 | 0 | | 0 |
| 1973 | | 0 | 0 | 0 | 0 | 0 | 0 | | 0 |
| 1974 | | 0 | 0 | 0 | 0 | 0 | 0 | 232 | 232 |
| 1975 | | 0 | 0 | 0 | 0 | 0 | 0 | | 0 |
| 1976 | | 0 | 0 | 0 | 0 | 0 | 0 | | 0 |
| 1977 | 1373 | 86 | 0 | 0 | 0 | 0 | 0 | | 1459 |
| 1978 | 1543 | 113 | 5 | 0 | 0 | 1 | 0 | | 1662 |
| 1979 | 2097 | 124 | 0 | 0 | 0 | 1022 | 0 | | 3243 |
| 1980 | 1997 | 161 | 0 | 0 | 0 | 1577 | 0 | | 3735 |
| 1981 | 0 | 0 | 0 | 0 | 0 | 3229 | 0 | | 3229 |
| 1982 | 0 | 0 | 0 | 0 | 0 | 2274 | 0 | 32 | 2306 |
| 1983 | 2523 | 129 | 0 | 0 | 0 | 582 | 0 | 203 | 3437 |
| 1984 | 2202 | 149 | 0 | 0 | 0 | 1607 | 0 | 642 | 4600 |
| 1985 | 2659 | 109 | 0 | 1 | 0 | 2327 | 0 | 636 | 5732 |
| 1986 | 1981 | 146 | 0 | 0 | 0 | 442 | 0 | 237 | 2806 |
| 1987 | 1862 | 155 | 1 | 5 | 0 | 584 | 0 | 311 | 2918 |
| 1988 | 1637 | 124 | 1 | 5 | 0 | 479 | 0 | 336 | 2582 |
| 1989 | 1748 | 42 | 102 | 3 | 1 | 17 | 57 | 3 | 1973 |
| 1990 | 1753 | 51 | 44 | 8 | 0 | 16 | 27 | 1 | 1900 |
| 1991 | 1903 | 46 | 87 | 52 | 0 | 2 | 76 | 2 | 2168 |
| 1992 | 1632 | 189 | 60 | 8 | 0 | 2 | 65 | 2 | 1958 |
| 1993 | 1227 | 174 | 48 | 13 | 0 | 3 | 47 | 1 | 1513 |
| 1994 | 1698 | 150 | 61 | 12 | 0 | 3 | 28 | 3 | 1955 |
| 1995 | 1421 | 127 | 51 | 11 | 0 | 8 | 59 | 2 | 1679 |
| 1996 | 1185 | 59 | 53 | 4 | 0 | 8 | 43 | 2 | 1354 |
| 1997 | 1192 | 65 | 57 | 6 | 0 | 2 | 54 | 2 | 1378 |
| 1998 | 933 | 79 | 94 | 2 | 0 | 1 | 55 | 1 | 1165 |
| 1999 | 11 | 2 | 107 | 0 | 0 | 0 | 36 | 1 | 157 |
| 2000 | 1154 | 75 | 86 | 5 | 2 | 114 | 49 | 15 | 1500 |
| 2001 | 1174 | 107 | 121 | 21 | 2 | 63 | 81 | 41 | 1610 |
| 2002 | 1307 | 139 | 40 | 3 | 0 | 148 | 35 | 45 | 1717 |
| 2003 | 1249 | 65 | 68 | 4 | 1 | 1 | 39 | 31 | 1458 |
| 2004 | 1143 | 97 | 112 | 3 | 0 | 1 | 102 | 0 | 1458 |
| 2005 | 1345 | 119 | 140 | 8 | 0 | 5 | 132 | 6 | 1755 |
| 2006 | 1565 | 82 | 164 | 17 | 0 | 12 | 102 | 0 | 1942 |
| 2007 | 1249 | 70 | 173 | 6 | 0 | 0 | 108 | 0 | 1606 |
| 2008 | 865 | 45 | 228 | 5 | 0 | 0 | 159 | 0 | 1302 |
| 2009 | 1491 | 77 | 180 | 19 | 0 | 0 | 71 | 0 | 1838 |
| 2010 | 1231 | 93 | 210 | 44 | 0 | 0 | 93 | 0 | 1671 |
| 2011 ³ | 26 | <0.5 | | <1 | | | | 1 | 28 |

¹ Until 1977 landings were not specified by division.

² Landings not specified by division. Assumed to be Division IXa.

³ Preliminary and incomplete (without Spanish landings).

ECOREGION Bay of Biscay and Atlantic Iberian waters
STOCK Whiting in Subarea VIII and Division IXa

Advice for 2013 and 2014

Based on the ICES approach to data-limited stocks, ICES advises that catches should decrease by 20% in relation to the last three years average. Due to the uncertainty in the landings data, ICES is not able to quantify the resulting catch.

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

Stock status

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

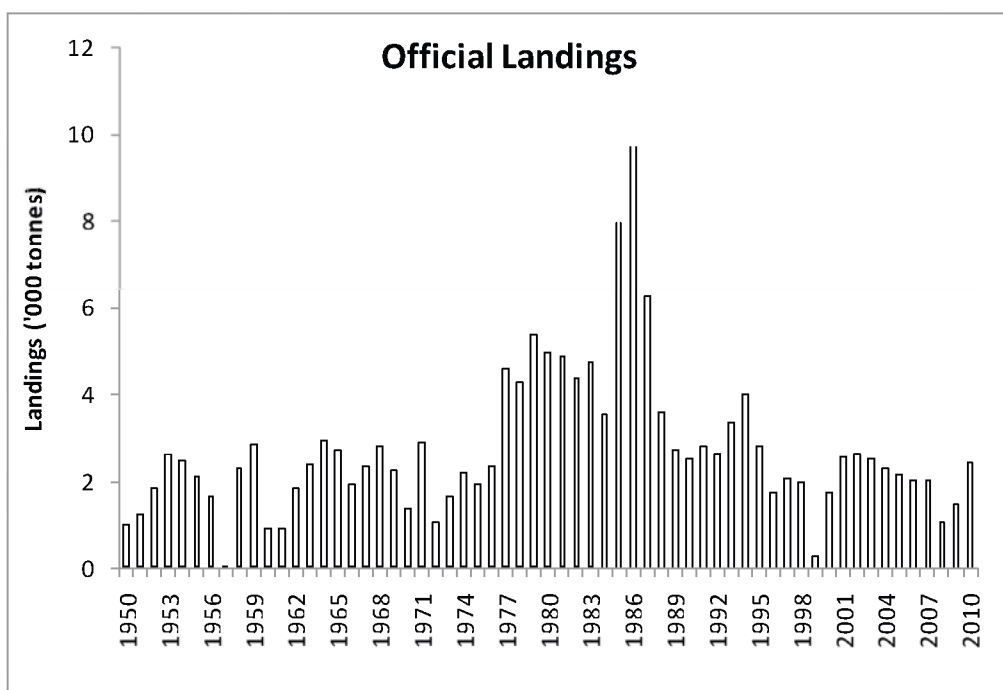


Figure 7.4.18.1 Whiting in Subarea VIII and Division IXa. Official landings (data for Division IXa and all landings for Subarea IX excluding Division IXb, in '000 tonnes). Landings in 2011 are incomplete and not presented in the plot.

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 plans

No specific management objectives are known to ICES.

Biology

Atlantic Iberian waters (Division IXa) represent the southern limits of the distribution of the species.

The fisheries

Whiting is taken in a mixed demersal fishery, mainly in Divisions VIIIa,b by France and Spain. The fishery is dominated by bottom trawl.

Quality considerations

Fishery statistics are currently being compiled. At present, only official landings are available, which are considered to be preliminary for the purpose of stock assessment. There are concerns about the reliability of the 2008-2009 French data. Landings statistics need to be quality-assured and confirmed for the region. Spanish commercial data for 2011 were not available. Survey information is available and could provide information on recruitment.

The stock unit definition of whiting in this area is not clear.

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.

Scientific basis

| | |
|-----------------------------|-------------------------------|
| Assessment type | No assessment. |
| Input data | Official landings statistics. |
| Discards and bycatch | Not included. |
| Indicators | EVHOE-WIBTS-Q4 |
| Other information | None. |
| Working group report | WGHMM |

ECOREGION Bay of Biscay and Atlantic Iberian waters
STOCK Whiting 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.

Outlook for 2013 and 2014

No assessment can be presented for this species in the Bay of Biscay and Atlantic Iberian waters ecoregion. The main reason is lack of data. Therefore, fishing possibilities cannot be projected.

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.

Additional considerations*Data requirements*

Landings statistics need to be confirmed and associated effort needs to be compiled to estimate proxies for the harvest rate.

Current bottom trawl surveys conducted in the area do not catch adult whiting in sufficient quantity to serve as an SSB indicator. Therefore, other approaches could be initiated to obtain fishery-independent information on total stock biomass.

Stock identity is poorly understood and further work is required.

Source

ICES. 2012. Report of the Working Group on the Assessment of Southern Shelf Stocks of Hake, Monk, and Megrim (WGHMM), 10–16 May 2012, ICES Headquarters, Copenhagen. ICES CM 2012/ACOM:11.

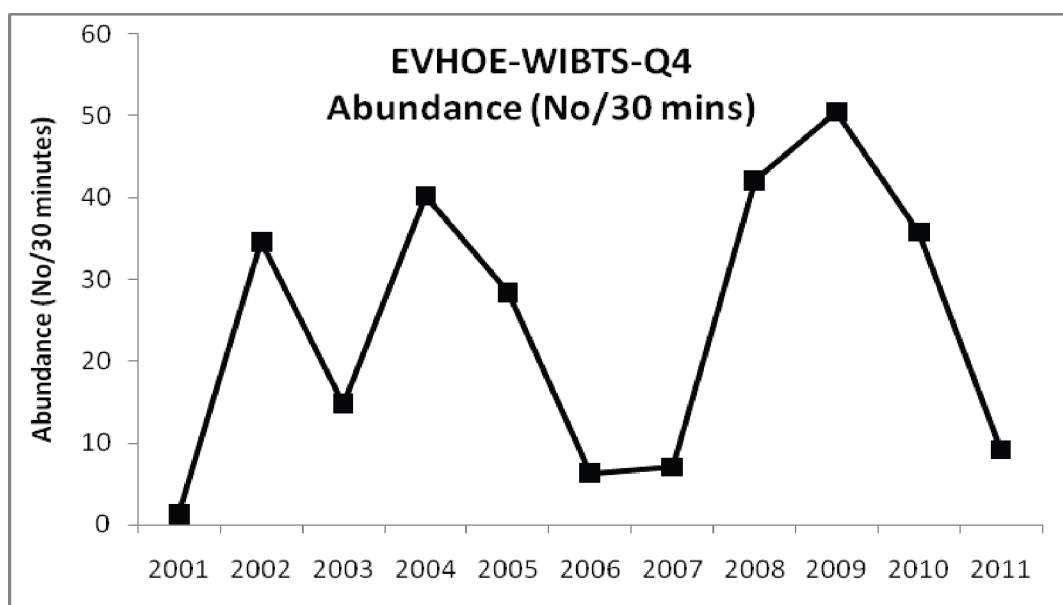


Figure 7.4.18.2 Whiting in Subarea VIII and Division IXa. Abundance (number/ 30 minutes) of French EVHOE-WIBTS-Q4 survey for the Bay of Biscay area.

Table 7.4.18.1 Whiting in Subarea VIII and Division IXa. ICES advice, management, and official landings.

| Year | ICES Advice | Predicted catch corresp. to advice | TAC in VIII | TAC in IX ¹⁾ | Official landings ²⁾ |
|------|---------------------------|------------------------------------|-------------|-------------------------|---------------------------------|
| 2000 | | | 7.000 | 2.640 | 1.746 |
| 2001 | | - | 5.600 | 2.100 | 2.592 |
| 2002 | | - | 5.600 | 1.700 | 2.634 |
| 2003 | | - | 5.600 | 1.360 | 2.532 |
| 2004 | | - | 4.500 | 1.020 | 2.307 |
| 2005 | | - | 3.600 | 0.816 | 2.173 |
| 2006 | | - | 3.600 | 0.653 | 2.029 |
| 2007 | | - | 3.600 | 0.653 | 2.024 |
| 2008 | | - | 3.600 | 0.653 | 1.059 |
| 2009 | | - | 3.600 | 0.653 | 1.467 |
| 2010 | | - | 3.240 | 0.588 | 2.462 |
| 2011 | | - | 3.175 | - | 2.076 |
| 2012 | No increase in catch | - | 3.175 | - | |
| 2013 | 20% reduction in catches | - | | | |
| 2014 | Same catch advice as 2013 | - | | | |

Weights in thousand tonnes.

¹⁾ In Subareas IX and X; EU waters of CECAF 34.1.1.

²⁾ 2011 data incomplete. Without Spanish landings.

Table 7.4.18.2 Whiting in Subarea VIII and Division IXa. Official landings (in tonnes) by division. Unspecified landings from Subareas IX and VIII are also presented.

| | IX ¹⁾ | IX a | VIII ²⁾ | VIII a | VIII b | VIII c | VIII d | VIII e | TOTAL |
|------|------------------|------|--------------------|--------|--------|--------|--------|--------|-------|
| 1950 | - | - | 1019 | - | - | - | - | - | 1019 |
| 1951 | - | - | 1245 | - | - | - | - | - | 1245 |
| 1952 | - | - | 1838 | - | - | - | - | - | 1838 |
| 1953 | - | - | 2636 | - | - | - | - | - | 2636 |
| 1954 | - | - | 2506 | - | - | - | - | - | 2506 |
| 1955 | - | - | 2123 | - | - | - | - | - | 2123 |
| 1956 | - | - | 1676 | - | - | - | - | - | 1676 |
| 1957 | - | - | - | - | - | - | - | - | - |
| 1958 | - | - | 2321 | - | - | - | - | - | 2321 |
| 1959 | - | - | 2874 | - | - | - | - | - | 2874 |
| 1960 | - | - | 919 | - | - | - | - | - | 919 |
| 1961 | - | - | - | - | 920 | - | - | - | 920 |
| 1962 | - | - | 1827 | - | - | - | - | - | 1827 |
| 1963 | - | - | 2412 | - | - | - | - | - | 2412 |
| 1964 | - | - | 2928 | - | - | - | - | - | 2928 |
| 1965 | 1 | - | 2714 | - | - | - | - | - | 2715 |
| 1966 | 1 | - | 1947 | - | - | - | - | - | 1948 |
| 1967 | - | - | 2343 | - | - | - | - | - | 2343 |
| 1968 | - | - | 2795 | - | - | - | - | - | 2795 |
| 1969 | - | - | 2245 | - | - | - | - | - | 2245 |
| 1970 | - | - | 1377 | - | - | - | - | - | 1377 |
| 1971 | - | - | 2898 | - | - | - | - | - | 2898 |
| 1972 | - | - | 1050 | - | - | - | - | - | 1050 |
| 1973 | 469 | - | 1194 | - | - | - | - | - | 1663 |
| 1974 | 236 | - | 1958 | - | - | - | - | - | 2194 |
| 1975 | 531 | - | 1410 | - | - | - | - | - | 1941 |
| 1976 | 317 | - | 103 | 1511 | 402 | - | - | - | 2333 |
| 1977 | 1360 | - | 1180 | 1705 | 378 | - | - | - | 4623 |
| 1978 | 2600 | - | 9 | 1225 | 428 | - | - | - | 4262 |
| 1979 | 2352 | - | - | 2581 | 450 | - | - | - | 5383 |
| 1980 | 2031 | - | - | 2551 | 403 | - | - | - | 4985 |
| 1981 | 1541 | - | 3332 | - | - | - | - | - | 4873 |
| 1982 | 895 | - | 3498 | - | - | - | - | - | 4393 |
| 1983 | 630 | - | 1689 | 1684 | 729 | - | - | - | 4732 |
| 1984 | 1223 | - | 1206 | 939 | 192 | - | - | - | 3560 |
| 1985 | 1629 | - | 1637 | 3693 | 1014 | - | 1 | - | 7974 |
| 1986 | 2386 | - | 1397 | 3758 | 2142 | - | 6 | - | 9689 |
| 1987 | 2518 | - | 318 | 2012 | 1400 | - | 2 | - | 6250 |
| 1988 | 1621 | - | 384 | 1323 | 282 | 1 | 1 | - | 3612 |
| 1989 | 416 | - | 3 | 2295 | 8 | 1 | - | - | 2723 |
| 1990 | 329 | 6 | 5 | 2167 | - | 10 | - | - | 2517 |
| 1991 | 211 | - | 3 | 2578 | 1 | 2 | - | - | 2795 |
| 1992 | 225 | - | 8 | 1710 | 671 | 11 | 8 | - | 2633 |
| 1993 | 266 | - | 2 | 2375 | 699 | 7 | 12 | - | 3361 |
| 1994 | 338 | - | 4 | 2771 | 851 | 21 | 3 | 1 | 3989 |
| 1995 | 167 | - | 5 | 2077 | 559 | 2 | 10 | - | 2820 |
| 1996 | 180 | - | 7 | 1271 | 272 | 17 | 1 | - | 1748 |
| 1997 | 136 | - | 4 | 1646 | 291 | 6 | 2 | - | 2085 |
| 1998 | 112 | - | 4 | 1526 | 301 | 3 | 30 | - | 1976 |
| 1999 | 75 | - | - | 72 | 129 | 11 | - | - | 287 |

¹⁾ Landings not specified by division. Assumed to be Division IXa.

²⁾ Landings not specified by division.

Table 7.4.18.2 Continued.

| | IX ¹⁾ | IX a | VIII ²⁾ | VIII a | VIII b | VIII c | VIII d | VIII e | TOTAL |
|-------|------------------|------|--------------------|--------|--------|--------|--------|--------|-------|
| 2000 | 75 | - | 223 | 1048 | 388 | 10 | 1 | 1 | 1746 |
| 2001 | 37 | - | 274 | 1721 | 527 | 24 | 3 | 6 | 2592 |
| 2002 | 42 | - | 389 | 1699 | 484 | 9 | 6 | 5 | 2634 |
| 2003 | 54 | 3 | 27 | 2057 | 381 | 4 | 6 | - | 2532 |
| 2004 | 14 | 76 | 2 | 1687 | 390 | 136 | 2 | - | 2307 |
| 2005 | 80 | 2 | 10 | 1425 | 649 | 1 | 6 | - | 2173 |
| 2006 | 167 | 2 | 21 | 1091 | 739 | 6 | 3 | - | 2029 |
| 2007 | - | 107 | 12 | 1029 | 871 | 1 | 2 | 2 | 2024 |
| 2008 | - | 97 | - | 532 | 425 | 1 | 4 | - | 1059 |
| 2009 | - | 116 | - | 1021 | 320 | 3 | 7 | - | 1467 |
| 2010 | - | 114 | - | 1863 | 462 | 4 | 9 | - | 2462 |
| 2011* | 102 | - | - | 1581 | 381 | 1 | 11 | <0.5 | 2076 |

¹⁾ Landings not specified by division. Assumed to be Division IXa.

²⁾ Landings not specified by division.

*Preliminary.

ECOREGION Bay of Biscay and Atlantic Iberian waters
STOCK Blue jack mackerel (*Trachurus picturatus*) in Subdivision Xa₂ (Azores)

Advice for 2013 and 2014

ICES advises on the basis of the approach for data limited stocks that catches should be no more than 1800 tonnes.

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

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 after increase |

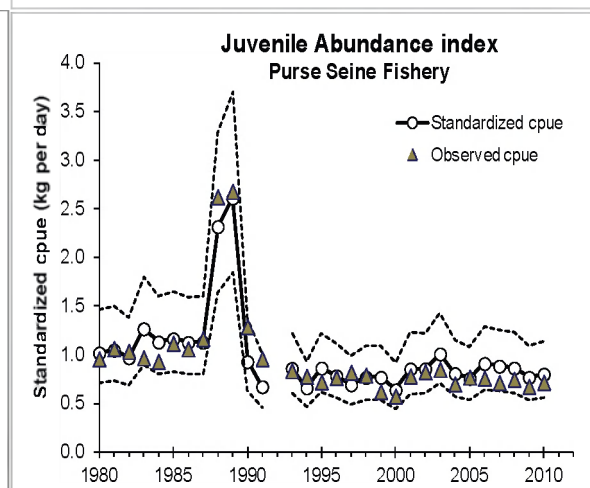
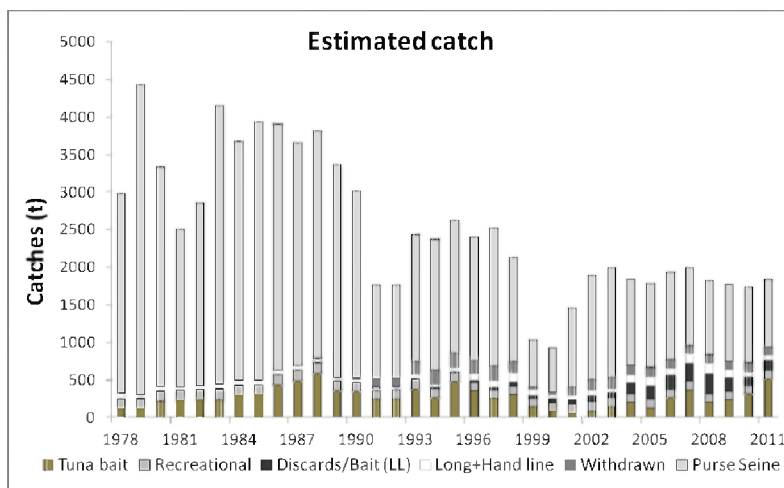
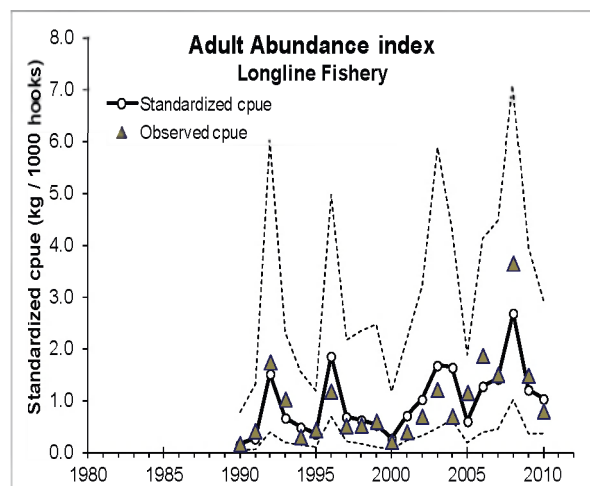


Figure 7.4.19.1 Blue jack mackerel (*Trachurus picturatus*) in Subdivision Xa₂. Left: Estimated catches ('000 tonnes). Top right: Standardized catch per unit effort (cpue, kg/day) in the Azores longline fishery on adult stock. Below: Standardized catch per unit effort (kg/1000 hooks) from artisanal purse seiners on juveniles. Dashed lines are the 95% confidence intervals.

The available information shows no trend in abundance indices in the purse seine fishery (catching mainly juvenile fish) since the 1990's and an increase in the abundance indices in the long-line fishery on adults since the late 1990's, levelling out in the last decade. The bulk of the catch comes from juvenile fisheries. The fishery has been stable for a long time and is hence likely sustainable.

Management plans

No specific management objectives are known to ICES.

Biology

Trachurus picturatus is a species of the Carangidae family commonly known as blue jack mackerel, and it is the only *Trachurus* species around the Azores. It occurs in deep waters to a maximum depth of around 370 m. It is a schooling species which is known to migrate between the coast of Sahara and the offshore seamounts, possibly reaching as far as the Cape Verde Islands. Around the Azores all life stages are found and therefore the species in the area is considered as one biological stock. Peak of spawning in Azores is around January–February.

The fisheries

The blue jack mackerel (*Trachurus picturatus*) 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.

Catch distribution Total catch (2011) 1842 t where 86.9 % landings (49% artisanal purse seiners, 27% live bait tuna vessels and 4% hook and lines, 6.4% recreational), 13.1 % discards.

Quality considerations

The advice is based on commercial abundance indices from the main fleets, used as an indicator of stock trends. The methods applied to derive quantitative advice for data-limited stocks are expected to evolve as they are further developed and validated

Scientific basis

| | |
|-----------------------------|---|
| Assessment type | Survey trends based assessment. |
| Input data | Catch statistics / Standardized cpue indices. |
| Discards and bycatch | Included in the estimated catches. |
| Indicators | None. |
| Other information | None. |
| Working group report | WGHANSA |

ECOREGION Bay of Biscay and Atlantic Iberian waters
STOCK Blue jack mackerel (*Trachurus picturatus*) in Subdivision Xa₂ (Azores)

Reference points

No reference points have been defined.

Outlook for 2013

Given the provisional nature of the assessment, no forecast was made. There is a strong stability in the fishery cpue and catches during the past 10 years

ICES approach to data limited stocks

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

For this stock, there are stable biomass indices of juveniles and increasing biomass indices of adults which indicate that current exploitation is appropriate for the stock. Therefore, ICES advises that catches should not increase in relation to the last three years average catch, corresponding to catches of no more than 1800 t in 2013.

Additional considerations*Management considerations*

This stock is presently been managed under the Council Regulation (EU) No 57/2011, article 6: TAC to be determined by the Member State. The catches have been maintained at a relatively stable level since 1990 in part by an auto regulation adopted by the fisherman association.

Stock identity

Studies on this species indicated differences in biological parameters between Azores, Madeira, the Canary Islands, and adjacent waters of Western Europe. Parasitological studies showed differences between the blue jack mackerel populations from Azores, Madeira, Western Sahara and the Mediterranean.

Fisheries

The catches of blue jack mackerel in recent 10 years are on average 1860 t. The blue jack mackerel is mostly landed by the artisanal fleet using purse-seines and since 1990, through a auto regulation adopted by the fishers' association and based on market restrictions, the catches have been relatively stable. This stability of the catches is mostly observed at S. Miguel Island, where around 70% of the annual catches are taken. A continuous decline in consumer demands lead to the catch limits adopted by the fleet, which explains the reduction observed in the landings in recent years.

Comparison with previous assessment and advice

The advice last year was based on precautionary considerations, this year the advice is based on the ICES approach to data-limited stocks.

Source

ICES. 2012. Report of the Working Group on Anchovy and Sardine (WGANSAs), 23–28 June 2012, Horta, Azores, Portugal. ICES CM 2012/ACOM:16.

Table 7.4.19.1 Jack mackerel (*Trachurus picturatus*) in Subdivision Xa₂. ICES advice, management, and catches.

| Year | ICES Advice | Predicted catch corresp. to advice | TAC in X ¹⁾ | Official landings | ICES catches |
|------|---|---------------------------------------|---------------------------|----------------------|-----------------|
| 2000 | | | 5000 | 644 | 932 |
| 2001 | | - | 5000 | 1100 | 1455 |
| 2002 | | - | 4000 | 1500 | 1894 |
| 2003 | | - | 3200 | 1500 | 1987 |
| 2004 | | - | 3200 | 1245 | 1840 |
| 2005 | | - | 3200 | 1230 | 1778 |
| 2006 | | - | 3200 | 1241 | 1927 |
| 2007 | | - | 3200 | 1154 | 1994 |
| 2008 | | - | 3200 | 1120 | 1818 |
| 2009 | | - | 3200 | 1120 | 1773 |
| 2010 | | - | 3072 | 1050 | 1744 |
| 2011 | | - | 3072 | 972 | 1842 |
| 2012 | No increase in catch | - | 3072 | | |
| 2013 | No increase in catch (last 3 years average) | 1800 | | | |
| 2014 | No increase in catch (last 3 years average) | 1800 | | | |

Weights in tonnes.

¹⁾ EU TAC for *Trachurus spp.* in Subarea X: EU waters adjacent to the Azores

Table 7.4.19.2 Blue jack mackerel (*Trachurus picturatus*) in Subdivision Xa₂. Official landings and ICES estimates of catches (tonnes).

| Year | Official Total landings | ICES estimates | | | | | | Total ICES catches |
|------|-------------------------|----------------|--------------|----------------------------|-------------------------|-------------|-----------------|--------------------|
| | | Tuna bait | Recreational | Discards/Bait (Long Lines) | Withdrawn after landing | Purse Seine | Long+ Hand line | |
| 1978 | 2720 | 115 | 129 | 15 | | 2657 | 63 | 2980 |
| 1979 | 4160 | 118 | 130 | 15 | | 4114 | 46 | 4424 |
| 1980 | 2968 | 210 | 132 | 22 | | 2920 | 48 | 3333 |
| 1981 | 2133 | 229 | 135 | 9 | | 2104 | 30 | 2507 |
| 1982 | 2461 | 239 | 142 | 10 | | 2429 | 33 | 2852 |
| 1983 | 3757 | 231 | 142 | 21 | | 3711 | 46 | 4152 |
| 1984 | 3225 | 295 | 135 | 17 | | 3180 | 46 | 3673 |
| 1985 | 3490 | 303 | 136 | 11 | | 3442 | 49 | 3941 |
| 1986 | 3330 | 433 | 135 | 9 | | 3282 | 48 | 3908 |
| 1987 | 3019 | 491 | 139 | 8 | | 2974 | 45 | 3658 |
| 1988 | 3078 | 586 | 143 | 8 | | 3032 | 47 | 3816 |
| 1989 | 2865 | 352 | 138 | 9 | | 2824 | 42 | 3365 |
| 1990 | 2509 | 345 | 117 | 11 | 27 | 2472 | 37 | 3010 |
| 1991 | 1274 | 242 | 115 | 6 | 127 | 1247 | 27 | 1765 |
| 1992 | 1255 | 249 | 121 | 6 | 126 | 1226 | 29 | 1756 |
| 1993 | 1731 | 375 | 130 | 22 | 173 | 1684 | 48 | 2432 |
| 1994 | 1785 | 264 | 125 | 18 | 179 | 1745 | 41 | 2371 |
| 1995 | 1823 | 474 | 119 | 24 | 182 | 1769 | 54 | 2623 |
| 1996 | 1727 | 351 | 110 | 38 | 173 | 1642 | 85 | 2399 |
| 1997 | 1921 | 259 | 110 | 39 | 192 | 1836 | 86 | 2521 |
| 1998 | 1507 | 308 | 111 | 54 | 151 | 1387 | 120 | 2131 |
| 1999 | 693 | 141 | 119 | 36 | 35 | 614 | 79 | 1023 |
| 2000 | 644 | 83 | 117 | 55 | 32 | 594 | 50 | 932 |
| 2001 | 1100 | 59 | 121 | 64 | 110 | 1047 | 54 | 1455 |
| 2002 | 1449 | 82 | 132 | 85 | 145 | 1385 | 65 | 1894 |
| 2003 | 1501 | 140 | 128 | 68 | 150 | 1453 | 49 | 1987 |
| 2004 | 1245 | 208 | 111 | 150 | 125 | 1146 | 100 | 1840 |
| 2005 | 1230 | 124 | 120 | 180 | 123 | 1110 | 120 | 1778 |
| 2006 | 1241 | 264 | 111 | 186 | 124 | 1149 | 93 | 1927 |
| 2007 | 1154 | 370 | 115 | 239 | 115 | 1035 | 119 | 1994 |
| 2008 | 1118 | 205 | 110 | 273 | 111 | 982 | 137 | 1818 |
| 2009 | 1121 | 230 | 119 | 190 | 112 | 1026 | 95 | 1773 |
| 2010 | 1078 | 313 | 114 | 122 | 116 | 1017 | 61 | 1744 |
| 2011 | 972 | 510 | 118 | 136 | 105 | 904 | 68 | 1842 |

ECOREGION Bay of Biscay and Atlantic Iberian waters
STOCK Grey gurnard in Subarea VIII and Division IXa

Advice for 2013 and 2014

For this stock, the ICES approach to data-limited stocks would imply 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.

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

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 plans

No specific management objectives are known to ICES. There is no TAC for this species.

Biology

Grey gurnard, *Eutrigla gurnardus*, occurs throughout the Northeast Atlantic. It is also found in the Mediterranean and Black seas. In the North Sea and in Skagerrak/Kattegat, grey gurnard is an abundant demersal species. The species is less abundant in the English Channel, the Celtic Sea, and in the Bay of Biscay and Atlantic Iberian waters. Spawning takes place in spring and summer. There do not seem to be well defined nursery areas. Grey gurnard has a large span of ages up to group 14 at around 40 cm; above 19–20 cm all individuals can be considered mature.

The fisheries

Currently, grey gurnard is a bycatch species in demersal fisheries. Catches are largely discarded.

Quality considerations

In the past, gurnards were often landed in one generic category of “gurnards”. 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.

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.

The EVHOE-WIBTS-Q4 survey in the Bay of Biscay can be used as a good indicator of abundance of grey gurnard in that area (Divisions VIIIabd). Other existing surveys in Divisions VIIIc and IXa are not considered appropriate to measure abundance of this species.

Scientific basis

| | |
|-----------------------------|---|
| Assessment type | No assessment. |
| Input data | None. |
| Discards and bycatch | No information on discards is used. |
| Indicators | EVHOE-WIBTS-Q4 survey. |
| Other information | 2011 was the first year ICES advised on grey gurnard. In 2012 the advice was split into ecoregions. |
| Working group report | WGNEW , WGHMM |

ECOREGION **Bay of Biscay and Atlantic Iberian waters**
STOCK **Grey gurnard in Subarea VIII and Division IXa**

Reference points

No reference points have been defined for this stock.

Outlook for 2013 and 2014

No reliable assessment can be presented for grey gurnard in Subarea VIII and Division IXa. Therefore, no catch projections are available.

ICES approach to data-limited stocks

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

For this stock, 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.

Additional considerations

Stock identity

In the absence of specific information on stock structure, the ICES ecoregions are chosen as minimum level of disaggregation for the definition of stock units. This is an interim solution until more information is available on stock units.

Data requirements

For management purposes, information is required on landings, discards, stock structure, appropriate management units, and basic biological parameters. Data on discards, considered the majority of the catch, are available and need to be analysed. The sampling level in observations at sea is not considered adequate yet for this species because the sampling effort is dedicated to more valuable species. A way to obtain specific samples of grey gurnard could be a self-sampling programme.

Comparison with previous assessment and advice

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. The advice this year is based on ICES approach to data-limited stocks.

Sources

- ICES. 2012a. Report of the Working Group on Assessment of New MoU Species (WGNEW), 5–9 March 2012, ICES Headquarters, Denmark. ICES CM 2012/ACOM:22.
- ICES. 2012b. Report of the Working Group on the Assessment of Southern Shelf Stocks of Hake, Monk, and Megrim (WGHMM), 10–15 May 2012, ICES Headquarters, Copenhagen. ICES CM 2012/ACOM:11.

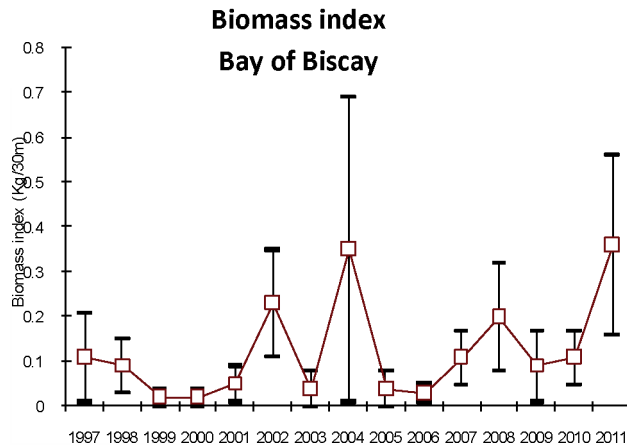


Figure 7.4.20.1 Grey gurnard in Subarea VIII and Division IXa. Biomass indicator (kg per 30 min for all length classes combined), from EVHOE-WIBTS-Q4 survey in Bay of Biscay (Divisions VIIIabd).

Table 7.4.20.1 Grey gurnard in Subarea VIII and Division IXa. ICES advice and official landings.

| Year | ICES Advice | Predicted catch corresp. to advice | Official landings ¹⁾ |
|------|-------------------------------|---------------------------------------|------------------------------------|
| 2003 | | - | - |
| 2004 | | - | - |
| 2005 | | - | - |
| 2006 | | - | - |
| 2007 | | - | - |
| 2008 | | - | - |
| 2009 | | - | - |
| 2010 | | - | - |
| 2011 | | - | - |
| 2012 | No increase in catch | - | |
| 2013 | 20% reduction in catches | - | |
| 2014 | Same catch advice as for 2013 | - | |

Weights in thousand tonnes.

¹⁾Not available due to inconsistent species split.

ECOREGION Bay of Biscay and Atlantic Iberian waters
STOCK Lesser-spotted dogfish (*Scyliorhinus canicula*) in Divisions VIIIa,b,d (Bay of Biscay)

Advice for 2013 and 2014

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 (due to the historical use of generic landings categories), ICES is not in a position to quantify the result. ICES does not advise that an individual TAC be set for this stock.

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

Stock status

| F (Fishing Mortality) | | |
|---|---|------------|
| 2009–2011 | | |
| MSY (F_{MSY}) | ? | Unknown |
| Precautionary approach (F_{pa}, F_{lim}) | ? | Unknown |
| Qualitative evaluation | ↘ | Decreasing |
| SSB (Spawning-Stock Biomass) | | |
| 2005–2011 | | |
| MSY ($B_{trigger}$) | ? | Unknown |
| Precautionary approach (B_{pa}, B_{lim}) | ? | Unknown |
| Qualitative evaluation | ↗ | Increasing |

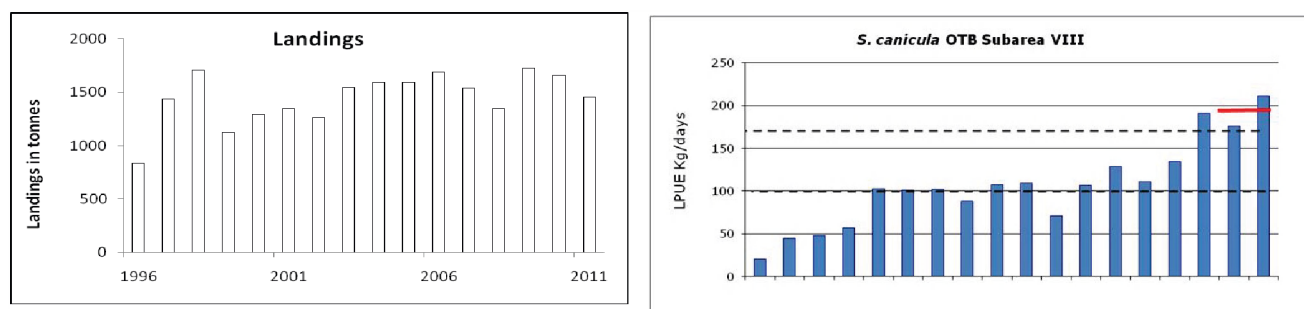


Figure 7.4.21.1 Lesser-spotted dogfish in Subarea VIII. Left: Reported landings in Subarea VIII (tonnes). Right: Relative abundance index for Divisions VIIIa, b, d. Landings per unit effort from Basque trawlers. Dashed lines indicate the mean annual cpue \pm st. dev. for 2005–2009, red line indicates the mean annual cpue for 2010–2011.

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^{-1}) in the last two years (2010–2011) is 39% higher than the average of the five previous years (2005–2009).

Management plans

There are no known management objectives for this stock.

Biology

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

The fisheries

Lesser-spotted dogfish 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.

Effects of the fisheries on the ecosystem

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

Quality considerations

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.

Scientific basis

| | |
|------------------------------|--|
| Assessment type | Lpue- and landings-based trends. |
| Input data | Lpue of Basque otter trawl. |
| Discards and by-catch | Data not examined. Improved knowledge of discard rates and discard survival is required. |
| Indicators | EVHOE-WIBTS-Q4. |
| Other information | Life history. |
| Working group report | WGEF |

ECOREGION Bay of Biscay and Atlantic Iberian waters
STOCK Lesser-spotted dogfish (*Scyliorhinus canicula*) in Divisions VIIIa,b,d (Bay of Biscay)

Reference points

No reference points have been defined for this stock.

Outlook for 2013 and 2014

No reliable quantitative assessment can be presented for this stock.

ICES approach to data-limited stocks

For data-limited stocks for which an abundance index is available, ICES uses a harvest control rule on 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 this stock the abundance is estimated to have increased more than 20% between 2005 and 2009 (average of the five years) and 2010–2011 (average of the two years) in the Basque commercial otter trawl lpue. This implies a 20% increase 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. The French EVHOE survey confirms the increase in abundance.

Considering that current exploitation levels are not thought to be detrimental to these stocks and given that there is a consistent increase of stock size indicators 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.

Additional considerations*Comparison with previous assessment and advice*

The advice is based on Category 3 of ICES approach to data-limited stocks. The previous advice was based on ICES precautionary approach.

Source

ICES. 2012. Report of the Working Group on Elasmobranch Fishes (WGEF), 19–26 June 2012, Lisbon, Portugal. ICES CM 2012/ACOM:19.

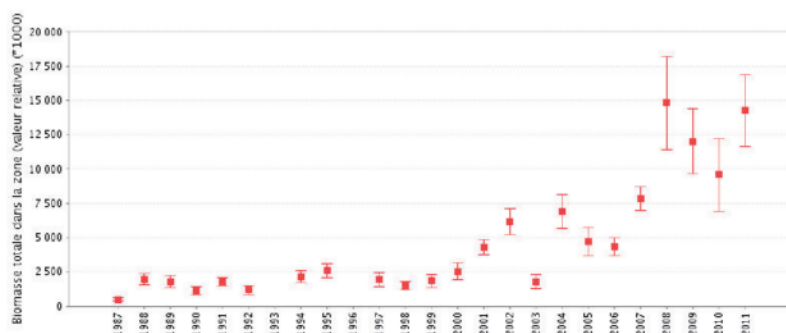


Figure 7.4.21.2 Lesser-spotted dogfish in Subareas VIII and IX. French EVHOE survey indices – Divisions VIIIa, b, d. Total biomass (weight).

Table 7.4.21.1 Lesser-spotted dogfish in Divisions VIIIa, b, d. ICES advice, management, and landings.

| Year | ICES Advice ¹ | Predicted catch corresp. to advice | Agreed TAC | Official Landings |
|------|--|------------------------------------|------------|-------------------|
| 2007 | No advice | | No TAC | 1.5 |
| 2008 | No advice | | No TAC | 1.1 |
| 2009 | No advice | <1.8 | No TAC | 1.6 |
| 2010 | No advice | <1.8 | No TAC | 1.4 |
| 2011 | Maintain catch at recent level | <1.7 | No TAC | 1.2 |
| 2012 | No new advice, same as for 2011 | <1.7 | No TAC | |
| 2013 | Increase catch by a maximum of 20% + no species specific TAC | - | | |
| 2014 | No new advice, same as for 2013 | - | | |

Weights in thousand tonnes.

¹ Before 2013 the advice included Divisions VIIIc and IXa.

Table 7.4.21.2 Lesser-spotted dogfish in Divisions VIIIa, b, d. Official landings (t) of lesser-spotted dogfish (*Scyliorhinus canicula*) in the Bay of Biscay (Divisions VIIIa,b,d).

| | 1996 | 1997 | 1998 | 1999 | 2000 | 2001 | 2002 | 2003 | 2004 | 2005 | 2006 | 2007 | 2008 | 2009 | 2010 | 2011 |
|----------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|
| Belgium | . | 3 | 8 | 7 | 9 | 11 | 10 | 8 | 9 | 10 | 13 | 13 | 18 | 24 | 28 | 28 |
| France | 610 | 694 | 817 | 408 | 774 | 850 | 756 | 1041 | 1179 | 1038 | 1118 | 1207 | 747 | 1126 | 1086 | 788 |
| Spain | 223 | 736 | 880 | 711 | 505 | 482 | 498 | 498 | 407 | 545 | 562 | 323 | 583 | 577 | 541 | 643 |
| UK (E&W) | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 2 | 0 | 3 | 0 | 0 | 0 | 0 | 0 | 0 |
| Total | 833 | 1433 | 1705 | 1127 | 1288 | 1343 | 1264 | 1549 | 1595 | 1596 | 1693 | 1543 | 1348 | 1727 | 1655 | 1459 |

ECOREGION Bay of Biscay and Atlantic Iberian waters
STOCK Lesser-spotted dogfish (*Scyliorhinus canicula*) in Divisions VIIIc and IXa (Atlantic Iberian waters)

Advice for 2013 and 2014

Based on ICES approach to data-limited stocks, ICES advises that catches should be decreased by 9%. 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. ICES does not advise that an individual TAC be set for this stock.

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

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) | |
| | 2005–2011 |
| MSY ($B_{trigger}$) | Unknown |
| Precautionary approach (B_{pa}, B_{lim}) | Unknown |
| Qualitative evaluation | Decreasing |

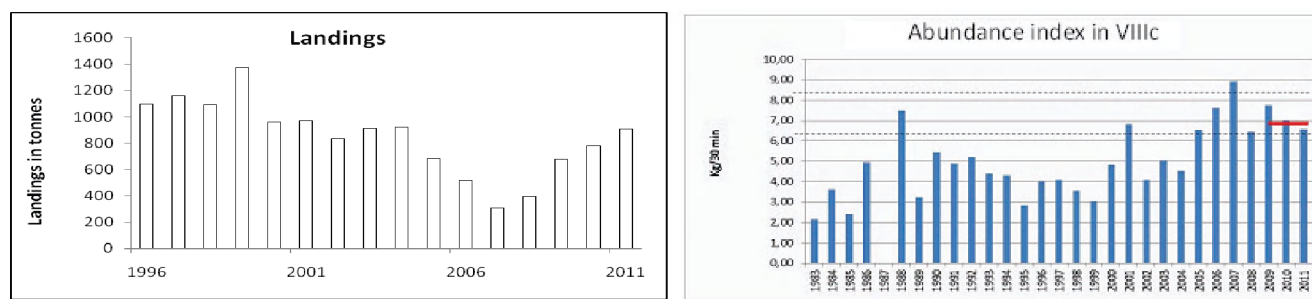


Figure 7.4.22.1 Lesser-spotted dogfish in Divisions VIIIc and IXa. Left: Reported landings in Divisions VIIIc and IXa (tonnes). Right: Survey (SpGFS-WIBTS-Q4) abundance index for Division VIIIc (kg per 30 min haul). Dashed lines indicate the mean annual catch rate \pm st. dev. for 2005–2009, red line indicates the mean annual catch rate for 2010–2011.

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).

Management plans

There are no known management objectives for this stock.

Biology

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

The fisheries

Lesser-spotted dogfish 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.

Effects of the fisheries on the ecosystem

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

Quality considerations

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.

There is no information on stock trends in Division IXa.

Scientific basis

| | |
|-----------------------------|--|
| Assessment type | Survey- and landings-based trends. |
| Input data | SpGFS-WIBTS-Q4 in Division VIIIc |
| Discards and bycatch | Data not examined. Improved knowledge of discard rates and discard survival is required. |
| Indicators | None. |
| Other information | Life history. |
| Working group report | WGEF |

ECOREGION Bay of Biscay and Atlantic Iberian waters
STOCK Lesser-spotted dogfish (*Scyliorhinus canicula*) in Divisions VIIIc and IXa
(Atlantic Iberian waters)

Reference points

No reference points have been defined for this stock.

Outlook for 2013 and 2014

No reliable quantitative assessment can be presented for this stock.

ICES approach to data-limited stocks

For data-limited stocks for which an abundance index is available, ICES uses a harvest control rule on 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 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.

Additional considerations*Comparison with previous assessment and advice*

The advice is based on Category 3 of ICES approach to data-limited stocks. The previous advice was based on ICES precautionary considerations.

Source

ICES. 2012. Report of the Working Group on Elasmobranch Fishes (WGEF), 19–26 June 2012, Lisbon, Portugal. ICES CM 2012/ACOM:19.

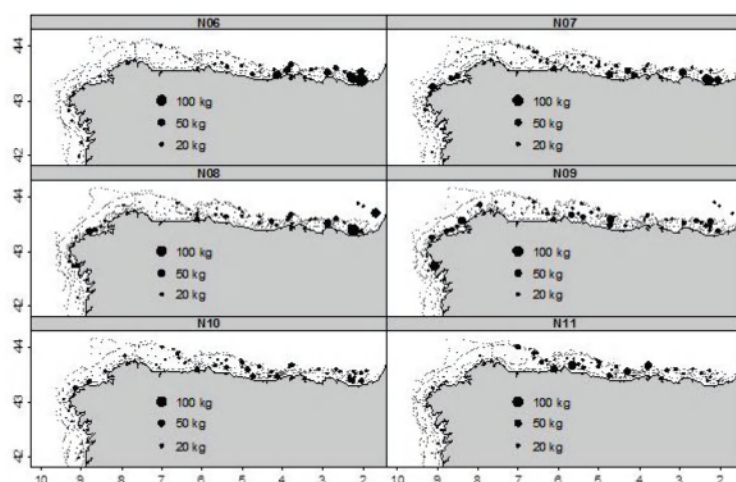


Figure 7.4.22.2 Lesser-spotted dogfish in Divisions VIIIc and IXa. Distribution and relative abundance (kg/30 min haul) of the Spanish bottom trawl survey in VIIIc (SpGFS-WIBTS-Q4).

Table 7.4.22.1 Lesser-spotted dogfish in Divisions VIIIc and IXa. ICES advice, management, and landings.

| Year | ICES Advice ¹ | Predicted catch corresp. to advice | Agreed TAC | Official Landings |
|------|--|------------------------------------|------------|-------------------|
| 2007 | No advice | | No TAC | 0.31 |
| 2008 | No advice | | No TAC | 0.39 |
| 2009 | No advice | <1.8 | No TAC | 0.68 |
| 2010 | No advice | <1.8 | No TAC | 0.78 |
| 2011 | Maintain catch at recent level | <1.7 | No TAC | 0.90 |
| 2012 | No new advice, same as for 2011 | <1.7 | No TAC | |
| | Decrease catch by 9% + no species-specific | - | | |
| 2013 | TAC | | | |
| 2014 | No new advice, same as for 2013 | - | | |

Weights in thousand tonnes.

¹ Before 2013 the advice included Divisions VIIIa, b, d.

Table 7.4.22.2 Combined landings (t) of lesser-spotted dogfish (*Scyliorhinus canicula*) in Iberian waters (Divisions VIIIc and IXa).

| | 1996 | 1997 | 1998 | 1999 | 2000 | 2001 | 2002 | 2003 | 2004 | 2005 | 2006 | 2007 | 2008 | 2009 | 2010 | 2011 |
|----------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|
| France | 0 | 0 | 1 | 1 | 1 | 4 | 3 | 4 | 5 | 1 | 0 | 1 | 1 | 1 | 0 | 0 |
| Spain | 431 | 472 | 403 | 491 | 202 | 236 | 155 | 248 | 237 | 297 | 333 | 147 | 273 | 229 | 336 | 431 |
| Portugal | 667 | 691 | 689 | 882 | 757 | 734 | 673 | 658 | 677 | 385 | 185 | 157 | 120 | 450 | 444 | 473 |
| Total | 1098 | 1163 | 1093 | 1374 | 960 | 974 | 831 | 910 | 920 | 683 | 518 | 305 | 394 | 680 | 780 | 904 |