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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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BOOK 7

Section **Page**

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 (*L. boscii*) in Div. VIIIc and IXa	Not available ?	Not available ?	Qualitative evaluation: Stable →		*L. boscii* (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 *Lepidorhombus boscii* and *Lepidorhombus whiffiagonis* should be no more than 890 t.
Megrim (*L. whiffiagonis*) in Div. VIIIc and IXa	Not available ?	Not available ?	Not available ?	Not available ?	*L. whiffiagonis* (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 *Lepidorhombus whiffiagonis* and *Lepidorhombus boscii* should be no more than 890 t.
White anglerfish (*L. piscatorius* in Div. VIIIc and IXa	Not available ?	Not available ?	Qualitative evaluation: Stable →		*L. piscatorius*: 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 *Lophius piscatorius* and *Lophius budegassa* should be no more than 2090 t.
Black-bellied anglerfish (*L. budegassa*) in Div. VIIIc and IXa	Not available ?	Not available ?	Not available ?	Not available ?	*L. budegassa*: 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 *Lophius piscatorius* and *Lophius budegassa* should be no more than 2090 t.
Horse mackerel *(Trachurus trachurus*) 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		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		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		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		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 (*Trachurus picturatus*) in Subdivision Xa2 (Azores)	Unknown		Qualitative evaluation: Stable after increase		Catches no more than 1800 t	-	-	Data-limited stock approach: catches no more than 1800 t
Nephrops in Divisions VIIIa,b (FU 23-24)	Qualitative evaluation: Above possible reference points		Qualitative evaluation: increasing		Catches no more than 3200 t	-	Cannot be calculated	Data-limited stock approach: Catches no more than 3200 t
Nephrops in Division VIIIc: *Nephrops* in North Galicia (FU 25)	Not available		Qualitative evaluation: decreasing		-	Zero catch	Cannot be calculated	Precautionary considerations: Zero catch
Nephrops in Division IXa: *Nephrops* in West Galicia and North Portugal (FU 26-27)	Not available		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**	
Nephrops in Division IXa: *Nephrops* 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
Nephrops in Division IXa: *Nephrops* 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
Nephrops in Division VIIIc: *Nephrops* in the Cantabrian Sea (FU 31)	Not available 		Qualitative evaluation: decreasing 		-	Zero catch	Cannot be calculated	Precautionary considerations: Zero catch
Lesser-spotted dogfish (*Scyliorhinus canicula*) 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 (*Scyliorhinus canicula*) 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 (*Raja clavata*) in Subarea VIII	Unknown 		Qualitative evaluation: Stable/increasing 		Catches should not increase [4]	-	-	Data-limited stock approach: catches should not increase
Cuckoo ray (*Leucoraja naevus*) 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 (*Raja montagui*) 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 (*Raja montagui*) 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 (*Leucoraja naevus*) 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 (*Raja clavata*) 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 (*Raja brachyura*) 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 (*Dipturus batis*) 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)
			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
Precautionary Approach	**Fishing Mortality…**		✓	o	✗	?
	is at or below PA ($F_{2011} \leq F_{pa}$)	✓				
	is at increased risk ($F_{lim} > F > F_{pa}$)	o	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)

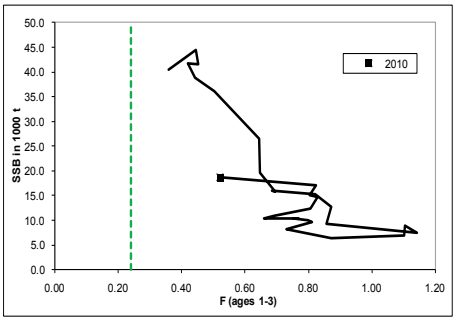
Advice for 2013

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



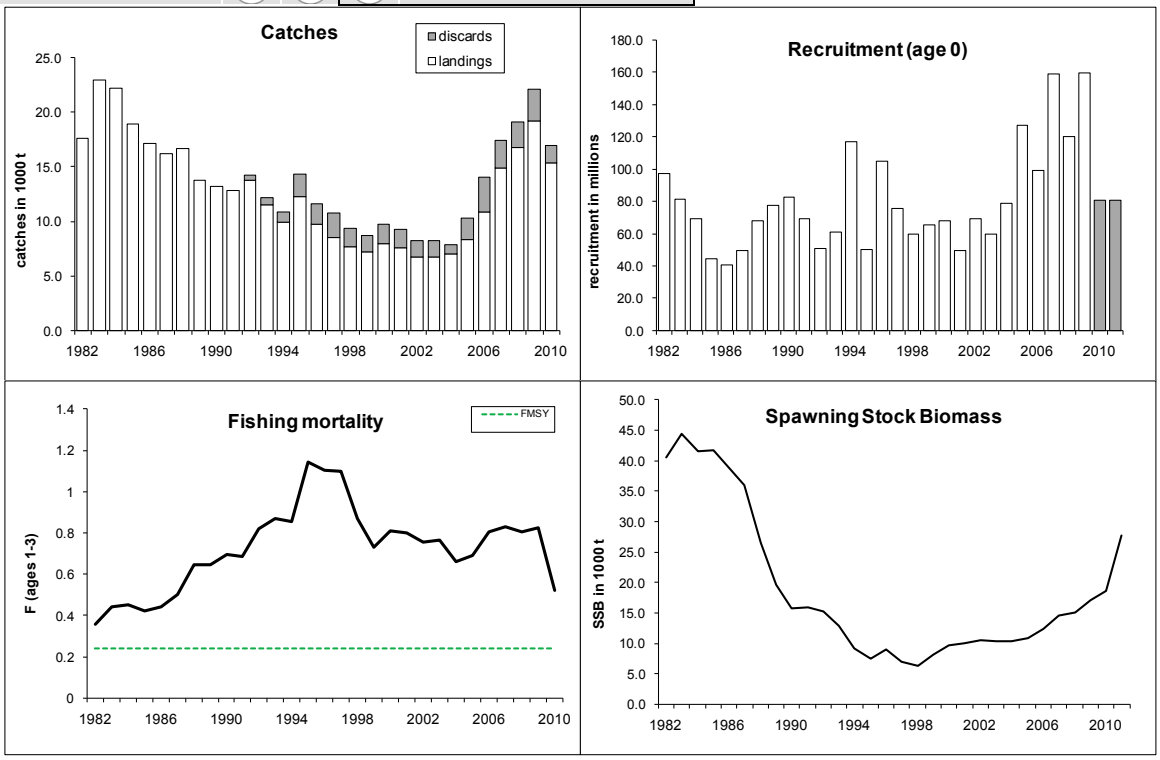


Figure 7.4.1.1 Hake in Divisions VIIIc and IXa. Summary of stock assessment (weights in thousand tonnes). Assumed recruitments are shaded. Top right: SSB/F for the time-series used in the assessment.

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.

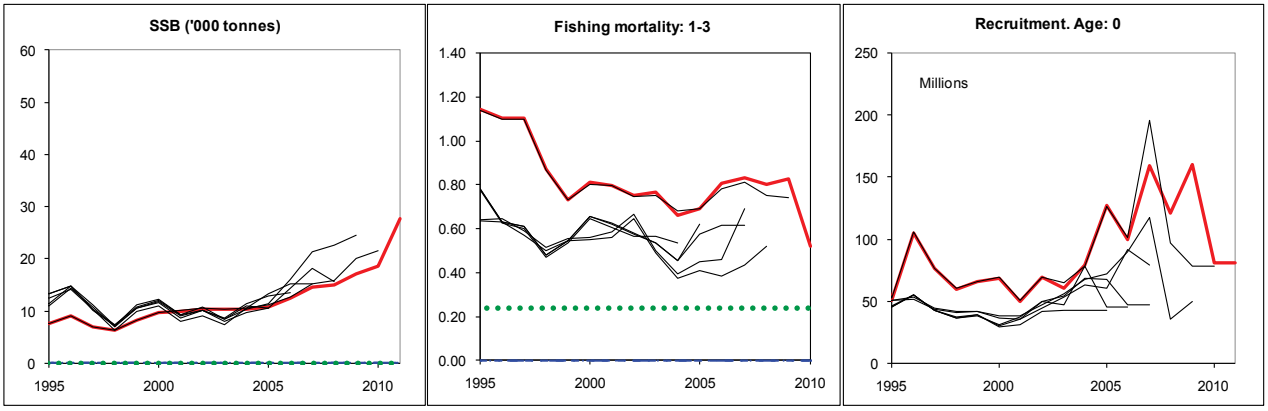


Figure 7.4.1.2 Hake in Divisions VIIIc and IXa. Historical assessment results (final-year recruitment estimates included). F corresponds to ages 1–3 in the last two assessments, but to ages 2–5 in previous assessments. This stock was benchmarked in 2010.

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

	Type	*Value*	*Technical basis*
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} = mean F (2008–2010); SSB (2012) = 25.08; HC landings (2011) = 25.02; Discards (2011) =2.1;
F(2012) = 0.71[1)] ; SSB (2013) = 20.63; HC landings (2012) = 21.24; Discards (2012) = 1.67; R = GM (1989–2009) = 80.8 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

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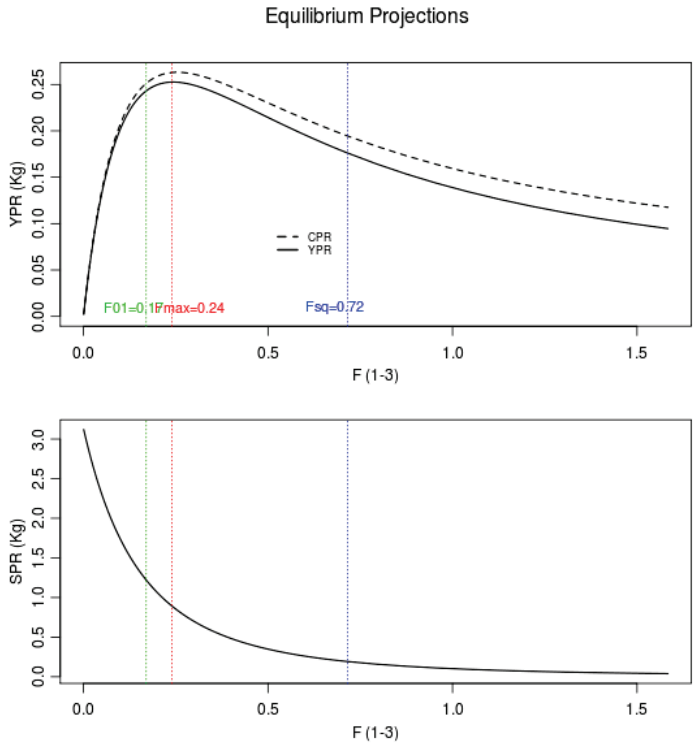

Figure 7.4.1.3 Hake in Divisions VIIIc and IXa. Equilibrium projections of long-term yield-per-recruit (upper panel) and SSB-per-recruit (lower panel) at different fishing mortality rates.

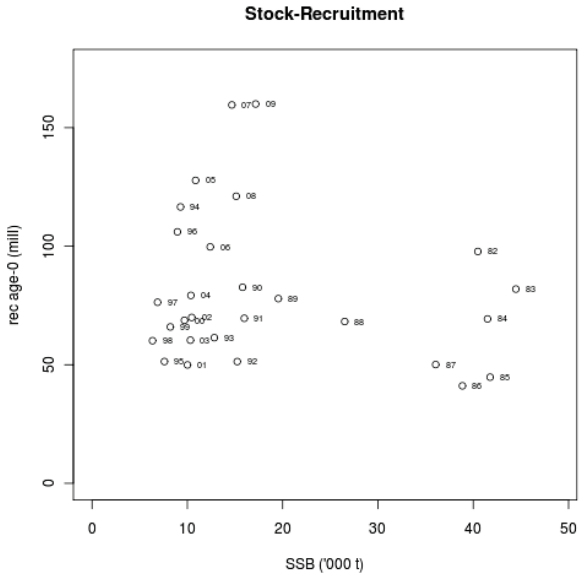

Figure 7.4.1.4 Hake in Divisions VIIIc and IXa. Stock–recruitment relationship.

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.

	SPAIN									PORTUGAL				FRANCE	TOTAL		
YEAR	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.

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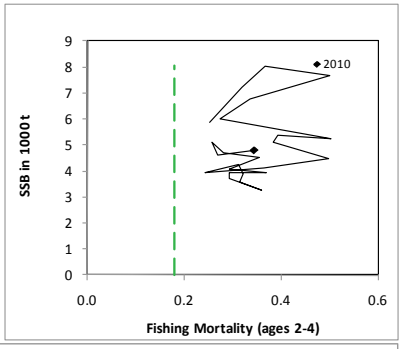
Advice for 2013

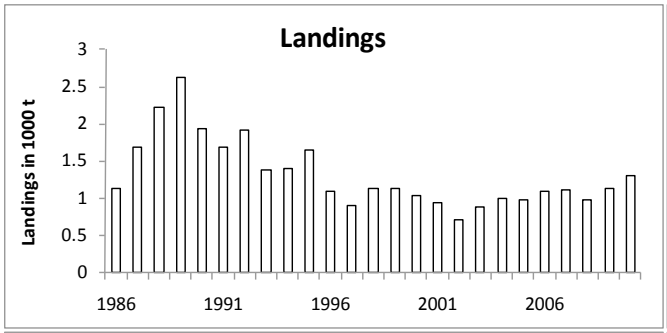
ICES advises on the basis of the MSY approach that landings in 2013 should be no more than 780 t. Combined landings of *Lepidorhombus boscii* and *Lepidorhombus whiffiagonis* should be no more than 890 t.

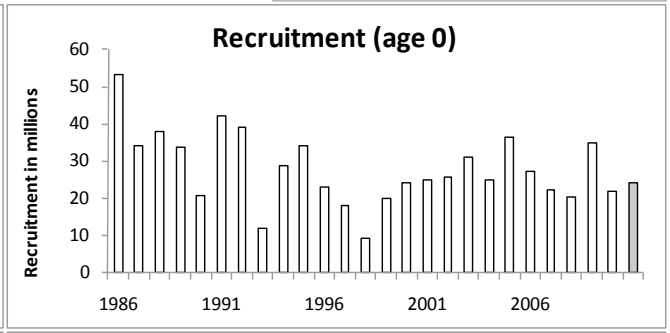
Stock status

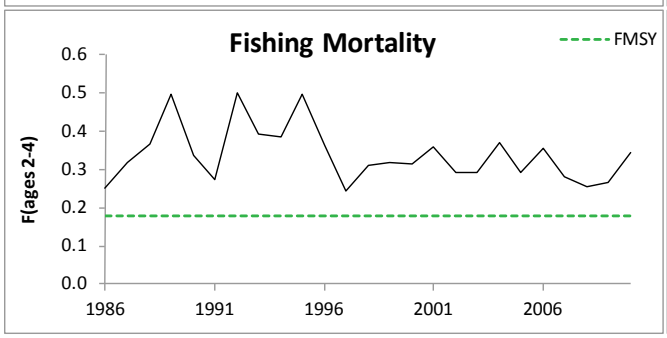
F (Fishing Mortality)	2009	2010	2011	
MSY (F_{MSY})	✗	✗	?	Not available
Precautionary approach (F_{pa},F_{lim})	?	?	?	Not available

SSB (Spawning-Stock Biomass)	2010	2011	2012	
MSY ($B_{trigger}$)	?	?	?	Not available
Precautionary approach (B_{pa},B_{lim})	?	?	?	Not available
Qualitative evaluation	→	→	→	Stable









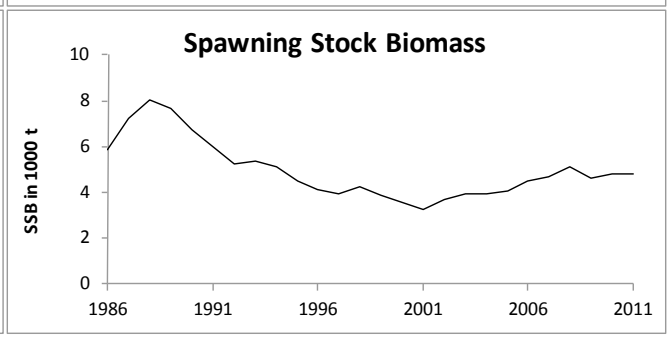


Figure 7.4.2.1 Four-spot megrim (*Lepidorhombus boscii*) in Divisions VIIIc and IXa. Summary of stock assessment (weights in thousand tonnes). Assumed recruitment values are shaded. Top right: SSB/F for the time-series used in the assessment.

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.

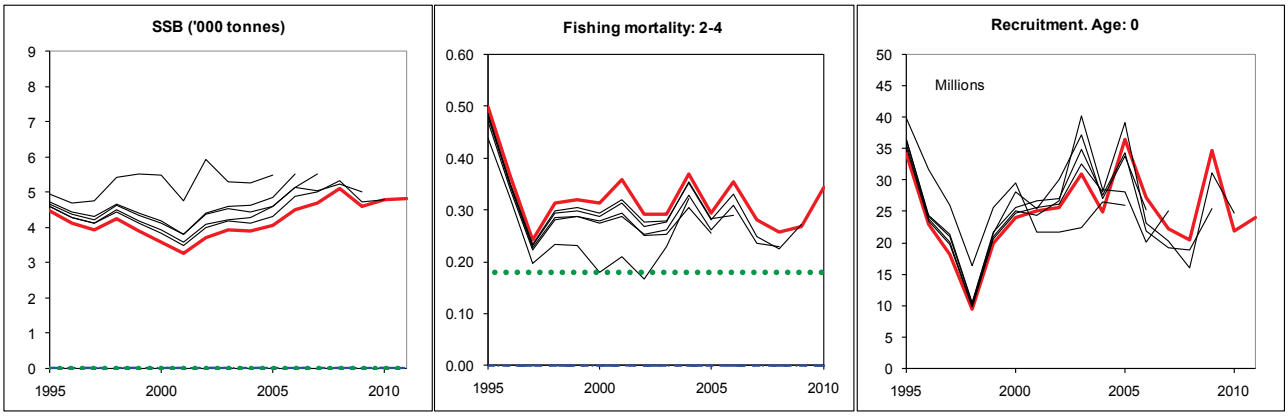


Figure 7.4.2.2 Four-spot megrim (*Lepidorhombus boscii*) in Divisions VIIIc and IXa. Historical assessment results (final-year recruitment estimates included).

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 *L. whiffiagonis* (Section 7.4.3) and the fisheries advice therefore combines both stocks.
Working group report	WGHMM

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Reference points

	Type	*Value*	*Technical basis*
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.

	L. boscii	Combined species		*L. boscii*			
Rationale	**Landings (2013)**	**Landings (2013)**	**Basis**	**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. whiffiagoni*s 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.

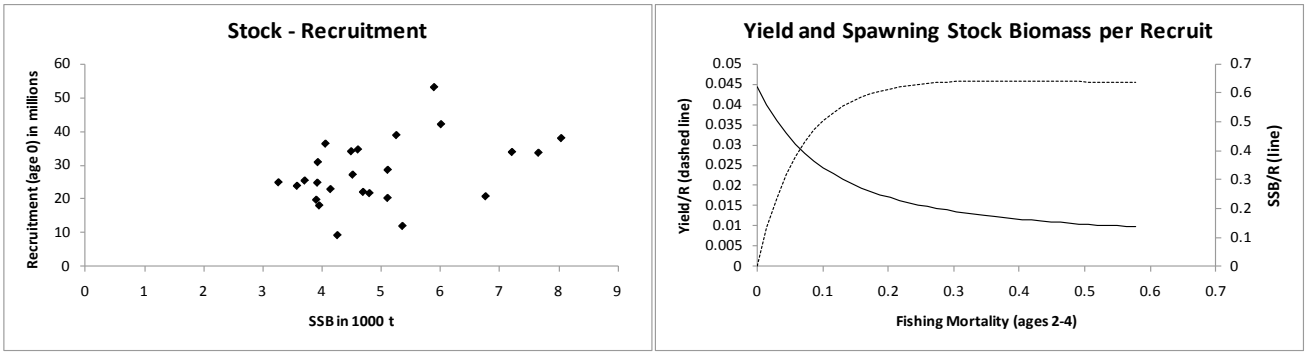


Figure 7.4.2.3 Four-spot megrim (*Lepidorhombus boscii*) in Divisions VIIIc and IXa. Stock–recruitment relationship (left) and yield and spawning-stock biomass per recruit (right).

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 *L. boscii*	Agreed TAC[1,2]	ICES landings[1]	Landings *L. boscii*
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	*L. boscii* no gain in increasing F, *L. whiff.* 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.

	Spain			Portugal	Total
Year	**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

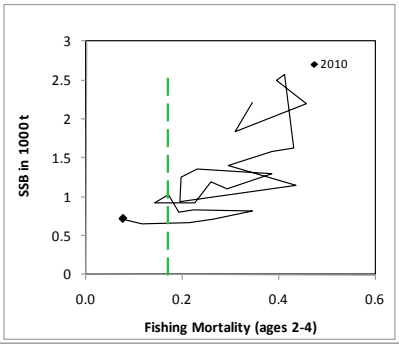
Advice for 2013

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



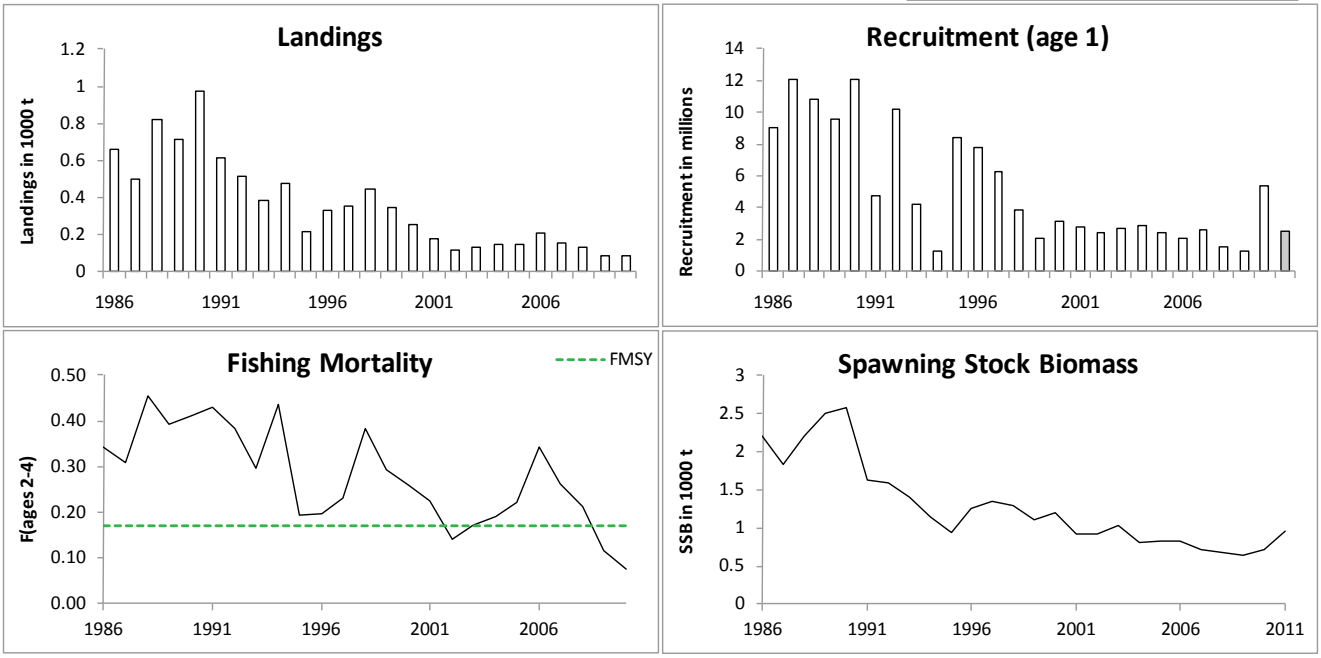


Figure 7.4.3.1 Megrim (*Lepidorhombus whiffiagonis*) in Divisions VIIIc and IXa. Summary of stock assessment (weights in thousand tonnes). Assumed recruitment values are shaded. Top right: SSB/F for the time-series used in the assessment.

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.

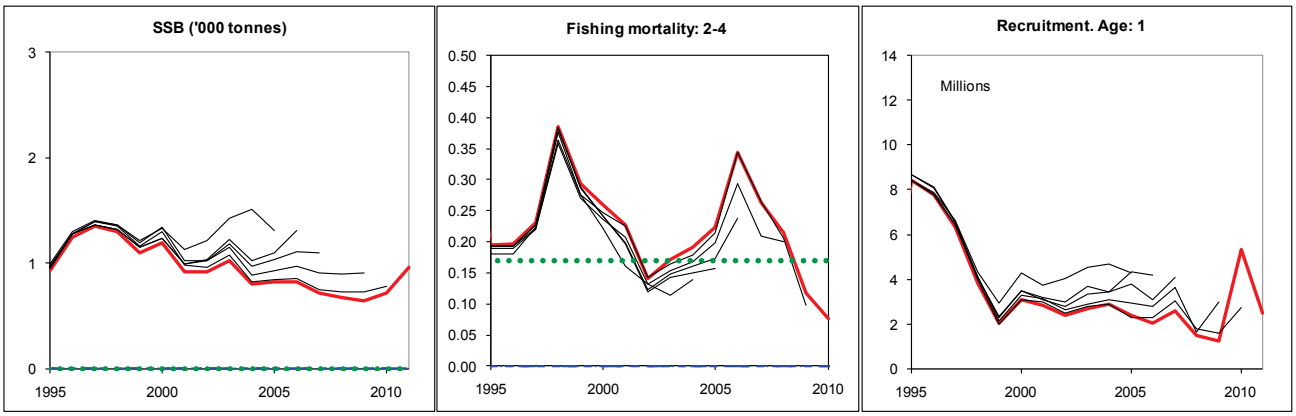


Figure 7.4.3.2 Megrim (*Lepidorhombus whiffiagonis*) in Divisions VIIIc and IXa. Historical assessment results (final-year recruitment estimates included).

Scientific basis

Assessment type	Age-based assessment (XSA).
Input data	Two commercial lpue series (SP-CORUTR8c 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 *L. boscii* (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

	Type	*Value*	*Technical basis*
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.

	L. whiff.	**Combined species**		***L. whiffiagonis***			
Rationale	**Landings (2013)**	**Landings (2013)**	**Basis**	**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. whiffiagoni*s 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.

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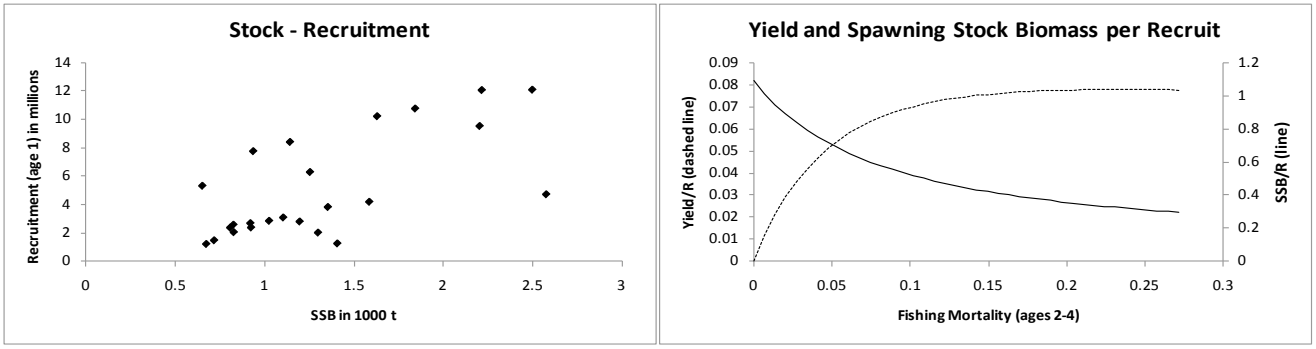


Figure 7.4.3.3 Megrim (*Lepidorhombus whiffiagonis*) in Divisions VIIIc and IXa. Stock–recruitment relationship and yield and spawning-stock biomass per recruit.

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 *L. whiffiagonis*	Agreed TAC[1)2)]	ICES landings[1)]	Landings *L. whiffiagonis*
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	*L. boscii* no gain in increasing F, *L. whiff.* 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.

	Spain			Portugal	Total
Year	**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 7.4.3.3 Megrim (*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

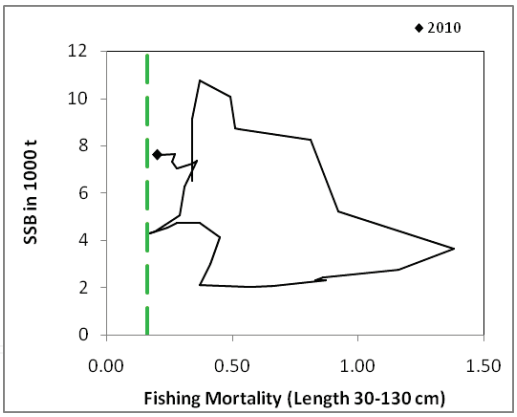
Advice for 2013

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



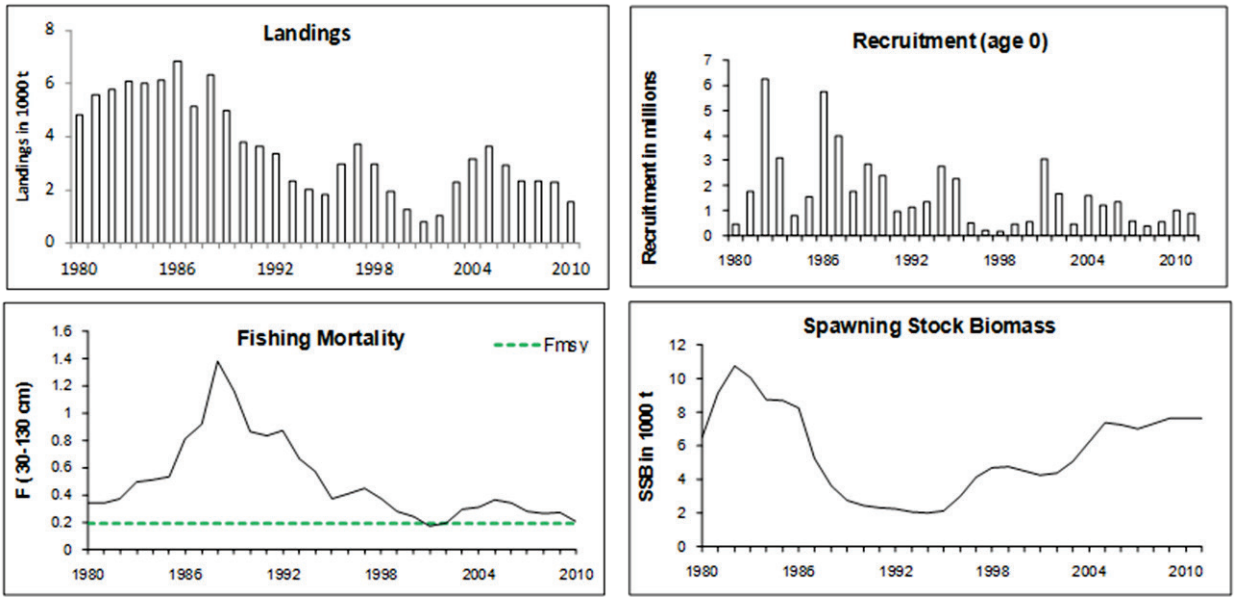


Figure 7.4.4.1 White anglerfish (*Lophius piscatorius*) in Divisions VIIIc and IXa. Summary of stock assessment (weights in thousand tonnes). Top right: SSB/F for the time-series used in the assessment.

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.

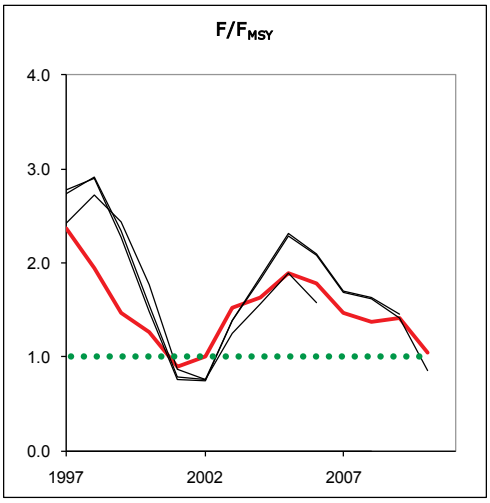


Figure 7.4.4.2 White anglerfish (*Lophius piscatorius*) in Divisions VIIIc and IXa. Historical assessment results. This stock was benchmarked in 2012.

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 *L. budegassa* (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) = mean F (2008–2010) = 0.24; SSB (2012) = 7.3; SSB (2013) = 7.2; Landings (2011) = 1.6; Landings (2012) = 1.5; R (2011) = prediction from 2011 survey index = 0.89 million; R (2012) = GM (1980–2011) = 1.17 million.

	L. pisc.	Combined species		*L. piscatorius*				
Rationale	**Landings (2013)**	**Landings (2013)**	**Basis**	**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 $(F_{2010}*0.4)+(F_{MSY}*0.6)$, 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.

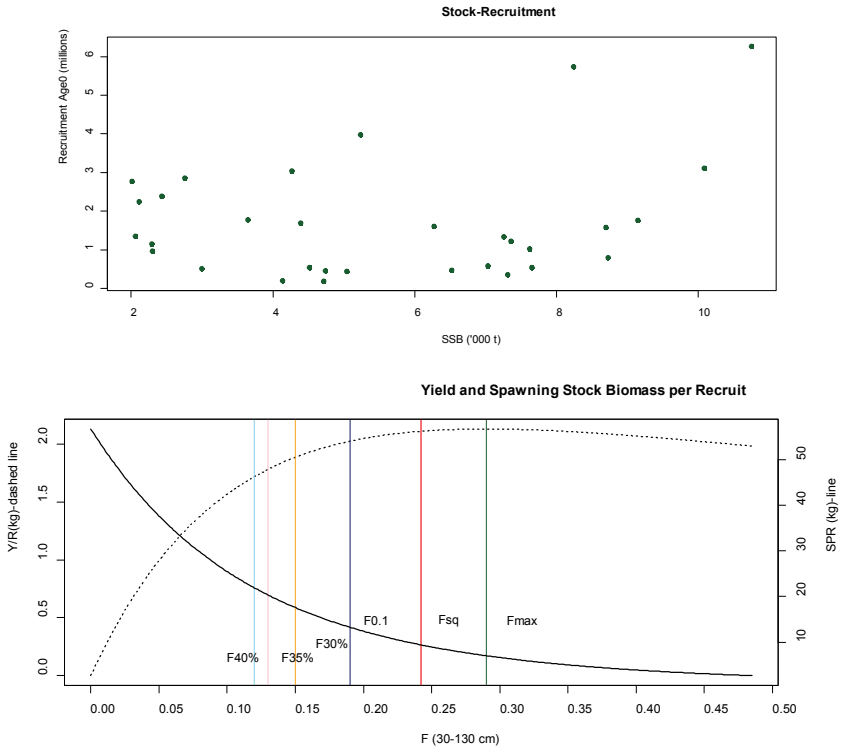


Figure 7.4.4.3 White anglerfish (*Lophius piscatorius*) in Divisions VIIIc and IXa. Stock–recruitment plot (upper panel) and yield and spawning-stock biomass per recruit (lower panel).

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 *L. piscatorius*	Agreed TAC[1,2]	ICES landings for combined species	ICES landings *L. piscatorius*
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.

	Div. VIIIc			Div. IXa				Div. VIIIc+IXa
	SPAIN			SPAIN	PORTUGAL			
Year	Trawl	Gillnet	TOTAL	Trawl	Trawl	Artisanal	TOTAL	TOTAL
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

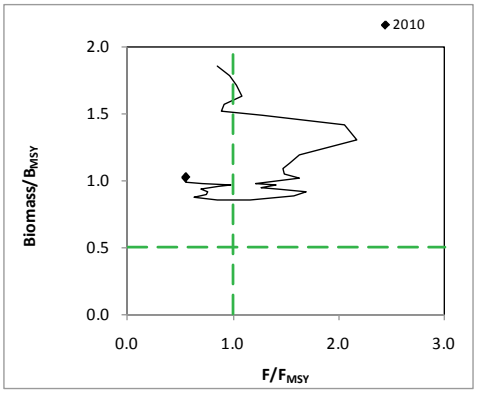
Advice for 2013

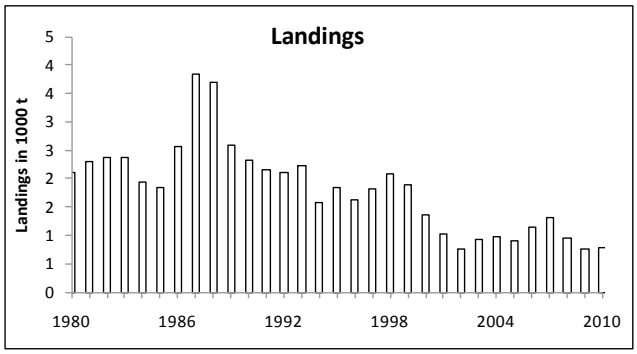
ICES advises on the basis of the MSY transition that landings in 2013 should be no more than 740 t. Combined landings of *Lophius piscatorius* and *Lophius budegassa* should be no more than 2090 t.

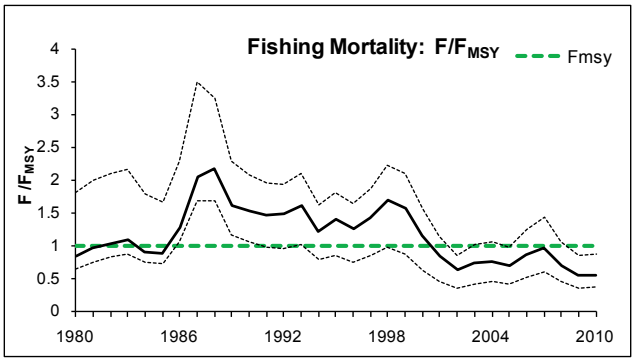
Stock status

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







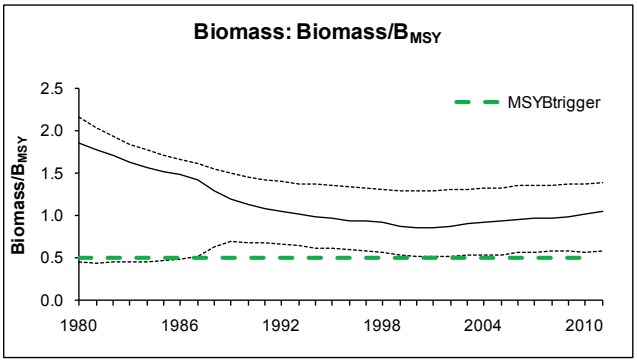


Figure 7.4.5.1 Black-bellied anglerfish *(Lophius budegassa)* in Divisions VIIIc and IXa. Summary of stock assessment: Landings (top left), F/F_{MSY} (bottom left), and B/B_{MSY} (bottom right) with 80% confidence intervals (dotted black line). Top right: SSB/B_{MSY} and F/F_{MSY} for the time series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

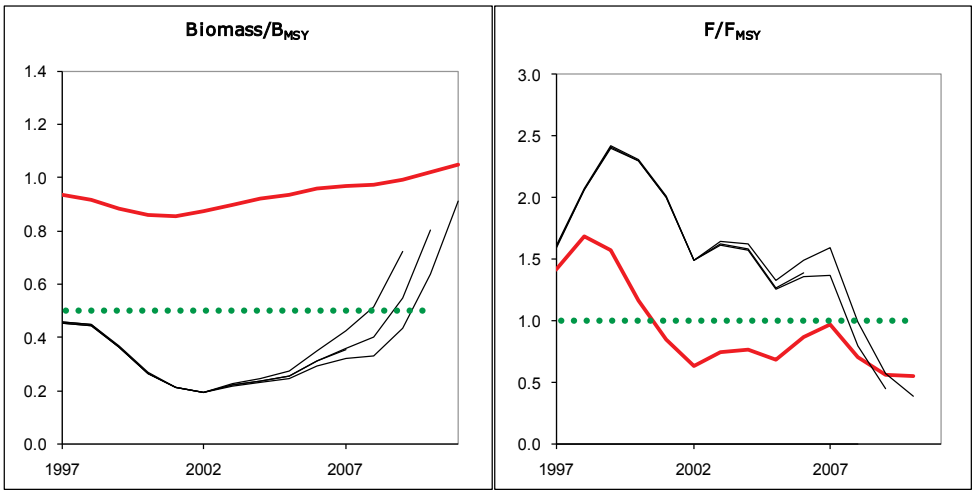


Figure 7.4.5.2 Black-bellied anglerfish *(Lophius budegassa)* in Divisions VIIIc and IXa. Historical assessment results. This stock was benchmarked in 2012.

Scientific basis

Assessment type	Surplus production model (ASPIC).
Input data	Landings and three commercial lpue series (SP-CORUTR8c, 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 *L. piscatorius* (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

	Type	*Value*	*Technical basis*
MSY Approach	MSY $B_{trigger}$	50% B_{MSY}	B_{MSY} is implicit estimated from surplus production model (ICES, 2012).
	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} = mean F (2008–2010) /F_{MSY} = 0.6; B (2013)/B_{MSY} = 1.09; Landings (2012) = 0.90.

Rationale	*L. bud.*	Combined species		*L. budegassa*			Combined species	
	Landings (2013)	Landings (2013)	Basis	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 *L. budegassa*	Agreed TAC[1,2]	ICES landings for combined species	ICES landings *L. budegassa*
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.

	Div. VIIIc			Div. IXa				Div. VIIIc+IXa
	SPAIN			SPAIN	PORTUGAL			
Year	Trawl	Gillnet	TOTAL	Trawl	Trawl	Artisanal	TOTAL	TOTAL
1978	n/a	n/a	n/a	248	n/a	107	355	355
1979	n/a	n/a	n/a	306	n/a	210	516	516
1980	1203	207	1409	385	n/a	315	700	2110
1981	1159	309	1468	505	n/a	327	832	2300
1982	827	413	1240	841	n/a	288	1129	2369
1983	1064	188	1252	699	n/a	428	1127	2379
1984	514	176	690	558	223	458	1239	1929
1985	366	123	489	437	254	653	1344	1833
1986	553	585	1138	379	200	847	1425	2563
1987	1094	888	1982	813	232	804	1849	3832
1988	1058	1010	2068	684	188	760	1632	3700
1989	648	351	999	764	272	542	1579	2578
1990	491	142	633	689	387	625	1701	2334
1991	503	76	579	559	309	716	1584	2162
1992	451	57	508	485	287	832	1603	2111
1993	516	292	809	627	196	596	1418	2227
1994	542	201	743	475	79	283	837	1580
1995	924	104	1029	615	68	131	814	1843
1996	840	105	945	342	133	210	684	1629
1997	800	198	998	524	81	210	815	1813
1998	748	148	896	681	181	332	1194	2089
1999	565	127	692	671	110	406	1187	1879
2000	441	73	514	377	142	336	855	1369
2001	383	69	452	190	101	269	560	1013
2002	173	74	248	234	75	213	522	770
2003	279	49	329	305	68	224	597	926
2004	250	120	370	285	50	267	603	973
2005	273	97	370	283	31	214	527	897
2006	323	124	447	541	39	121	701	1148
2007	372	68	440	684	66	111	861	1301
2008	386	70	456	336	40	119	495	951
2009	301	148	449	172	34	114	320	769
2010	352	81	432	197	70	84	351	784
2011	n/a	n/a	n/a	n/a	75	119	n/a	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/Fmsy	Landings tonnes	B/Bmsy
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

F (Fishing Mortality)	2009	2010	2011	
MSY (F_{MSY})	?	?	?	Not available
Precautionary approach (F_{pa},F_{lim})	?	?	?	Not available
Qualitative evaluation	✓	✓	?	Not available

SSB (Spawning Stock Biomass)	2010	2011	2012	
MSY ($B_{trigger}$)	?	?	?	Not available
Precautionary approach (B_{pa},B_{lim})	?	?	?	Not available
Qualitative evaluation	→	→	?	Not available

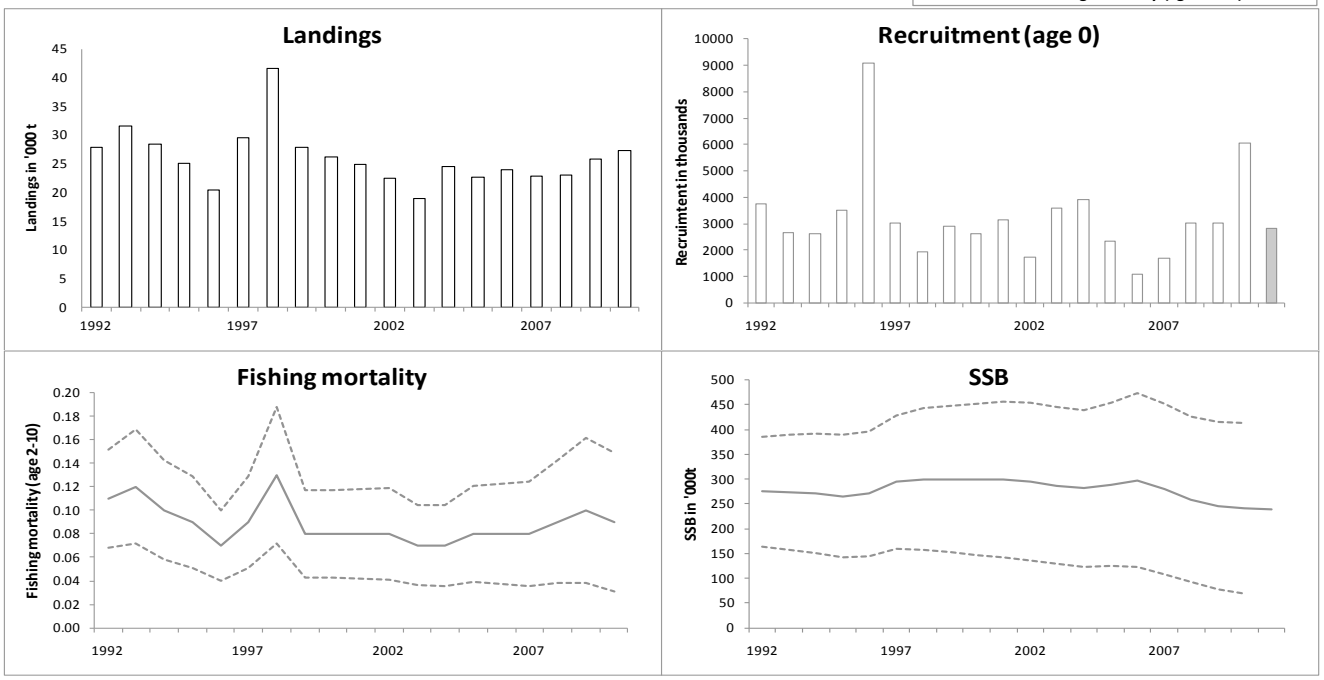


Figure 7.4.6.1 Horse mackerel in Division IXa. Summary of stock assessment 2011 (weights in '000 tonnes) with 95% confidence intervals included for F and SSB. Top right: SSB and F over the time-series used in the assessment. Estimates are shaded.

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) = 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

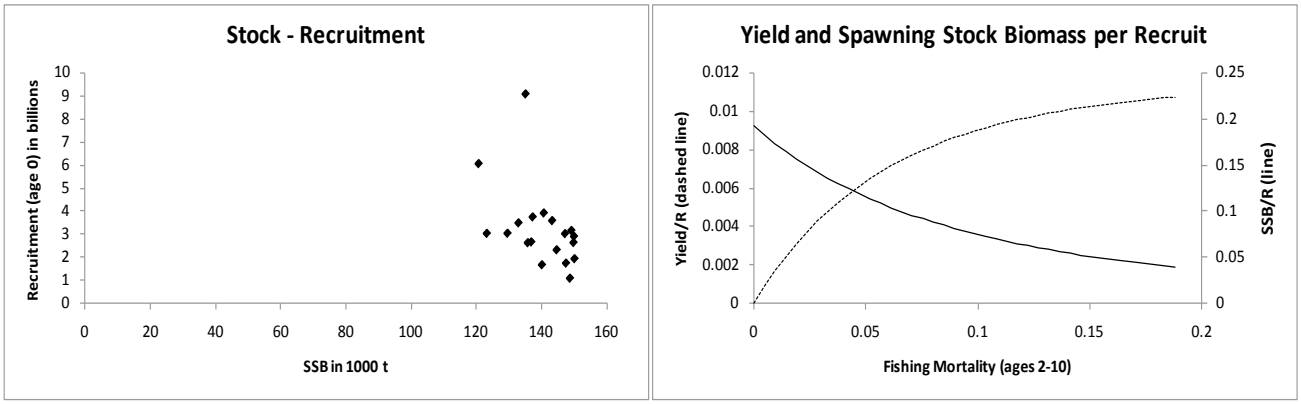


Figure 7.4.6.2 Horse mackerel in Division IXa. 2011 Stock–recruitment plot and yield-per-recruit analysis.

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	*Status quo* 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

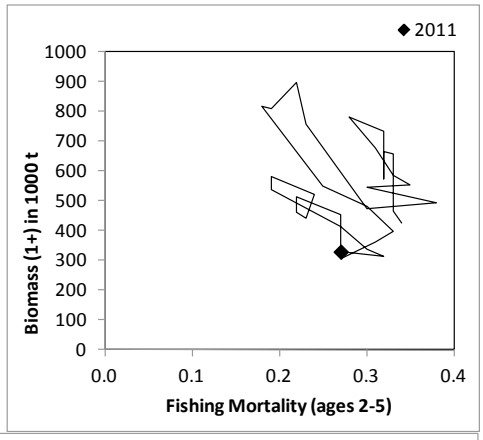
Advice for 2013

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

Stock status

F (Fishing Mortality)		2009–2011
MSY (F_{MSY})	?	Undefined
Precautionary approach (F_{pa},F_{lim})	?	Undefined
Qualitative evaluation	→	Stable

SSB (Spawning Stock Biomass)		2010–2012
MSY ($B_{trigger}$)	?	Undefined
Precautionary approach (B_{pa},B_{lim})	?	Undefined
Qualitative evaluation	→	Stable



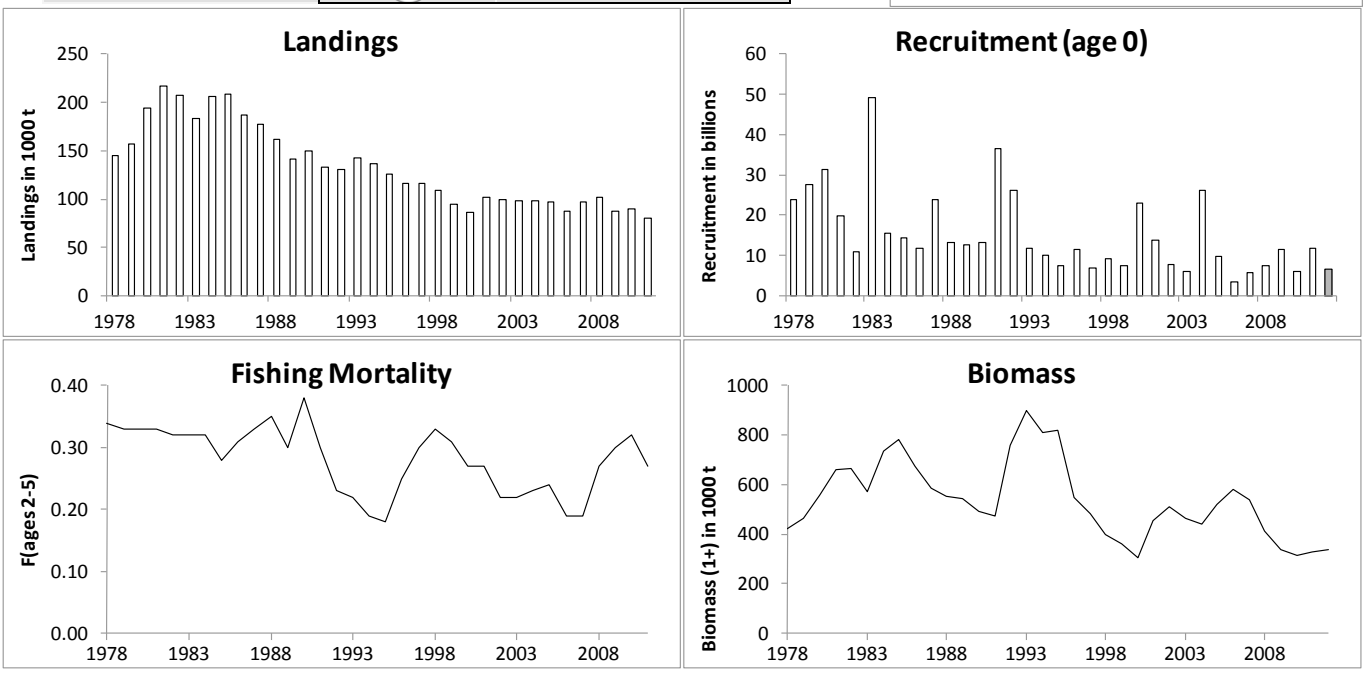


Figure 7.4.7.1 Sardine in Divisions VIIIc and IXa. Summary of stock assessment (weights in '000 tonnes, biomass expressed in weight of age 1 and older fish). Top right: Biomass 1+ and F over the years. Predicted values on recruitment are shaded.

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.

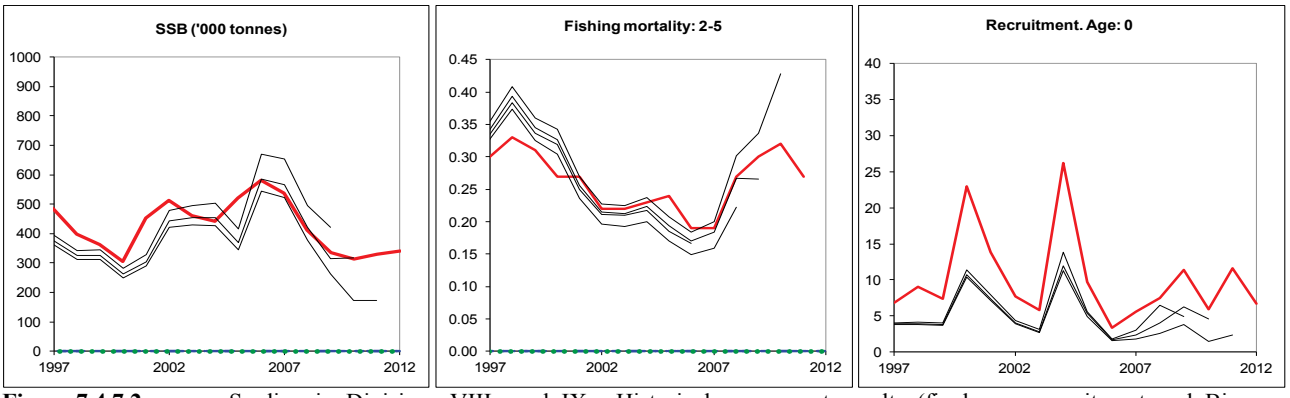


Figure 7.4.7.2 Sardine in Divisions VIIIc and IXa. Historical assessment results (final year recruitment and Biomass estimates included).

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 slipping 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) = average F(09– 11) 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 = 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 (WGANSA), 23–28 June 2012, Horta, Azores Portugal. ICES CM 2012/ACOM:16.

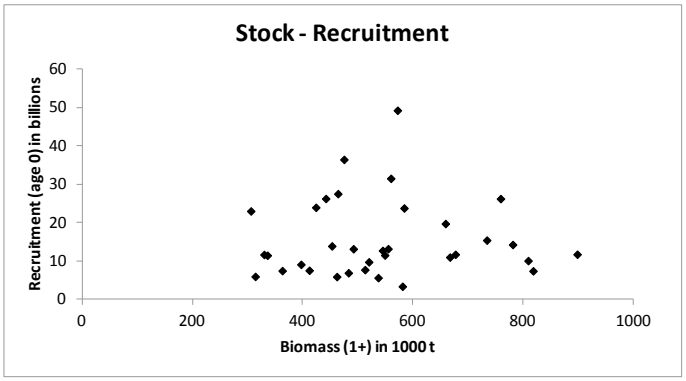


Figure 7.4.7.3 Sardine in Divisions VIIIc and IXa: Stock–recruitment plot.

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.
[1]Estimated catch at *status quo* F.
[2]Includes 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.

			Sub-area								
Year	VIIIc	IXa North	IXa Central North	IXa Central South	IXa South Algarve	IXa South Cadiz	All sub-areas	Div. IXa	Portugal	Spain (excl.Cadiz)	Spain (incl.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	**87740**	**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).

ECOREGION Bay of Biscay and Atlantic Iberian waters
STOCK Anchovy in Subarea VIII (Bay of Biscay)

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

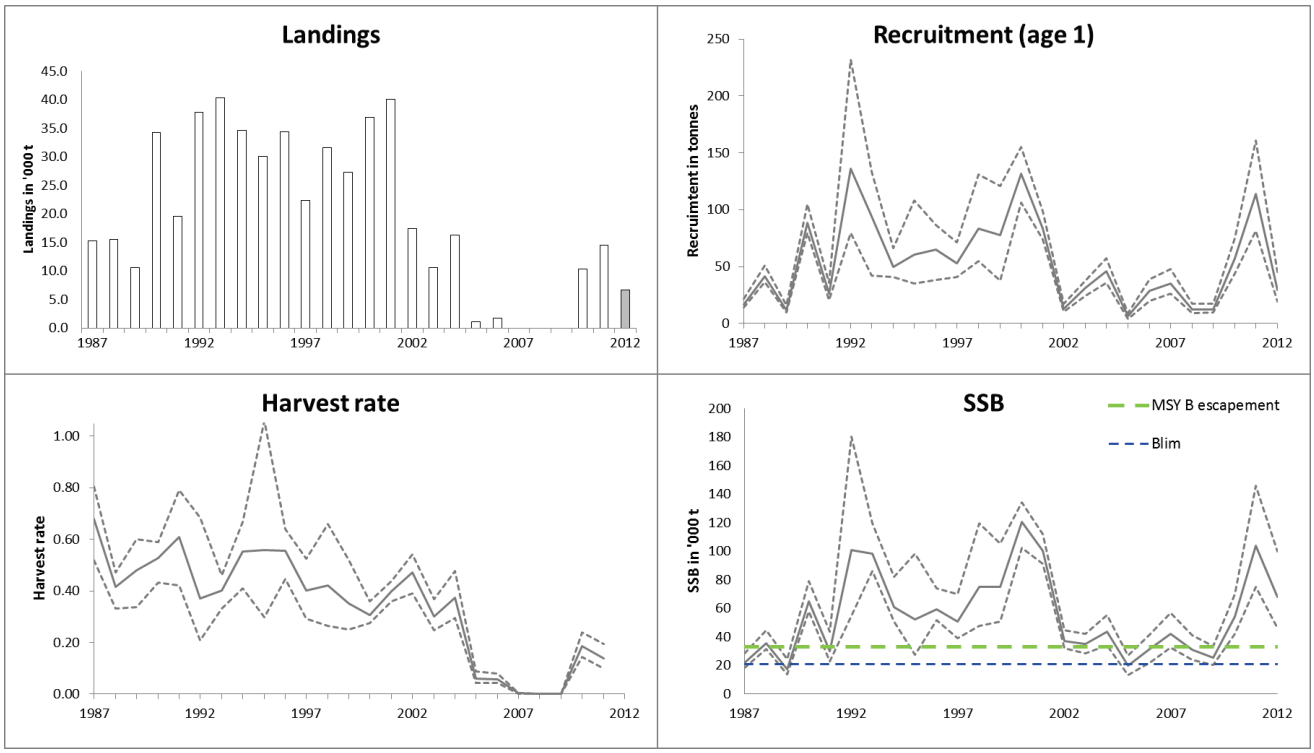


Figure 7.4.8.1 Anchovy in Subarea VIII (Bay of Biscay). Trends in landings, recruitment (age 1 biomass in January), harvest rates (catch/SSB), and spawning-stock biomass. Solid lines – posterior median; dashed lines – 95% probability intervals. The 2012 landings are until the end of May.

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%.

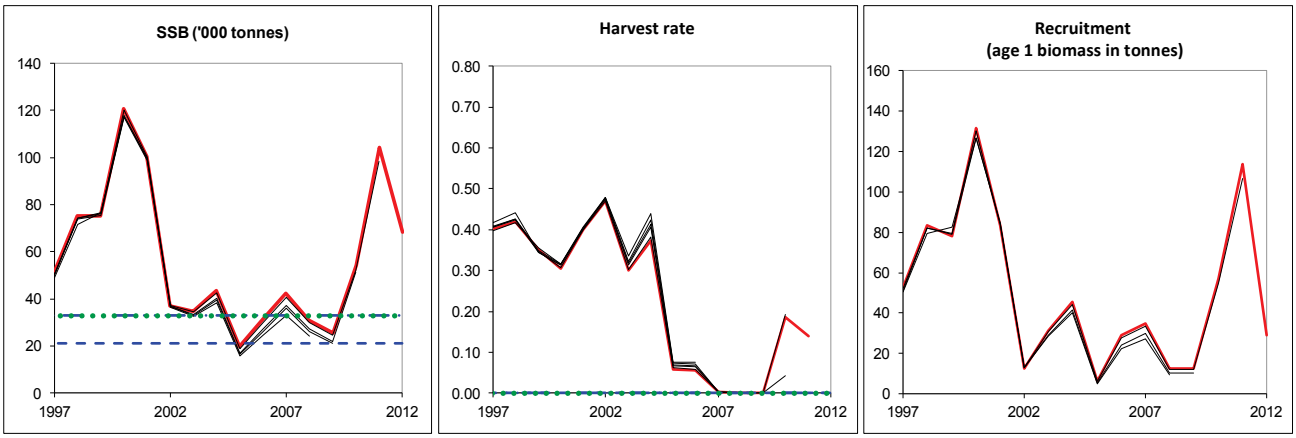


Figure 7.4.8.2 Anchovy in Subarea VIII (Bay of Biscay). Historical assessment results for median SSB (final year estimate included).

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)

ECOREGION Bay of Biscay and Atlantic Iberian waters
STOCK Anchovy in Subarea VIII (Bay of Biscay)

Reference points

	Type	Value	Technical basis
MSY Approach	MSY $B_{escapement}$	33 000 t	Provisional value based on B_{pa}.
	F_{MSY}	Not defined.	
Precautionary approach	B_{lim}	21 000 t	B_{lim}: B_{loss} = 21 000 t (1989 SSB).
	B_{pa}	33 000 t	$B_{pa} = B_{loss} \times \exp(1.645\sigma)$.
	F_{lim}		Not defined.
	F_{pa}	1.0–1.2	F_{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 $SSB_{2013}<B_{lim}$	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 $B_{escapement}$ 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. Athough 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 DEMP 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.

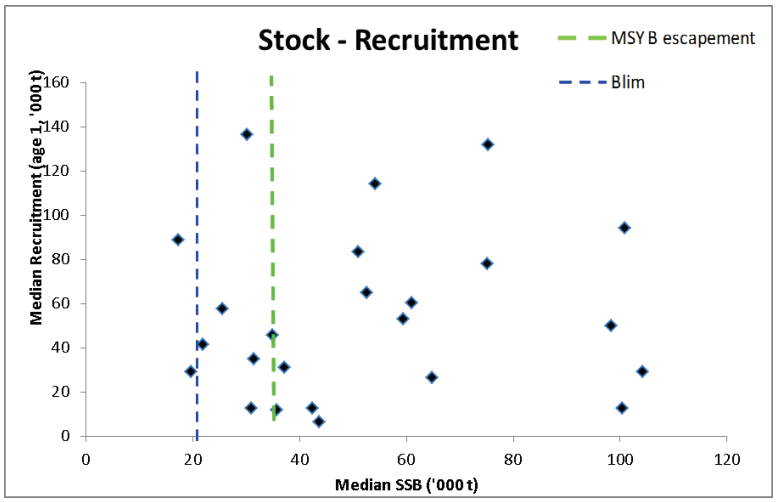


Figure 7.4.8.3 Anchovy in Subarea VIII (Bay of Biscay). Stock–recruitment plot based on median values.

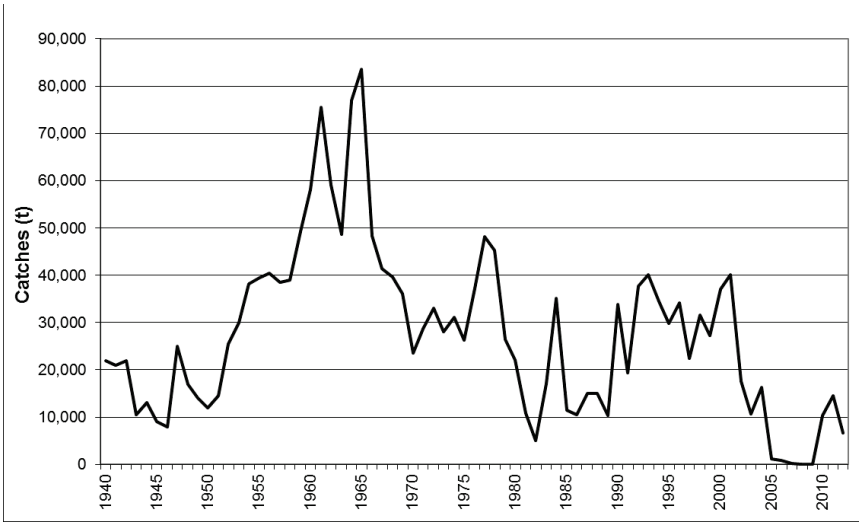


Figure 7.4.8.4 Anchovy in Subarea VIII (Bay of Biscay). Catches (in tonnes) from the beginning of the time-series. Catches in 2012 are until the end of May.

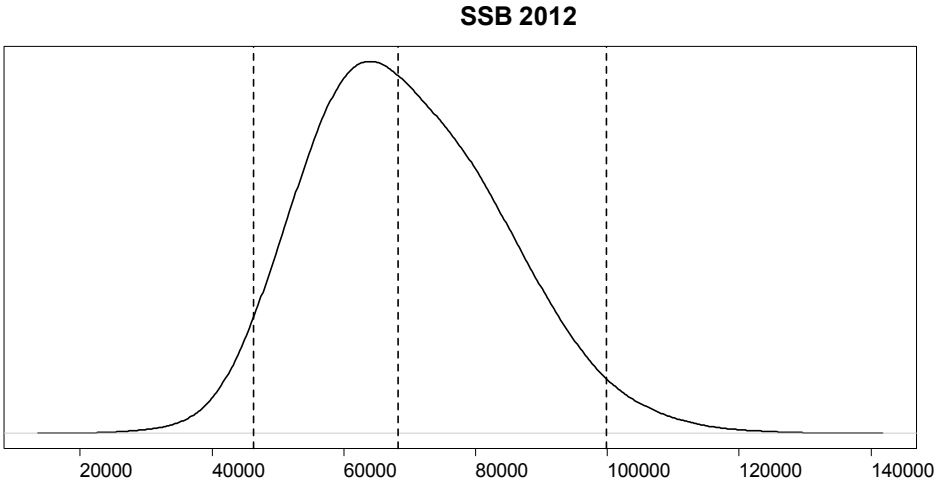


Figure 7.4.8.5 Anchovy in Subarea VIII (Bay of Biscay). Posterior distribution of spawning biomass in 2012. Vertical dashed lines correspond to posterior median and 95% probability intervals.

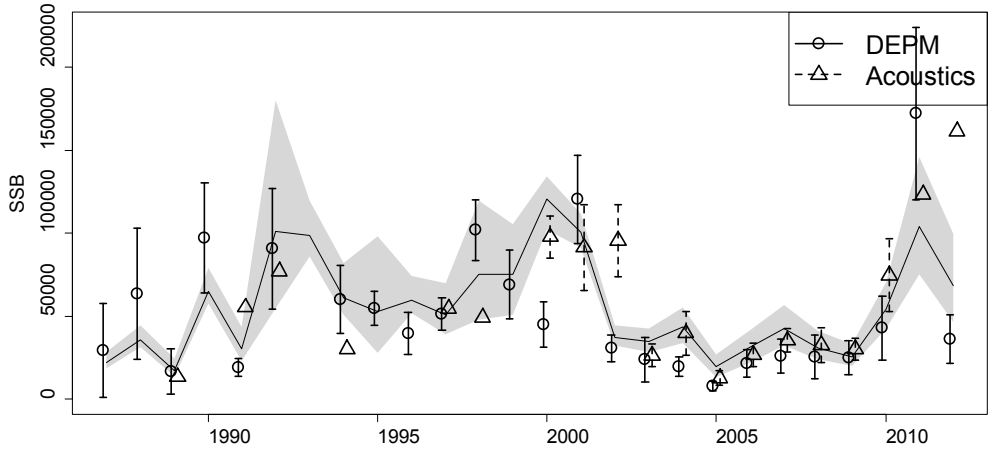


Figure 7.8.4.6 Anchovy in Subarea VIII (Bay of Biscay). Comparison of the SSB posterior 95% probability intervals from the assessment (grey area) and the SSB indices corrected by their catchability with the corresponding confidence intervals from DEPM (open circle and solid line) and Acoustics (triangle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

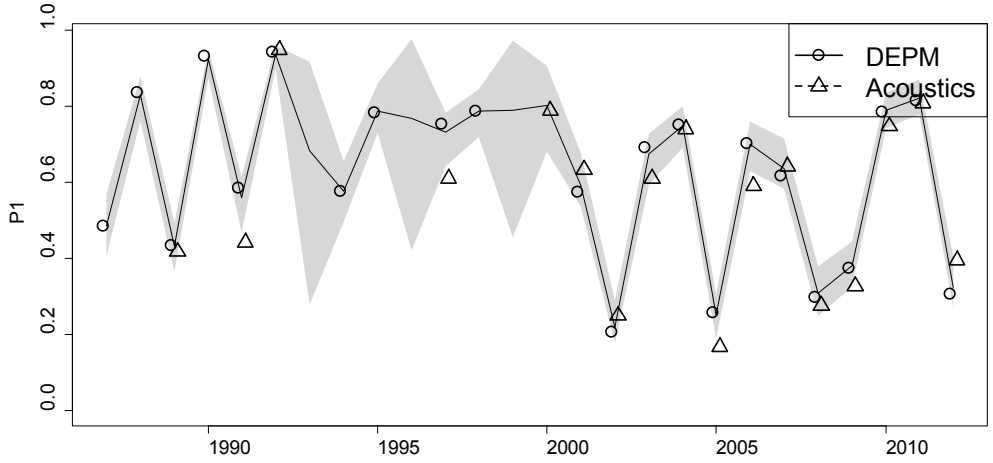


Figure 7.8.4.7 Anchovy in Subarea VIII (Bay of Biscay). Comparison of the proportion of age 1 in biomass posterior 95% probability intervals from the BBM (grey area) and the point estimates from DEPM (open circle) and Acoustics (triangle).

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	n1	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.

	R (tonnes)			SSB (tonnes)			Harvest rate			SSB/SSB_{1989}		
Year	**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

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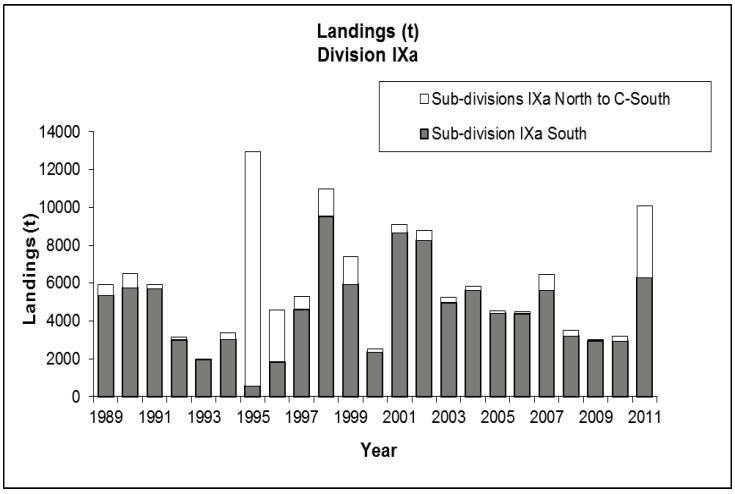
Advice for 2013

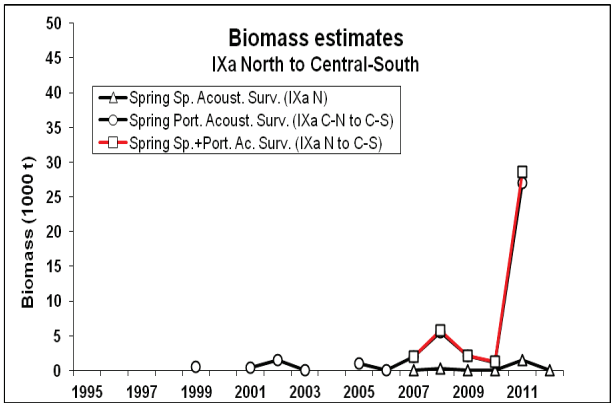
ICES cannot give catch advice for 2013. This is due to the lack of available data on year classes that constitute the bulk of the biomass and catches. ICES notes, however, that the historic fisheries and management measures seem to have been sustainable.

Stock status

F (Fishing Mortality)	
	2009-2011
Qualitative evaluation	? Insufficient information

SSB (Spawning Stock Biomass)	
	2009-2011
Qualitative evaluation	North: North: 10 fold increase South: South: Variable without trend





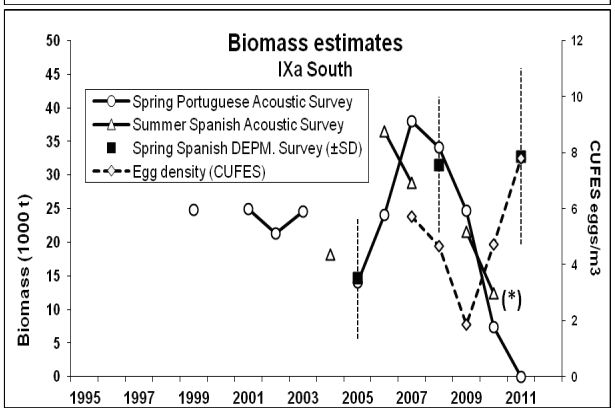


Figure 7.4.9.1 Anchovy in Division IXa. Left: landings (t). Right: survey biomass estimates; Top –Subdivision IXa North and Central (north-western area). Below – IXa South, where (*) denotes a partial estimate in 2010 for only the Spanish part of the Subdivision IXa South during the Spanish survey. The 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 *PELACUS* (IXa North); spring *SAR* Q2/*PELAGO* (IXa C-North, C-South and South), and summer *ECOCÁDIZ* (IXa South), and one DEPM survey: *BOCADEVA* (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

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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 penninsula: 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 lpue as well as age distribution from landings and surveys. The main indicators are shown in Figures 7.4.9.1–3. Commercial lpue has been relatively stable in recent years; however, lpue 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 (WGANSA), 23–28 June 2012, Horta, Azores Portugal. ICES CM 2012/ACOM:16.

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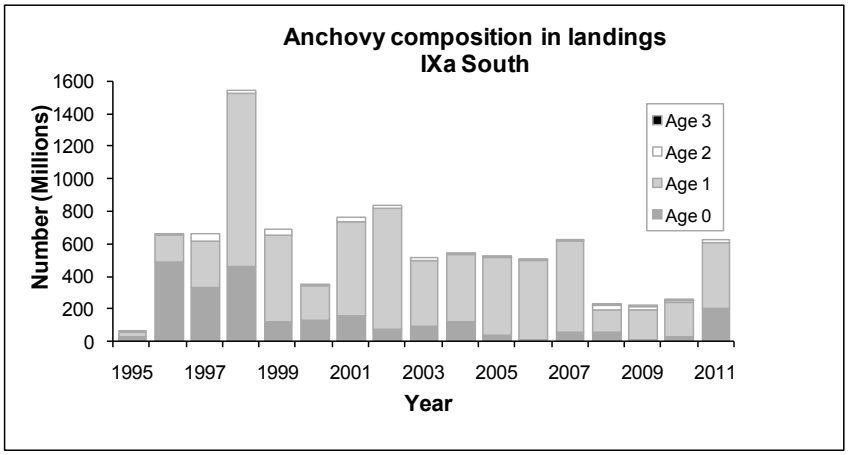


Figure 7.4.9.2 Anchovy in Division IXa. Subdivision IXa South. Age composition in landings (in numbers, millions).

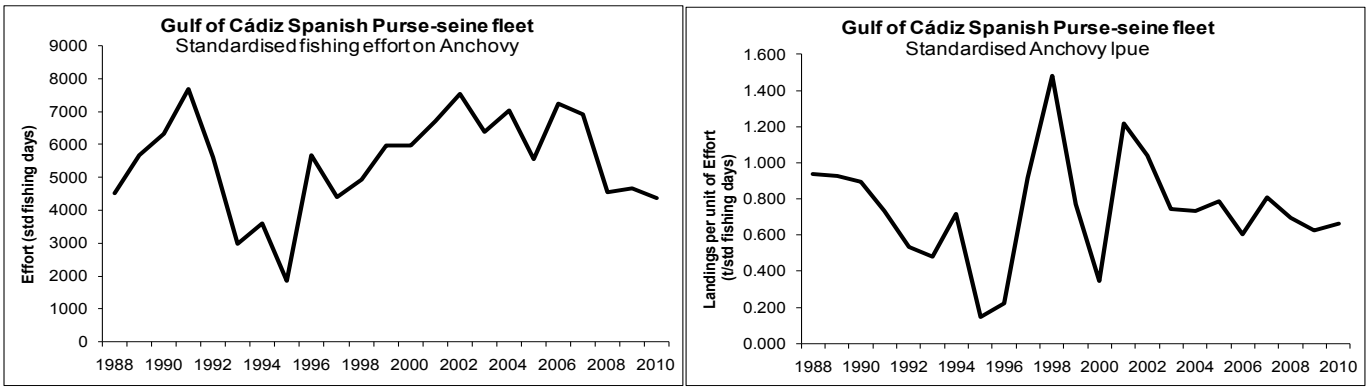


Figure 7.4.9.3 Anchovy in Division IXa. Subdivision IXa South. Anchovy specific standardized effort (fishing days) and landings per unit effort (t/fishing day) for the Gulf of Cádiz Spanish purse-seine fleet.

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.
[1]TAC 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.

	Official landings			ICES landings								
	Portugal	Spain	TOTAL	Portugal				Spain			Total	TOTAL
Year	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

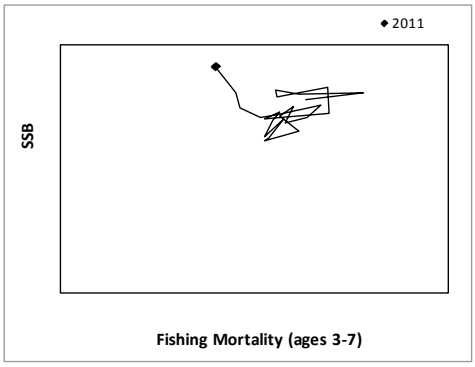
Based on the ICES approach for data-limited stocks, ICES advises that landings should be no more than 3200 tonnes.

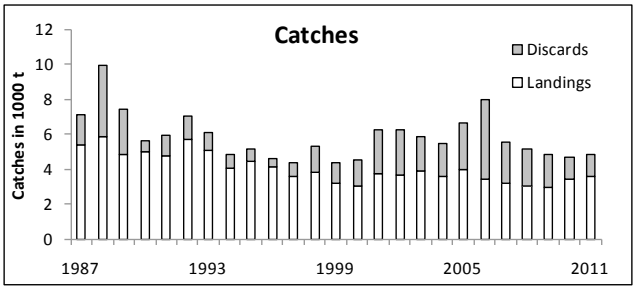
This is the first year ICES is providing quantitative advice for data-limited stocks (see Quality considerations).

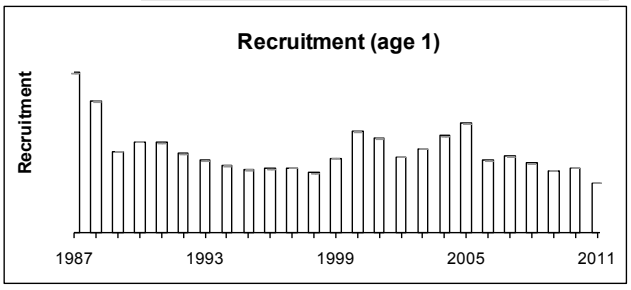
Stock status

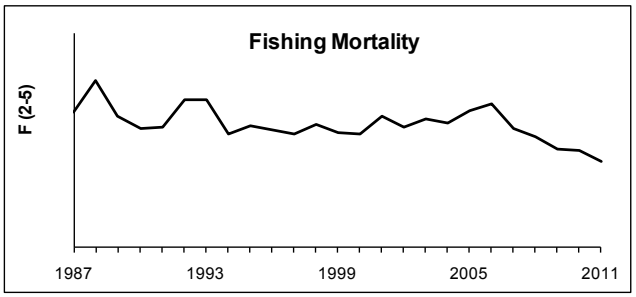
F (Fishing Mortality)		2009–2011
MSY (F_{MSY})	?	Unknown
Precautionary approach (F_{pa},F_{lim})	?	Unknown
Qualitative evaluation	✗	Above poss. reference points

SSB (Spawning-Stock Biomass)		2007–2011
MSY ($B_{trigger}$)	?	Unknown
Precautionary approach (B_{pa},B_{lim})	?	Unknown
Qualitative evaluation	↗	Increasing









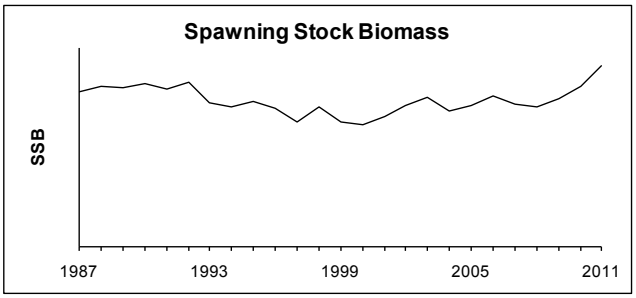


Figure 7.4.10.1 *Nephrops* in Division VIIIab (Bay of Biscay, FUs 23–24): Summary of stock assessment. Top right: SSB/F for the time-series used in the assessment.

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	WGHMM

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

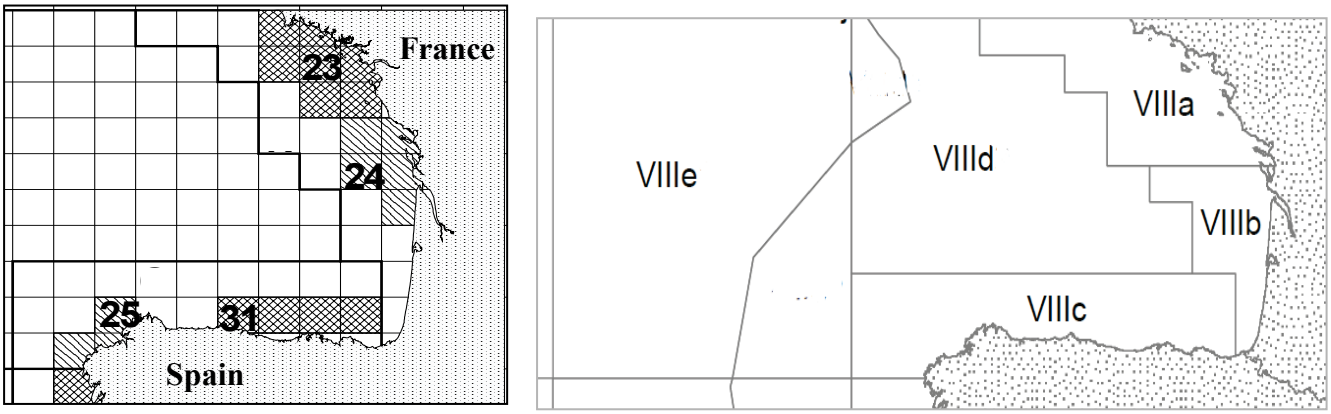


Figure 7.4.10.2 *Nephrops* in the Bay of Biscay: (left) the assessment areas for FUs 23–24, and (right) the TAC areas in Divisions VIIIabde.

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	Landings [1]					Total Discards		Catches
	FU 23–24 [2] VIIIa,b	FU 23 VIIIa	FU 24 VIIIb	Unallocated (MA N) [3]	Total VIIIa,b used by WG	FU 23–24 VIIIa,b		Total 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

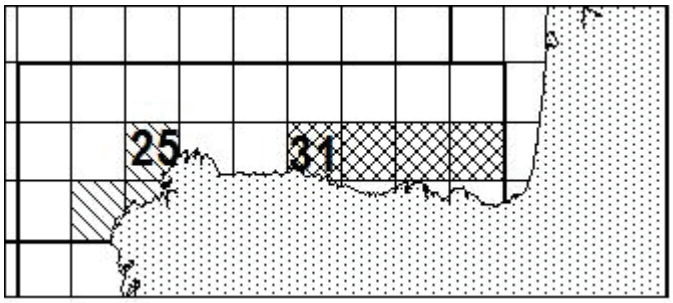


Figure 7.4.11.1 *Nephrops* functional units in Division VIIIc.

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})	?	?	Not available
Precautionary approach (F_{pa},F_{lim})	?	?	Not available
Qualitative evaluation	↘	?	Not available

SSB (Spawning-Stock Biomass)	1975–2010	2011	
MSY ($B_{trigger}$)	?	?	Not available
Precautionary approach (B_{pa},B_{lim})	?	?	Not available
Qualitative evaluation	↘	↘	Decreasing

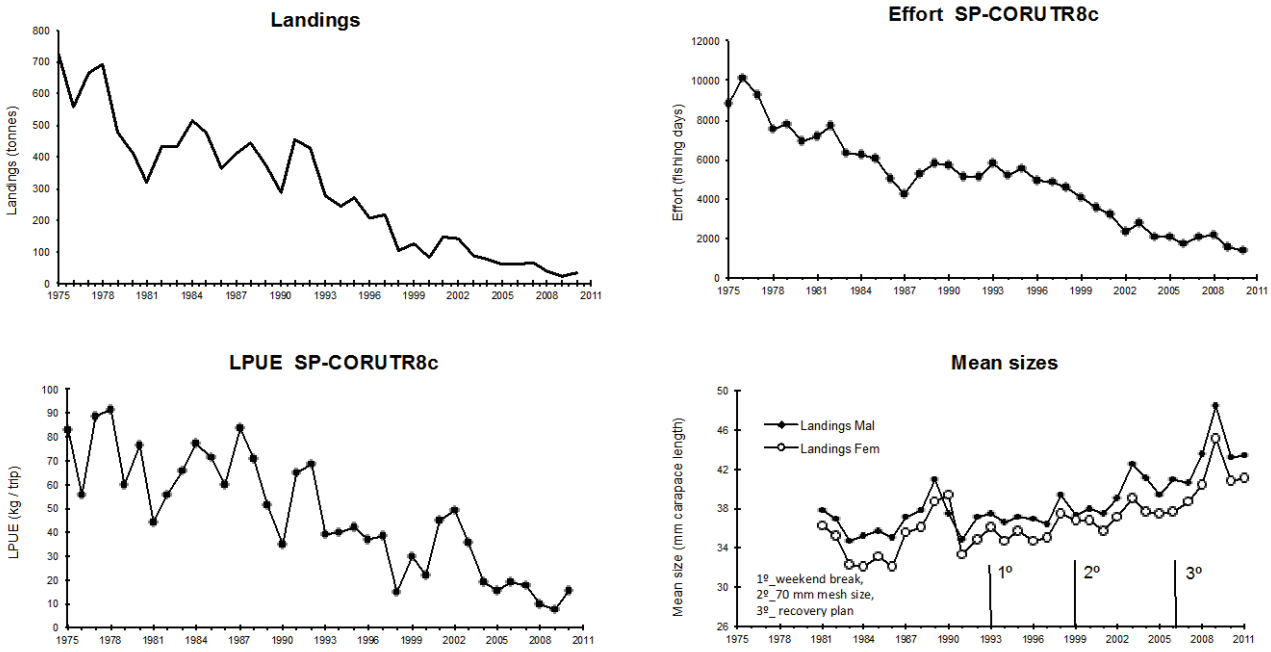


Figure 7.4.11.1.1 *Nephrops* in North Galicia (FU 25). Long-term trends in landings for FU 25, effort and lpue for main fishing fleet, and mean sizes.

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 lpue time-series.

No fishery-independent information is available for this stock.

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

Scientific basis

Assessment type	Trends-based on lpue 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 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.

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

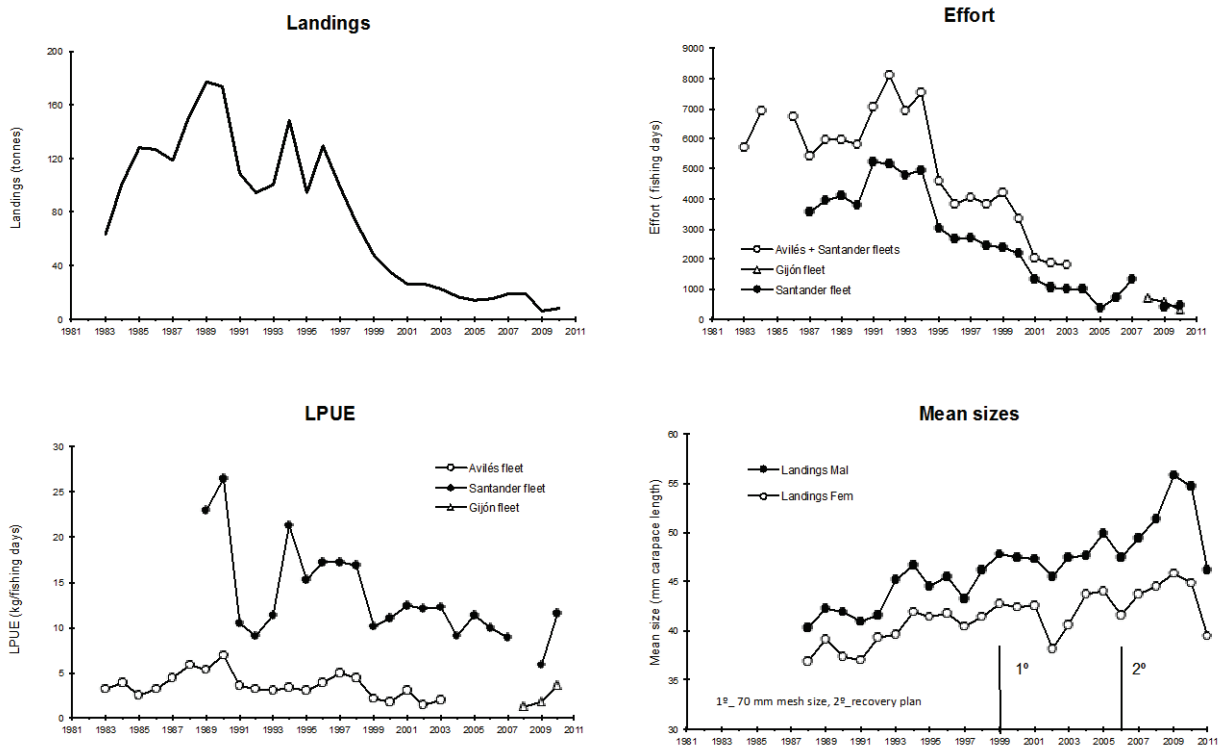


Figure 7.4.11.2.1 *Nephrops* in the Cantabrian Sea (FU 31): Long-term trends in landings (in tonnes), effort, lpue, and mean sizes in landings (mm of carapace length).

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 lpue time-series.

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

Scientific basis

Assessment type	Trends-based on lpue 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 Avilés+Santander (fishing days)	Effort Santander (Fishing days)	Effort Gijón (Fishing days)	LPUE Avilés (Kg/fishing days)	LPUE Santander (Kg/fishing days)	LPUE Gijon (Kg/fishing days)	Mean size in landings (mm CL) 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

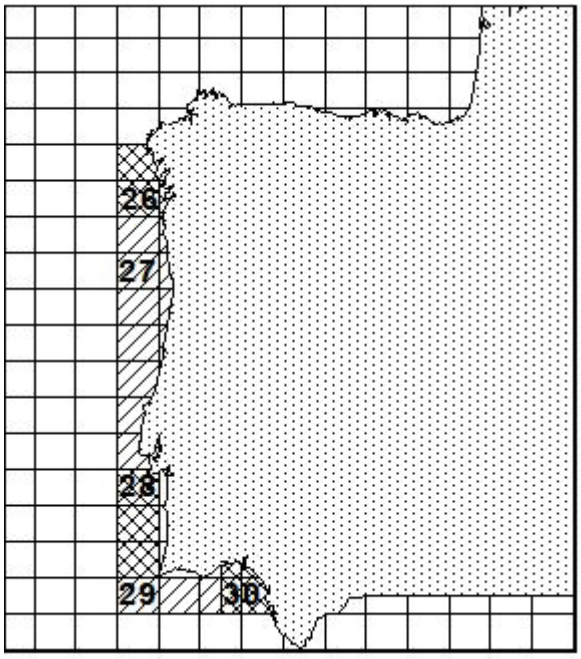


Figure 7.4.12.1 *Nephrops* functional units in ICES Division IXa.

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 (WGHMM), 10–16 May 2012, ICES Headquarters, Copenhagen. ICES CM 2012/ACOM:11.

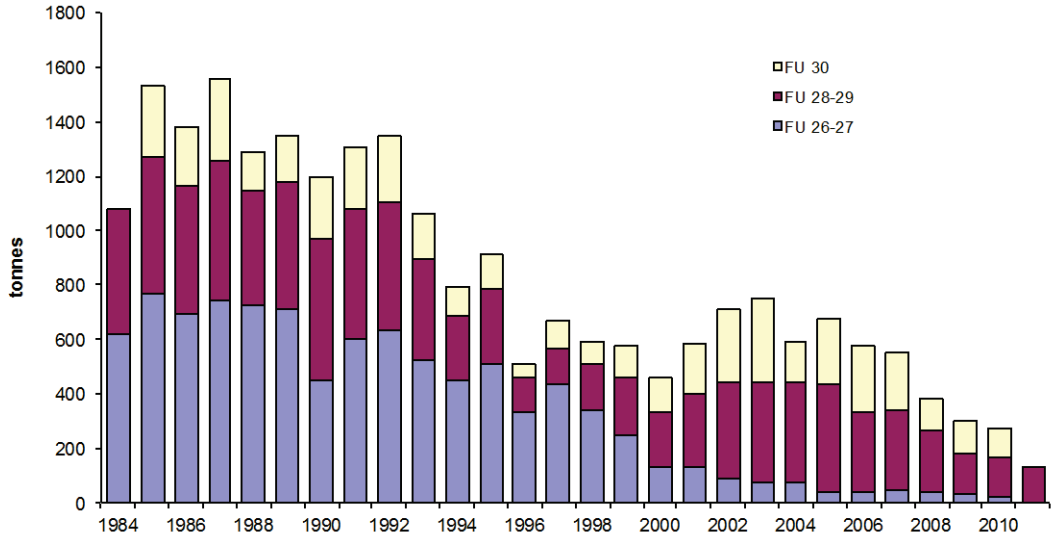


Figure 7.4.12.2 *Nephrops* in Division IXa. Total landings by functional unit (tonnes).
* In 2011, only Portuguese landings are shown. Spanish landings are not available.

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})	?	?	Not available
Precautionary approach (F_{pa},F_{lim})	?	?	Not available
Qualitative evaluation	↘	?	Not available

	SSB (Spawning-Stock Biomass)		
	1984–2010	2011	
MSY ($B_{trigger}$)	?	?	Not available
Precautionary approach (B_{pa},B_{lim})	?	?	Not available
Qualitative evaluation	↘	↘	Decreasing

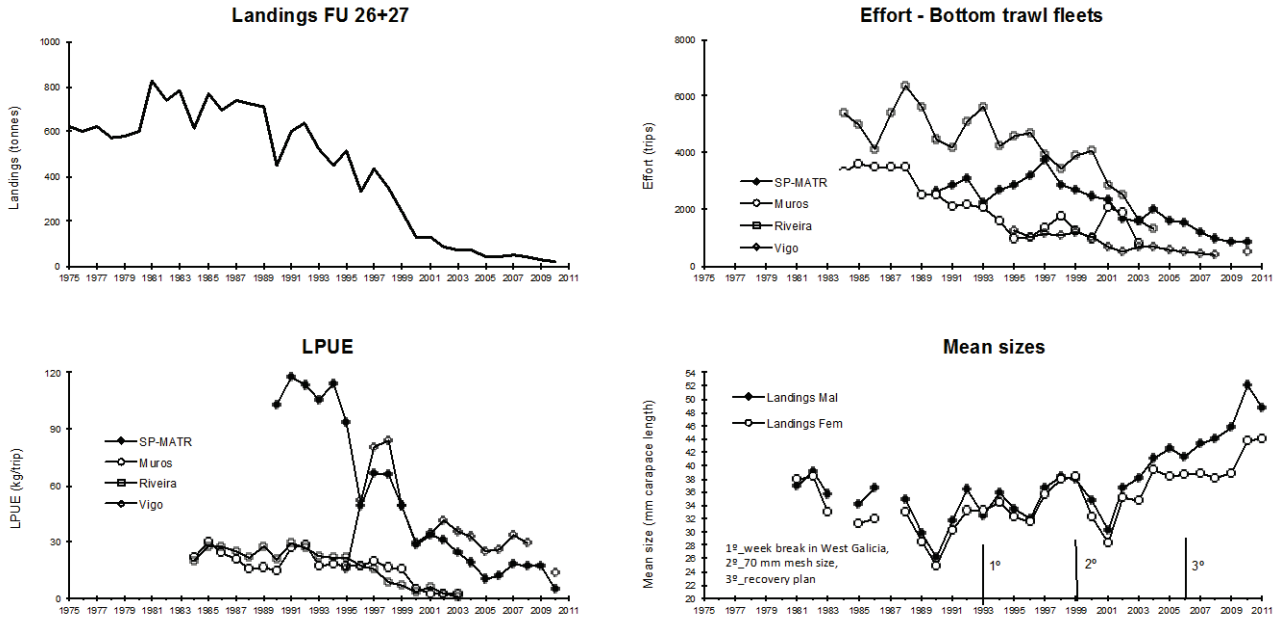


Figure 7.4.12.1.1 *Nephrops* in West Galicia and North Portugal (FUs 26–27). Long-term trends in landings (in tonnes), effort, lpue, and mean sizes in landings (mm carapace length).

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 lpue 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).

	Spain		Portugal	Total
Year	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-MARTR (Trips)	Effort SP-Muros (Trips)	Effort SP-Riveira (Trips)	Effort SP-Vigo (Trips)	LPUE SP-MARTR (Kg/trip)	LPUE SP-Muros (Kg/trip)	LPUE SP-Riveira (Kg/trip)	LPUE SP-Vigo (Kg/trip)	Mean size in landings (mm CL)	
										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

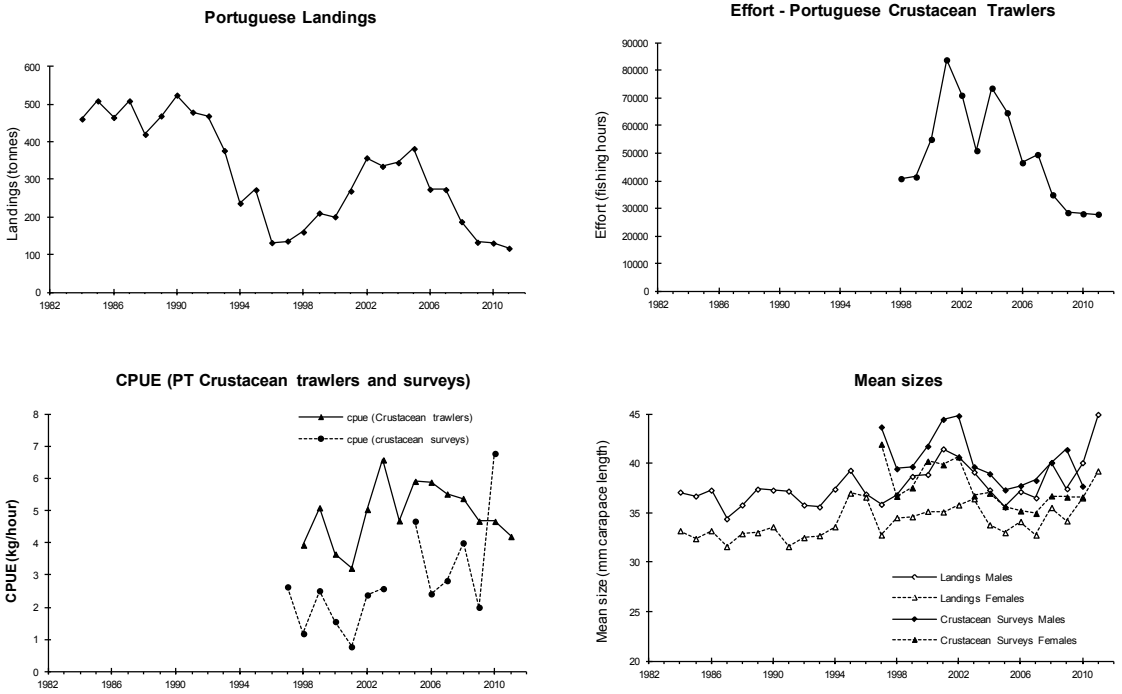


Figure 7.4.12.2.1 *Nephrops* in Southwest and South Portugal (FUs 28–29): Landings (tonnes), standardized fishing effort (hours), biomass survey index and standardized cpue (kg/hour), and mean sizes in landings and surveys (mm carapace length).

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 lpue from the fishery is estimated to have decreased 14% in 2007–2009 (average of the three years) and 2010–2011 (average of the two years). This implies a 14% decrease in catches compared to last year's landings (2011), corresponding to catches of no more than 110 t.

Considering that the effort has decreased significantly even though the exploitation status is unknown, no additional precautionary reduction is needed.

Management plan

The calculation of a TAC corresponding to a reduction in F of 10% as called for in the recovery plan (Council Regulation (EC) 2166/2005) was not feasible because short-term forecasts could not be conducted.

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

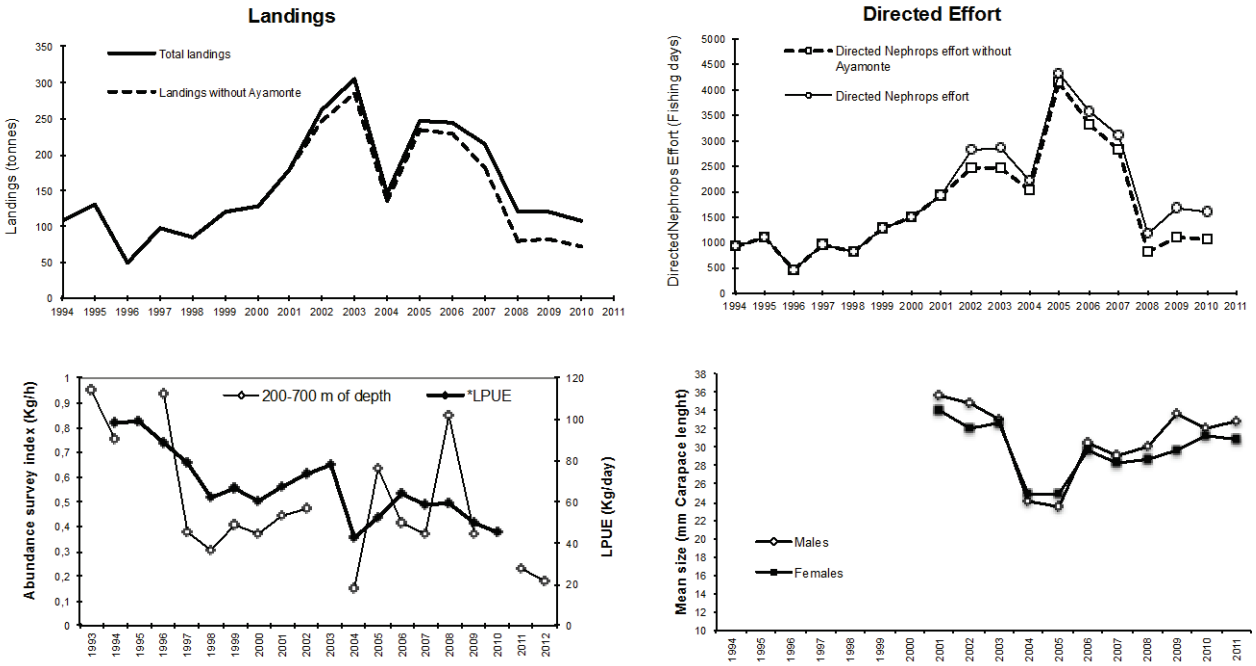


Figure 7.4.12.3.1 *Nephrops* in Gulf of Cadiz (FU 30). Landings (upper left), directed fishing effort (days) (upper right), survey abundance (kg/hour) and lpue (kg/day) (lower left), and mean sizes (mm, carapace length) (lower right). Directed effort and lpue were estimated based on landings of at least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

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

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

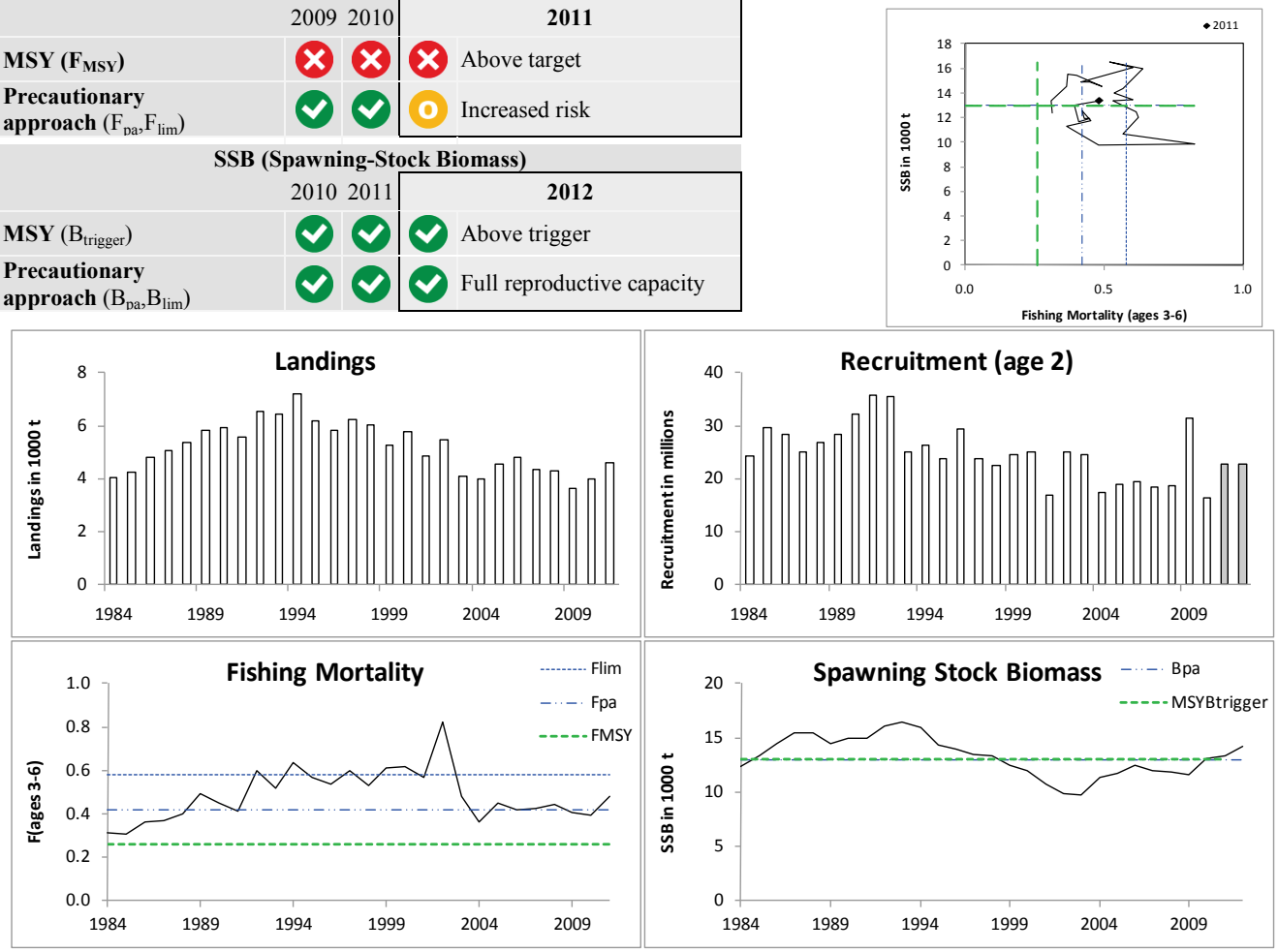


Figure 7.4.13.1 Sole in Divisions VIIIa, b. Summary of stock assessment (weights in thousand tonnes). Assumed recruitment values are shaded Top right: SSB and F over the years for the time-series used in the assessment.

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.

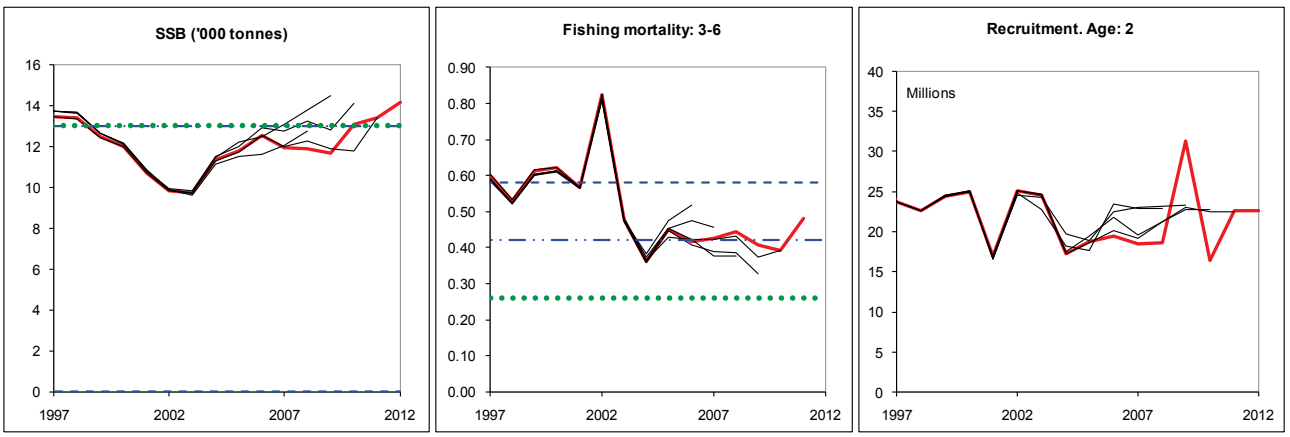


Figure 7.4.13.2 Sole in Divisions VIIIa,b. Historical assessment results (final-year recruitment estimates included).

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

	Type	*Value*	*Technical basis*
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} = mean F (2009–2011) = 0.43; SSB (2013) = 14.7; Landings (2012) = 4.2; R (age 2) = GM (1993–2009) = 22.6 million.

Rationale	Landings (2013)	Basis	F Total (2013)	SSB (2014)	%SSB change [1)]	%TAC change [2)]
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 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.

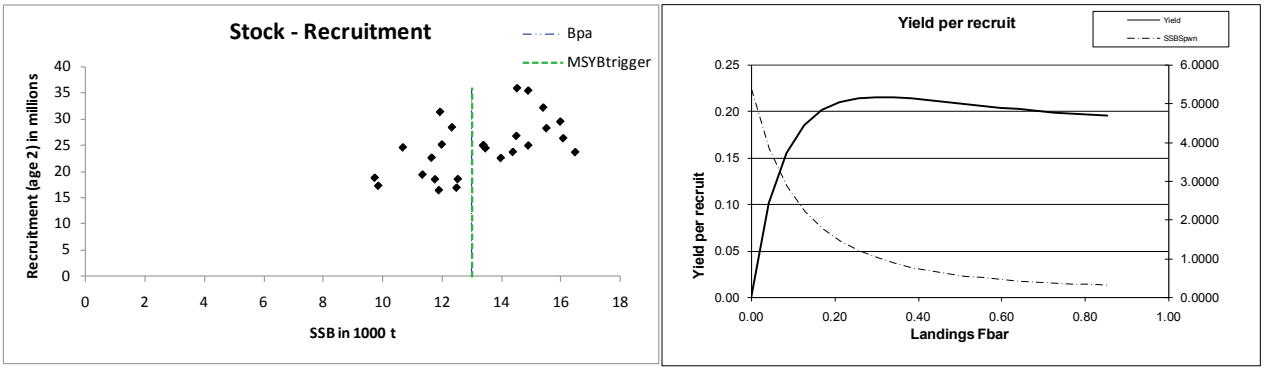


Figure 7.4.13.3 Sole in Divisions VIIIa,b. Stock–recruitment relationship (left panel) and yield and spawning-stock biomass per recruit (right panel).

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.
[1]Not reported for all countries.
[2]Landings assuming current discarding practise.
[3] Discards revised in 1998.
[4] Preliminary. TAC in 2001 increased from 5.8 to 6.3 in November.
[5] Single-stock boundaries and the exploitation of this stock should be conducted in the context of mixed fisheries.
[6] A 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).

	Official landings						WG	Discards [2]	WG
Years	Belgium	France[1]	Nether.	Spain	Others	Total	landings		catches
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 VIIIc,d [2] Discards = Partial estimates for the French offshore trawlers fleet

* reported in VIII ** Preliminary *** reported as S*olea* 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 (*Raja clavata*) in Subarea VIII (Bay of Biscay and Cantabrian Sea)
7.4.14.2	Cuckoo ray (*Leucoraja naevus*) in Subarea VIII (Bay of Biscay and Cantabrian Sea)
7.4.14.3	Spotted ray (*Raja montagui*) in Subarea VIII (Bay of Biscay and Cantabrian Sea)
7.4.14.4	Spotted ray (*Raja montagui*) in Division IXa (west of Galicia, Portugal, and Gulf of Cadiz)
7.4.14.5	Cuckoo ray (*Leucoraja naevus*) in Division IXa (west of Galicia, Portugal, and Gulf of Cadiz)
7.4.14.6	Thornback ray (*Raja clavata*) in Division IXa (west of Galicia, Portugal, and Gulf of Cadiz)
7.4.14.7	Blonde ray (*Raja brachyura*) in Division IXa (west of Galicia, Portugal, and Gulf of Cadiz)
7.4.14.8	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)
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.									-	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 ±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 lpue trends, Category 3, Category 5.
Input data	Survey indices (WIBTS Q4, SpGFS-WIBTS-Q4, PtGFS-WIBTS-Q4). Commercial lpue.
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.

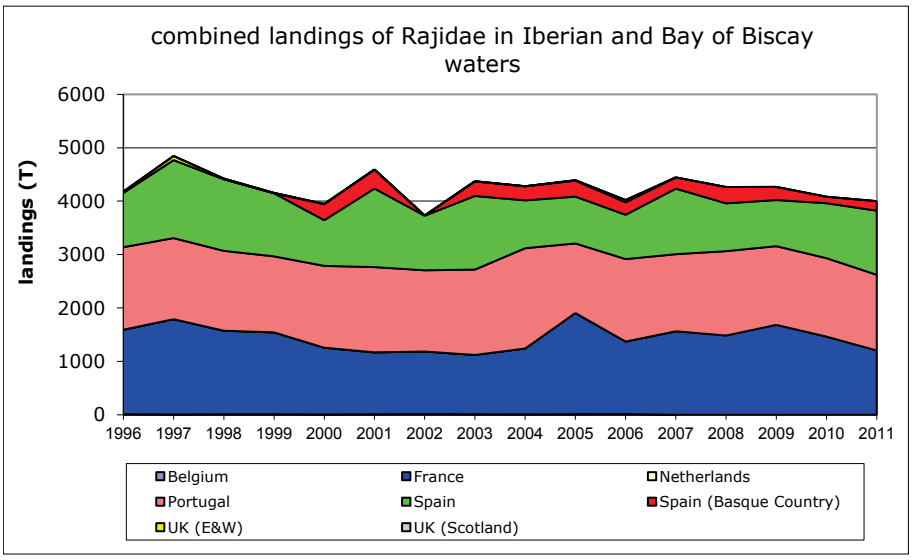


Figure 7.4.14.1 Rays and skates in the Bay of Biscay and Atlantic Iberian waters. Combined landings by country (in tonnes).

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 VIIId.

	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)		
	2009–2011	
Qualitative evaluation	?	Unknown
SSB (Spawning-Stock Biomass)		
	2005–2011	
Qualitative evaluation	↗	Stable/increasing

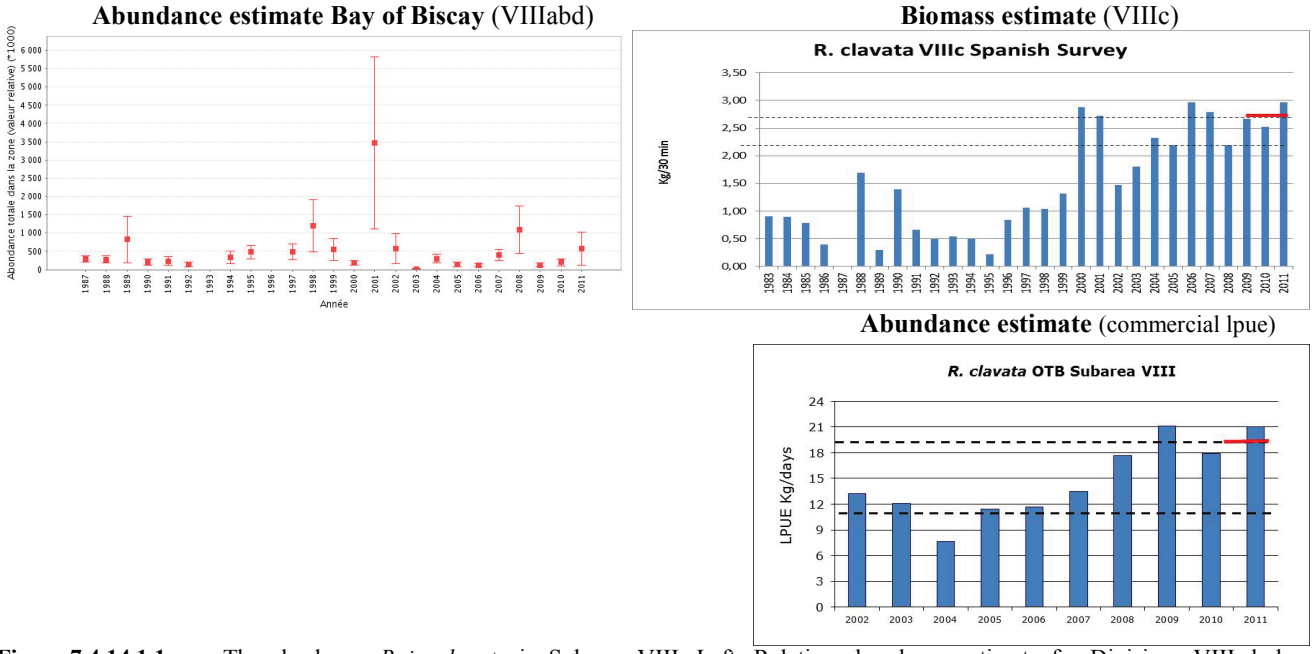


Figure 7.4.14.1.1 Thornback ray *Raja clavata* in Subarea VIII. Left: Relative abundance estimate for Divisions VIIIa,b,d (French EVHOE), right: biomass estimate for Division VIIIc (SpGFS–WIBTS-Q4, kg/30 min haul). Bottom. Subarea VIII (OTB Basque fleet, commercial landings per unit effort). Dashed lines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

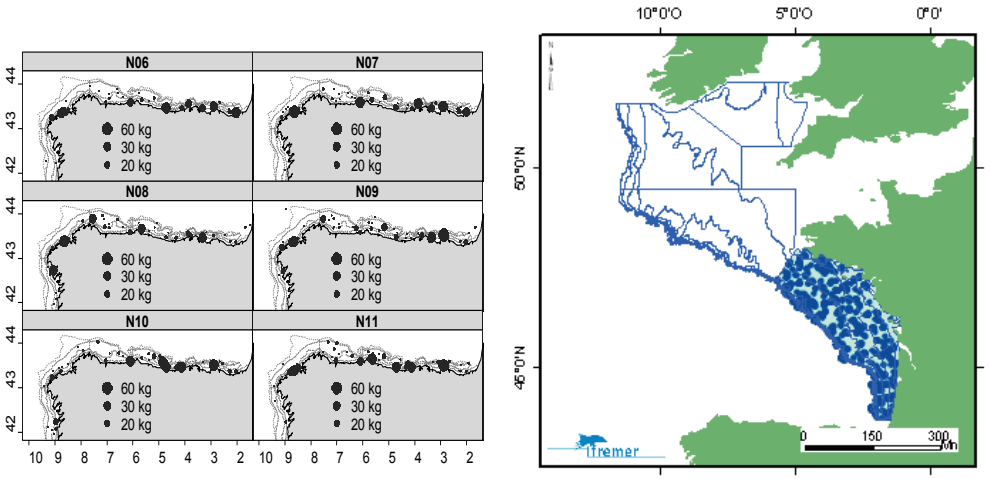


Figure7.4.14.1.2 Thornback ray in the Subarea VIII. Distribution and relative abundance of *Raja clavata* in survey area. Left, SpGFS-WIBTS-Q4. Right, EVHOE-WIBTS-Q4 survey.

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.

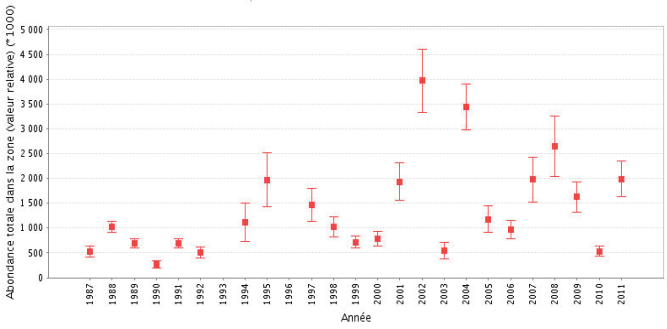
Additional measures should be identified that can regulate exploitation of this stock. Such measures may include seasonal and/or area closures, technical measures, and tailored measures for target fisheries. Such measures should be developed by stakeholder consultations, considering the overall mixed fisheries context.

Stock status

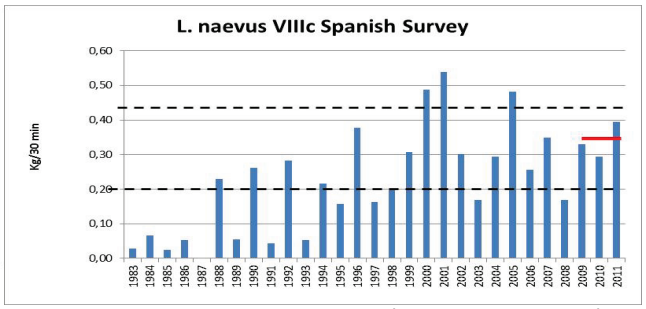
F (Fishing Mortality)		
	2009-2011	
Qualitative evaluation	?	Unknown

SSB (Spawning Stock Biomass)		
	2005-2011	
Qualitative evaluation	↗	Stable/Increasing

Abundance estimate Bay of Biscay (VIIIabd)



Abundance estimate (VIIIc)



Abundance estimate (commercial lpue)

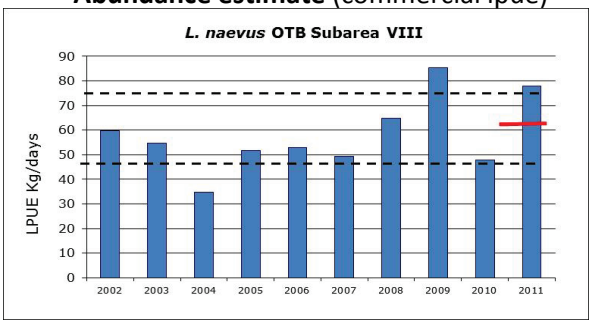


Figure 7.4.14.2.1 Cuckoo ray *Leucoraja naevus* in Subarea VIII. Left: Relative abundance estimate for VIIIa,b,d (EVHOE-WIBTS-Q4), right: biomass estimate for Division VIIIc (SpGFS-WIBTS-Q4, kg/30 min haul). Bottom: Subarea VIII (OTB Basque fleet, commercial landings per unit effort). Dashed lines give mean annual cpue ±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 lpuefrom 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 Bubarea 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.

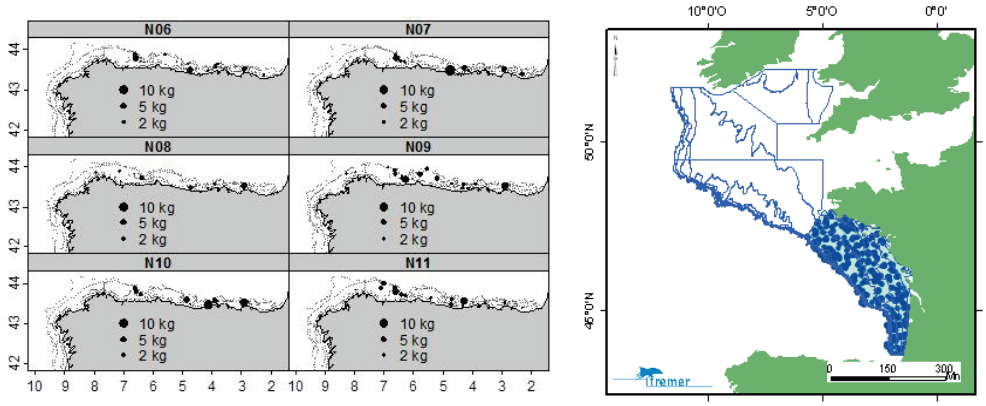


Figure 7.4.14.2.2 Cuckoo ray in Subarea VIII. Distribution and relative abundance of cuckoo ray in survey area. Left, Spanish survey (Sp-GFS-WIBTS-Q4), 1996-2011. Right, French EVHOE survey (EVHOE-WIBTS-Q4).

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	WGEF

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.

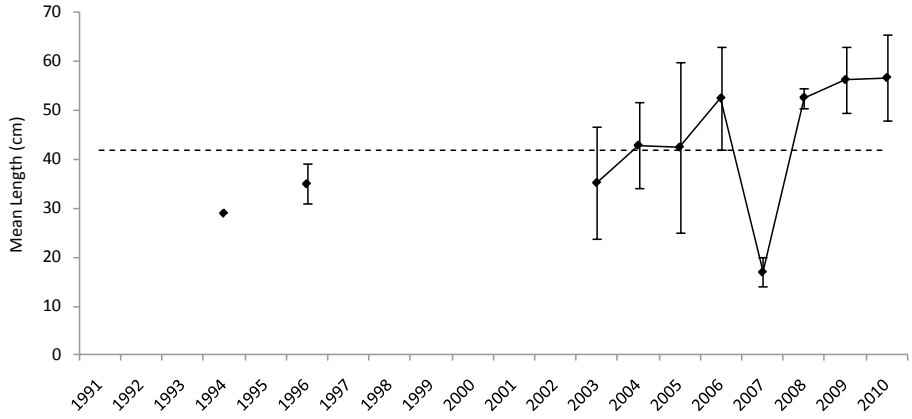


Figure 7.4.14.4.1 Spotted ray in Division IXa. Portuguese PtGFS-WIBTS-Q4 Survey mean length of spotted ray, during 1991-2010.

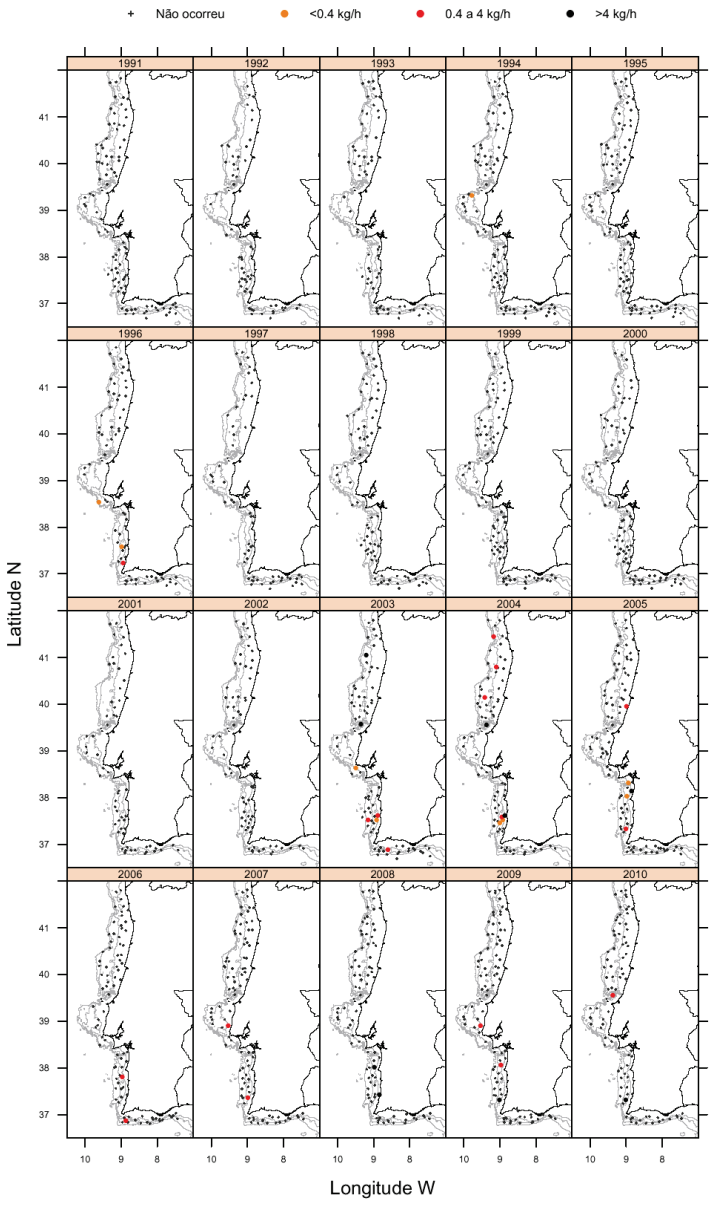


Figure 7.4.14.4.2 Spotted ray in Division IXa. PtGFS-WIBTS-Q4 Survey indices in IXa. Distribution and relative biomass.

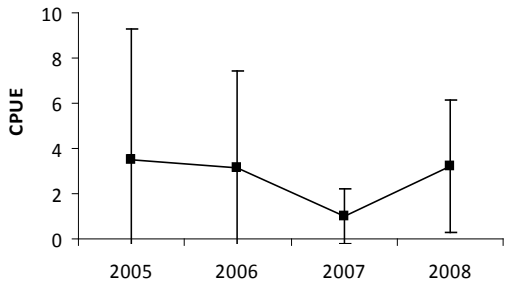


Figure 7.4.14.4.3 Spotted ray in Division IXa. Portuguese PtGFS-WIBTS-Q4 Survey Distribution and relative abundance of spotted ray in IXa.

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	WGEF

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.

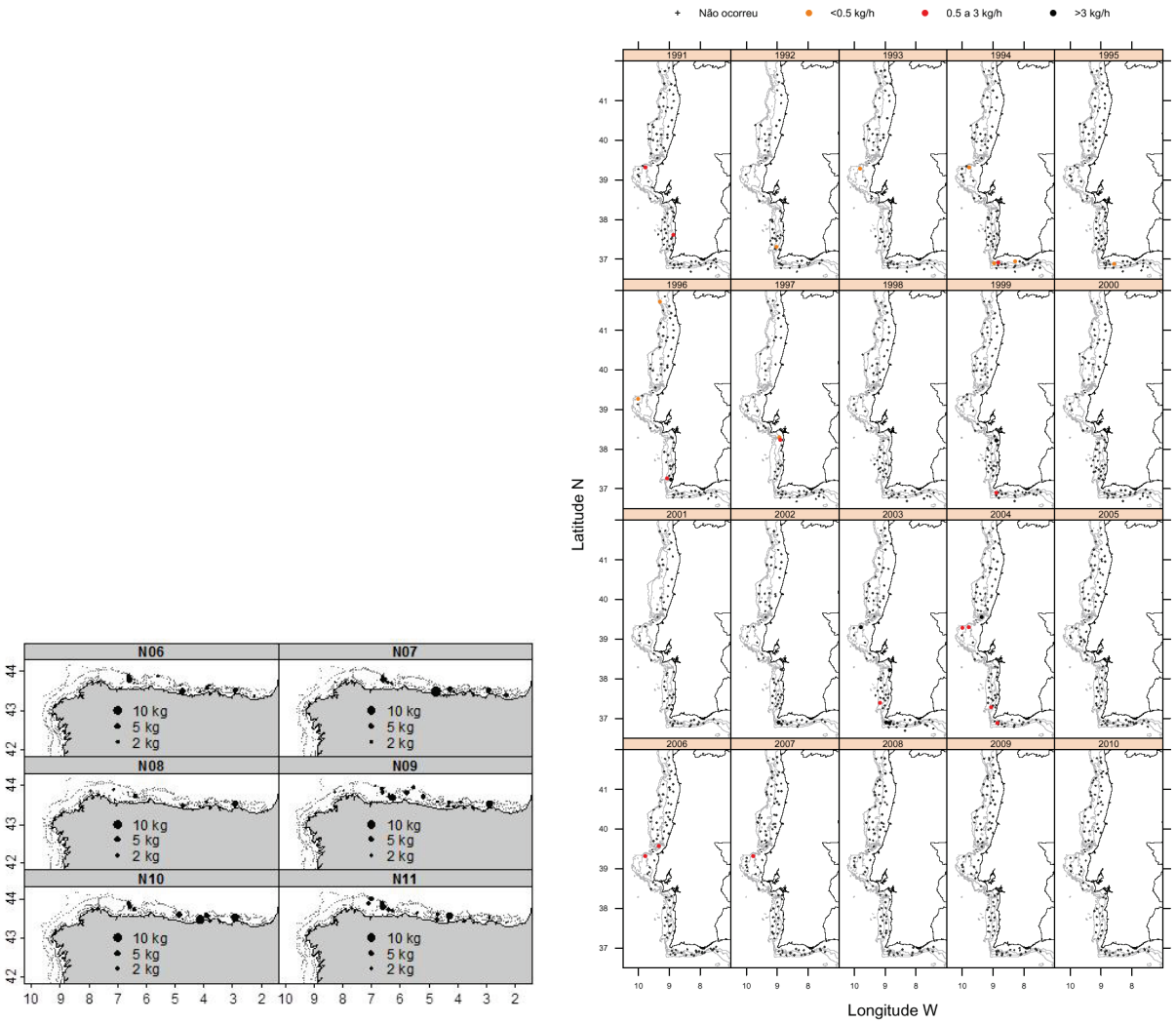


Figure 7.4.14.5.1 Cuckoo ray in Division IXa. Distribution and relative abundance of cuckoo ray in surveys: SpGFSWIBTS-Q4 in VIIIc and IXa 1996-2011 (left) and PtGFS-WIBTS-Q4 (1991-2010) (right).

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

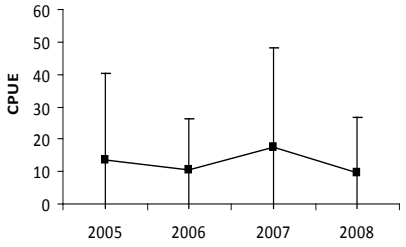
Based on ICES approach to data-limited stocks, ICES advises that catches should be reduced by at least 20% current levels. However, as species-specific landings data are not complete, it is not possible to quantify the current catch. ICES does not advise that an individual TAC be set for this stock, 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)		
	2009-2011	
Qualitative evaluation	?	Unknown
SSB (Spawning Stock Biomass)		
	2009-2011	
Qualitative evaluation	→	Stable



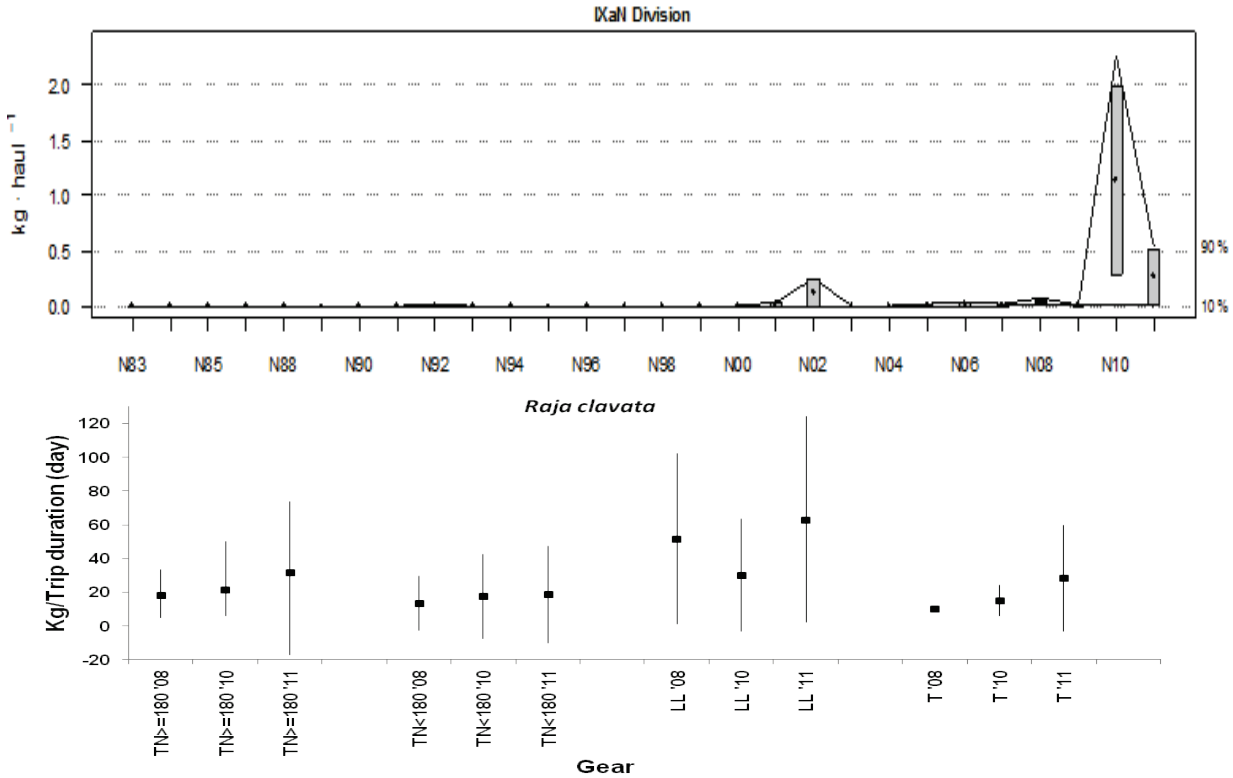


Figure 7.4.14.6.1 Thornback ray *Raja clavata* in Division IXa. Top: Relative biomass estimate for Division IXa (catch per unit effort, PtGFS-WIBTS-Q1). Middle: Biomass index (SpGFS-WIBTS-Q4 Kg/haul)..Lower: landings per unit effort (lpue in kg/Fishing days) estimates for different gear categories in 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.

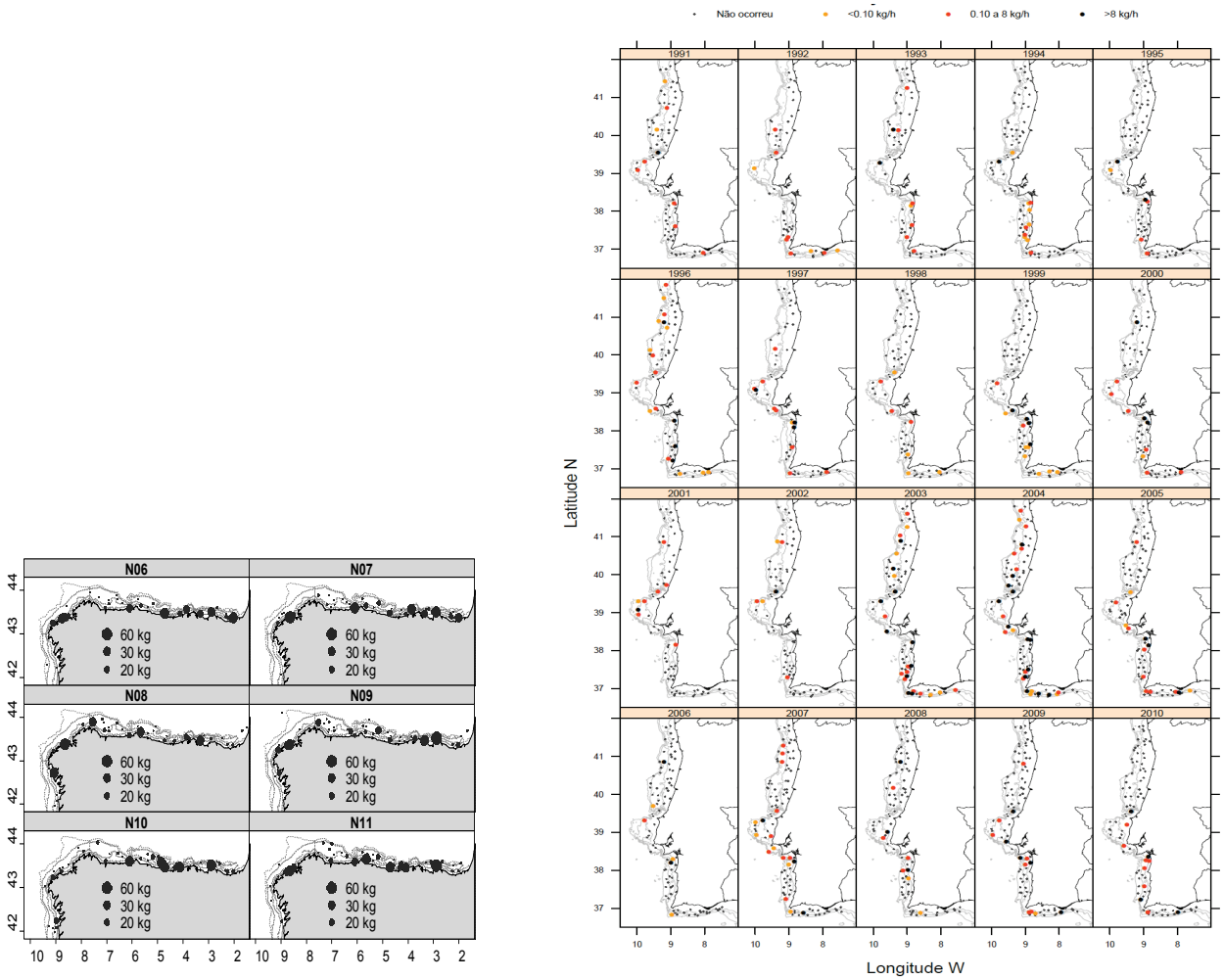


Figure 7.4.14.6.2 Thornback ray in Division IXa . Relative abundance of thornback ray in survey area:SpGFS-WIBTS-Q4(kg/30 min haul) (left) and PtGFS-WIBTS-Q4 (right).

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 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 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.

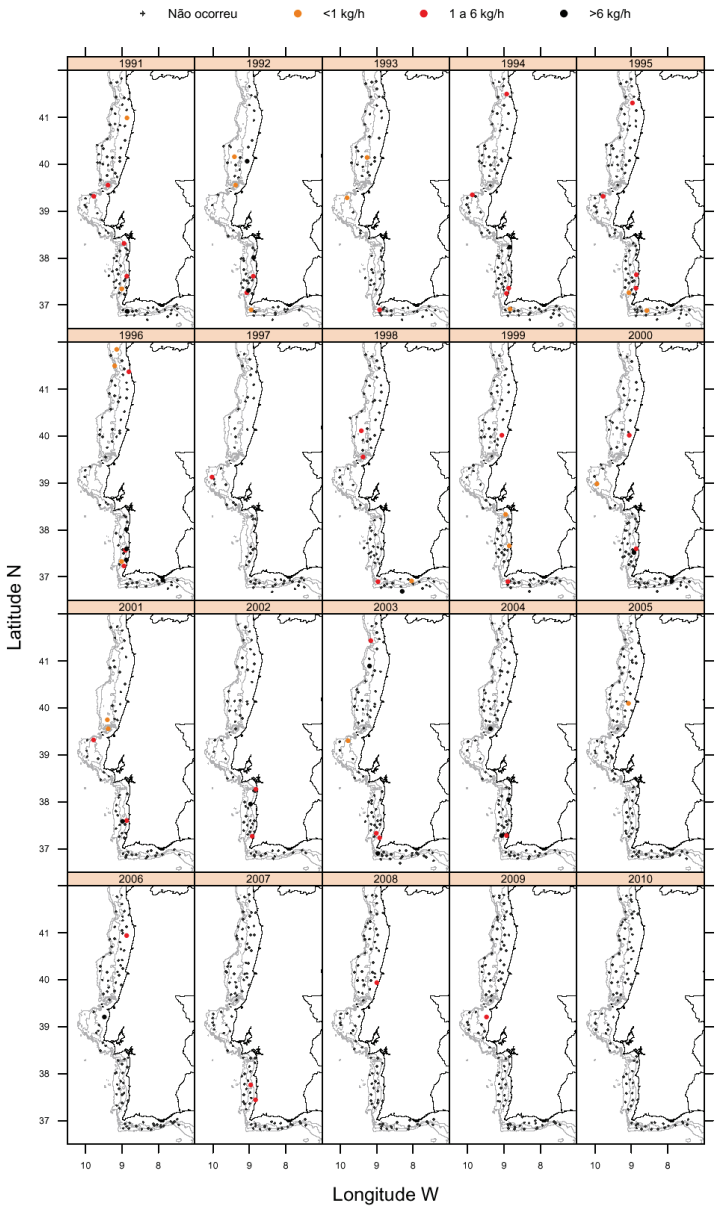


Figure 7.4.14.7.1 Blonde ray in Division IXa. Distribution and relative abundance of Thornback ray in survey area, PtGFS-WIBTS-Q4.

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

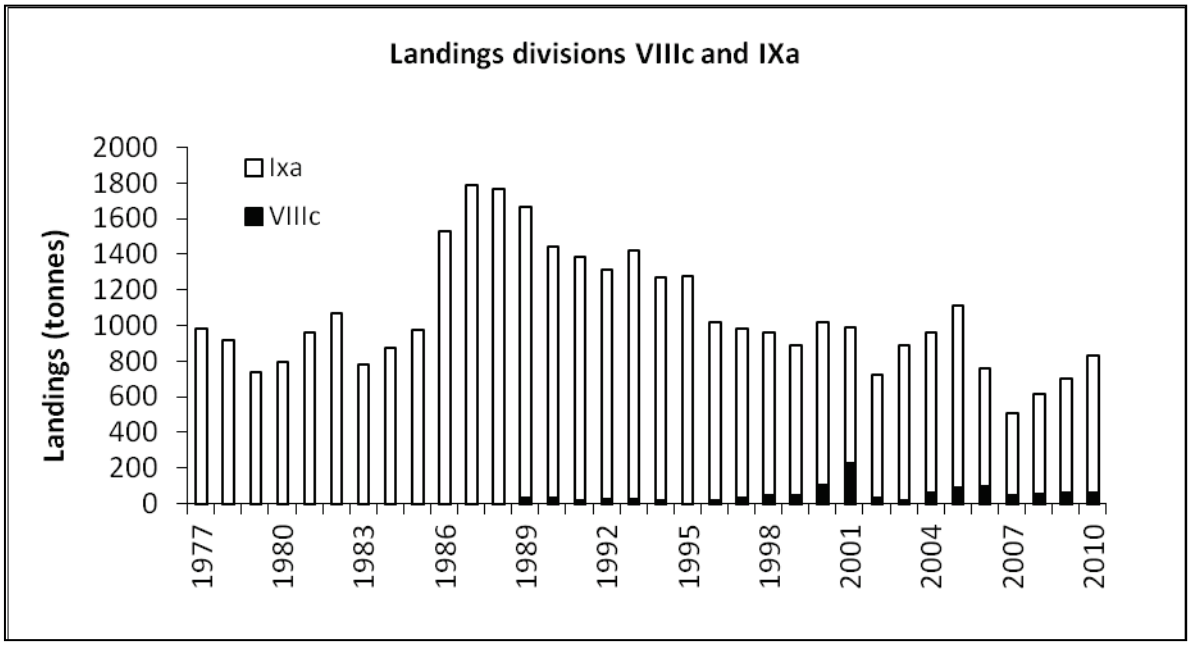


Figure 7.4.15.1 Sole in Divisions VIIIc and IXa. Total official landings (tonnes) of *Solea* species (*Solea solea, Solea senegalensis*, and *Pegusa lascaris)*. Landings in Subarea IX are included, and assumed to be taken in Division IXa.

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 Megrim (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 *S. solea*	Official landings *P. lascaris*	Official landings *Solea* 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, VIIId, and VIIIe, 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
	Spain	**Portugal**	**France**	**Total**	**Spain**	**Portugal**	**Total**	***Solea* spp**
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

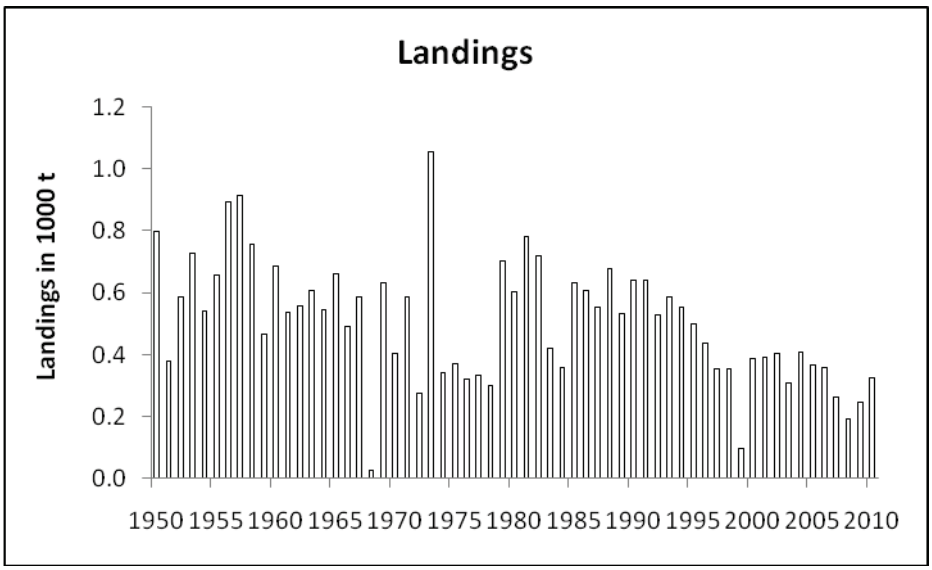


Figure 7.4.16.1 Plaice in Subarea VIII and Division IXa. Official landings (in tonnes). Landings in Division IXa correspond to official landings in Division IXa and Subarea IX (excluding landings specifically identified as Division IXb). Landings in 2011 are incomplete and not included.

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

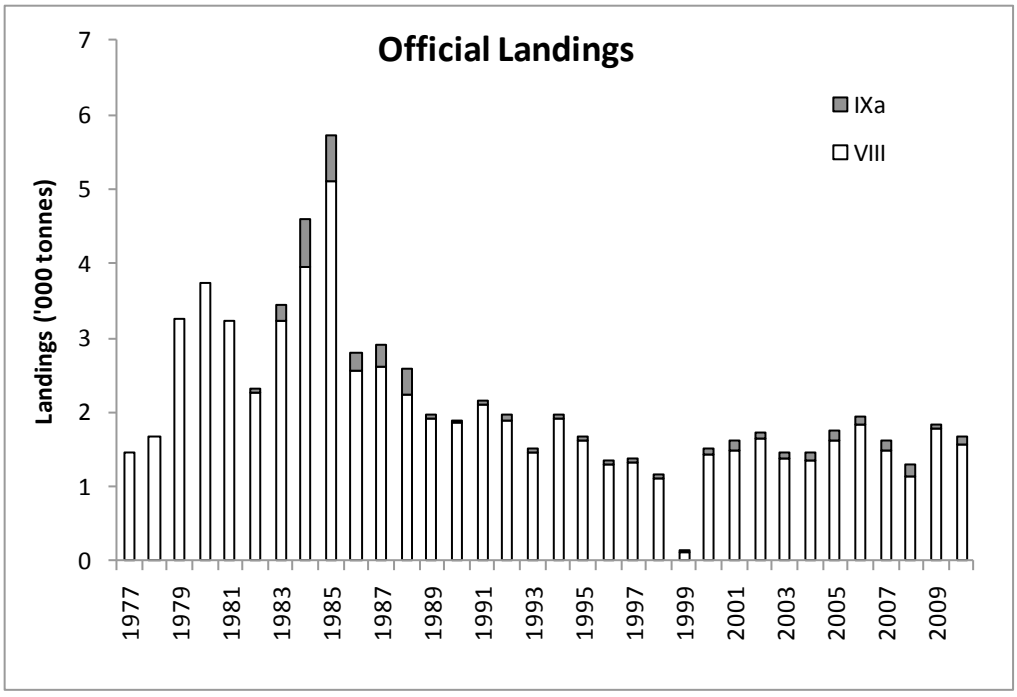


Figure 7.4.17.1 Pollack in Subarea VIII and Division IXa**.** Official landings (in thousand tonnes) 1977–2010. Landings in Subarea IX (excluding landings specifically identified as Division IXb) are included. Landings in 2011 are very incomplete and not included.

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	VIIId	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

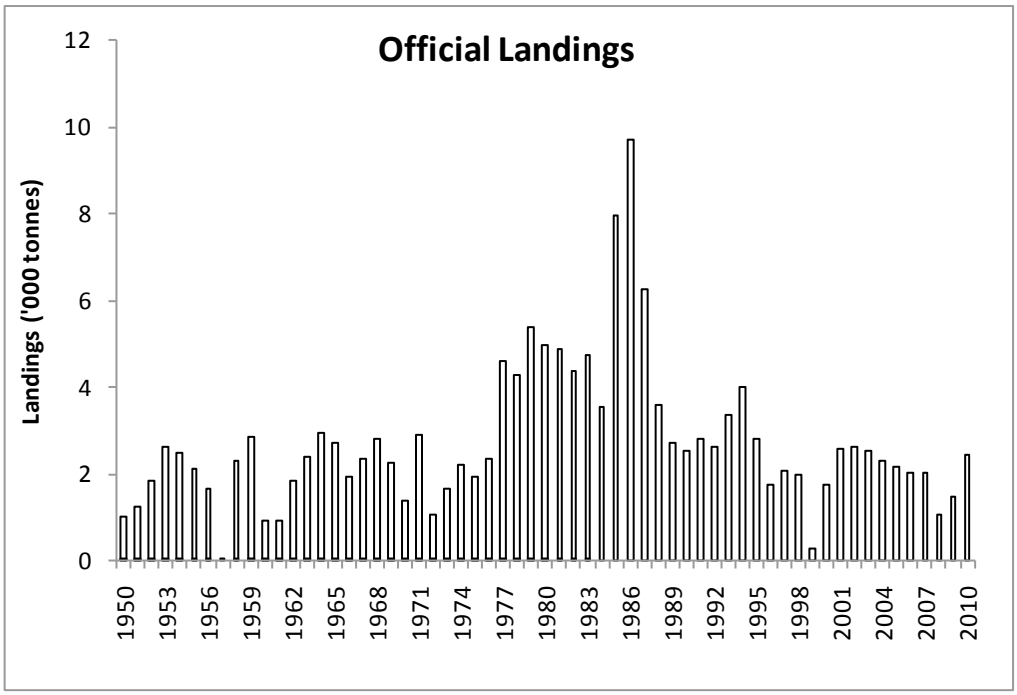


Figure 7.4.18.1 Whiting in Subarea VIII and Division IXa. Official landings (data for Division IXa and all landings for Subarea IX excluding Division IXb, in '000 tonnes). Landings in 2011 are incomplete and not presented in the plot.

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.

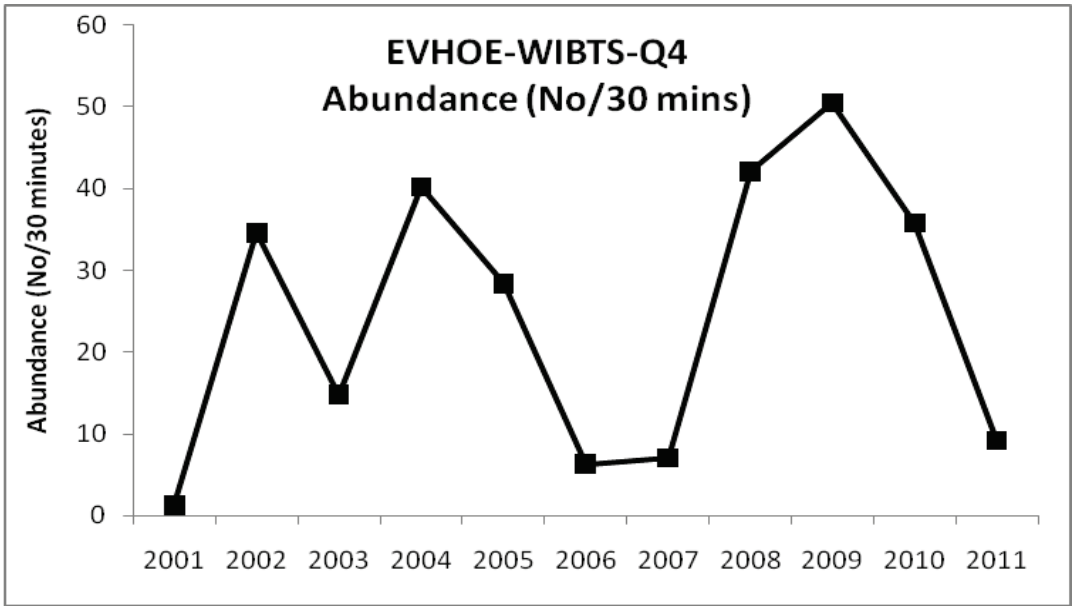


Figure 7.4.18.2 Whiting in Subarea VIII and Division IXa. Abundance (number/ 30 minutes) of French EVHOE-WIBTS-Q4 survey for the Bay of Biscay area.

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 Xa_2 (Azores)

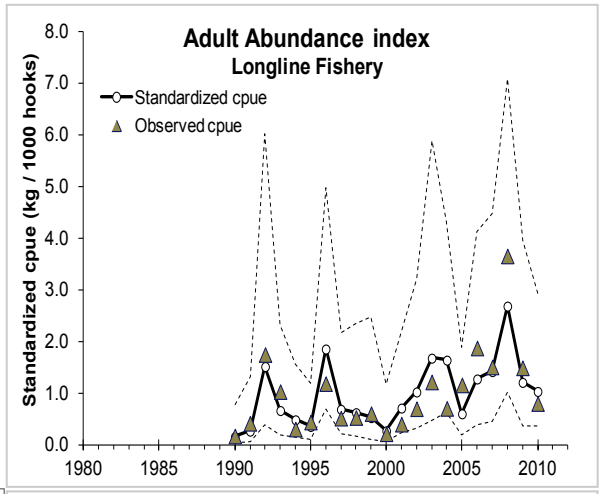
Advice for 2013 and 2014

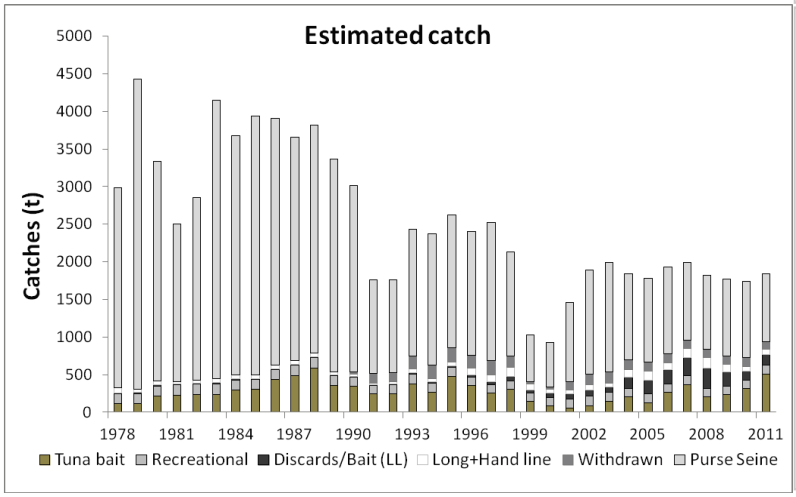
ICES advises on the basis of the approach for data limited stocks that catches should be no more than 1800 tonnes.

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





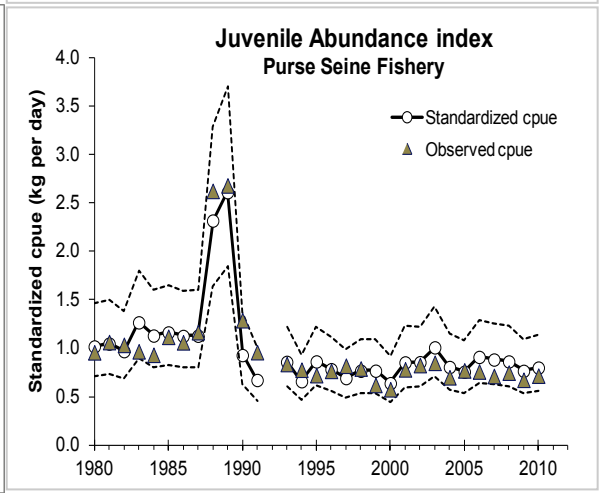


Figure 7.4.19.1 Blue jack mackerel (*Trachurus picturatus*) in Subdivision Xa_2. Left: Estimated catches ('000 tonnes). Top right: Standardized catch per unit effort (cpue, kg/day) in the Azores longline fishery on adult stock. Below: Standardized catch per unit effort (kg/1000 hooks) from artisanal 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 Xa_2 (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 (WGANSA), 23–28 June 2012, Horta, Azores, Portugal. ICES CM 2012/ACOM:16.

Table 7.4.19.1 Jack mackerel (*Trachurus picturatus*) in Subdivision Xa_2. 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 Xa_2. Official landings and ICES estimates of catches (tonnes).

Year	Official Total landings	ICES estimates						
		Tuna bait	Recreational	Discards/ Bait (Long Lines)	Withdrawn after landing	Purse Seine	Long+ Hand line	Total ICES catches
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.

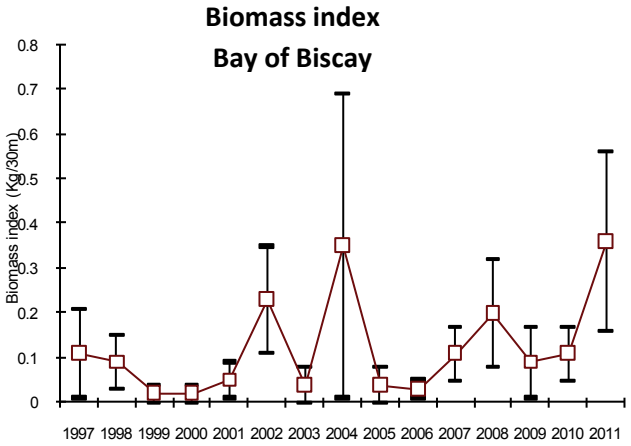


Figure 7.4.20.1 Grey gurnard in Subarea VIII and Division IXa. Biomass indicator (kg per 30 min for all length classes combined), from EVHOE-WIBTS-Q4 survey in Bay of Biscay (Divisions VIIIabd).

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

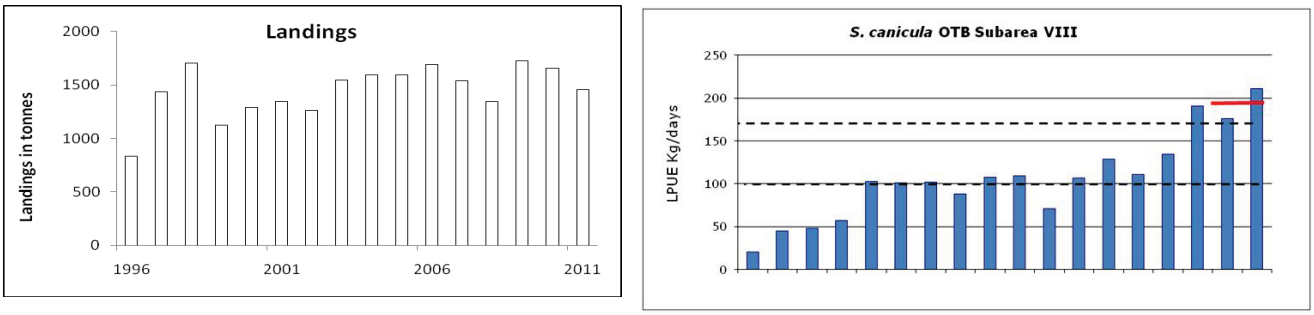


Figure 7.4.21.1 Lesser-spotted dogfish in Subarea VIII. Left: Reported landings in Subarea VIII (tonnes). Right: Relative abundance index for Divisions VIIIa, b, d. Landings per unit effort from Basque trawlers. Dashed lines indicate the mean annual cpue ± st. dev. for 2005–2009, red line indicates the 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.

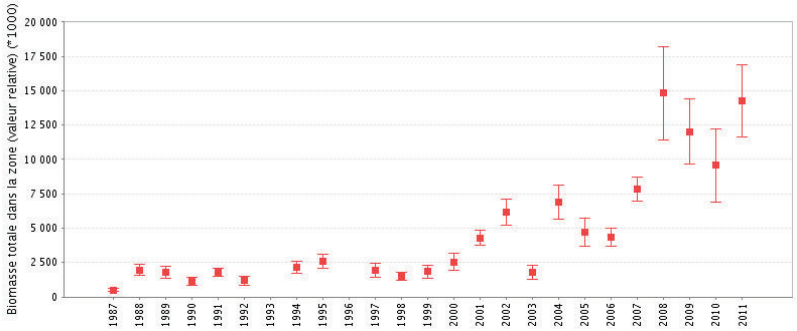


Figure 7.4.21.2 Lesser-spotted dogfish in Subareas VIII and IX. French EVHOE survey indices – Divisions VIIIa, b, d. Total biomass (weight).

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)

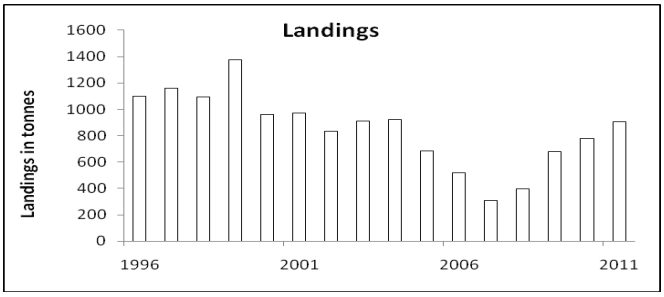
Advice for 2013 and 2014

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



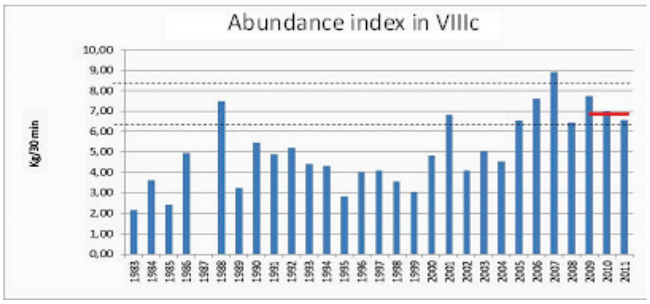


Figure 7.4.22.1 Lesser-spotted dogfish in Divisions VIIIc and IXa. Left: Reported landings in Divisions VIIIc and IXa (tonnes). Right: Survey (SpGFS-WIBTS-Q4) abundance index for Division VIIIc (kg per 30 min haul). Dashed lines indicate the mean annual catch rate ± st. dev. for 2005–2009, red line indicates 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-Q4in 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.

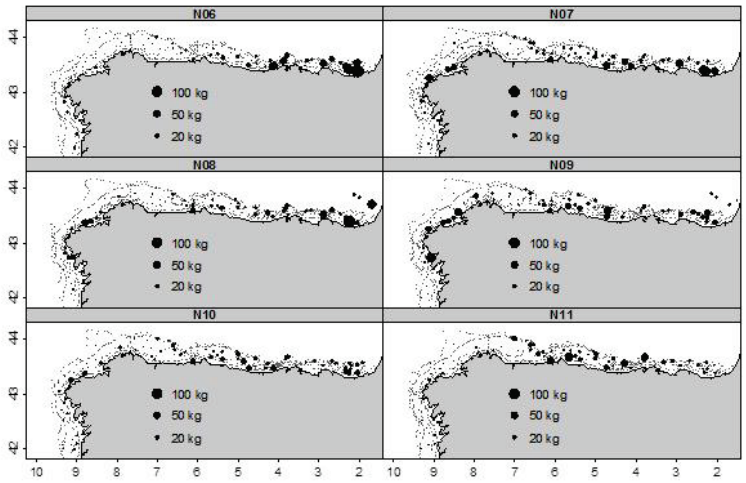


Figure 7.4.22.2 Lesser-spotted dogfish in Divisions VIIIc and IXa. Distribution and relative abundance (kg/30 min haul) of the Spanish bottom trawl survey in VIIIc (SpGFS-WIBTS-Q4).

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	
2013	Decrease catch by 9% + no species-specific 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