

# **ICES advice for 2014**

**West of Scotland; West of Ireland and Celtic Sea;  
Channel; Irish Sea**

**NWWRAC (Dublin, July 23, 2013)**

**Carmen Fernández, ACOM vice-chair**

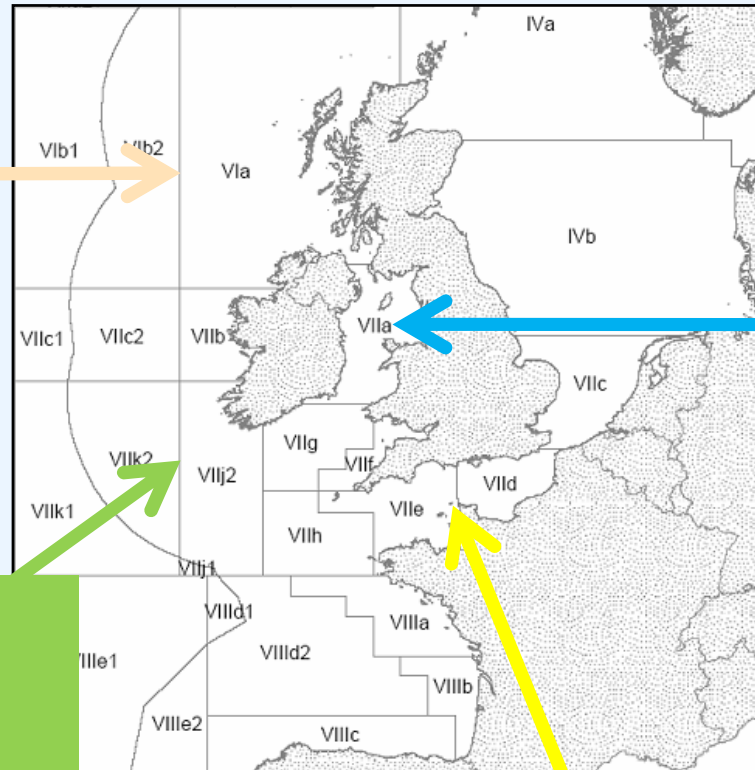


**ICES** International Council for  
the Exploration of the Sea  
**CIEM** Conseil International pour  
l'Exploration de la Mer

## Advice for Nephrops and Rockall haddock in autumn

### West of Scotland & Rockall (VIab)

- Cod (VIa; VIb)
- Haddock (VIa; VIb)
- Whiting (VIa; VIb)
- Anglerfish (IIIa,IV,VI)
- Megrin (IVa-VIa; VIb)
- *Nephrops* (FUs11-12-13)



### Irish Sea (VIIa)

- Cod
- Haddock
- Whiting
- Plaice
- Sole
- *Nephrops* (FUs 14-15-19)

### Celtic Sea & West, Southwest Ireland

- Cod (VIIe-k)
- Haddock (VIIb-k)
- Whiting (VIIe-k)
- Plaice (CS; VIIh-k; VIIbc)
- Sole (CS; VIIh-k; VIIbc)
- Northern hake
- Anglerfish (VIIb-k, VIIIabd)
- Megrin (VIIb-k, VIIIabd)
- *Nephrops* (FUs 16-17-20-22)

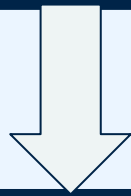
### Channel

- Cod (IV, VIId, Skagerrak)
- Plaice (VIId)
- Plaice (VIIe)
- Sole (VIId)
- Sole (VIIe)

# Steps in Advisory Process

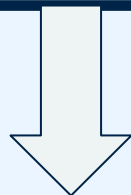
## Expert Groups

Conduct assessments &  
first draft of advice



## Advice Drafting Groups

Finalise advice documents



## ACOM

Approves and releases advice

## Benchmark Workshops

In-depth revision of  
assessment methods:  
data, models...

External Reviewers

Technical audits annually  
& extra reviewing  
when needed

# Basis for ICES Advice

**Management Plan**  
Consistent with PA & recognised  
as potential basis for advice by competent authorities

No

**ICES MSY approach**  
Transition to MSY approach in 2015

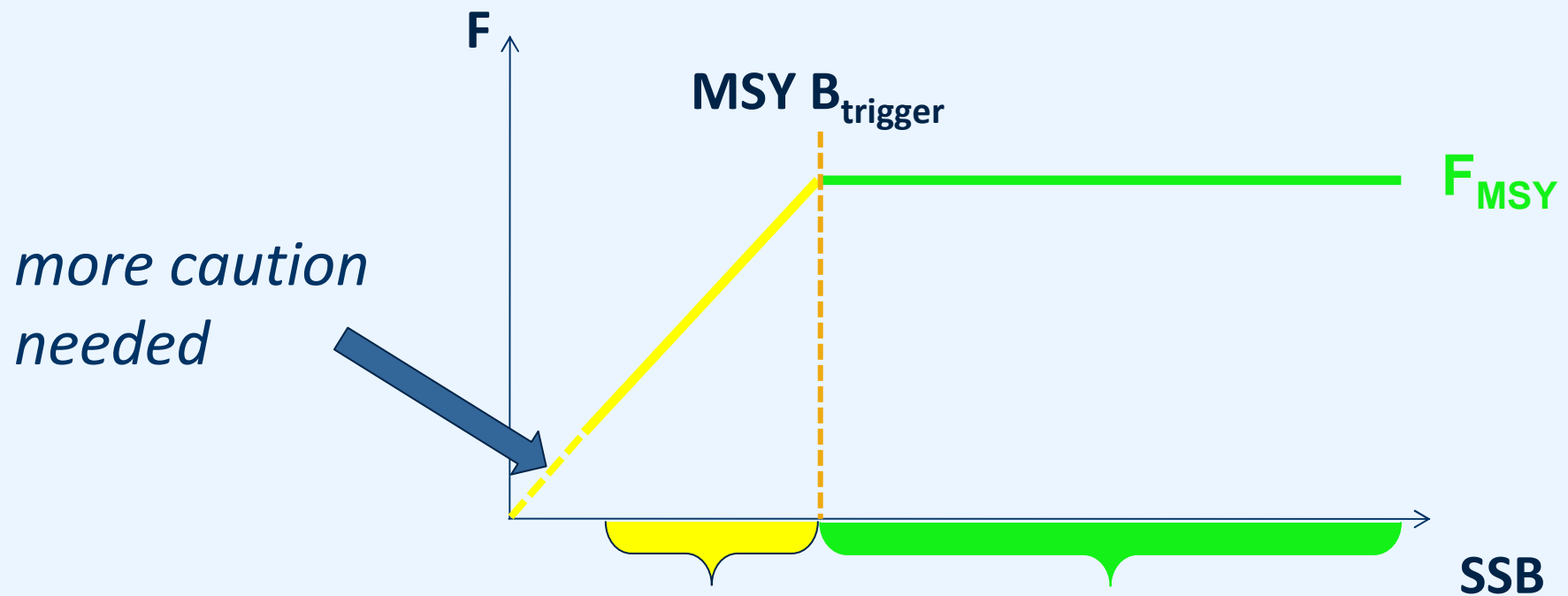
No

**ICES PA approach**

All options in Outlook Table

# ICES MSY approach:

- ✓ Maximize long term average yield
- ✓ Safeguard against low SSB



\* If current  $F$  higher than this: transition for 2015

## Transition to MSY HCR by 2015

Moving from  $F_{2010}$  to  $F_{\text{MSY-HCR}}$  in 2015 in 5 steps

$$F_{\text{MSY-HCR transition}} 2013 = 0.4 F(2010) + 0.6 F_{\text{MSY-HCR}}$$

$$F_{\text{MSY-HCR transition}} 2014 = 0.2 F(2010) + 0.8 F_{\text{MSY-HCR}}$$

$$F_{\text{MSY-HCR transition}} 2015 = 0.0 F(2010) + 1.0 F_{\text{MSY-HCR}} = F_{\text{MSY-HCR}}$$

(values of advised  $F$  capped at  $F_{pa}$ , for consistency with PA)

# Data limited stocks (DLS): new approach in 2012

All stocks for which a “full assessment” and outlook table with catch options can not be provided (more than 100)

*In 2012, ICES provided quantitative advice for the first time*

- Categorisation of all stocks (6 categories)  
from data rich towards situations of decreasing information
- Methods for each category
- Progress will continue in 2013: WKLIFE3 in October

**Category 3: *If a reliable stock abundance index exists:***

**advice:** recent catch multiplied by index trend in last 5 years (average last 2 years)/(average previous 3 years)

1.limit result to 20% change (to dampen noise)

2.Precautionary margin: 20% reduction if stock status relative to reference points unknown -- unless evidence that stock is strongly increasing or exploitation (F or effort) has decreased substantially.

\* Where least information available, and when precautionary margin applied:

no expected changes in advice for some years, unless important new knowledge emerges



# ICES advice

All advice available online at:

<http://www.ices.dk>

Follow link to

Community → Advisory process → Latest advice

In addition to advice items,

document “General context to ICES advice”

explains principles and basis for advice

For advice release dates, follow link:

Community → Advisory process → Advice requests  
and advice release dates

# Template (as last year)

Two-pager  
simple  
information for managers

Supporting information  
Background to two-pager

6.4.10

Advice June 2010

ECOREGION North Sea  
STOCK Sole in Subarea IV (North Sea)

Advice Summary for 2011

SSB has fluctuated around the precautionary reference points for the last decade. Fishing mortality has shown a declining trend since 1995 and is estimated to be below  $F_{MSY}$  in 2008 and 2009.

Stock status

	F (Fishing Mortality)		
	2007	2008	2009
MSY ( $F_{MSY}$ )	✗	✗	✗ Overfishing
Precautionary approach ( $F_{CA}$ , $F_{MSY}$ )	✗	✓	✓ Harvested sustainably
Management plan $F_{MSY}$	✗	✗	✗ $F > 0.2$

	SSB (Spawning Stock Biomass)		
	2008	2009	2010
MSY ( $B_{MSY}$ )	✓	✗	✗ Below trigger
Precautionary approach ( $B_{CA}$ , $B_{MSY}$ )	✓	○	○ Increased risk
Management plan $SSB_{MSY}$	✓	✗	✗ $SSB < 3.5 000 t$

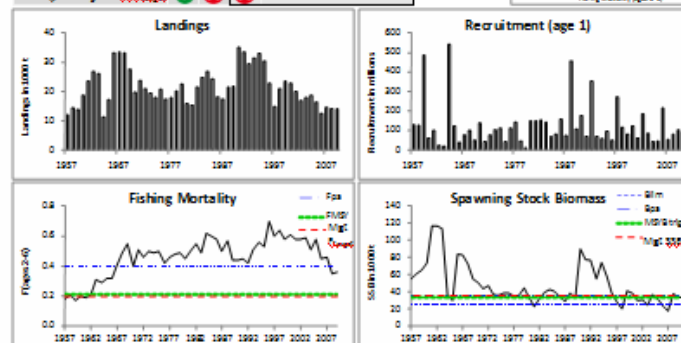
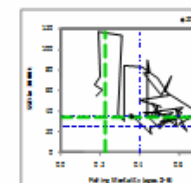




















Figure 6.4.10.1 Sole in Subarea IV (North Sea). Summary of stock assessment (weights in 1000 tonnes). Top right: SSB and F over the years.










SSB has fluctuated around the precautionary reference points for the last decade. Fishing mortality has shown a declining trend since 1995 and is estimated to be below  $F_{MSY}$  in 2008 and 2009.

Management plan

A management plan for North Sea plaice and sole was agreed by the EC in 2007 (Council Regulation (EC) No. 676/2007) which results in a TAC of 13 500 and effort reduction of 10%. ICES has evaluated the long-term management plan and concluded that it leads on average to a low risk of  $R_{MSY}$  below the next 10 years. ICES concludes that for sole the management plan can be provisionally accepted as precautionary.

# State of stock table (as last year)

F (Fishing Mortality)				
	2008	2009	2010	
MSY ( $F_{MSY}$ )				Appropriate
Precautionary approach ( $F_{pa}, F_{lim}$ )				Harvested sustainably
Management plan ( $F_{MGT}$ )				Below target
SSB (Spawning Stock Biomass)				
	2009	2010	2011	
MSY ( $B_{trigger}$ )				Below trigger
Precautionary approach ( $B_{pa}, B_{lim}$ )				Increased risk
Management plan ( $SSB_{MGT}$ )				Above target

Status relative to refpoints	Qualitative evaluation	
		Desirable situation e.g. F is below the relevant reference point or SSB is above the relevant reference point
		Status lies between the precautionary (pa) and limit (lim) reference points
		Undesirable situation e.g. F is above the relevant reference point or SSB is below the relevant reference point
		Status of the stock is either unknown because there is no quantitative assessment, or undefined when there is an analytical assessment but reference points are not undefined
		Absolute level unknown, but increasing
		Absolute level unknown, but unchanged
		Absolute level unknown, but decreasing

## Overview of advice by stock

Stock	F <sub>MSY</sub>	MSY B <sub>trigger</sub>	Advice for 2013: landings (catch in brackets)	Advice for 2014: landings (catch in brackets)
Cod West Scotland VIa	0.19	22 000 t	no directed fisheries; minimise bycatch, discards	no directed fisheries; minimise bycatch, discards
Cod Rockall VIb	nd	nd	(< 70 t)	SALY
Cod Celtic Sea VIIe-k	0.4	10 300 t	< 10 200 t	< 6 848 t (catch can not be calculated)
Cod Irish Sea VIIa	0.4	10 000 t	no directed fisheries; minimise bycatch, discards	SALY
Cod North Sea IV, VIId, IIIaW	0.19	150 000 t	< 25 441 t	< 28 809 t (< 37 507 t)

Stock	F <sub>MSY</sub>	MSY B <sub>trigger</sub>	Advice for 2013: landings (catch in brackets)	Advice for 2014: landings (catch in brackets)
Haddock West Scotland VIa	0.3	30 000 t	< 3 100 t technical measures in <i>Nephrops</i> TR2	< 3 988 t (< 6 432 t) technical measures in <i>Nephrops</i> TR2
Haddock Rockall VIb	0.3	9 000 t	no directed fisheries; minimise bycatch, discards	advice in autumn
Haddock VIIb-k	0.33	7 500 t	< 9 500 t ; technical measures	< 3 602 t (< 5 281 t)
Haddock Irish Sea VIIa	nd	nd	(< 710 t); technical measures	< 572 t (< 1 120 t); technical measures

**SALY:** Same Advice as Last Year

## Overview of advice by stock

Stock	$F_{MSY}$	$MSY B_{trigger}$	Advice for 2013: landings (catch in brackets)	Advice for 2014: landings (catch in brackets)
Whiting West Scotland VIa	nd	nd	lowest possible catch; technical measures in <i>Nephrops</i> TR2 fleet	lowest possible catch; technical measures in <i>Nephrops</i> TR2 fleet
Whiting Rockall VIb	nd	nd	(< 11 t)	SALY
Whiting Celtic Sea VIIe-k	0.36	21 000 t	< 17 500 t; technical measures to reduce discard rates	< 15 562 t (catch can not be calculated)
Whiting Irish Sea VIIa	nd	nd	lowest possible catch; technical measures to reduce discard rates	SALY

**SALY:** Same Advice as Last Year

Stock	F <sub>MSY</sub>	MSY B <sub>trigger</sub>	Advice for 2013: landings (catch in brackets)	Advice for 2014: landings (catch in brackets)
Plaice SW Ireland VIIh-k	nd	nd	(< 100 t); reduce bycatch and discards	< 135 t (catch can not be calculated)
Plaice W Ireland VIIb,c	nd	nd	(< 30 t)	SALY
Plaice Celtic Sea VIIf,g	nd	nd	< 360 t; technical measures to reduce discard rates	< 519 t (< 1 608 t); technical measures to reduce discard rates
Plaice Irish Sea VIIa	nd	nd	< 490 t	< 497 t (< 1 827 t)
Plaice W Channel VIIe	0.24	1 650 t	< 2 100 t	< 1 397 t (catch can not be calculated)
Plaice E Channel VIId	0.23	nd	(< 4 300 t); reduce discards	< 3 925 t (catch can not be calculated); reduce discards

Stock	F <sub>MSY</sub>	MSY B <sub>trigger</sub>	Advice for 2013: landings (catch in brackets)	Advice for 2014: landings (catch in brackets)
Sole SW Ireland VIIh-k	nd	nd	(< 200 t); take into account advice for plaice	< 252 t (< 252 t)
Sole W Ireland VIIb,c	nd	nd	(< 30 t)	SALY
Sole Celtic Sea VIIf,g	0.31	2 200 t	< 1 100 t	< 920 t (< 920 t)
Sole Irish Sea VIIa	0.16	3 100 t	no directed fisheries; minimise bycatch, discards	no directed fisheries; minimise bycatch, discards
Sole W Channel VIIe	0.27	2 800 t	< 960 t	< 832 t (< 832 t)
Sole E Channel VIId	0.29	8 000 t	< 5 900 t	< 3 251 t (< 3 251 t)

**SALY:** Same Advice as Last Year

## Overview of advice by stock

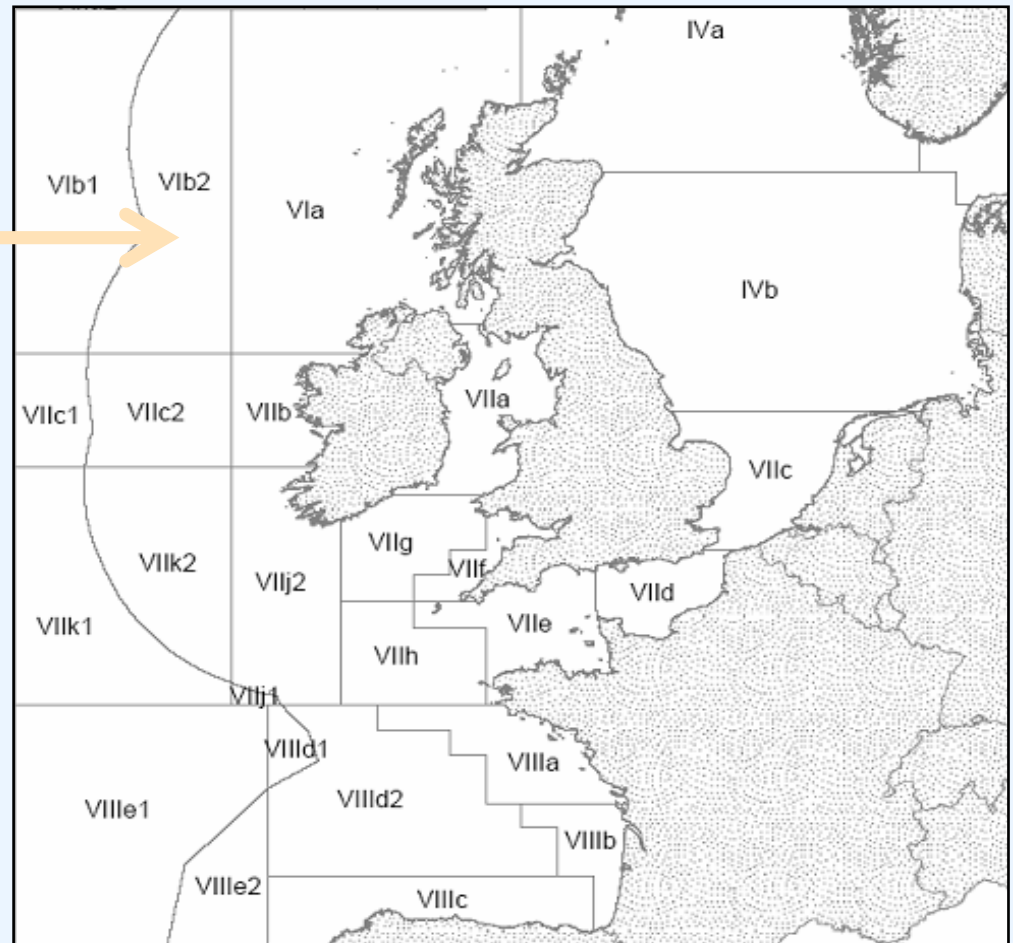
Stock	F <sub>MSY</sub>	MSY B <sub>trigger</sub>	Advice for 2013: landings (catch in brackets)	Advice for 2014: landings (catch in brackets)
Hake – Northern	0.24	nd	< 45 400 t	< 81 846 t (catch can not be calculated)
Angler VIIb-k & VIIIabd	nd	nd	(< 24 800 t)	< 37 450 t (catch can not be calculated)
Angler IIIa, IV, VI	nd	nd	(reduce catch by 20%)	< 10 231 t (< 10 231 t)
Megrim IVa, VIa	0.33	9 740 t	< 4 700 t	< 5 950 t (< 7 000 t)
Megrim Rockall VIb	nd	nd	(< 160 t)	< 207 t (catch can not be calculated)
Megrim VIIb-k & VIIIabd	nd	nd	< 12 000 t	SALY
Pollack VI, VII	nd	nd	(< 4 200 t)	SALY
Sea bass IVbc, VIIa, VIId-h	nd	nd	Combined for Northeast Atlantic	Commercial landings < 2 707 t (catch can not be calculated)
Sea bass VIa, VIIb, VIIj	nd	nd	Combined for Northeast Atlantic	Commercial landings < 18 t (catch can not be calculated)

**SALY:** Same Advice as Last Year



## West of Scotland & Rockall (VIa & VIb)

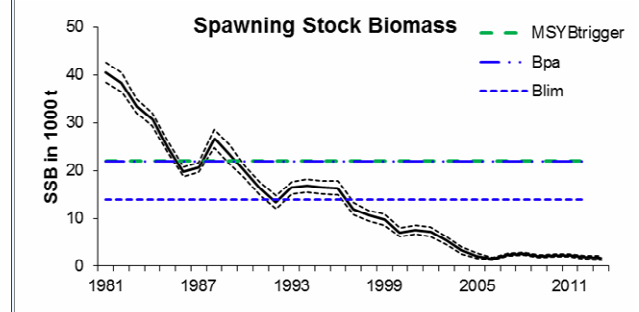
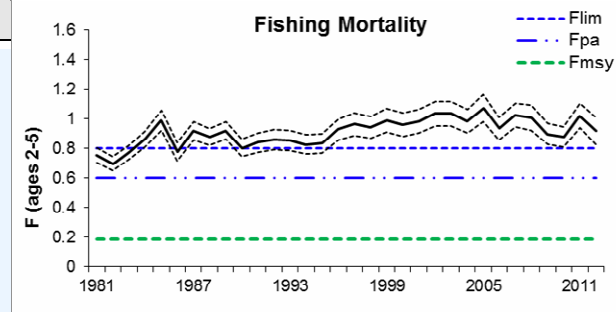
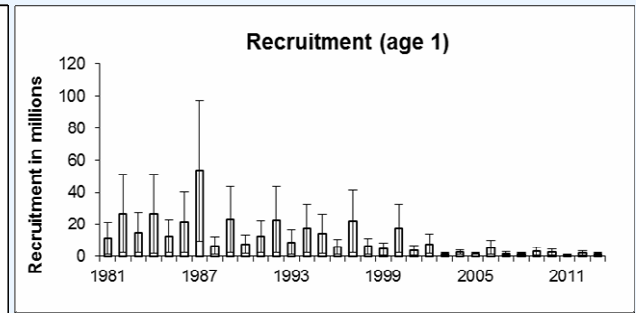
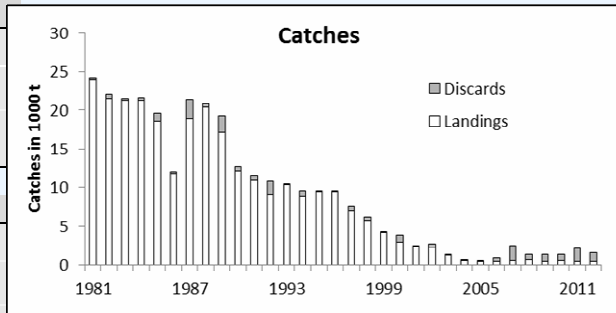
- Cod (VIa; VIb)
- Haddock (VIa; VIb in autumn)
- Whiting (VIa; VIb)
- Anglerfish (IIIa,IV,VI)
- Megrim (IVa-VIa; VIb)
- *Nephrops* (FUs11-12-13) in autumn



# Cod in Division VIa (West of Scotland)

**Advice for 2014, MSY:** No directed fisheries; minimise bycatch and discards

F (Fishing Mortality)			
	2010	2011	2012
MSY ( $F_{MSY}$ )	✗	✗	✗ Above target
Precautionary approach ( $F_{pa}, F_{lim}$ )	✗	✗	✗ Harvest unsustainable
SSB (Spawning-Stock Biomass)			
	2011	2012	2013
MSY ( $B_{trigger}$ )	✗	✗	✗ Below trigger
Precautionary approach ( $B_{pa}, B_{lim}$ )	✗	✗	✗ Reduced reproductive capacity



\* Mortality high, very high discarding since 2006

\*  $SSB \ll B_{lim}$

\* Rec low in last decade

- Cod MP since 2008: not evaluated by ICES for conformity with PA, but catches have not been constrained and no increase in SSB
- Cod form aggregations → high catch rates and high F possible under low abundance and low effort

# Cod in Division VIa (West of Scotland)

- Catch 2012 ~ 1 600 t (discards 71%)
- Catch dominated by discards → very important to maintain the highest possible sampling (observer) coverage of vessels in Division VIa

$F(2013) = F(2010-12) = 0.92$ ;  $SSB(2014) = 1.7 \ll B_{lim}$  (14 kt)  $F_{MSY} = 0.19$

Rationale	Catch Total (2014)	Landings (2014)	Discards (2014)	Basis	F Total (2014)	F Land (2014)	F Disc (2014)	SSB (2015)	%SSB change
MSY transition	0.33	0.11	0.22	$(F_{2010} \times 0.2) + ((F_{MSY} \times (SSB_{2014}/MSY B_{trigger})) \times 0.8)$	0.19	0.06	0.13	3.01	+79%
MSY approach	0.010	0.003	0.007	$F_{MSY} \times SSB_{2014}/MSY B_{trigger}$	0.01	0.003	0.007	3.44	+105%
Precautionary approach	0	0	0	$B_{pa}$	0	0	0	3.46	+106%
Management plan	0.98	0.31	0.67	$F = F_{2013} \times 0.75$	0.69	0.22	0.47	2.12	+26%
Zero catch	0	0	0	$F = 0$	0	0	0	3.46	+106%
Other options	0.32	0.10	0.22	$F_{2013} \times 0.2$	0.18	0.06	0.12	3.02	+80%
	0.59	0.19	0.40	$F_{2013} \times 0.4$	0.37	0.12	0.25	2.65	+58%
	0.83	0.26	0.57	$F_{2013} \times 0.6$	0.55	0.17	0.38	2.33	+39%
	1.03	0.32	0.71	$F_{2013} \times 0.8$	0.74	0.23	0.51	2.06	+23%
	1.20	0.37	0.83	$F_{2013} \times 1.0$	0.92	0.28	0.64	1.82	+8.3%
	1.35	0.41	0.94	$F_{2013} \times 1.2$	1.10	0.33	0.77	1.62	-3.6%

Weights in '000 tonnes weight

TAC(2013)=0, bycatch may be landed up to 1.5% of retained catch by

SSB will remain well below  $B_{lim}$  in 2015 → MSY (“more caution” part of HCR):

## Cod in Division VIb (Rockall)

**Advice for 2014 and 2015, DLS:** Catch < 70 t

- Advice issued in 2012 was biennial, valid for 2013 and 2014
- Same catch is also applicable to 2015
  
- Stock category: 6
- Only data are official landings
- Doubts on accuracy of landings data: vessels operate in VIa and VIb
  
- Precautionary buffer (20% reduction) applied in the advice issued in 2012 and catches are marginal → same catch advice also considered valid for 2015
  
- Cod TAC unit VIb (Rockall subunit) is included in the list of the Joint statement by the Council and the Commission. 2013 TAC likely to remain the same for 5 years.

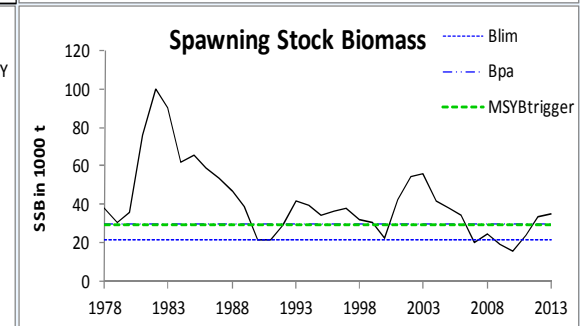
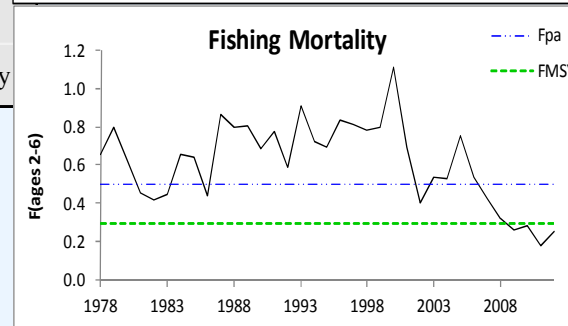
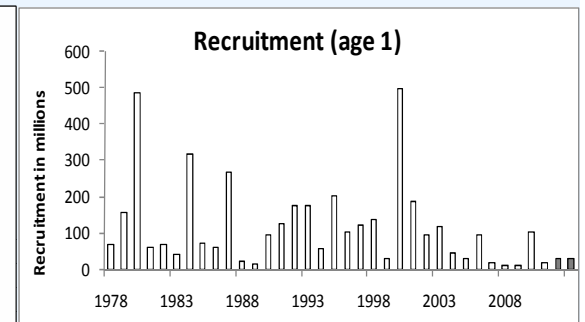
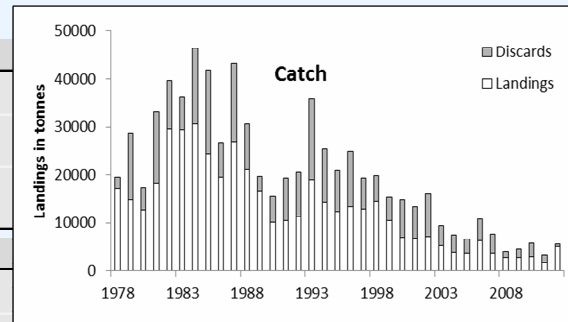
# Haddock in Division VIa (West of Scotland)

**Advice for 2014, MSY:** Catch < 6 432 t

➔ Landings < 3 988 t, assuming discard rates stay at last 3-year average

• Technical measures to reduce discard rates in *Nephrops* (TR2) fleet

F (Fishing Mortality)			
	2010	2011	2012
MSY ( $F_{MSY}$ )	✓	✓	✓ Appropriate
Precautionary approach ( $F_{pa}, F_{lim}$ )	✓	✓	✓ Harvested sustainably
SSB (Spawning-Stock Biomass)			
	2011	2012	2013
MSY ( $B_{trigger}$ )	✗	✓	✓ Above trigger
Precautionary approach ( $B_{pa}, B_{lim}$ )	⊙	✓	✓ Fully reproductive capacity



- F decreasing since 2000, and below  $F_{MSY}$  in recent years
- 2009 yc strong in relative terms

• SSB now above  $B_{pa}$   
EU MP proposal (not formally agreed): evaluated by ICES and found precautionary

• Some connectivity with haddock in North Sea: **benchmark for both stocks in 2014**

## Haddock in Division VIa (West of Scotland)

Catch 2012 ~ 5 600 t (discards: 10% in 2012; 46% in 2011)

*Nephrops* fleet (TR2) produced ~70% of all discards while landing ~20% of the total landings

$F(2013) = F(2010-2012) = 0.24$ ;  $SSB(2014) = 26 \text{ kt} < MSY B_{\text{trigger}} (30 \text{ kt})$

Rationale	Total catch (2014)	Landings (2014)	Discards (2014)	Basis	F Total (2014)	F landings (2014)	F Disc. (2014)	SSB (2015)	%SSB change	%TAC change
<b>MSY approach</b>	6.432	3.988	2.444	$F_{MSY} \times SSB_{2014} / MSY B_{\text{trigger}}$	0.26	0.16	0.10	27.27	+3%	-5%
<b>Precautionary approach</b>	4.158	2.578	1.580	$SSB_{2015} > B_{pa} (F_{2013} \times 0.67)$	0.16	0.10	0.06	30.043	+14%	-39%
<b>Proposal for Management plan</b>	5.223	3.238	1.985	-23% TAC ( $F_{2013} \times 0.86$ )	0.21	0.13	0.08	28.743	+9%	-23%
<b>Zero catch</b>	0.000	0.000	0.000	$F = 0$	0.00	0.00	0.00	35.13	+33%	-100%
<b>Other options</b>	5.765	3.574	2.191	TAC -15% ( $F_{2013} \times 0.96$ )	0.23	0.14	0.09	28.082	+6%	-15%
	6.791	4.210	2.581	Stable TAC ( $F_{2013} \times 1.156$ )	0.28	0.17	0.11	26.832	+2%	0%
	5.978	3.706	2.272	$F_{2013}$	0.24	0.15	0.09	27.823	+5%	-12%
	7.811	4.843	2.968	TAC +15% ( $F_{2013} \times 1.36$ )	0.33	0.20	0.13	25.592	-3%	+15%

Weights in '000 tonnes.

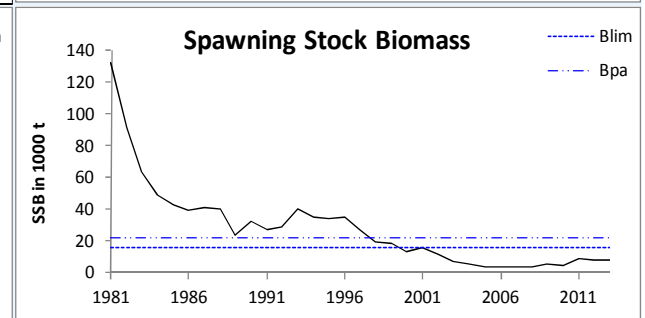
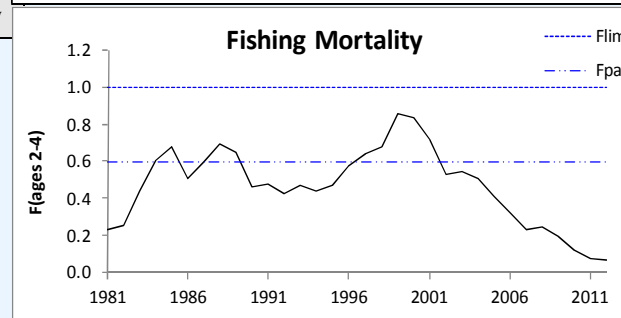
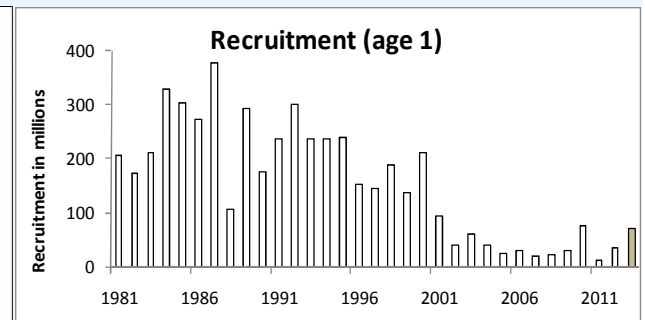
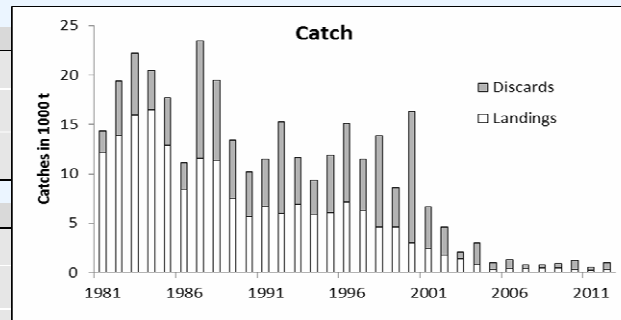
- Main uncertainty in forecast is Rec(2012-14): 57% of age 2 fish assumed mature  
Rec (2012-14) assumed as GM(2004-11) has high impact on forecast

# Whiting in Division VIa (West of Scotland)

**Advice for 2014, PA:** Lowest possible catch

Technical measures to reduce discards in *Nephrops* (TR2) fleet

F (Fishing Mortality)			
	2010	2011	2012
MSY ( $F_{MSY}$ )	?	?	? Unknown
Precautionary approach ( $F_{pa}, F_{lim}$ )	✓	✓	✓ Harvested sustainably
SSB (Spawning-Stock Biomass)			
	2011	2012	2013
MSY ( $B_{trigger}$ )	?	?	? Unknown
Precautionary approach ( $B_{pa}, B_{lim}$ )	✗	✗	✗ Reduced reproductive capacity



\* Fishing mortality very low

\* SSB remains  $< B_{lim}$

\* Rec low in last decade; 2009 yc relatively strong, 2011 yc a bit above recent average

- Mainly taken as bycatch with species such as haddock, cod, anglerfish
- Very high discarding
- Catch (2012) ~ 1 000 t (70% discarded)
- Approx 80% of all discards are from *Nephrops* (TR2) fleet

# Whiting in Division VIa (West of Scotland)

$F(2013) = F_{sq}$  (2010-2012 rescaled to 2012) = 0.07;  $SSB(2014) = 11 \text{ kt} < B_{lim}$  (16 kt)

Rationale	Catch Total (2014)	Landings (2014)	Discards (2014)	Basis	F Total (2014)	F Landings (2014)	F Discards (2014)	SSB (2015)	% SSB change
Precautionary approach	0	0	0	$B_{pa}$	0	0	0	12100	8.0%
Zero catch	0	0	0	$F = 0$	0	0	0	12100	8.0%
Other options	126	65	62	$F_{2013} \times 0.2$	0.014	0.007	0.007	11940	6.6%
	251	128	123	$F_{2013} \times 0.4$	0.028	0.013	0.014	11780	5.2%
	375	191	183	$F_{2013} \times 0.6$	0.042	0.02	0.021	11630	3.8%
	496	253	243	$F_{2013} \times 0.8$	0.054	0.026	0.028	11480	2.5%
	616	314	302	$F_{2013} \times 1.0$	0.069	0.033	0.036	11330	1.2%
	735	374	361	$F_{2013} \times 1.2$	0.082	0.04	0.042	11180	-0.2%

Weights in tonnes.

SSB expected to remain below  $B_{lim}$  in 2015, even with no catch in 2014

➔ Precautionary approach: lowest possible catch

Effective technical measures should be implemented to improve selection pattern and reduce discards in *Nephrops* (TR2) fleet



## Whiting in Division VIb (Rockall)

**Advice for 2014 and 2015, DLS:** Catch < 11 t

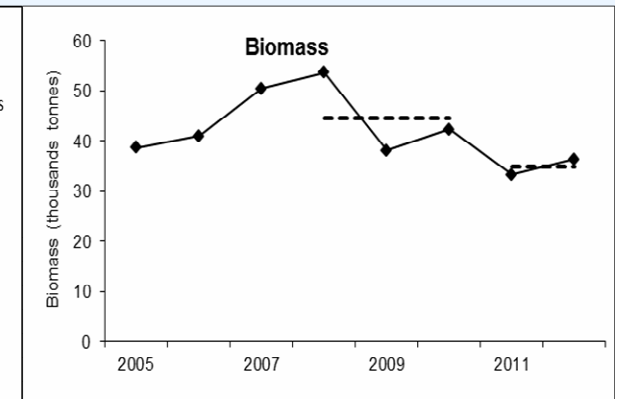
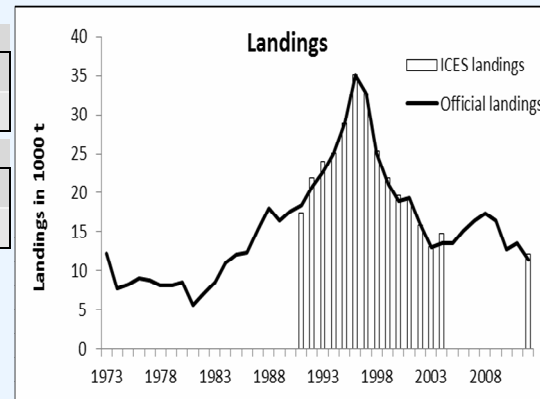
- Advice issued in 2012 was biennial, valid for 2013 and 2014
  - Same catch is also applicable to 2015
- 
- Stock category: 6
  - Only data are official landings
  - Doubts on accuracy of landings data: vessels operate in VIa and VIb
- 
- Precautionary buffer (20% reduction) applied in the advice issued in 2012 and catches are marginal → same catch advice also considered valid for 2015

# Anglerfish (*L. piscatorius* & *L. budegassa*) in IIIa, IV and VI

**Advice for 2014, DLS:** Catch < 10 231 t

- All catches assumed to be landed
- Management area should be consistent with assessment area

	<b>F (Fishing Mortality)</b>
	2010–2012
Qualitative evaluation	⊕ Insufficient information
	<b>SSB (Spawning-Stock Biomass)</b>
	2008–2012
Qualitative evaluation	⬇ Decreasing



- Benchmarked in 2012 and 2013

Age-based assessment attempted, not accepted: sensitivity to growth assumptions

Advice: DLS (category 3), using anglerfish industry-science survey

Trend in last 5 years: 22% decrease

1. Uncertain window: 20% decrease
2. Precautionary margin: no, because significant effort decrease in main fisheries

➔ 20% catch decrease with respect to recent average (last 3 year average)

Previous concerns about landings underreporting no longer considered an issue  
Recent landings data adequate for provision of catch advice

# Megrim (*Lepidorhombus spp.*) in Div. IVa and VIa

**Advice for 2014 and 2015, MSY:** Catch < 7 000 t in each year

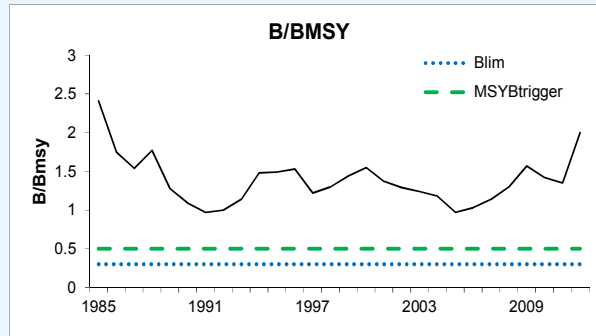
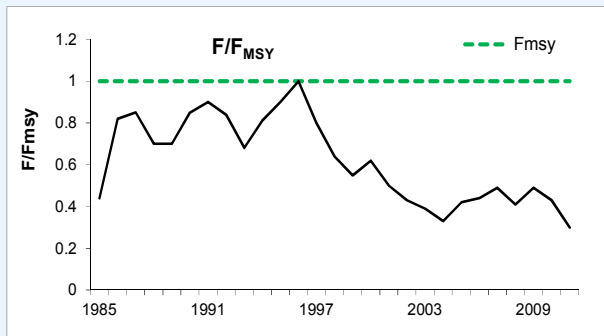
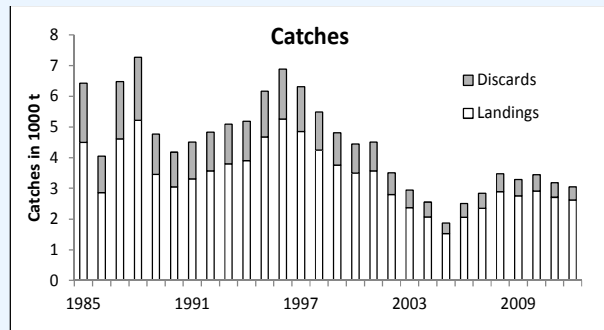
➔ Landings < 5 950 t, assuming discard rates stay at last 3-year average

F (Fishing Mortality)				
	2010	2011	2012	
MSY ( $F_{MSY}$ )	✓	✓	✓	Appropriate
Precautionary approach ( $F_{pa}, F_{lim}$ )	?	?	?	Undefined
Biomass				
	2011	2012	2013	
MSY ( $B_{trigger}$ )	✓	✓	✓	Above trigger
Precautionary approach ( $B_{pa}, B_{lim}$ )	✓	✓	✓	Full reproductive capacity

Assessment based on biomass dynamics model (no age or length data used)

\*  $F$  below  $F_{MSY}$ , Biomass above MSY  $B_{trigger}$

Catch (2012) ~ 3 000 t (15% discards)



# Megrim in Divisions IVa and VIa

$$F(2013)/F_{MSY} = F(2012)/F_{MSY} = 0.33, B(2014)/B_{MSY} = 1.41$$

Rationale	Catch (2014)	Landings (2014)	Discards (2014)	Basis	Fishing mortality ( $F_{2014}/F_{MSY}$ )	Stock size ( $B_{2015}/B_{MSY}$ )	Probability of Biomass <sub>2015</sub> falling below MSY $B_{trigger}$	Probability of Biomass <sub>2015</sub> falling below $B_{lim}$
<b>MSY approach</b>	7000	5950	1050	$F_{MSY} (= 0.33)$	1.0	1.32	1%	0%
<b>Zero catch</b>	0	0	0	$F = 0$			0%	0%
<b>Other options</b>	6076	5164	911	Long-term MSY	0.86	1.42	1%	0%
	6000	5100	900	0.36	0.85	1.41	1%	0%
	5000	4250	750	0.21	0.65	1.53	1%	0%
	4000	3400	600	0.16	0.48	1.59	1%	0%

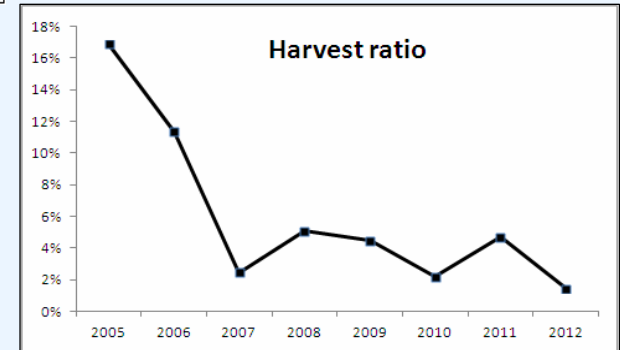
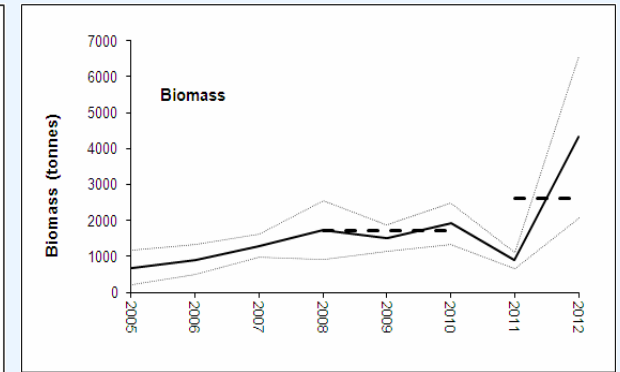
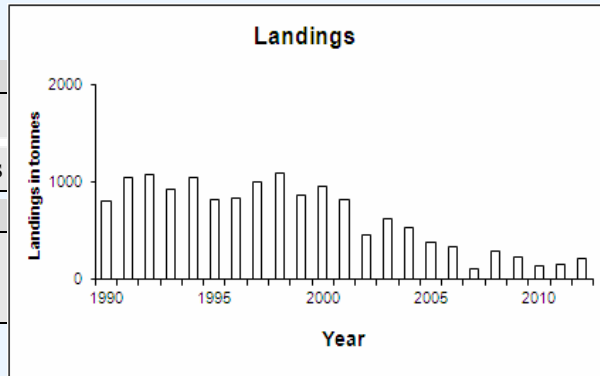
- Current TAC areas inconsistent with the ICES stock and advisory area
- ICES advice (ICES, 2013a) recommends that the management unit should match the assessment unit

# Megrim (*Lepidorhombus* spp) in VIb (Rockall)

**Advice for 2014, DLS:** Landings < 207 t

- Discards exist but cannot be quantified → total catch can not be calculated
- Management area should be the same as the assessment area

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



DLS (category 3), uses anglerfish-megrim industry-science survey index:

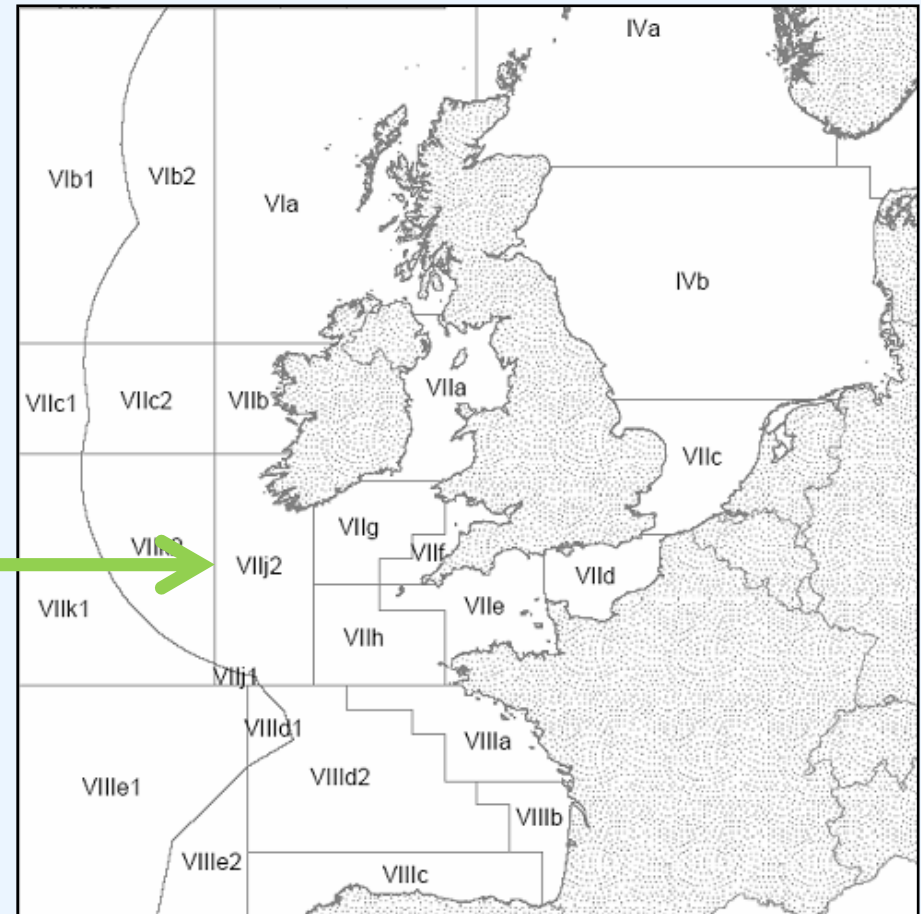
• Trend last 5 years: 52% increase

1. Uncertainty window: 20% increase
2. Precautionary margin: no, because harvest ratio very low (<5%)

→ 20% catch increase in relation to recent average (last 3 year average)

## Celtic Sea & West, Southwest Ireland

- Cod (VIIe-k)
  - Haddock (VIIb-k)
  - Whiting (VIIe-k)
  - Plaice (CS; VIIh-k; VIIbc)
  - Sole (CS; VIIh-k; VIIbc)
  - Anglerfish (VIIb-k, VIIIabd)
  - Megrin (VIIb-k, VIIIabd)
- 
- Northern hake
  - Pollack (VI, VII)
  - Sea bass (IVbc, VIIa, VIId-h; VIa, VIIb, VIIj)
- 
- *Nephrops* (FUs 16-17-20-22) in autumn

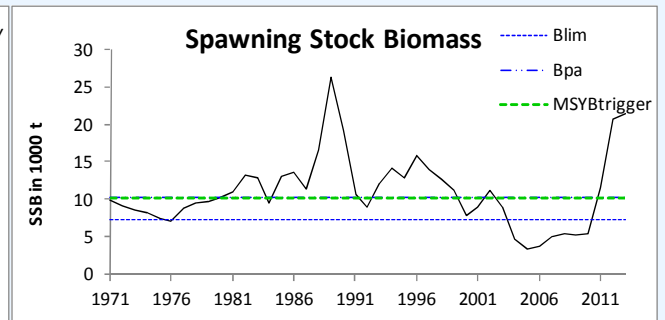
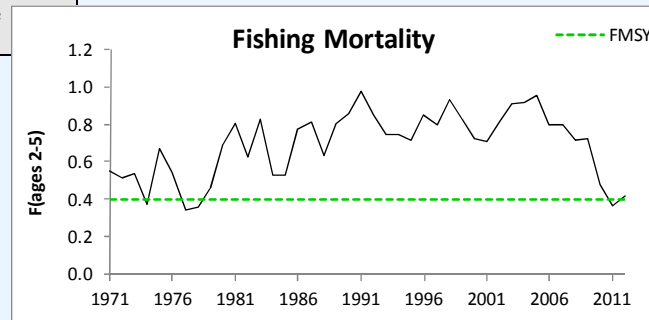
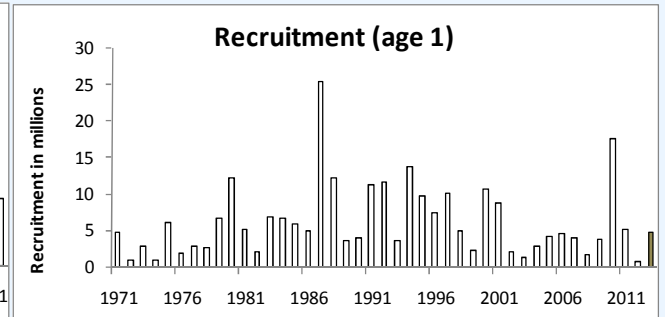
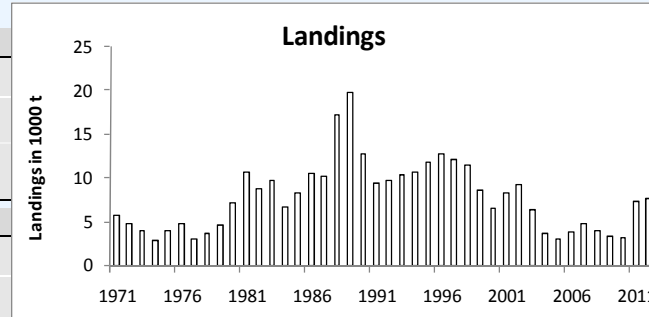


# Cod in Divisions VIIe–k (Celtic Sea cod)

**Advice for 2014, MSY:** Landings < 6 848 t

• Discards exist but cannot be quantified → total catch can not be calculated

F (Fishing Mortality)			
	2010	2011	2012
MSY ( $F_{MSY}$ )	✗	✓	✗ At target
Precautionary approach ( $F_{pa}, F_{lim}$ )	?	?	? Undefined
SSB (Spawning-Stock Biomass)			
	2011	2012	2013
MSY ( $B_{trigger}$ )	✓	✓	✓ Above trigger
Precautionary approach ( $B_{pa}, B_{lim}$ )	✓	✓	✓ Full reproductive capacity



\* Fishing declined and is around  $F_{MSY}$  in last 2 years

\* 2009 yc very strong

\* Very strong SSB increase

\* highgrading significant in 2011 (2009 yc), before TAC was revised; now back to normal

MP under development by the NWWRAC and STECF

## Cod in Divisions VIIe–k (Celtic Sea cod)

Catch 2012 ~ 8 600 t (discards 11%)

$F(2013) = F(2010-12) = 0.43$ ;  $SSB(2014) = 17 \text{ kt} > MSY B_{\text{trigger}} (10.3 \text{ kt})$

Rationale	Landings (2014)	Basis	F (2014)	SSB (2015)	%SSB change	% TAC change
<b>MSY approach</b>	6 848	$F_{MSY}$	0.40	15 290	-11%	-33%
<b>Zero catch</b>	0	$F = 0$	0	22 782	+32%	-100%
<b>Other options</b>	7 211	$F_{2013}$	0.43	14 899	-13%	-29%
	8 670	TAC-15% ( $F_{2013} \times 0.80$ )	0.54	13 333	-23%	-15%
	10 200	Stable TAC	0.67	11 706	-32%	0%
	11 726	TAC+15% ( $F_{2013} \times 1.15$ )	0.82	10 102	-41%	+15%

Weights in tonnes

Discards have been estimated for 2011 and 2012, but not considered sufficient to estimate a discard proportion that could be applied to give catch advice; therefore total catches cannot be calculated.



# Haddock in Divisions VIIb-k

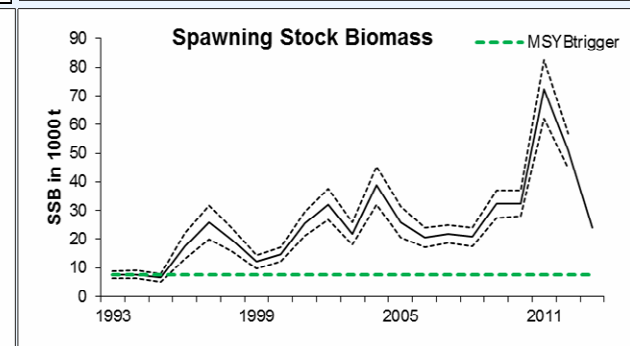
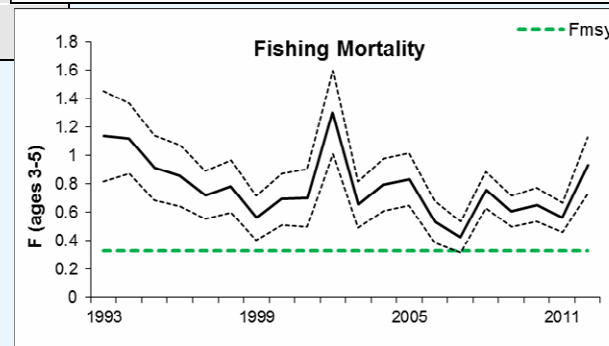
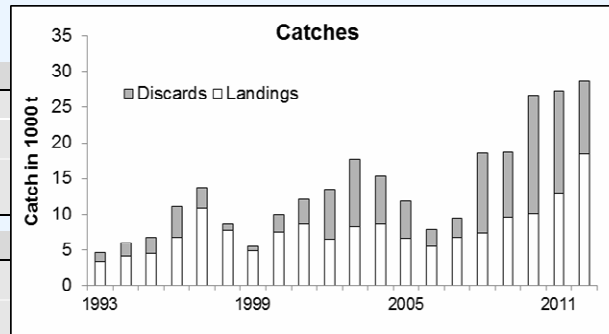
**Advice for 2014, MSY transition:** Catch < 5 281 t

➔ Landings < 3 602 t, assuming discard rates stay at last 3-year average

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

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



\* Fishing mortality above  $F_{MSY}$

\* 2009 yc exceptionally strong

\* Rec below average after 2009, Rec in 2012 lowest of time series

\* SSB increased until 2011, followed by decrease

\* increased discarding in 2010 (below MLS) and since 2011 (over quota)

\* Discarding serious problem: in last 10 years, ~80% of catch in numbers discarded

➔ technical measures should be in place to reduce discards

# Haddock in Divisions VIIb–k

Catch 2012 ~ 28 700 t (discards 36%)

Considerable uncertainty about estimated discards, but assessment results appear quite robust to this uncertainty

$F(2013) = F(2010-2012) = 0.72$ ;  $SSB(2014) = 12\,600\text{ t} > MSY B_{\text{trigger}} (7\,500\text{ t})$

Rationale	Catch (2014)	Land. (2014)	Disc. (2014)	Basis	F Total (2014)	F land (2014)	F disc. (2014)	SSB (2015)	%SSB change	%TAC change
MSY approach	4 521	3 098	1 423	$F_{MSY} = 0.33$	0.33	0.28	0.05	20 218	+60%	-78%
MSY transition	5 281	3 602	1 679	$(F_{2010} \times 0.2) + (F_{MSY} \times 0.8)$	0.39	0.34	0.06	19 398	+54%	-75%
Zero catch	0	0	0	$F = 0$	0	0	0	25 140	+99%	-100%
Other options	0	0	0	$F_{2013} \times 0.8$	0.57	0.49	0.09	17 329	+37%	-66%
	7 202	4 852	2 350	$F_{2013} \times 0.9$	0.64	0.55	0.1	16 576	+31%	-63%
	7 907	5 300	2 607	$F_{2013}$	0.72	0.61	0.11	15 863	+26%	-60%
	8 576	5 720	2 856	$F_{2013} \times 1.1$	0.79	0.67	0.12	15 187	+20%	-57%
	21 385	12 026	9 359	-15% TAC	3.99	3.39	0.59	3 077	-76%	-15%
		13 172		Stable TAC	inf					
	15 148		+15% TAC	inf						

Predicted SSB(2015) very uncertain: highly dependent on Rec assumption for 2013

# Whiting in Divisions VIIe-k

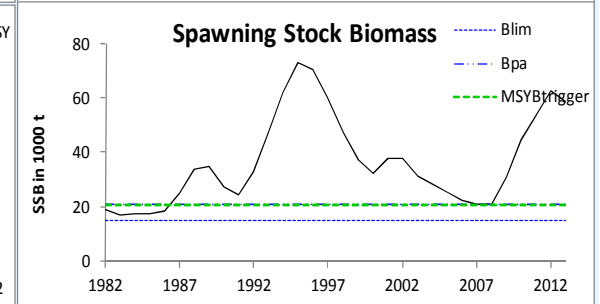
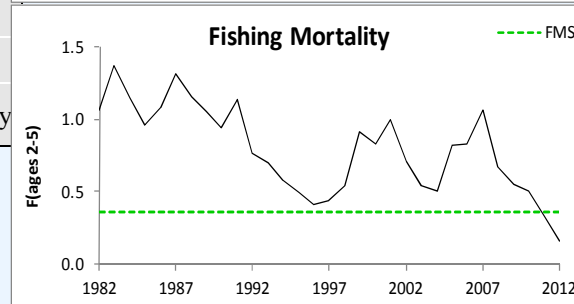
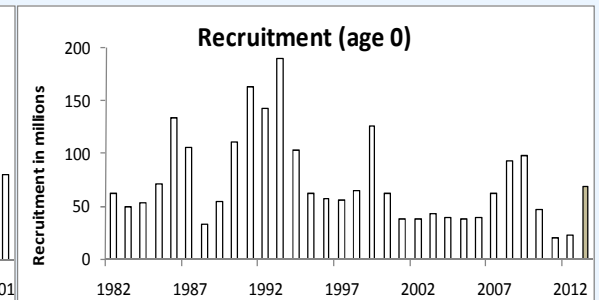
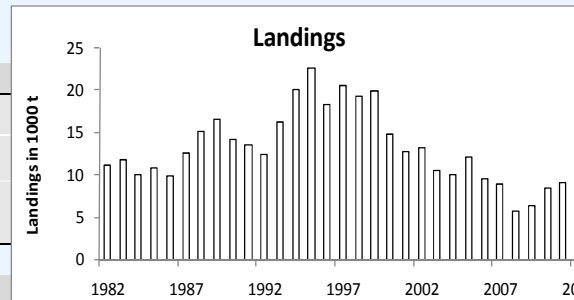
**Advice for 2014, MSY:** Landings < 15 562 t

• Discards exist but cannot be quantified → total catch can not be calculated

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

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



\* Fishing mortality declining and below  $F_{MSY}$  in last 2 years

\* SSB increasing

\* 2007 and 2008 yc above average, 2011 and 2012 yc lowest of time series

\* high discards, low market value (but discards not quantified)

\* Discards not included in assessment (problematic, given high discards)

**Benchmark in 2014**

# Whiting in Divisions VIIe–k

Landings 2012 ~ 10 000 t (discards unknown)

$F(2013) = F(2010-2012) = 0.33$ ; Landings(2013) = 18 kt;  $SSB(2014) = 49 \text{ kt} > MSY B_{trigger} (21 \text{ kt})$

Rationale	Landings (2014)	Basis	$F_{landings} (2014)$	SSB (2015)	%SSB change
<b>MSY approach</b>	15 562	$F_{MSY}$	0.36	45 329	-8%
<b>Precautionary approach</b>	38 505	$B_{pa}$	1.08	21 000	-57%
<b>Zero catch</b>	0	$F = 0$	0	62 023	26%
<b>Other options</b>	14 618	$F_{2013}$	0.33	46 331	-6%
	16 791	$F_{2013} \times 1.2$	0.40	44 027	-11%
	18 769	$F_{2013} \times 1.4$	0.46	41 938	-15%

Weights in tonnes

Additional technical measures introduced in 2012 to reduce haddock and whiting discards in Celtic Seas

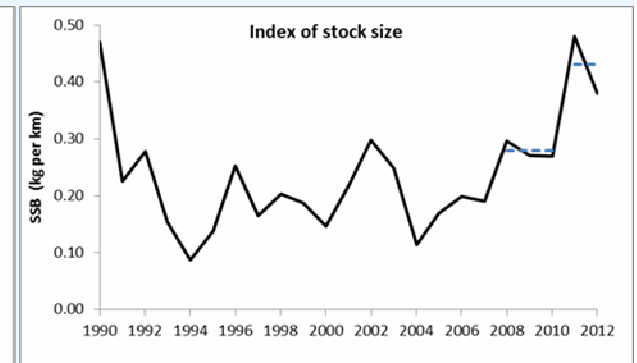
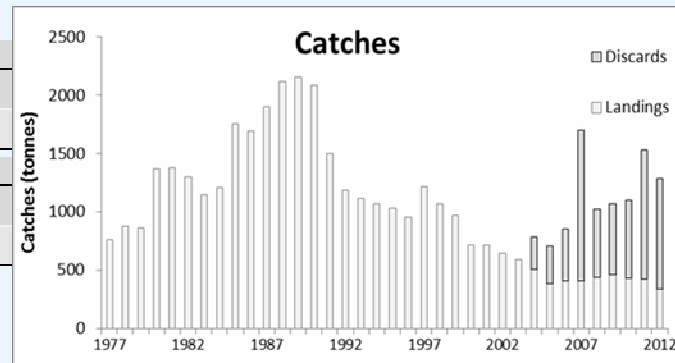
# Plaice Celtic Sea (VIIf,g)

**Advice for 2014, DLS:** Catch < 1 608 t

➔ Landings < 519 t, assuming discard rates stay at last 3-year average

• Technical measures to reduce discard rates

	F (Fishing Mortality)	
	2010–2012	
Qualitative evaluation	?	Unknown
	SSB (Spawning-Stock Biomass)	
	2008–2012	
Qualitative evaluation	↗	Increasing



\* Very high discards in recent years (mostly below MLS)

\* Catch (2012) ~ 1 390 t (68% discards)

\* This year, advice based on Q3 E&W beam trawl survey, as indicator of SSB

\* Commercial LPUE, also used in previous assessment, show a long-time decrease. But not representative of stock abundance, due to high discards

## Plaice Celtic Sea (VII f,g)

DLS (category 3):

Survey trend in last 5 years: 50% increase

1. Uncertainty window: 20% increase
2. Precautionary margin: no, because of the large increase (50%) in biomass

→ 20% catch increase in relation to recent average (last 3 year average)

**Result:** Catch < 1 608 t

If discard rates stay at last 3-year average: Landings < 519 t

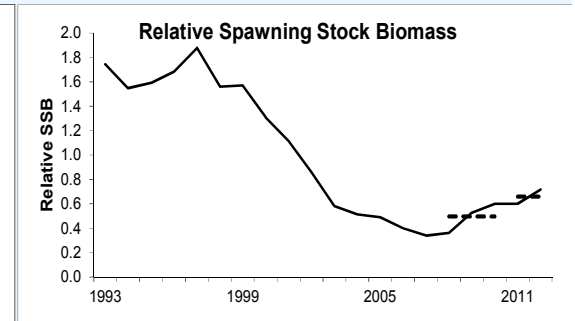
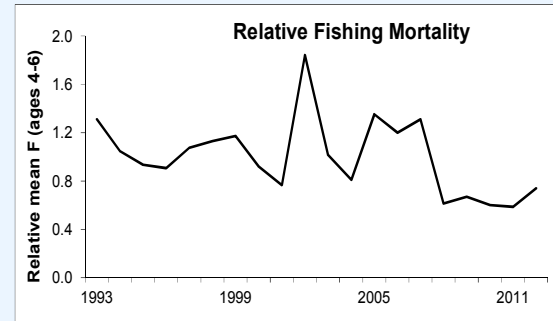
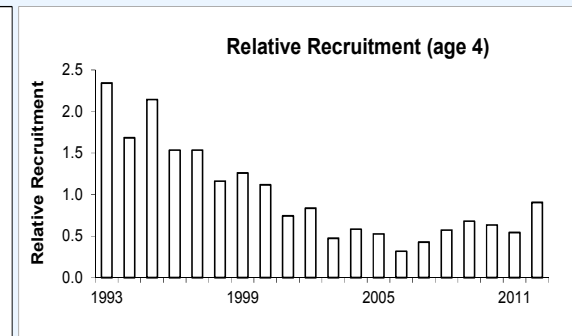
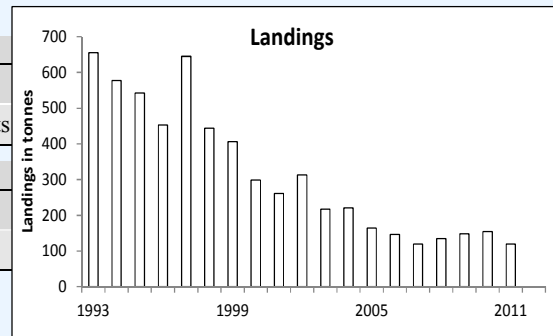
- Survey also indicates an overall reduction of mortality over time
- Use of larger-mesh gear should be encouraged in this fishery where mixed fisheries issues allow for it

# Plaice in Divisions VIIh-k (Southwest of Ireland)

**Advice for 2014, DLS:** Landings < 135 t

• Discards exist but cannot be quantified → total catch can not be calculated

F (Fishing Mortality)	
	2010-2012
Qualitative evaluation	⊗ Above possible reference points
SSB (Spawning-Stock Biomass)	
	2008-2012
Qualitative evaluation	↗ Increasing



\* high discards  
(only quantified in 2012)

\* Biological link between plaice in  
Div VIIh and VIIjk unclear  
→ needs investigation

\* Data from Div VIIh scarce

\* Exploratory assessment based only on commercial data from VIIjk:

- F stable since 2008, but considered to be above potential reference points
- some increase in SSB in recent years

## Plaice in Divisions VIIh-k (Southwest of Ireland)

DLS (category 3):

SSB trend, from assessment, in last 5 years: 33% increase

1. Uncertainty window: 20% increase
2. Precautionary margin: yes, because stock considered overexploited

→ 20% increase, followed by 20% reduction in relation to recent average (last 3 years)

**Result applied to the landings from Div VII h-k: Landings < 135 t**

- Management should take into account that plaice is caught in a mixed fishery
- Plaice caught in spatially distinct areas: restricting effort in those areas may be more effective than limiting landings
- Discards should be reduced. Use of larger-mesh gear could improve selection, but mixed fishery aspects should be taken into consideration



## Plaice in Divisions VIIbc (West of Ireland)

**Advice for 2014 and 2015, DLS:** Catch < 30 t

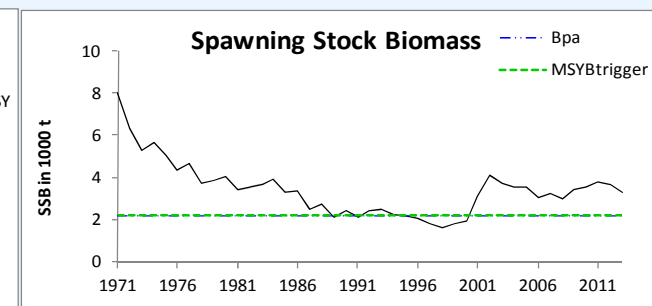
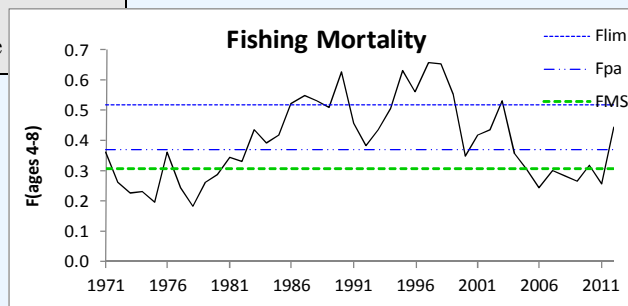
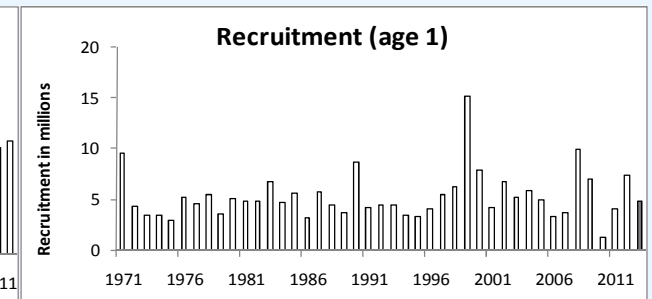
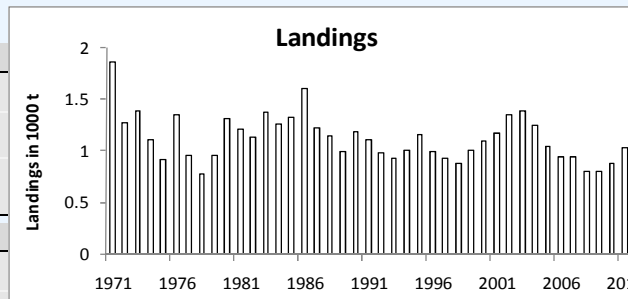
- Advice issued in 2012 was biennial, valid for 2013 and 2014
- Same catch is also applicable to 2015
  
- Stock category: 6
- Only data are official landings
- Catches too low to support collection of necessary information for stock assessment
  
- Precautionary buffer (20% reduction) applied in the advice issued in 2012 and catches are marginal → same catch advice also considered valid for 2015
  
- Plaice TAC unit VIIbc is included in the list of the Joint statement by the Council and the Commission. 2013 TAC likely to remain the same for 5 years.

# Sole in Celtic Sea (VII f,g)

**Advice for 2014, MSY:** Catch < 920 t

• Discards considered low → all catches assumed to be landed

F (Fishing Mortality)			
	2010	2011	2012
MSY ( $F_{MSY}$ )	✘	✔	✘ Above target
Precautionary approach ( $F_{pa}, F_{lim}$ )	✔	✔	⚠ Increased risk
SSB (Spawning-Stock Biomass)			
	2011	2012	2013
MSY ( $B_{trigger}$ )	✔	✔	✔ Above trigger
Precautionary approach ( $B_{pa}, B_{lim}$ )	✔	✔	✔ Full reproductive



\* SSB above MSY  $B_{trigger}$  in last decade

\* F around  $F_{MSY}$  since 2005, but increased in 2012

\* Rec fluctuates around average; 2009 yc lowest in time series

# Sole in Celtic Sea (VII f,g)

\* Landings (2012) ~ 1 100 t (mainly by beam trawlers; discards ~ 2-5%)

Discards not included in assessment (not a problem, low)

$F(2013) = F(2010-2012) = 0.34$ ; Catch(2013) = 986 t; SSB(2014) = 3 300 t > MSY  $B_{trigger}$  (2 200 t)  
 $F_{MSY} = 0.31$



Rationale	Catches (2014)	Basis	F(2014)	SSB(2015)	%SSB change	% TAC change
<b>MSY approach</b>	920	$F_{MSY}$	0.31	3465	+5%	-16%
<b>Precautionary approach</b>	1071	$F_{pa}$	0.37	3316	+1%	-3%
<b>Zero catch</b>	0	$F = 0$	0.00	4377	+33%	-100%
<b>Other options</b>	935	TAC – 15% ( $F_{2013} \times 0.92$ )	0.32	3450	+5%	-15%
	1004	$F_{2013}$	0.34	3382	+3%	-9%
	1100	Stable TAC ( $F_{2013} \times 1.11$ )	0.38	3287	0%	0%
	1265	TAC + 15% ( $F_{2013} \times 1.29$ )	0.45	3126	-5%	+15%

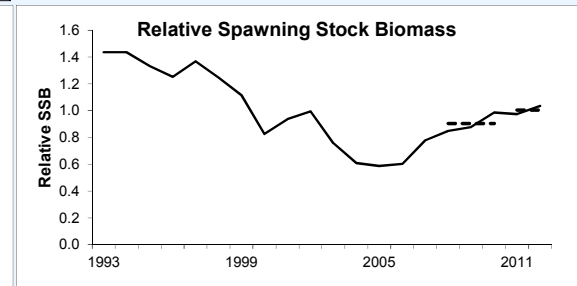
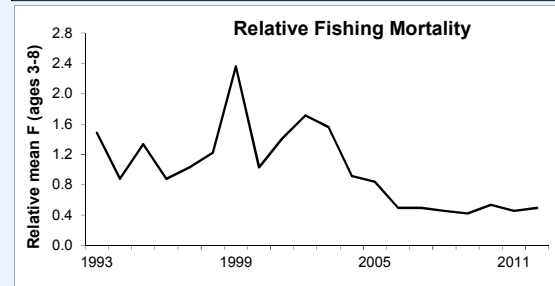
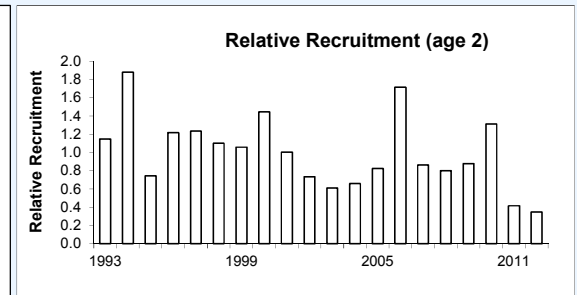
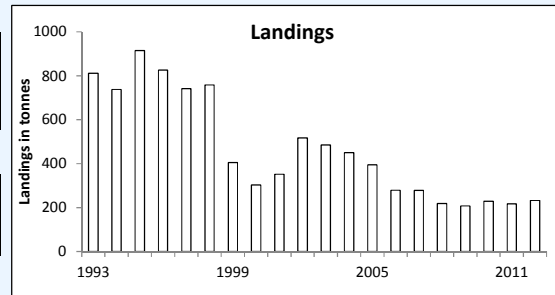
Weights in tonnes

# Sole in Divisions VIIh-k (Southwest of Ireland)

**Advice for 2014, DLS:** Catch < 252 t.

• All catches assumed to be landed

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



\* Biological link between Div VIIh and VIIjk unclear

\* Exploratory assessment based on commercial data from Div VII jk

DLS (category 3): SSB trend, from assessment, in last 5 years: 11% increase

1. Uncertainty window: 11% increase
2. Precautionary margin: no, because of significant reduction in F

➔ 11% increase (applied to last 3-year average landings)

**Result applied to the catch from Div VII h-k: Catch < 252 t**

## Sole in Divisions VIIbc (West of Ireland)

**Advice for 2014 and 2015, DLS:** Catch < 30 t

- Advice issued in 2012 was biennial, valid for 2013 and 2014
  - Same catch is also applicable to 2015
- 
- Stock category: 6
  - Only data are official landings
  - Catches too low to support collection of necessary information for stock assessment
- 
- Precautionary buffer (20% reduction) applied in the advice issued in 2012 and catches are marginal → same catch advice also considered valid for 2015
- 
- Sole TAC unit VIIbc is included in the list of the Joint statement by the Council and the Commission. 2013 TAC likely to remain the same for 5 years.

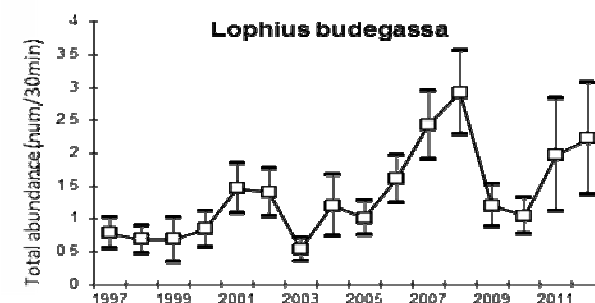
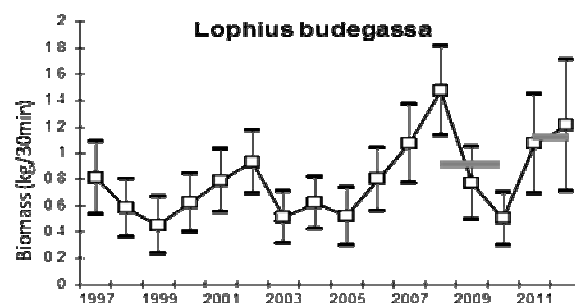
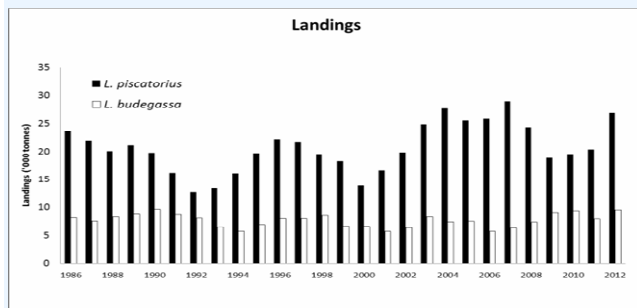
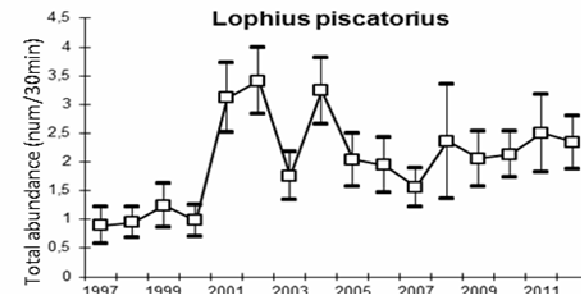
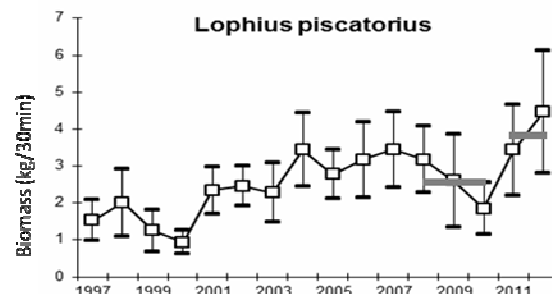
# Anglerfish (*Lophius piscatorius* & *L. budegassa*) Div VIIb–k and VIIla,b,d

**Advice for 2014, DLS:** Landings < 37 450 t

• Discards exist but cannot be quantified → total catch can not be calculated

## *L. piscatorius* & *L. budegassa*

<b>F (Fishing Mortality)</b>	
<b>Qualitative evaluation</b>	2010–2012 ? Insufficient information
<b>SSB (Spawning-Stock Biomass)</b>	
<b>Qualitative evaluation</b>	2008–2012 ↗ Increasing



- \* Overall stock trend (from bottom trawl survey) stable or increasing
- \* Increasing trend in last 5 years for both species
- \* Landings (2012) ~ 36 400 t (approx 75% *L.piscatorius*)
- \* Indications that discarding of small fish increased in recent years, but no reliable discard estimates

## Anglerfish (*Lophius piscatorius* & *L. budegassa*) Div VIIb–k and VIIIa,b,d

DLS (category 3):

Biomass index from survey as stock indicator. Trend in last 5 years:

55% increase for *L. piscatorius*, 25% increase for *L. budegassa*

1. Uncertainty window: 20% increase

2. Precautionary margin: not applied, because steady effort decline in main fisheries

→ 20% increase over recent average landings (last 3-year average)

Result: Landings < 37 450 t

## Megrim (*Lepidorhombus whiffiagonis*) Divisions VIIb–k and VIIIa,b,d

### Advice for 2014, DLS:

New data (landings, discard, surveys) available do not change stock perception. Therefore, advice for 2014 is the same as given for 2013:

Landings < 12 000 t

- Stock category: 3
- Statistical catch-at-age model, that can consistently deal with heterogeneous and some missing data (mainly discards), developed in 2012 benchmark.

Used only as indicative of trends.

- Precautionary margin applied in the advice last year (because exploitation unknown and no indication of low or decreasing  $F$  from assessment results)
- This year: available data do not change stock perception, and same advice issued.



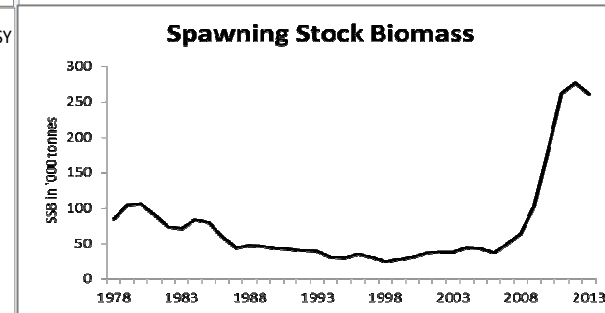
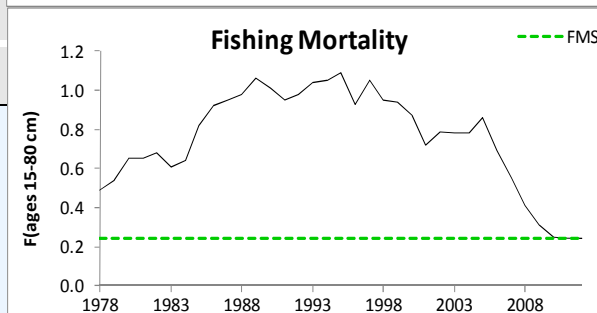
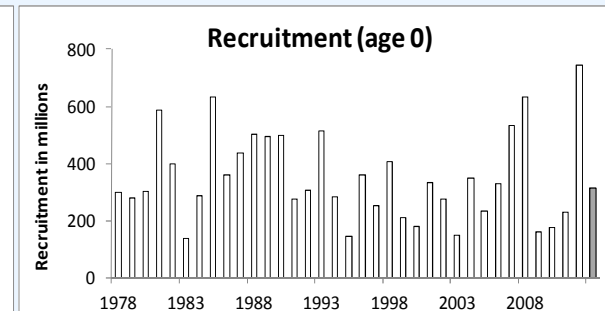
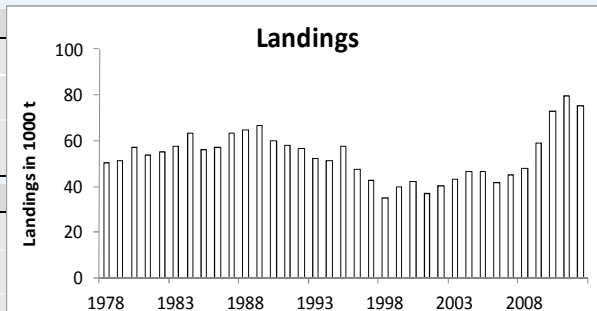
# Hake – Northern stock (IIIa, IV, VI, VII, VIIIabd)

**Advice for 2014, MSY:** Landings < 81 846 t

• Some discards included in assessment, but total cannot be quantified

➔ total catch can not be calculated

F (Fishing Mortality)			
	2010	2011	2012
MSY ( $F_{MSY}$ )	✘	✔	✔ Appropriate
Precautionary approach ( $F_{pa}, F_{lim}$ )	?	?	? Undefined
SSB (Spawning-Stock Biomass)			
	2011	2012	2013
MSY ( $B_{trigger}$ )	?	?	? Undefined
Precautionary approach ( $B_{pa}, B_{lim}$ )	?	?	? Undefined
Qualitative evaluation	↗	↗	✔ Above poss. reference points



\* Very strong SSB increase and F decrease in recent years

\* Rapid growth and fast dynamics

\* Important increase in landings in northern areas (IIIa, IV and VI) in recent years

\* Discards of juvenile hake substantial in some areas and fleets. Discard estimates incomplete (partially included in assessment)

**Benchmark in**

**2014**

\* Some concern that the very strong SSB increase and F decrease not totally

# Hake – Northern stock

Landings 2012 ~ 75 000 t (discards ~ 16%, but underestimated and partially included in assessment)

$F(2013) = F(201-12) = 0.24$ ; landings (2013) = 69 kt, SSB (2014) = 270 kt

Rationale	Human consump. landings (2014)	Basis	F Total (2014)	F HC (2014)	F Disc (2014)	Disc. (2014)	Catch Total (2014)	SSB (2015)	%SSB change	%TAC change
<b>MSY approach</b>	81.846	$F_{MSY}$ ( $F_{sq} \times 0.99$ )	0.24	0.20	0.04	2.265	84.111	333	+23%	+49%
<b>Recovery plan</b>	63.397	+15% TAC ( $F_{sq} \times 0.745$ )	0.18	0.15	0.03	1.733	65.129	352	30%	15%
<b>Zero catch</b>	0.0	$F = 0$	0.00	0.00	0.00	0.0	0.0	417	+55%	-100%
<b>Other options</b>	9.195	$F_{sq} \times 0.1$	0.02	0.02	0.00	0.243	9.438	408	+51%	-83%
	26.924	$F_{sq} \times 0.3$	0.07	0.06	0.01	0.719	27.644	390	+44%	-51%
	46.679	-15% TAC ( $F_{sq} \times 0.535$ )	0.13	0.11	0.02	1.262	47.941	370	+37%	-15%
	43.808	$F_{sq} \times 0.5$	0.12	0.10	0.02	1.183	44.991	372	+38%	-21%
	55.145	Equal TAC ( $F_{sq} \times 0.64$ )	0.16	0.13	0.02	1.499	56.644	361	+34%	+0%
	63.397	+15% TAC ( $F_{sq} \times 0.745$ )	0.18	0.15	0.03	1.733	65.129	352	30%	15%
	59.886	$F_{sq} \times 0.7$	0.17	0.14	0.03	1.633	61.519	356	+32%	+10%
	75.197	$F_{sq} \times 0.9$	0.22	0.19	0.03	2.071	77.268	340	+26%	+36%
	82.576	$F_{sq} \times 1$	0.24	0.21	0.04	2.286	84.862	332	+23%	+50%
96.804	$F_{sq} \times 1.2$	0.29	0.25	0.04	2.707	99.511	318	+18%	+76%	

Weights in '000 tonnes

Short-term projection influenced by the record high 2012 Rec estimate

## Pollack in Subareas VI and VII

### Advice for 2014, DLS:

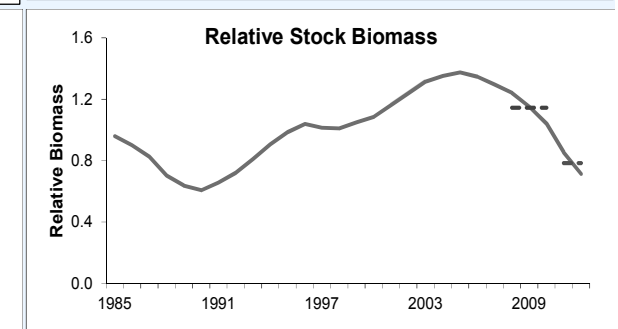
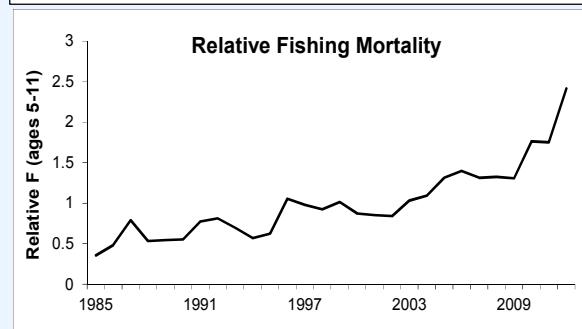
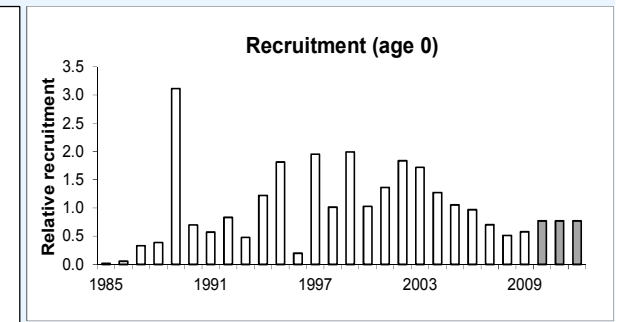
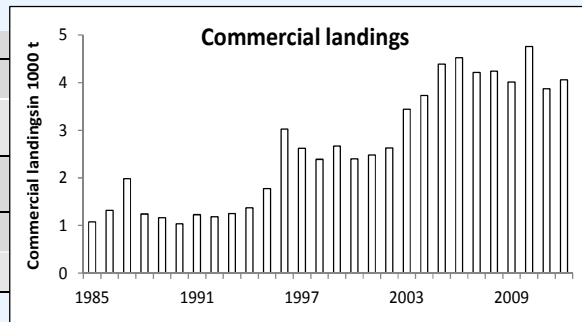
- Advice issued in 2012 was biennial (for 2013 and 2014):  
Catch < 4 200 t per year
- New data available do not change stock perception
  
- \* Stock category: 4
- \* Advice based on official landings (almost all landings from Subarea VII)
- \* DCAC (method that estimates a sustainable catch) applied to Subareas VI and VII separately
- \* More information would be needed to conduct an assessment: stock identity, detail of fisheries, biological information, recreational fisheries
  
- \* Pollack TAC Unit Vb (EU waters), VI, XII and XIV is included in the list of Joint statement by the Council and the Commission. 2013 TAC likely to remain the same for 5 years.

# Sea bass in IVbc, VIIa and VIId-h

**Advice for 2014, DLS:** Commercial landings < 2 707 t

- Discards exist, but not quantified; Recreational catch not quantified  
 → total catch can not be calculated

	<b>F (Fishing Mortality)</b>	
		<b>2010–2012</b>
Qualitative evaluation	✘	Above possible reference points
	<b>SSB (Spawning Stock Biomass)</b>	
		<b>2008–2012</b>
Qualitative evaluation	↘	Decreasing



Before this year: advice for sea bass in Northeast Atlantic

*Benchmark autumn 2012:*

4 stocks considered

Slow growth, late maturation, spawning aggregation, site fidelity

→ vulnerable to exploitation and local depletion

- Discarding low in most fisheries (not included in assessment)
- Important recreational species (could be up to 20% of total stock removals)

Surveys used in assessment terminated in 2009 and 2011

## Sea bass in IVbc, VIIa and VIId-h

- Assessment indicative of trends

DLS (category 3):

Biomass from survey as stock indicator. Trend in last 5 years: 32% decrease

1. Uncertainty window: 20% decrease
2. Precautionary margin: yes, because stock considered overexploited (exploratory analysis indicates  $F$  above possible  $F_{MSY}$  proxy)

➔ 20% decrease, followed by another 20% decrease: applied to recent average commercial landings (last 3-year average)

Result: Commercial landings < 2 707 t

- Improvement of fishery selection pattern needed (to allow more fish to spawn at least once before capture) ➔ would require changes to gear design and spatial management measures that do not incite discarding

# Sea bass in VIa, VIb and VIIj (West of Scotland and Ireland)

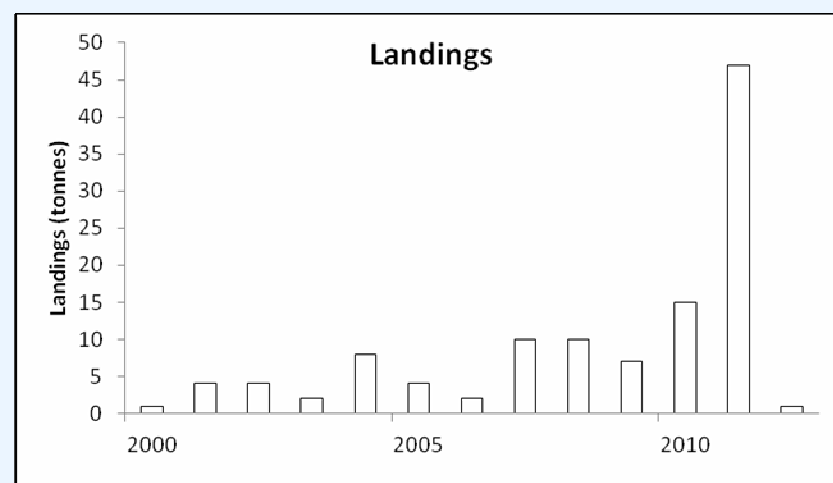
**Advice for 2014, DLS:** Commercial landings < 18 t

- No information on discards; Recreational catch not quantified  
→ total catch can not be calculated
  - Not clear whether this should constitute a separate management unit
- ICES does not necessarily advocate the introduction of a TAC for sea bass in this area

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

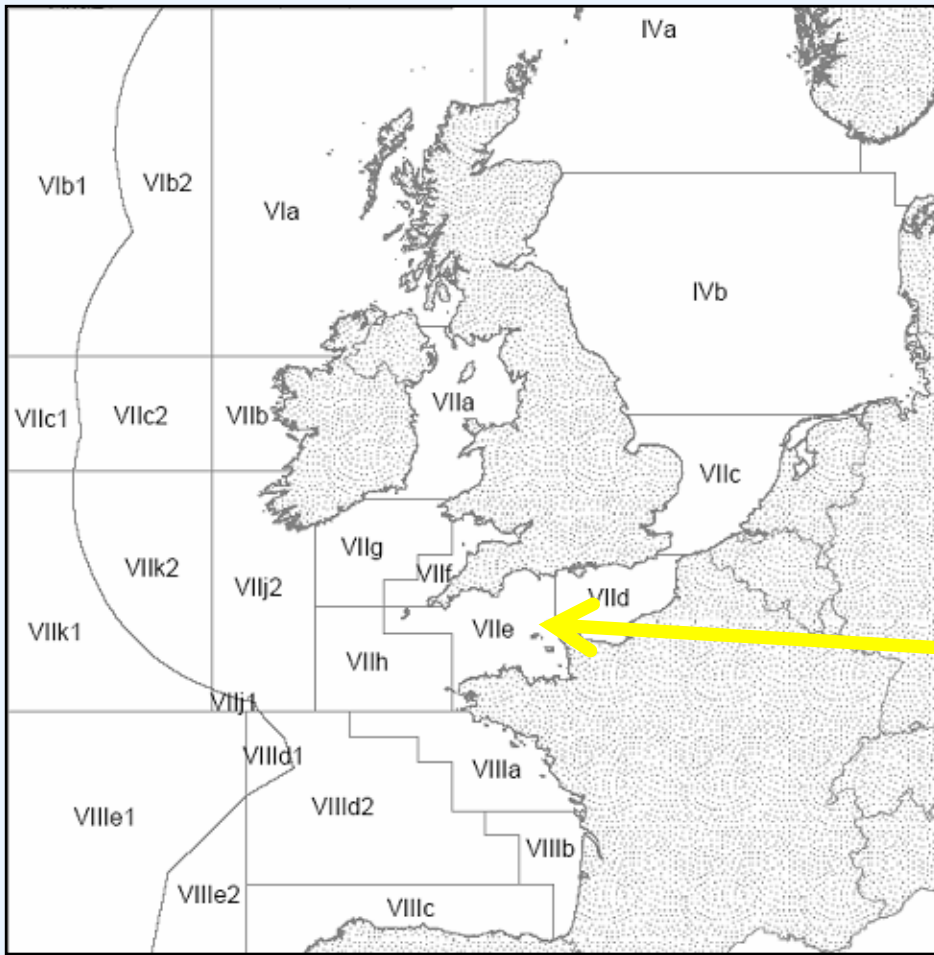
  

SSB (Spawning-Stock Biomass)	
2011–2013	
Qualitative evaluation	? Insufficient information



- Only official landings available
- Important recreational species (data needed)
- Not clear that it constitutes a different stock
- Stock category: 6
- In the absence of representative data for assessment: advice based on 20% precautionary reduction over recent (last 3 year average) commercial landings

## Channel (Divisions VII d and e)



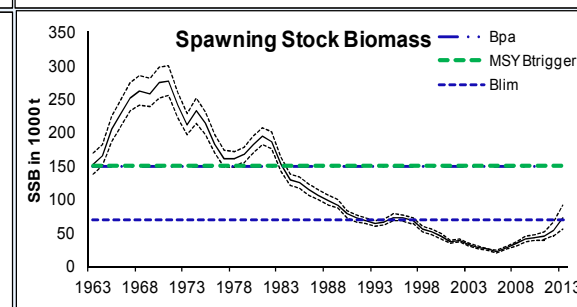
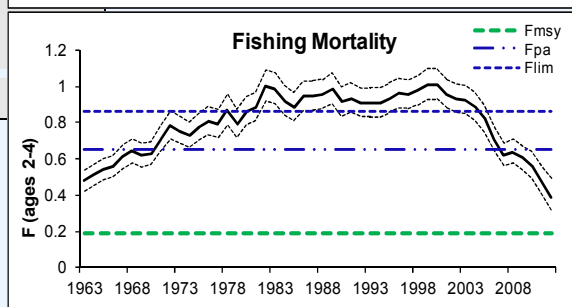
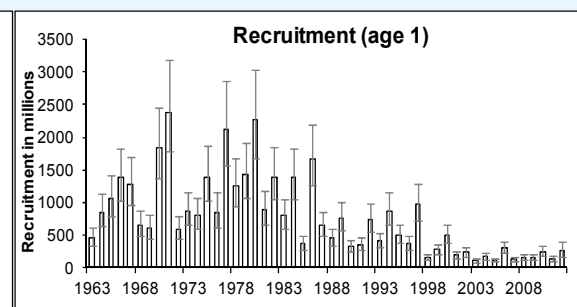
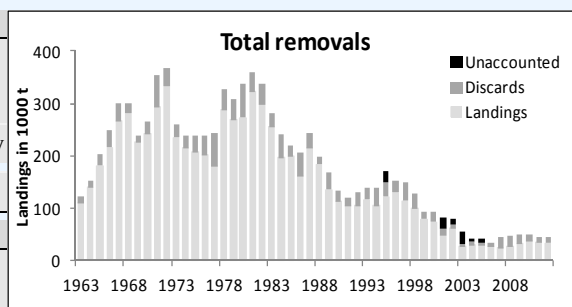
- Cod (IV, VII d, Skagerrak)
- Plaice (VII d)
- Plaice (VII e)
- Sole (VII d)
- Sole (VII e)

# Cod in Subarea IV and Divisions VIId and IIIa West

**Advice for 2014, EU/Norway MP:** Landings < 28 809 t

➔ Catch < 37 507 t, assuming discard rates as in 2012

F (Fishing Mortality)			
	2010	2011	2012
MSY ( $F_{MSY}$ )	✗	✗	✗ Above target
Precautionary approach ( $F_{pa}, F_{lim}$ )	✓	✓	✓ Harvested sustainably
Management plan ( $F_{MP}$ )	✗	✗	✓ Below target
SSB (Spawning-Stock Biomass)			
	2011	2012	2013
MSY ( $B_{trigger}$ )	✗	✗	✗ Below trigger
Precautionary approach ( $B_{pa}, B_{lim}$ )	✗	✗	○ Increased risk
Management plan ( $SSB_{MP}$ )	✗	✗	✗ Below trigger



\* Gradual improvement in last years, SSB now around  $B_{lim}$

\* F declining since 2000, now between  $F_{pa}$  and  $F_{MSY}$

\* Rec poor for over a decade

\* Discard rates declining from highest on record (in 2007; 48% in weight) to just above historical average in 2011 and 2012 (24% in weight)

\* Catch data quality improved since 2006; unaccounted removals no longer estimated from 2006



## Cod in Subarea IV and Divisions VIId and IIIa West

$F(2013)=F(2012)=0.39$ ; Landings(2013) = 41 kt, SSB(2014) = 88 kt (between  $B_{lim}$  and  $B_{pa}$ )

Rationale	Catch (2014)	Landings (2014)	Discards (2014)	Basis	$F_{total}$ (2014)	$F_{land}$ (2014)	$F_{disc}$ (2014)	SSB (2015)	%SSB Change	%TAC Change
<b>Management plan</b>	37.496	28.809	8.687	Long-term phase	0.21	0.15	0.06	127.392	+45%	-9%
<b>MSY approach</b>	21.014	16.187	4.827	$F_{MSY} \times SSB_{2014}/B_{trigger}$	0.11	0.08	0.03	141.150	+61%	-49%
<b>MSY transition</b>	36.507	28.057	8.450	Transition rule	0.20	0.14	0.06	128.251	+46%	-12%
<b>Precautionary approach</b>	10.064	7.781	2.283	$SSB_{2015} = B_{pa}$	0.05	0.04	0.01	150.000	+71%	-76%
<b>Zero catch</b>	0	0	0	$F = 0$	0	0	0	158.364	+80%	-100%
<b>Other options</b>	34.672	26.664	8.008	$F_{MSY}$	0.19	0.13	0.06	129.804	+48%	-16%
	32.988	25.382	7.606	$TAC_{2013} - 20\%$	0.18	0.13	0.05	131.145	+49%	-20%
	41.449	31.801	9.648	Constant TAC	0.23	0.16	0.07	124.147	+41%	0%
	49.722	38.088	11.634	$TAC_{2013} + 20\%$	0.28	0.20	0.08	117.281	+34%	+20%
	65.739	50.227	15.512	$F_{2013}$	0.39	0.28	0.11	104.192	+19%	+58%
<b>Mixed fisheries options – minor differences with calculation above can occur due to different methodology used</b>										
<b>Maximum</b>	96.751	78.729	18.022	A	0.75	-	-	65.054	-26%	+247%
<b>Minimum</b>	33.126	27.332	5.794	B	0.20	-	-	116.680	+33%	-14%
<b>Cod MP</b>	33.413	27.567	5.846	C	0.20	-	-	116.438	+33%	-13%
<b>SQ effort</b>	60.828	49.924	10.903	D	0.41	-	-	93.639	+7%	+57%
<b>Effort Mgt</b>	29.314	29.314	6.229	E	0.22	-	-	114.641	+31%	-8%

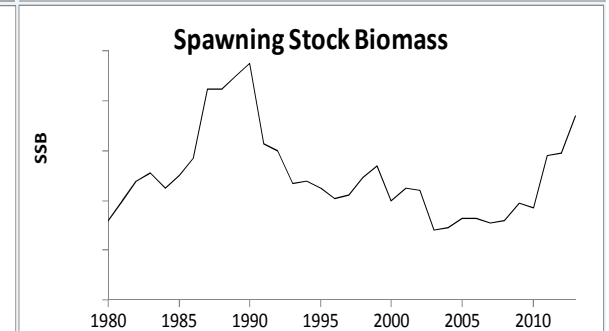
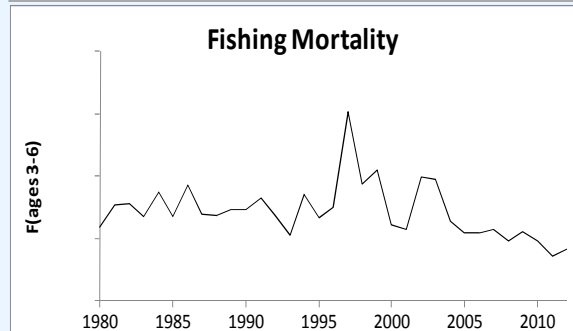
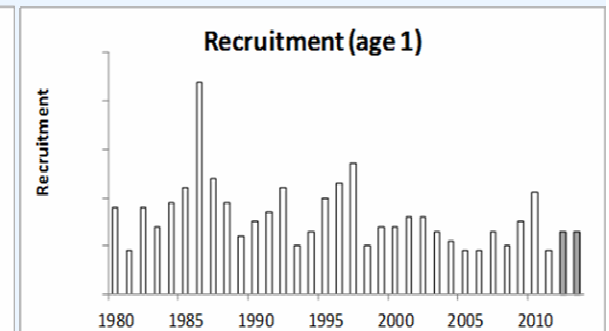
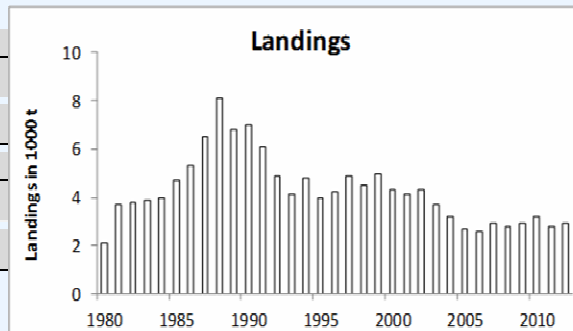
Mixed fisheries options presented in advice since 2012: Cod limiting species in North Sea in 2014. “Maximum” scenario leads to F for cod above  $F_{pa}$  (not precautionary)

# Plaice in Division VIId (Eastern Channel)

**Advice for 2014, DLS:** Plaice landings in VIId < 3 925 t; reduce discards

• Discards high, but cannot be quantified → total catch can not be calculated

	<b>F (Fishing Mortality)</b>	
	2010-2012	
Qualitative evaluation	↘	Among the lowest in time series
	<b>SSB (Spawning-Stock Biomass)</b>	
	2009-2013	
Qualitative evaluation	↗	Increasing



\* F declined since mid 1990s, now among lowest (but still almost twice  $F_{MSY}$ )

\* SSB increasing

\* Discards substantial (up to 50% in number; 80 mm mesh does not match MLS of plaice)

\* Discards not included in assessment → only indicative of trends

\* Stock category: 2

## Plaice in Division VIIId (Eastern Channel)

Landings in VIIId, 2012 ~ 3 600 t (discards high, but not quantified)

For category 2, advice based on a short-term projection aimed at reaching an  $F_{MSY}$  proxy by 2015. Uncertainty window ( $\pm 20\%$  change limit) applied to the result.

$F(2013)=0.29$  (based on TAC constraint, and assumed proportion of TAC caught in VIIId);

Landings(2013) ~ 3 000 t

Rationale	Landings all plaice in VIIId (2014)	Landings VIIId plaice stock (2014)	Basis	F landings (2014)	%SSB index change 2014-2015
<b>MSY transition</b>	3925	3016	$(F_{2010} * 0.2) + (F_{MSY} * 0.8)$	0.28	+ 18%
<i>Mixed fisheries options: minor differences with calculation above can occur due to different methodology used</i>					
Maximum	5996	4608	A	0.33	-3%
Minimum	2208	1697	B	0.11	+28%
Cod_ MP	2213	1701	C	0.11	+28%
SQ effort	4127	3171	D	0.21	+12
Effort_ Mgt	3390	2605	E	0.17	+18

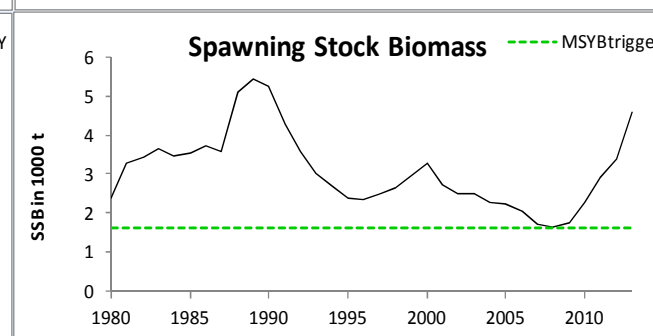
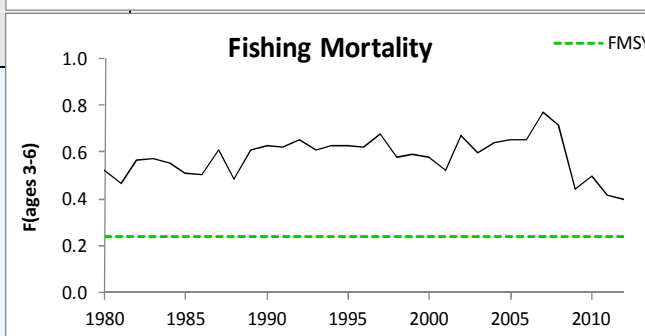
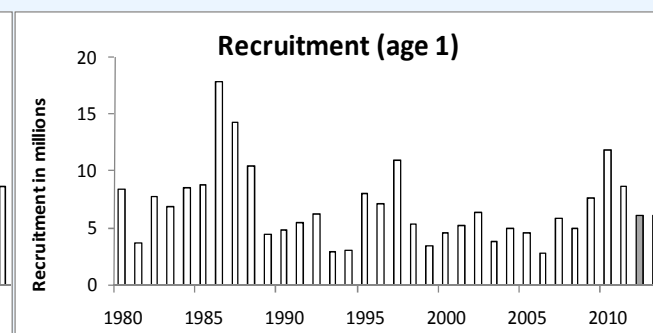
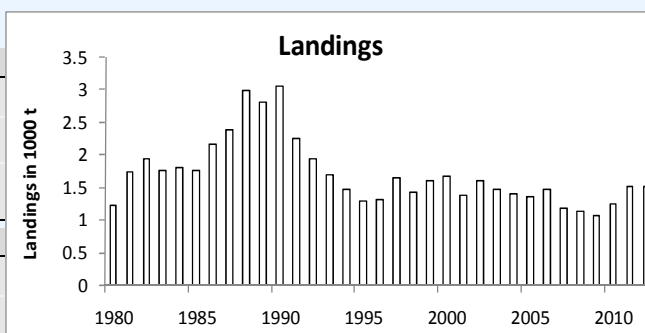
- Plaice from North Sea and VIIe are present in VIIId in Quarter 1. Assessment and advice for all 3 stocks takes account of this.
- Landings of plaice in VIIId: 3 925 t, within 20% of last 3-year average
- Stock included in North Sea mixed fisheries analysis for first time this year

# Plaice in Division VIIe (Western Channel)

**Advice for 2014, MSY transition:** Plaice landings in VIIe < 1 397 t

• Discards exist but cannot be quantified → total catch can not be calculated

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



\* F decreasing, above  $F_{MSY}$

\* SSB increasing

\* Rec 2009-2011 above average

\* Discards not in assessment, but lower than for other plaice stocks

\* Landings in VIIe, 2012 ~ 1 360 t (discards not quantified)

## Plaice in Division VIIe (Western Channel)

\* Plaice stock identity uncertainties (migration at spawning time between VIIe and VIId): accounted for in assessments and forecasts of both divisions

$F(2013)=F(2010-12)$  scaled to  $F(2012) = 0.40$ ;  $SSB(2014) = 4\,600\text{ t} > MSY B_{\text{trigger}} (1\,650\text{ t})$

Rationale	Landings plaice in VIIe (2014)	Basis	F(2014)	SSB(2015)	%SSB change
MSY approach	1148	$F_{MSY} (F_{2013} \times 0.60)$	0.24	5467	+18%
MSY transition	1397	$(0.2 \times F_{2010} + 0.8 \times F_{MSY}) = F_{2013} \times 0.73$	0.29	5227	+13%
Zero catch	0	$F = 0$	0.00	6778	+47%
Other options	948	$F_{2013} \times 0.5$	0.20	5663	+23%
	1148	$F_{2013} \times 0.6$	0.24	5467	+18%
	1341	$F_{2013} \times 0.7$	0.28	5278	+14%
	1526	$F_{2013} \times 0.8$	0.32	5096	+10%
	1704	$F_{2013} \times 0.9$	0.36	4922	+7%
	1875	$F_{2013} \times 1.0$	0.40	4755	+3%
	2040	$F_{2013} \times 1.1$	0.44	4594	-1%

Weights in tonnes

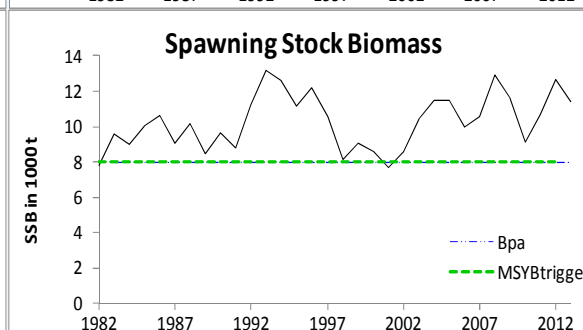
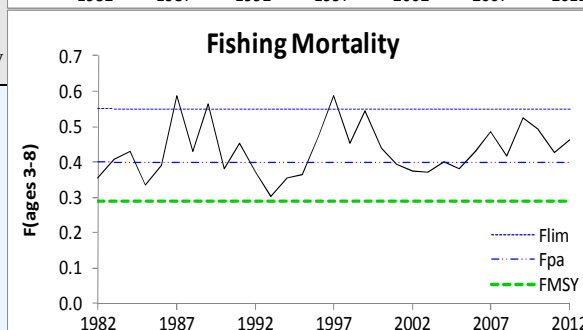
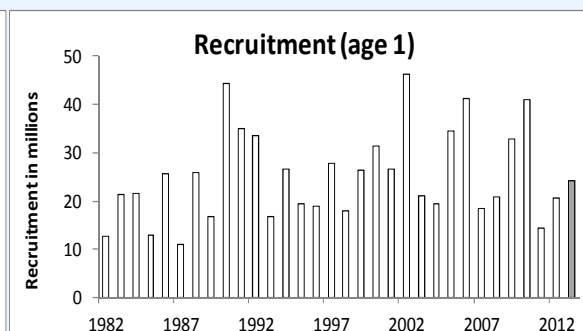
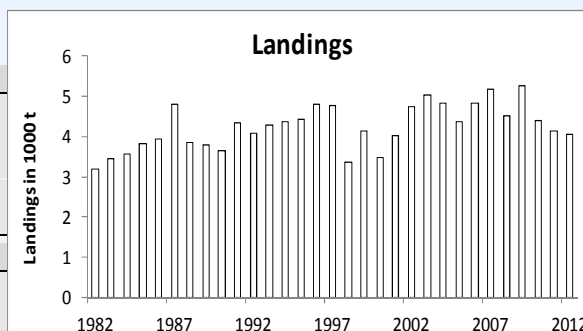
TAC is for VIId,e

# Sole VIId – Eastern Channel

**Advice for 2014, MSY transition:** Catch < 3 251 t

• All catch assumed to be landed

F (Fishing Mortality)			
	2010	2011	2012
MSY ( $F_{MSY}$ )	✘	✘	✘ Above target
Precautionary approach ( $F_{pa}, F_{lim}$ )	○	○	○ Increased risk
SSB (Spawning-Stock Biomass)			
	2011	2012	2013
MSY ( $B_{trigger}$ )	✔	✔	✔ Above trigger
Precautionary approach ( $B_{pa}, B_{lim}$ )	✔	✔	✔ Full reproductive capacity



\* SSB, Rec and F fluctuating without trend

\* SSB above MSY  $B_{trigger}$

\* F above  $F_{pa}$  and  $F_{MSY}$

\* Landings (2012) ~ 4 000 t (discards considered to be < 5%)  
High discards of plaice below MLS

## Sole in Division VIId (Eastern Channel)

$F(2013) = F(2010-12) = 0.46$ ;  $Catch(2013) = 4\,750\text{ t}$ ;  $SSB(2014) = 10\,200\text{ t} > MSY B_{trigger} (8\,000\text{ t})$

Rationale	Catches (2014)	Basis	F(2014)	SSB(2015)	%SSB change	%TAC Change
<b>MSY transition</b>	3251	$(F_{2010} * 0.2) + (F_{MSY} * 0.8)$	0.33	10 951	+8%	-45%
<b>Precautionary approach</b>	3803	$F_{pa}$	0.40	10 389	+2%	-36%
<b>Zero catch</b>	0	$F=0$	0.00	14 290	+40%	-100%
<b>Other options</b>	2894	$F_{MSY}$	0.29	11 319	+11%	-51%
	4264	$F_{2013}$	0.46	9918	-3%	-28%
	5015	TAC -15% $(F_{2013} * 1.23)$	0.57	9151	-10%	-15%
	5900	Stable TAC $(F_{2013} * 1.53)$	0.71	8249	-19%	0%
	6785	TAC +15% $(F_{2013} * 1.88)$	0.87	7349	-28%	15%
<b>Mixed fisheries options – minor differences with calculation above can occur due to different methodology used</b>						
<b>Maximum</b>	5858	A	0.70	8271	-19%	-1%
<b>Minimum</b>	2359	B	0.23	11 852	+ 16%	-60%
<b>Cod_ MP</b>	2365	C	0.23	11 845	+ 16%	-60%
<b>SQ effort</b>	4266	D	0.46	9897	+ 3%	-28%
<b>Effort_Mgt</b>	3873	E	0.41	10 299	+ 1%	-34%

Weights in tonnes

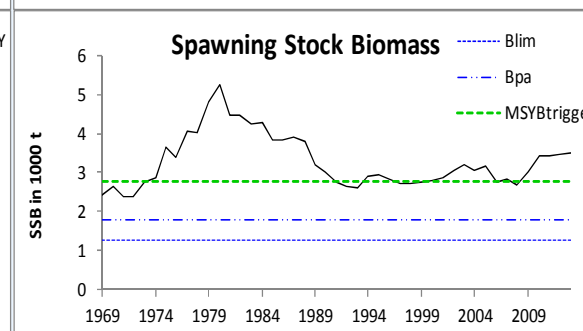
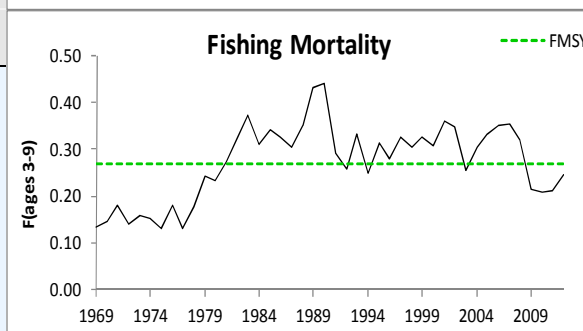
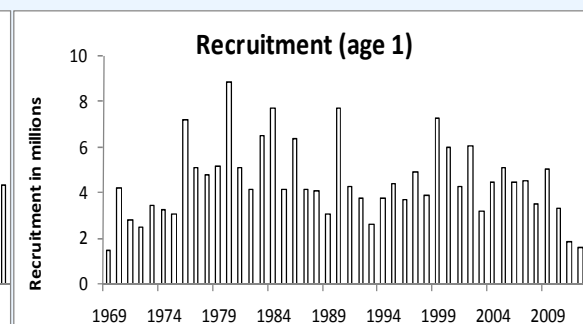
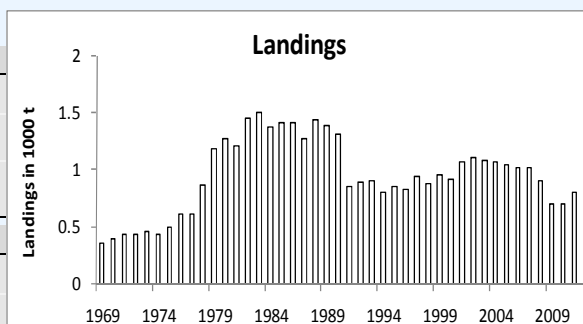
- Stock included in North Sea mixed fisheries analysis for first time this year  
“Maximum”, “Status-quo effort” and “Effort management” scenarios lead to F for sole above  $F_{pa}$  (not precautionary)

# Sole VIIe – Western Channel

**Advice for 2014, MSY:** Catch < 832 t

• All catch assumed landed

F (Fishing Mortality)			
	2010	2011	2012
MSY ( $F_{MSY}$ )	✓	✓	✓ Appropriate
Precautionary approach ( $F_{pa}, F_{lim}$ )	?	?	? Undefined
SSB (Spawning-Stock Biomass)			
	2011	2012	2013
MSY ( $B_{trigger}$ )	✓	✓	✓ Above trigger
Precautionary approach ( $B_{pa}, B_{lim}$ )	✓	✓	✓ Full reproductive capacity



\* No trends in recruitment  
2010 and 2011 yc below average

\* SSB stable for about 2 decades, above MSY  $B_{trigger}$

\* F below  $F_{MSY}$  since 2009

Landings (2012) ~ 871 t (discards low)



## Sole in Division VIIe (Western Channel)

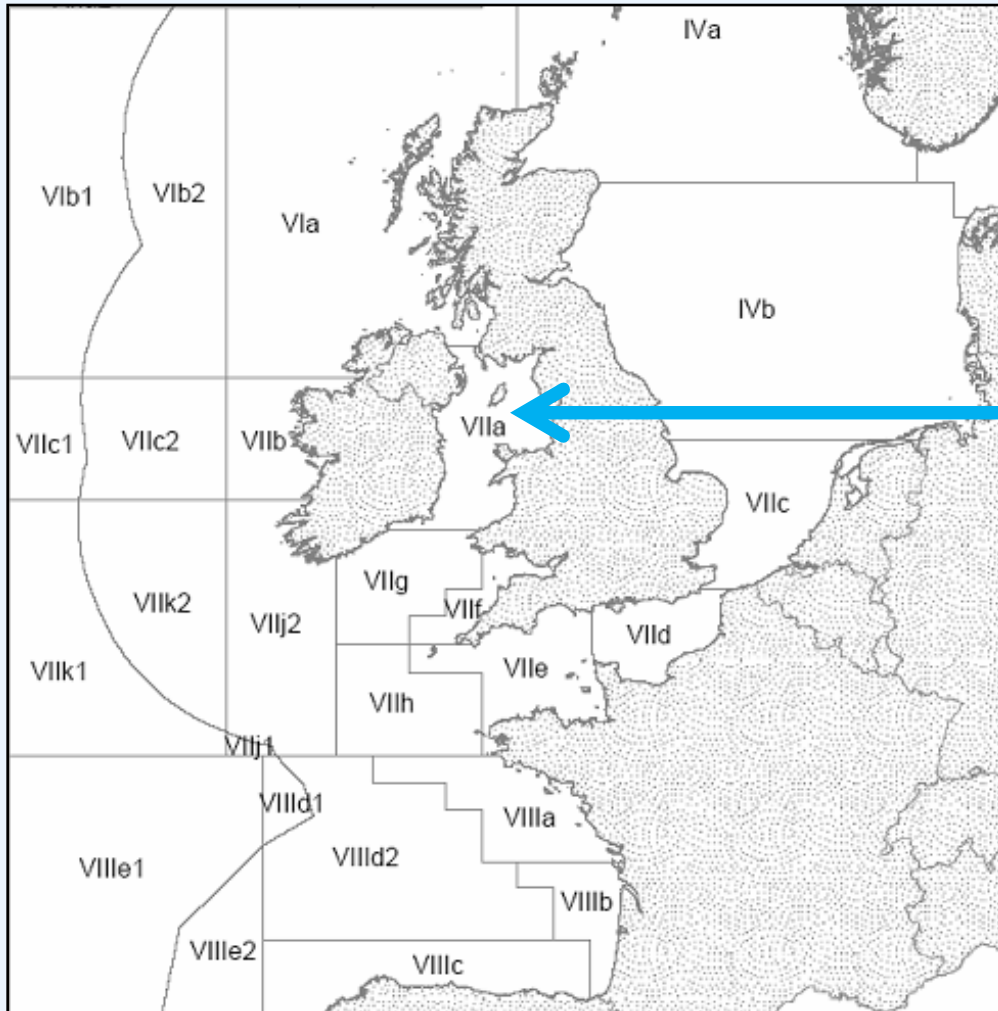
$F(2013) = F(2010-12)$  scaled to  $F(2012) = 0.25$ ; Landings(2013)=870 t; SSB(2014)= 3 100 t > MSY  $B_{trigger}$  (2 800 t)

Rationale	Catch (2014)	Basis	$F_{total}$ (2014)	SSB (2015)	%SSB Change	%TAC Change
<b>MSY approach</b>	832	$F_{MSY}$	0.27	2894	-8%	-7%
<b>Management Plan</b>	832	$F_{MP\ target}$	0.27	2894	-8%	-7%
<b>Zero catch</b>	0	$F = 0$	0	3713	+19%	-100%
<b>Other options</b>	764	$TAC_{2013} - 15\%$	0.24	2961	-5%	-15%
	1028	$TAC_{2013} + 15\%$	0.35	2701	-14%	+15%
	483	$F_{2013} \times 0.6$	0.15	3237	+3%	-46%
	628	$F_{2013} \times 0.8$	0.20	3093	-1%	-30%
	898	$F_{2013} \times 1.2$	0.30	2829	-10%	0%
	1023	$F_{2013} \times 1.4$	0.35	2706	-14%	114%

Weights in tonnes

\* Management plan has target  $F = 0.27$  with 15% TAC constraint  
ICES has not evaluated management plan

## Irish Sea (VIIa)



- Cod
- Haddock
- Whiting
- Plaice
- Sole
- *Nephrops* (FUs 14-15-19) in autumn

## Cod in Division VIIa (Irish Sea)

### Advice for 2014, MSY:

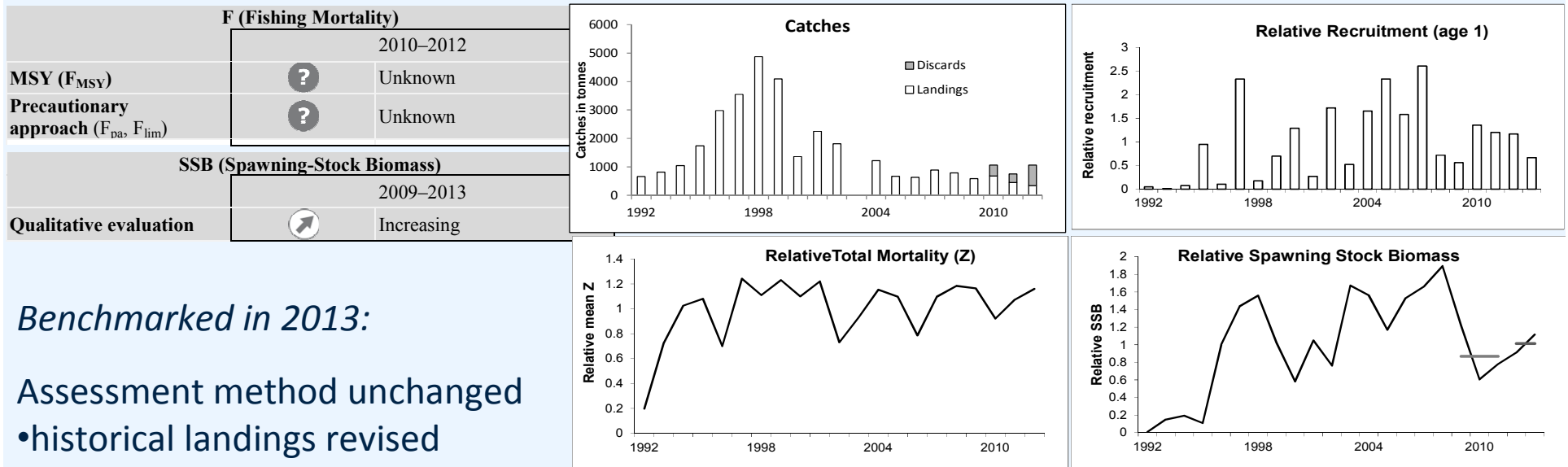
- Advice issued in 2012 was biennial (for 2013 and 2014):  
No directed fisheries; bycatch and discards minimised
  
- Assessment method: age-based analytical
- Model estimates of total removals around 2-3 times the reported landings, despite more accurate catch reporting  
Causes for discrepancy unclear
- Tagging studies indicate only limited movement of cod out of Division VIIa
- Discard estimates not integrated in assessment due to the short time-series
- New assessment method adopted at 2012 benchmark – has not changed stock perception, but indicates declining mortality rates

# Haddock in Division VIIa (Irish Sea)

**Advice for 2014, DLS:** Catch < 1 120 t

➔ Landings < 572 t, assuming discard rates stay at last 3-year average

•further technical measures to reduce discards



*Benchmarked in 2013:*

Assessment method unchanged

- historical landings revised
- discards data for 2010-12

➔ *This brings some differences to the advice this year when compared to last year*

\* Assessment: survey-based, only indicative of trends

\* Stock category: 3. Uses SSB from assessment as indicator: Trend in last 5 years: 17% increase

1. Uncertainty window: 17% increase

2. Precautionary margin: No, because effort reduction in main fisheries

# Whiting in Division VIIa (Irish Sea)

## **Advice for 2014, precautionary considerations:**

- Advice issued in 2012 was biennial (for 2013 and 2014):  
lowest possible catch; technical measures to reduce discards
  
- Assessment method: survey-based, only indicative of trends
- Survey data consistent indicate high total mortality and low stock size
- Discard estimates since 2007 show that more than 1 000 t of whiting discarded annually, with ~50 t of landings.

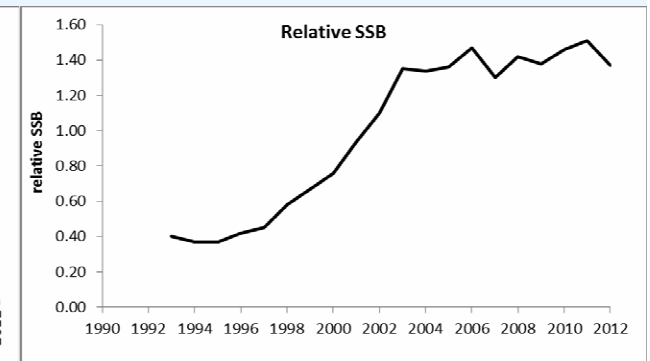
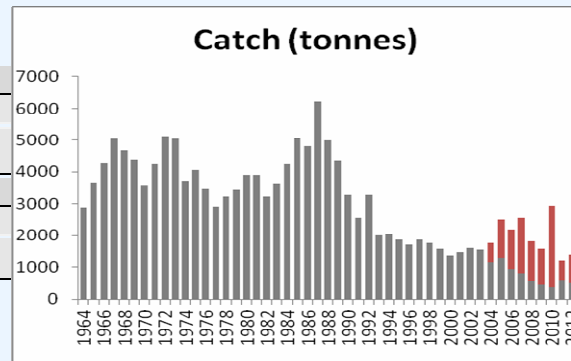
Majority of discards below MLS

# Plaice in Division VIIa (Irish Sea)

**Advice for 2014, DLS:** Catch < 1 827 t

➔ Landings < 497 t, assuming discard rates stay at last 3-year average

	<b>F (Fishing Mortality)</b>	
	2010–2012	
<b>Qualitative evaluation</b>	✓	Below poss. reference points
	<b>SSB (Spawning-Stock Biomass)</b>	
	2008–2012	
<b>Qualitative evaluation</b>	✓	Above poss. reference points



\* Assessment only indicative of trends

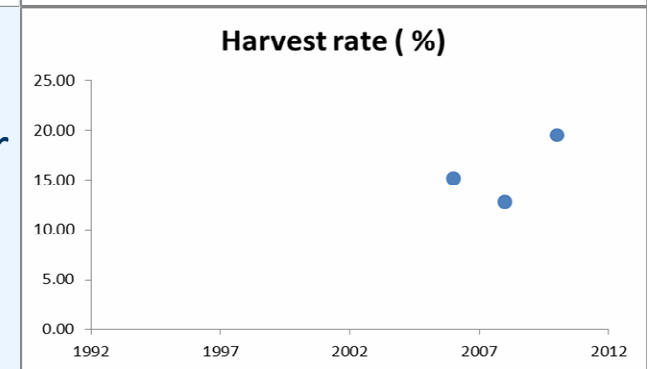
\* Stock category: 3. SSB from assessment as stock indicator

Trend in last 5 years: 1% increase

1. Uncertainty window: 1% increase

2. Precautionary margin: No, because recent F likely very low (Catch/SSB ~ 15% in recent years)

➔ Result: 1% increase, applied to average catch of last 3 years

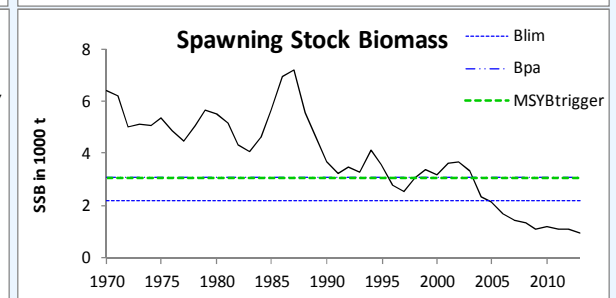
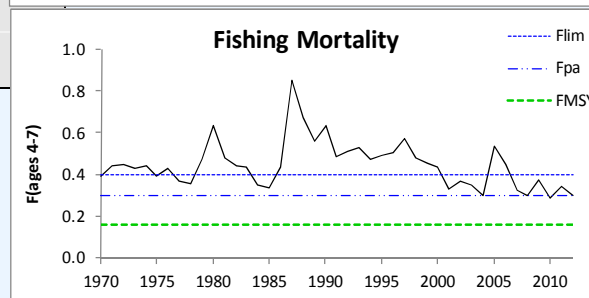
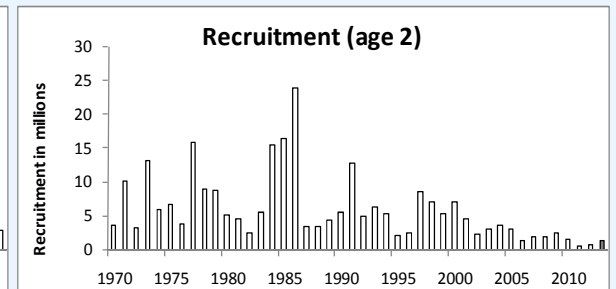
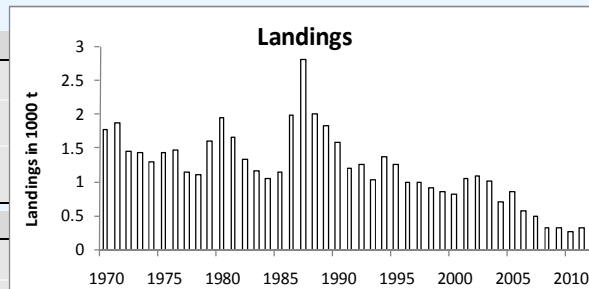


**Benchmark in 2014**

# Sole in Division VIIa (Irish Sea)

**Advice for 2014, MSY:** No directed fisheries; bycatch and discards should be minimised

F (Fishing Mortality)			
	2010	2011	2012
MSY ( $F_{MSY}$ )	✗	✗	✗ Above target
Precautionary approach ( $F_{pa}, F_{lim}$ )	✓	⦿	⦿ Increased risk
SSB (Spawning-Stock Biomass)			
	2011	2012	2013
MSY ( $B_{trigger}$ )	✗	✗	✗ Below trigger
Precautionary approach ( $B_{pa}, B_{lim}$ )	✗	✗	✗ Reduced reproductive capacity



In last decade:

- \* SSB declined continuously and is now at historic minimum
- \* F stable around  $F_{pa}$
- \* Recruitment lower than previously; Rec in 2011 and 2012 lowest in time series

# Sole in Division VIIa (Irish Sea)

\* Landings 2012 ~ 290 t (discards ~ 5%)

\* Discards not included in assessment (not considered problematic)

F(2013)=0.16 (TAC constraint); Catch(2013)=140 t ; SSB(2014) = 1 048 t < B<sub>lim</sub> (2 200 t )

$$F_{MSY} = 0.16$$

Rationale	Catches (2014)	Basis	F(2014)	SSB(2015)	%SSB change	%TAC Change
<b>MSY approach</b>	52	$F_{HCR-MSY} = \frac{F_{MSY} \times SSB_{(2014)}}{MSY B_{trigger}}$	0.05	1278	+22%	-62%
<b>MSY transition</b>	95	$0.2 \times F_{(2010)} + 0.8 \times F_{HCR-MSY}$	0.10	1237	+18%	-32%
<b>Precautionary approach</b>	0	$SSB_{2015} > B_{pa}$	0	1328	+27%	-100%
<b>Zero catch</b>	0	$F = 0$	0	1328	+27%	-100%
<b>Other options</b>	105	TAC - 25% ( $F_{2013} \times 0.69$ )	0.11	1228	+17%	-25%
	119	TAC - 15% ( $F_{2013} \times 0.78$ )	0.13	1215	+16%	-15%
	140	Stable TAC	0.15	1196	+14%	0%
	147	$F_{2013}$	0.16	1189	+13%	+5%
	161	TAC + 15% ( $F_{2013} \times 1.08$ )	0.18	1176	+12%	+15%

Weights in tonnes

Even with no catch in 2014, the stock will remain well below B<sub>lim</sub> in 2015

Given very low SSB and Rec in recent years → catch advice = 0



# Thank you



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l'Exploration de la Mer