

ICES Widely Distributed and Migratory Stocks - Pelagic - autumn 2015

Marine Scotland - Science



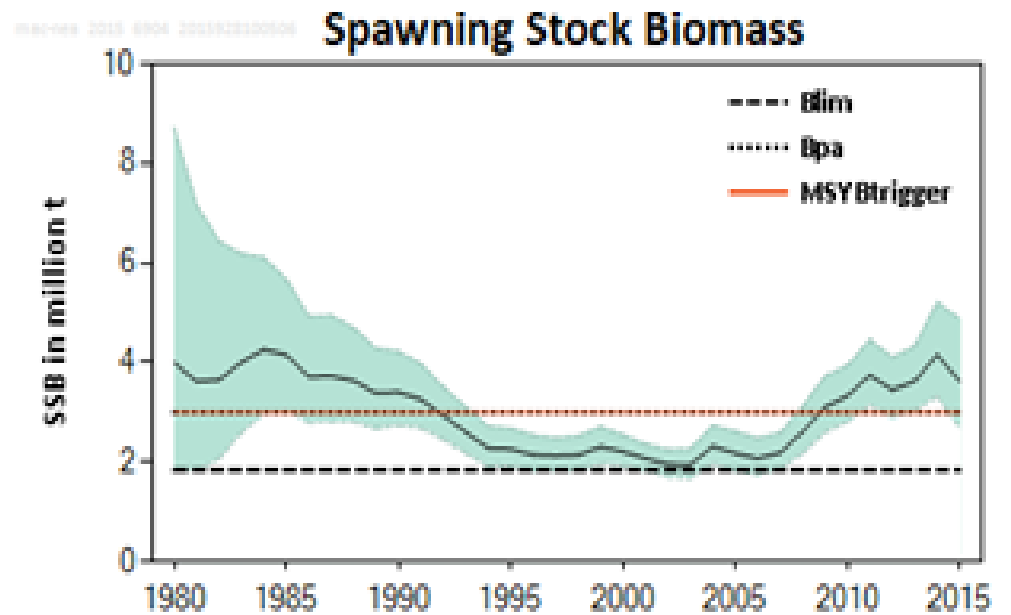
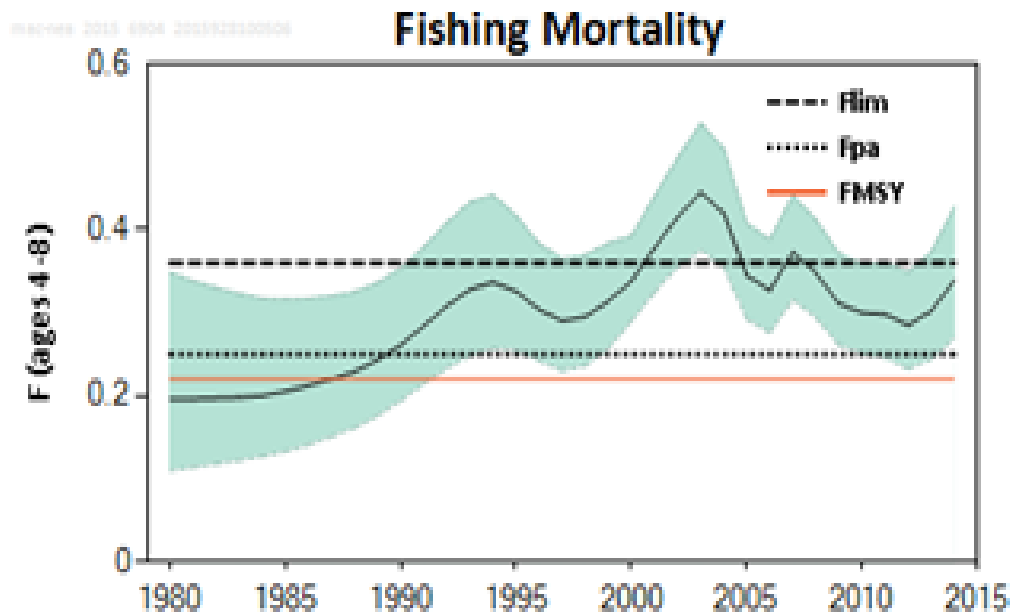
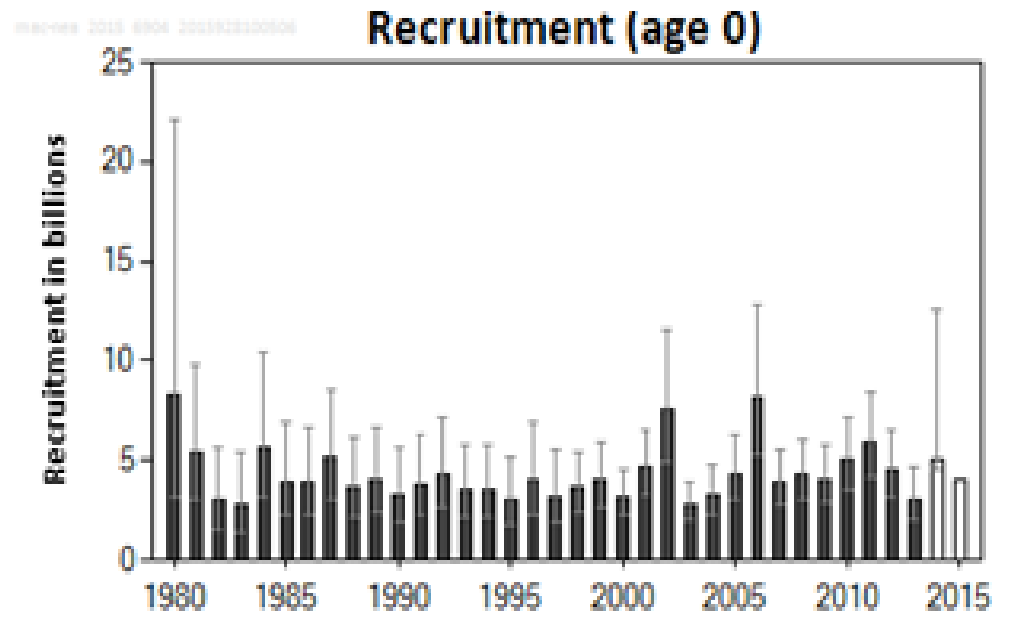
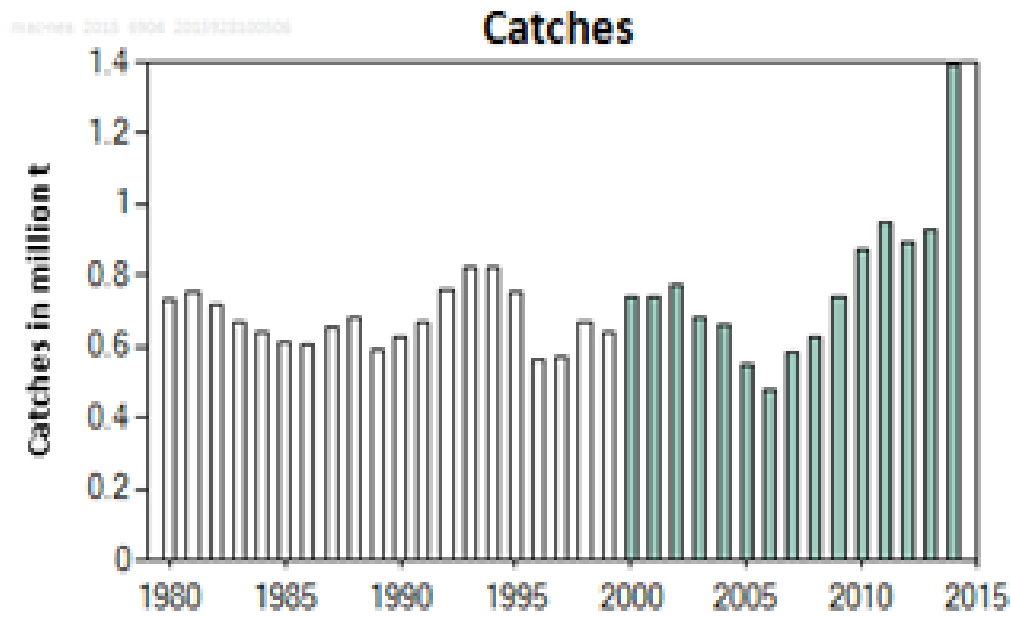
The Scottish
Government

marinescotland
science

Today's stocks

- **Mackerel**
- **Atlanto-Scandian herring**
- **Blue whiting**
- **Horse mackerel**
- **Horse mackerel North sea**
- **Boar Fish**

Mackerel



Mackerel

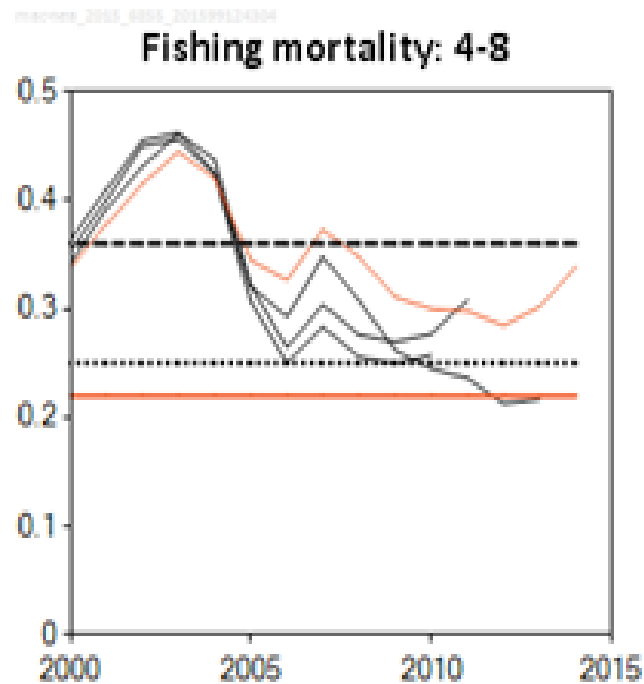
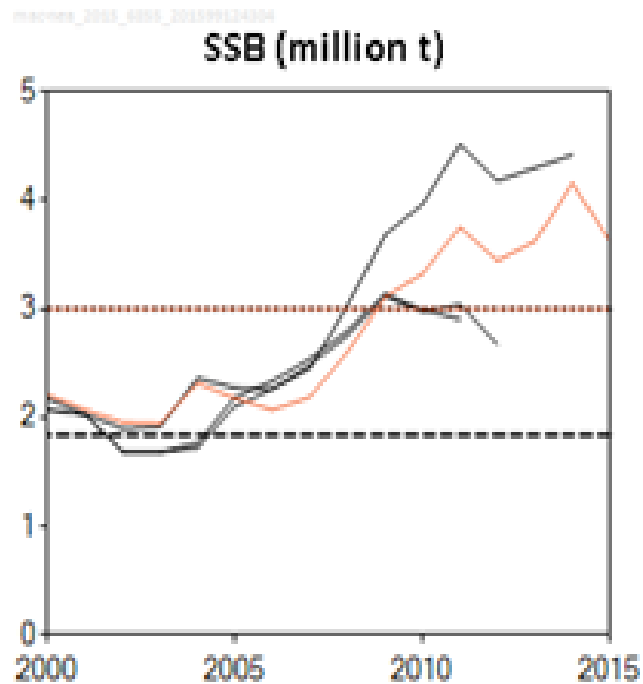
		Fishing pressure			Stock size		
		2012	2013	2014	2013	2014	2015
Maximum sustainable yield	F_{MSY}	✘	✘	✘	Above	MSY B _{trigger}	✓ ✓ ✓ Above trigger
Precautionary approach	F_{pa} , F_{lim}	○	○	○	Increased risk	B _{pa} , B _{lim}	✓ ✓ ✓ Full reproductive capacity
Management plan	F_{MGT}	-	-	-	Not applicable	SSB _{MGT}	- - - Not applicable

- **Assessment unstable and perception revised**
- **F is above F_{pa} but remains below F_{lim} and the high values of the early 2000s**
- **SSB has increased – above B_{pa} and B trigger**
- **Good recruitments**
 - 2002 and 2006 very large, 2011 also good but 2013 one of lowest

Mackerel advice

- **No current management plan**
- **ICES advises that when the MSY approach is applied, catches in 2016 should be no more than 667 385 tonnes**
 - **Represents TAC change -37%**
 - **Represents a 46% change on assumed large catch in 2015**
 - **Represents advice change -20% to -26%**
- **ICES further advises that the existing measures to protect the North Sea spawning component should remain in place.**

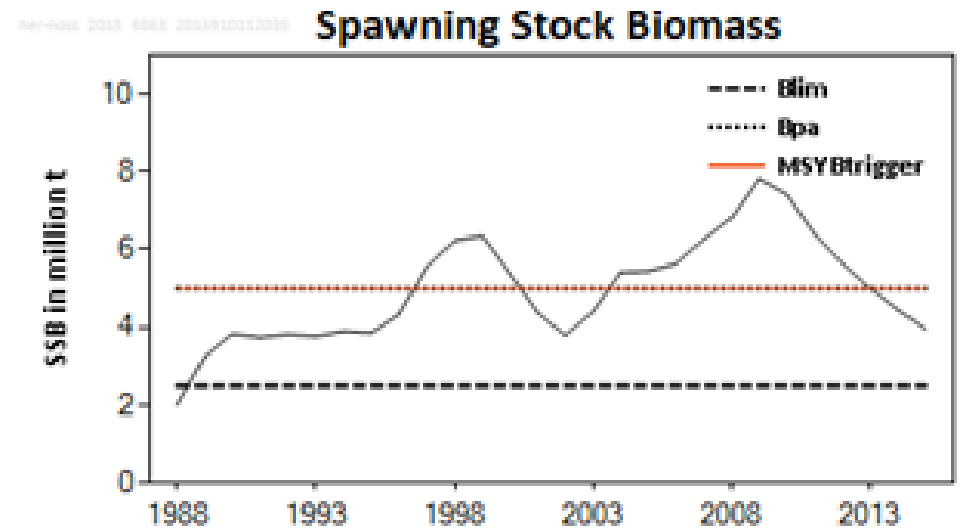
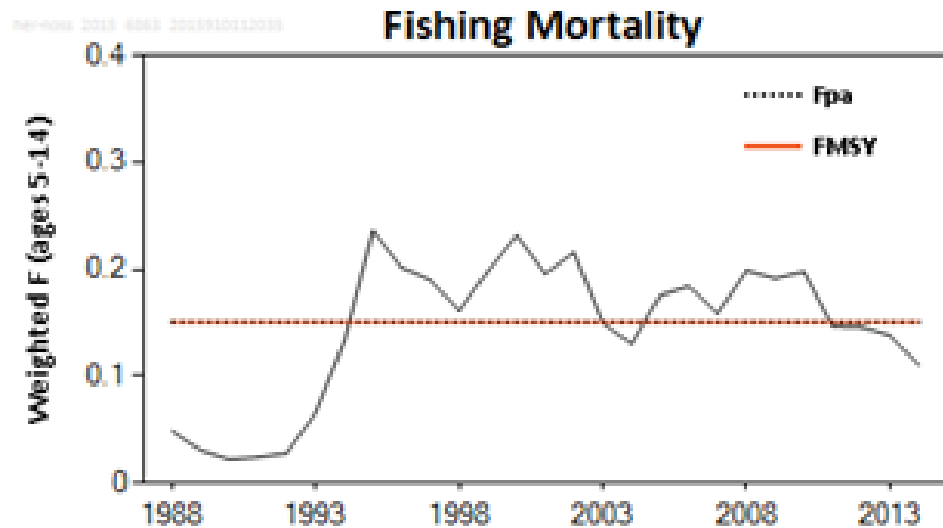
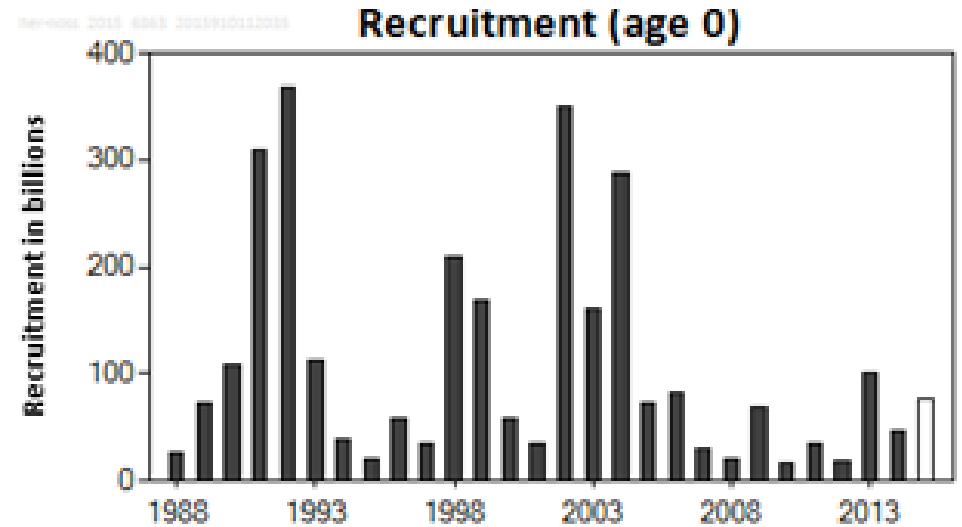
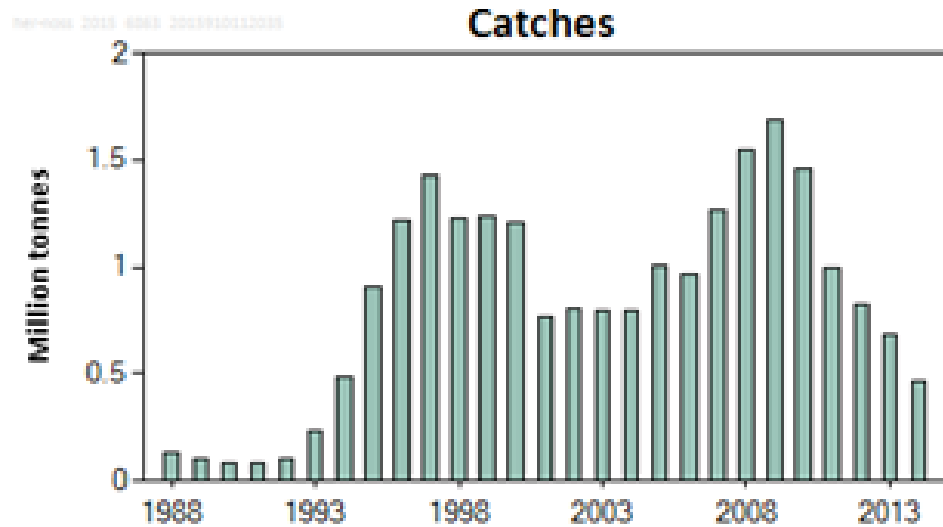
Mackerel – why the revision from last year?



Mackerel – why the revision from last year?

- Assessment uses catch data, tag data and egg , IBTS and IESSNS surveys. There were numerous revisions to these series
- Simple update assessment rejected, model unrealistically taking most signal from IBTS
- Exploratory runs including/excluding certain series produced variable results – no obvious solution.
- Model reconfigured to adjust constraints and ‘behaved better’ when a recruit model was used (Ricker) instead of random walk. This was used in final assessment.
- Appears model is sensitive to each data source and even individual points
- Of particular concern is the v short Nordic ecosystem survey, the 2015 data point resulted in the revised SSB – earliest point in survey is still however, influential and appears to be an outlier.
- Next year’s egg survey will, again be very important.

Atlanto Scandian herring



Atlanto Scandian herring

		Fishing pressure			Stock size		
		2012	2013	2014	2013	2014	2015
Maximum sustainable yield	F_{MSY}	✓	✓	✓	MSY	✓	✗
Precautionary approach	F_{pa}	✓	✓	✓	$B_{trigger}$	✗	✗
Management plan	F_{MGT}	✗	✗	✓	B_{pa}, B_{lim}	○	○
				Appropriate	SSB_{MGT}	✓	✗
				Harvested sustainably			✗
				Appropriate			Below $B_{trigger}$
							Increased risk
							Below trigger

- **Stock not presently in v good shape**
- **Fishing mortality in 2014 was below F_{pa} and F_{MSY} and the management plan target F.**
- **Biomass declining and below B_{pa} in 2014**
- **2013 recruitment estimated to be quite good but other recent years (since 2005) not good**

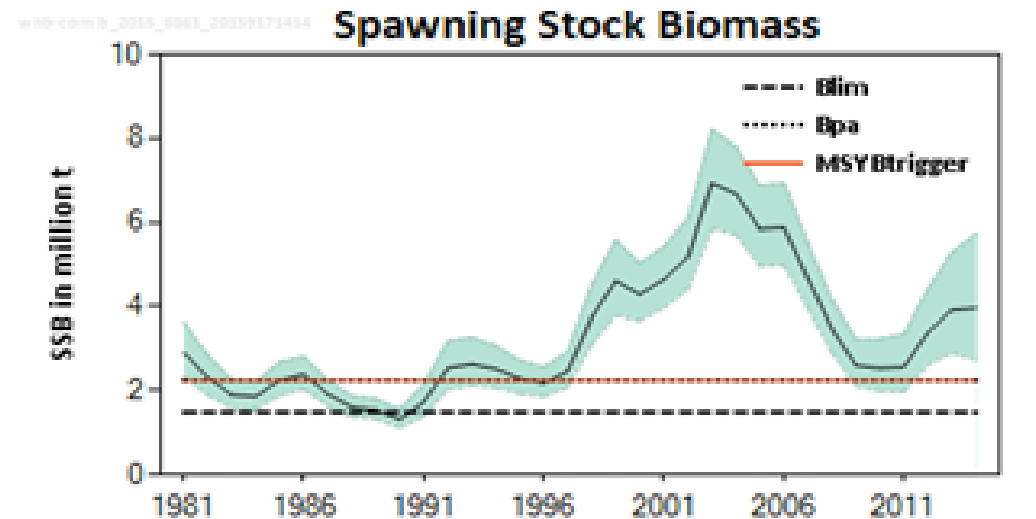
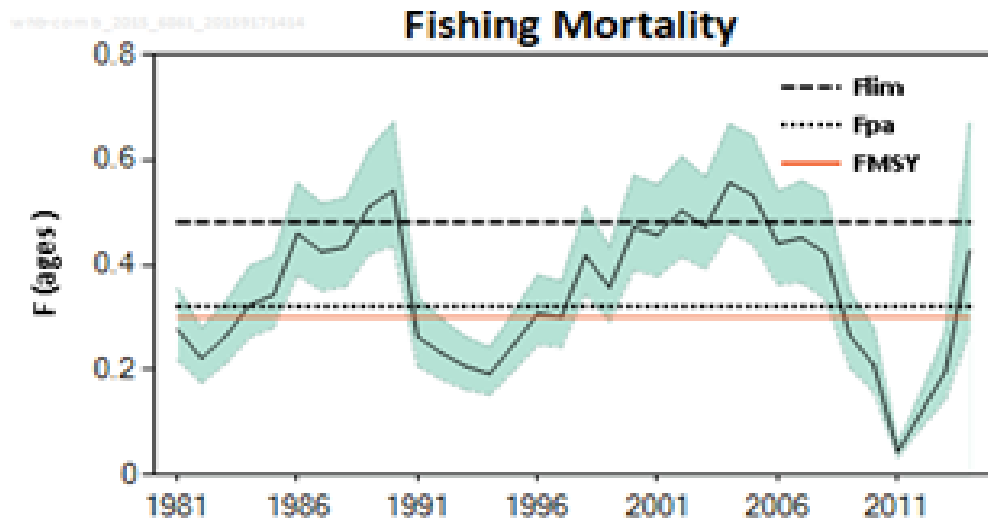
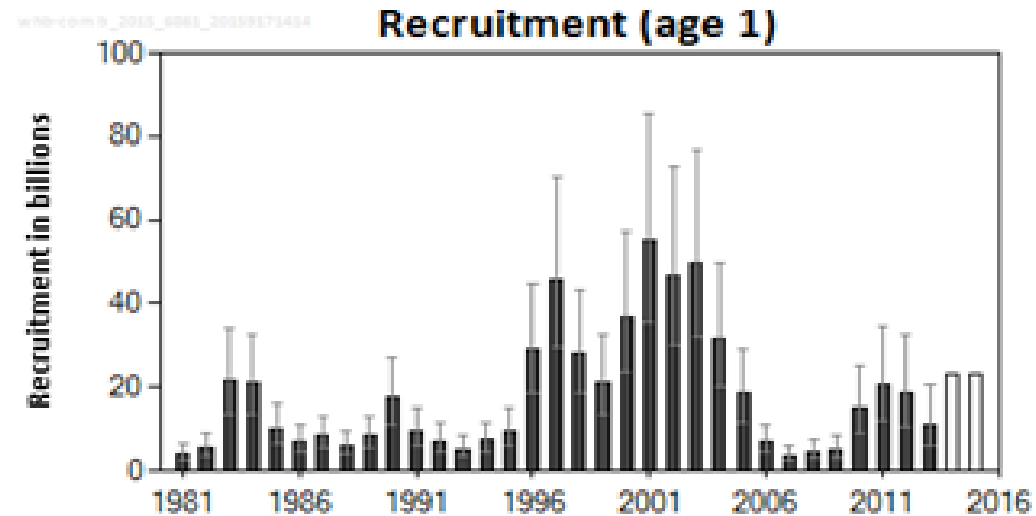
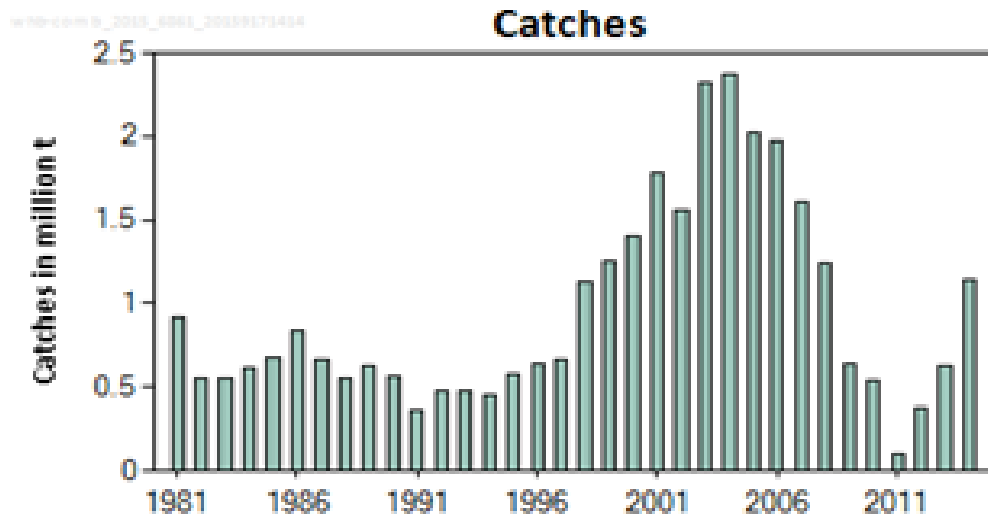
Atlanto Scandian herring advice

- **Man. plan EU, Faroes, Iceland, Norway, Russia**
- **ICES advises that when the EU, Faroe Islands, Iceland, Norway, and Russia management plan is applied, catches in 2016 should be no more than 316 876 tonnes.**

Represents a +12% TAC change

Represents a -3% change in catches based on assumed 2015 catch

Blue whiting



Blue whiting

		Fishing pressure			Stock size		
		2012	2013	2014	2013	2014	2015
Maximum sustainable yield	F_{MSY}	✓	✓	✗ Above	MSY	✓	✓
Precautionary approach	F_{par} , F_{lim}	✓	✓	⚠ Increased risk	$B_{trigger}$	✓	✓
Management plan	F_{MGT}	-	-	- Not applicable	B_{par} , B_{lim}	✓	✓
					SSB_{MGT}	-	-
							✓ Above trigger
							✓ Full reproductive capacity
							- Not applicable

- **Substantial downward revision – model uncertainty**
- **Stock has been doing reasonably well since 2010**
- **Fishing mortality (F) has increased from a historical low in 2011 to above F_{MSY} in 2014.**
- **Biomass has increased since 2010 now just under 4 million t**
- **A series of good recruitments since 2010 and above average in 2014 and 2015**

Blue whiting

- **No current management plan**
- **ICES advises that when the MSY approach is applied, catches in 2016 should be no more than 776 391 tonnes**

Represents a -40% catch change (based on estimated 2015 catches

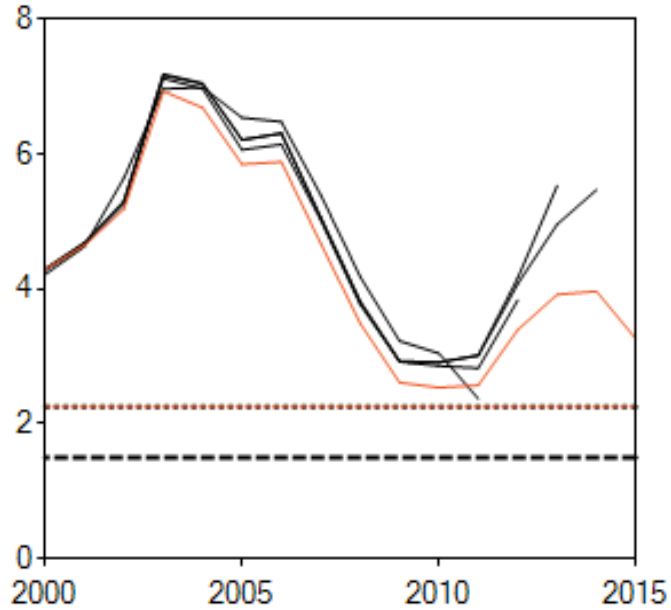
Represents a -38 % catch change based on TAC

Represents a -7.6% change from last years advice

Blue whiting – so why a downward revision?

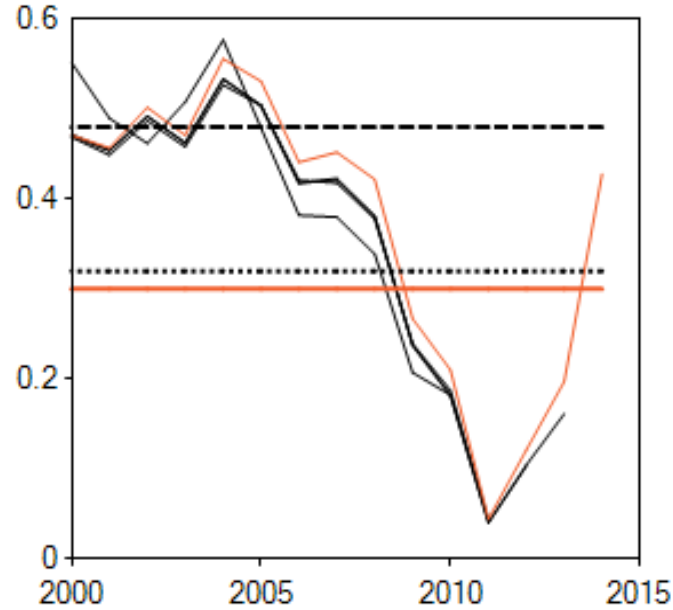
whb-comb_2015_6861_20158311526

SSB (million t)



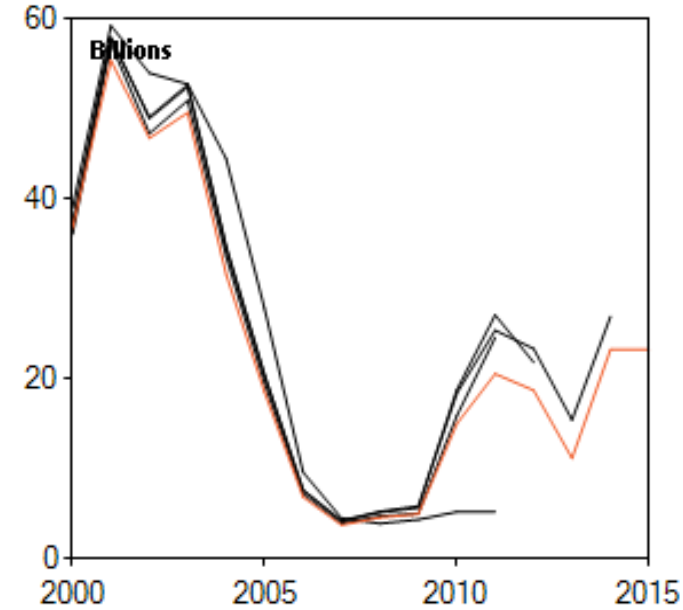
whb-comb_2015_6861_20158311526

Fishing mortality:



whb-comb_2015_6861_20158311526

Recruitment. Age: 1



Blue whiting – so why a downward revision?

- Assessment uses catch data and the results from international blue whiting spawning stock survey (other indices used qualitatively to adjust recruitment series)
- The Survey results in 2015 were very different from the previous year and estimated a huge (58%) reduction in stock biomass and 47% reduction in numbers. This was largely driven by the absence of the strong age classes (4-6) in the previous year.
- The SAM assessment reflected the large reduction but is now considered uncertain and further development required
- Several other assessment models were tried generally confirming the major drop in SSB or proving too uncertain to be reliably used.

Blue whiting - Revised long term management strategy



Stefan Asmundsson
The North East Atlantic Fisheries Commission
22 Berners Street
W1T 3DY London
United Kingdom

International Council for the
Exploration of the Sea

Conseil International pour
l'Exploration de la Mer

General Secretary:
Anne Christine Bruandorf

H. C. Andersen Boulevard 44-46
DK-1583 Copenhagen V
Denmark

Telephone: (45) 33 38 67 00
Telefax: (45) 33 93 42 15
E-mail: info@ices.dk
www.ices.dk

Our Ref: C.24/CM/hs

29 September 2015

Subject: ICES advice on NEAFC request on blue whiting management strategy evaluation

Dear Stefan,

The NEAFC request to ICES to evaluate some long-term management strategies for blue whiting has been considered by ICES Working Group on Widely Distributed Stocks (WGWIDE) and ICES Advisory Committee (ACOM) during the past months. However, due to unforeseen problems with the estimation of the uncertainty in the stock assessment, ICES is currently unable to provide advice on this request.

An important parameter in the method used by ICES in evaluating management strategies is the uncertainty associated with the estimation of the stock size and the fishing mortality; and the results of the evaluation is dependent on the level of uncertainty. These uncertainty estimates are normally taken from the latest assessment to reflect the current situation. For the questions that NEAFC has asked relating specifically to the period of five and ten years into the future, the uncertainty in the current state of the stock is critically important.

This year's 2015 assessment of blue whiting exhibits a significant downward revision of the stock size compared to the previous assessment conducted in 2014. Analyses of the assessment outcome indicate that the estimate of the assessment uncertainty based on the latest 2015 assessment gives an underestimation of the true uncertainty associated with the estimation of the stock size and exploitation rate. This evident when comparing the model derived uncertainty which appears to be only 50% with the historic revision of advice over the last 10 years.

Further model developments are required to address the assessment uncertainty, through an inter-benchmark, before ICES will be in the position to evaluate the management strategies requested.

Despite these considerations of uncertainty, ICES would like to reassure NEAFC that we will provide the recurrent catch advice for this stock at the agreed date at 30 September 2015. In the advice sheet further details will be

given on the implication of the uncertainties mentioned above for 2016 catch advice.

There will be no cost implication for NEAFC for the work that ICES has carried out on this request to date.

With best regards,

A handwritten signature in black ink that reads 'Cristina Morgado'.

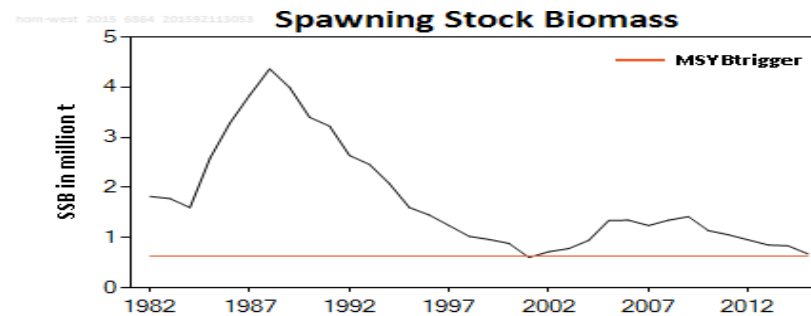
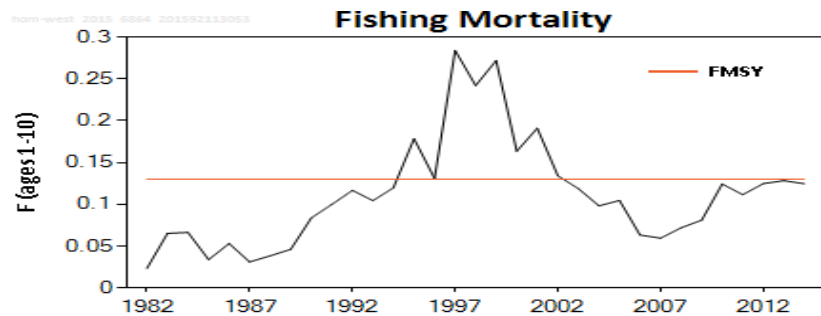
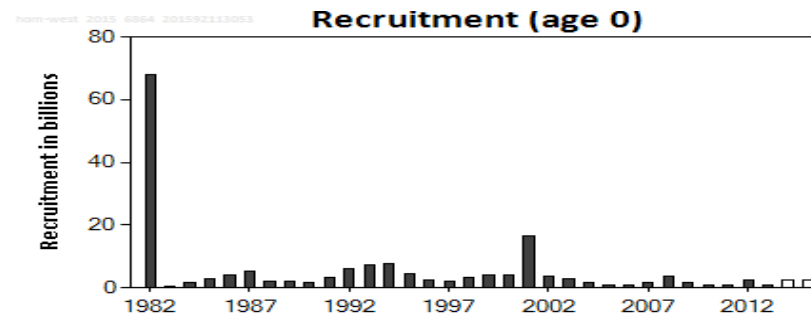
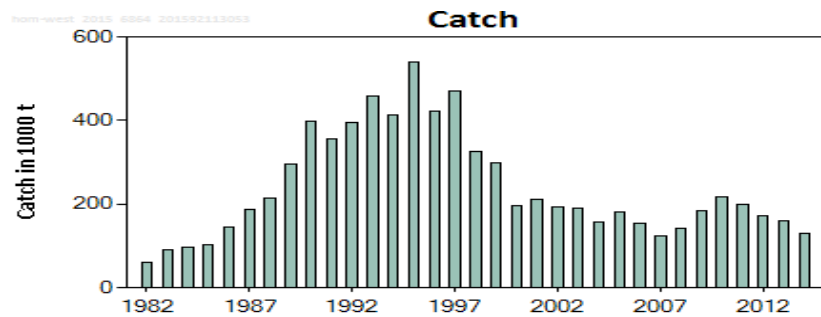
Cristina Morgado

Head of ACOM Support

Blue whiting – Revised long term management strategy

- Considerable assessment model uncertainty which would need to be taken account of in evaluation
- Uncertainty considered to be underestimated in the 2015 evaluation (based on 2015 WGWIDE)
- Not robust enough to evaluate the range of questions. More model development and a benchmark required
- To ‘fit’ the very low survey indices in the assessment model, calculated F is unrealistically high and catch and SBB at Jan 1 2015 over optimistic
- Other model runs at the WG produced very variable results and less optimistic scenarios.

Horse mackerel (western)



reference points.

		Fishing pressure			Stock size				
		2012	2013	2014	2013	2014	2015		
Maximum sustainable yield	F_{MSY}	✓	✓	✓	MSY	✓	✓	✓	Above
Precautionary approach	F_{pa} , F_{lim}	?	?	?	B_{pa} , B_{lim}	?	?	?	Undefined
Management plan	F_{MGT}	-	-	-	SSB_{MGT}	-	-	-	Not applicable

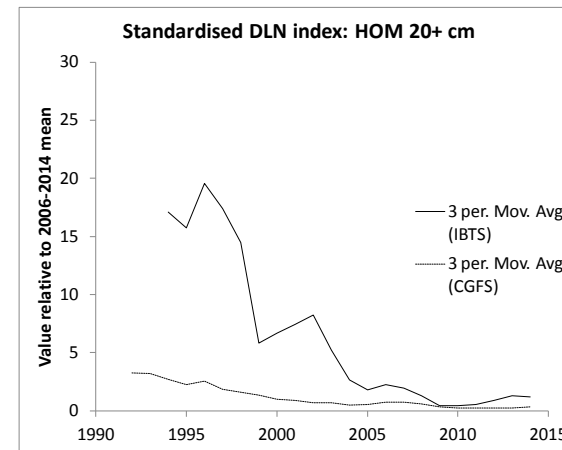
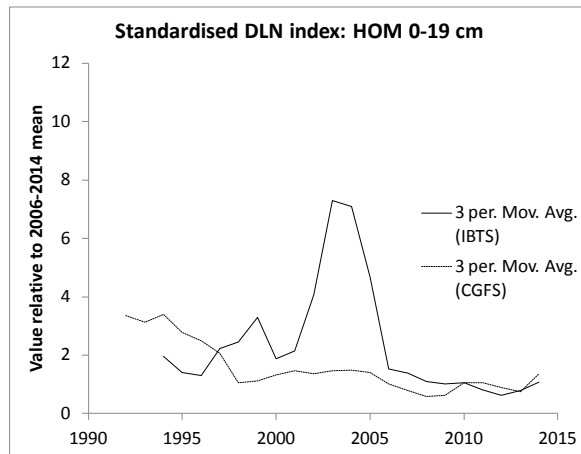
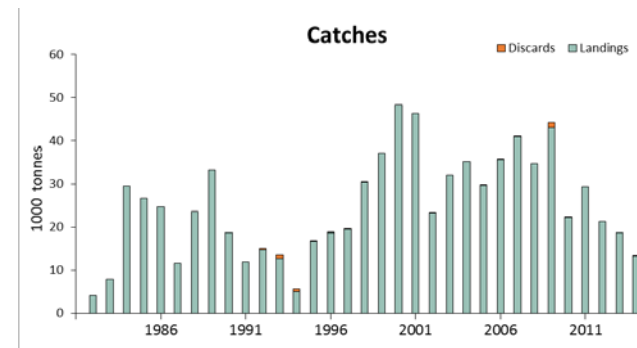
Horse mackerel (western)

- Stock dependent on occasional recruitments**
- F has increased since 2007 but is estimated just below Fmsy**
- SSB has declined and is now just above Bmsy trigger**
- Recruitment has been low since 2002**

- ICES advises that when the MSY approach is applied, catches in 2016 should be no more than 126 103 tonnes**

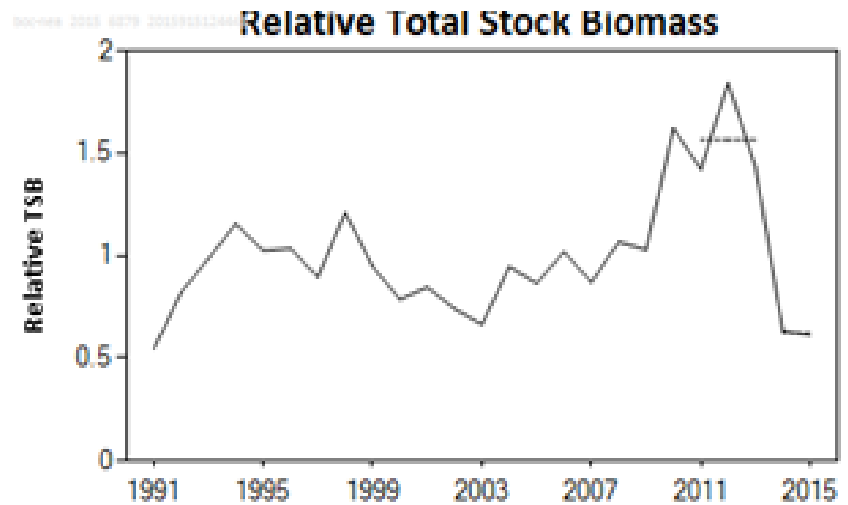
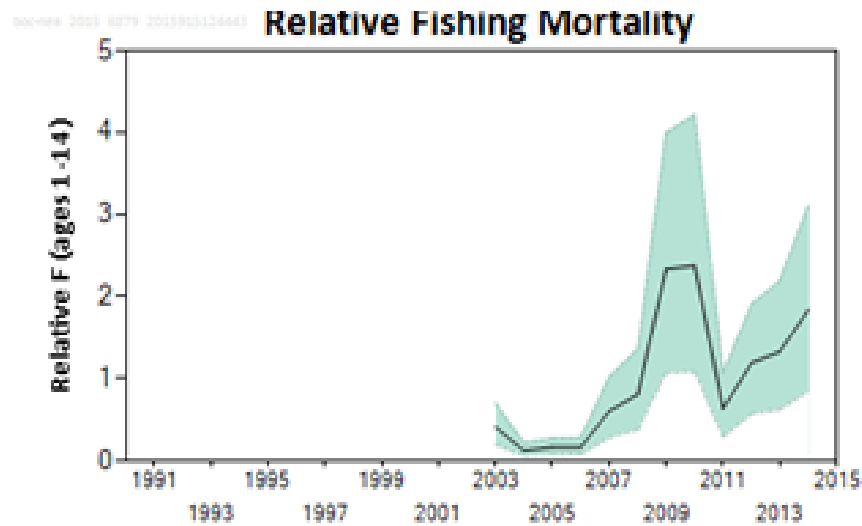
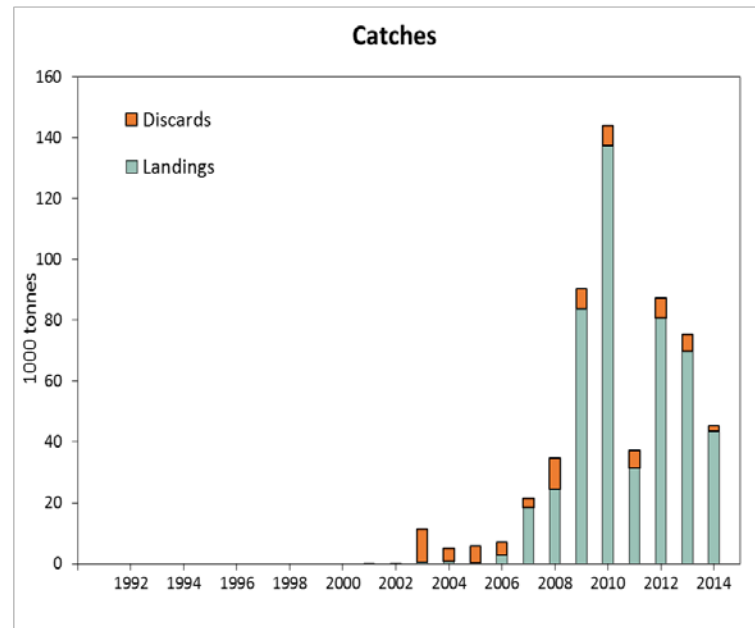
Represents a 27% TAC increase (similar to increase on 2014 advice)

Horse mackerel (NSea)



- Catches declining slowly, state of stock not well understood
- Survey results suggest some stability but biomass and state of exploitation not known
- Large TAC reduction for 2015 – impact not yet clear
- ICES recommends no change in advice from last year this corresponds to catches < 15200t

Boar fish



Boar fish

- **Stock status currently unknown**
- **Survey and exploratory assessment suggests biomass declining sharply**
- **Fishing mortality is has risen in the last 3 years**

- **ICES advises that when the precautionary approach is applied, catches in 2016 should be no more than 42 637 tonnes.**

This represents a 20% reduction on the advice for last year

Pelagic stocks – flexibilities Q to ICES

- In general, principle of flexibility from one year to next not considered to be a problem.**
- 10% flexibility unlikely to be of concern if repeated in successive years, but 20-30% flexibilities may become problematic.**
- Evaluations of a range of species suggest limited problems with several herring stocks and some horse mackerel stocks**
- Concern that for mackerel and bluewhiting the, already, excessive fishing mortalities would create difficulties if flexibilities of the size suggested were put in place.**
- For North Sea horse mackerel, the advice has not been F based and so appropriate evaluation not possible**
- For stocks with zero TAC proposals the flexibility is not really appropriate.**