

International Council for
the Exploration of the Sea
Coryell International post
Chapmanville, Idaho

FAO. VI-200

Equidistant azimuthal projection

Background to the ICES fisheries advice framework



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1998 ICES PA approach

Avoid recruitment impairment

2002 WSSD rebuild fisheries to MSY by 2015

2006 EU MSY Policy

2009 – ICES MSY framework

Getting the best from the marine
ecosystem

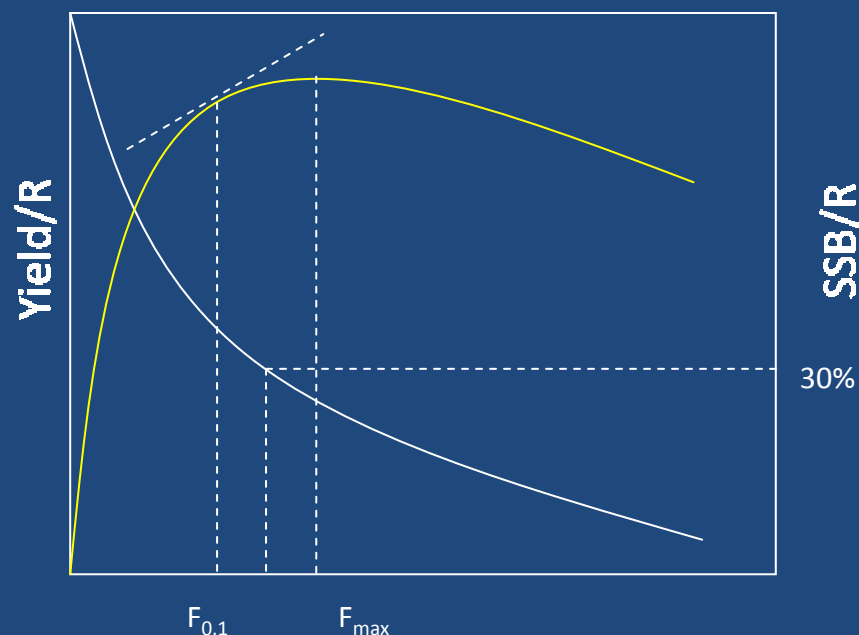


MSY Framework Reference Points

Advice is provided in relation to biological reference points intended to maximise long term yields and maintain biomass within precautionary limits

F_{MSY} is the fishing mortality that in the long-term will maximize yield.

$B_{trigger}$ is a biomass reference point that triggers a cautious response: “A cautious biomass triggering action to maintain a stock within a desirable stock size range”





MSY Framework Reference Points

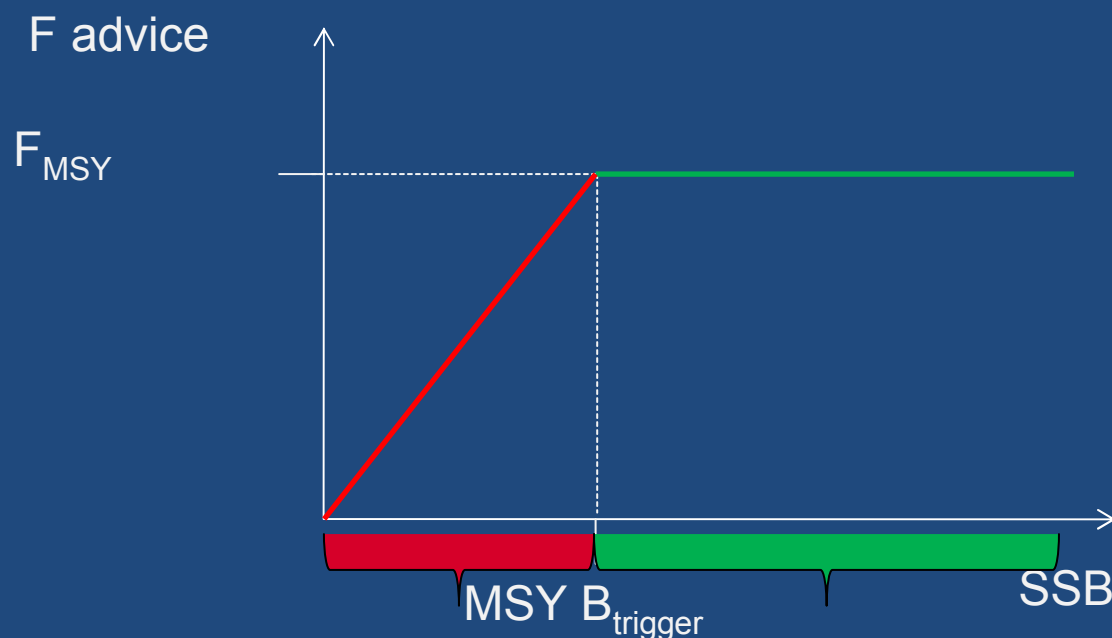
Set F_{MSY} Ref. Point

Assess current SSB in relation to MSY $B_{trigger}$

Advise based on F

F_{MSY}

$F_{MSY} \times SSB / MSY B_{trigger}$





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Limitations for 'data poor' stocks

The ICES MSY framework depends on ability to estimate current F and SSB

Most deepwater stocks are classed as 'data poor' meaning that they lack data on F and SSB

However we do have:

Commercial catch and effort data

Survey data

Fishermen's information (tally books etc)

Biological data

Life history data



- Workshop on the Application of Advisory Framework to Data Poor stocks (WKFRAME 3)
- Workshop on the Development of Assessments based on LIFE history traits and Exploitation Characteristics (WKLIFE)

ICES MSY Empirical Harvest Control Rule for “data poor” stocks



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$$\text{Catch}_{y+1} = \text{Catch}_{\text{current}} * r * f * b * \theta$$

Where:

r is the stock response (rate of change of survey index)

f is a proxy for the ratio target $F_{\text{MSY proxy}}/F_{\text{current}}$

b is the smaller of 1 and some proxy for $B_{\text{current}}/\text{MSYB}_{\text{trigger}}$ ($0 < b \leq 1$).

θ is a precautionary factor

When r , f and b are all known, $\theta = 1$

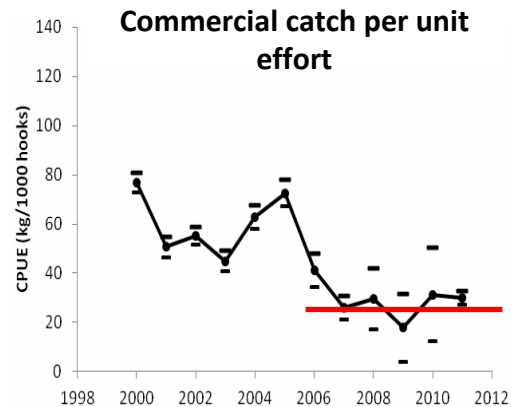
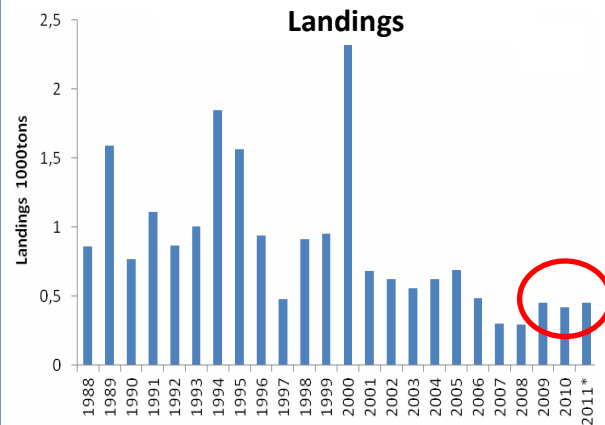
If one or more is unknown, a value of 1 is substituted and the value of θ is reduced to add a precautionary element



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Example: Tusk at Rockall (V1b)



- Stable abundance in recent years → $r = 1$
- $\text{Catch}_{\text{current}}$ is estimated from the average of the last 3 years = 440 t
- f and b are unknown so θ set at 0.8
- ICES advice: catches should be no more than 330 t

Example: Black scabbardfish Vb, VII VIII XIIb



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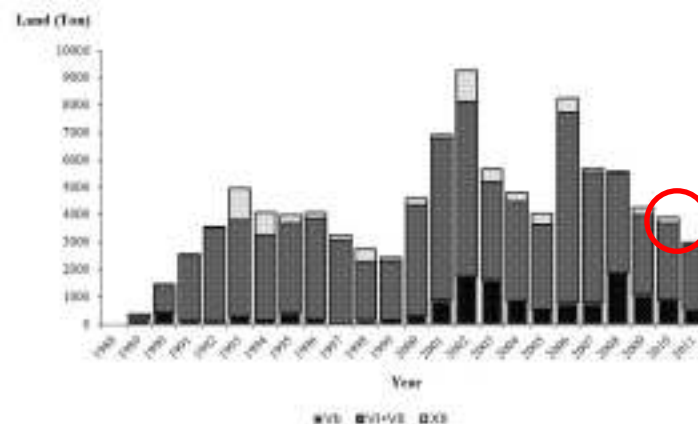
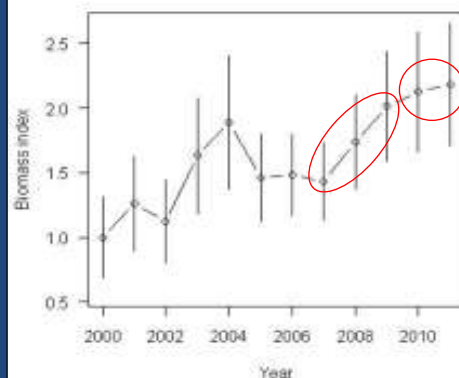
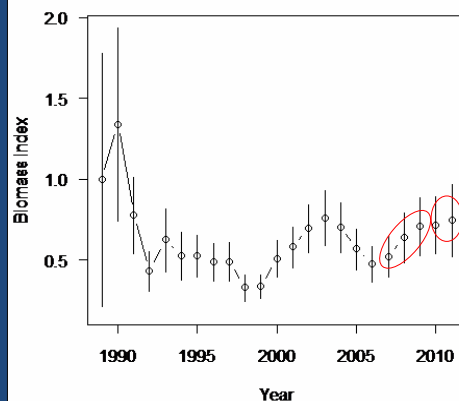
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- r estimated from the ratio of the last 2 years to the previous 3 $r = 1.2$

- $Catch_{current}$ is estimated from the landings in 2010

- f and b are unknown but because the stock has increased by $>50\%$ no precautionary factor applied

- ICES advice: catches should be no more than 4700 t





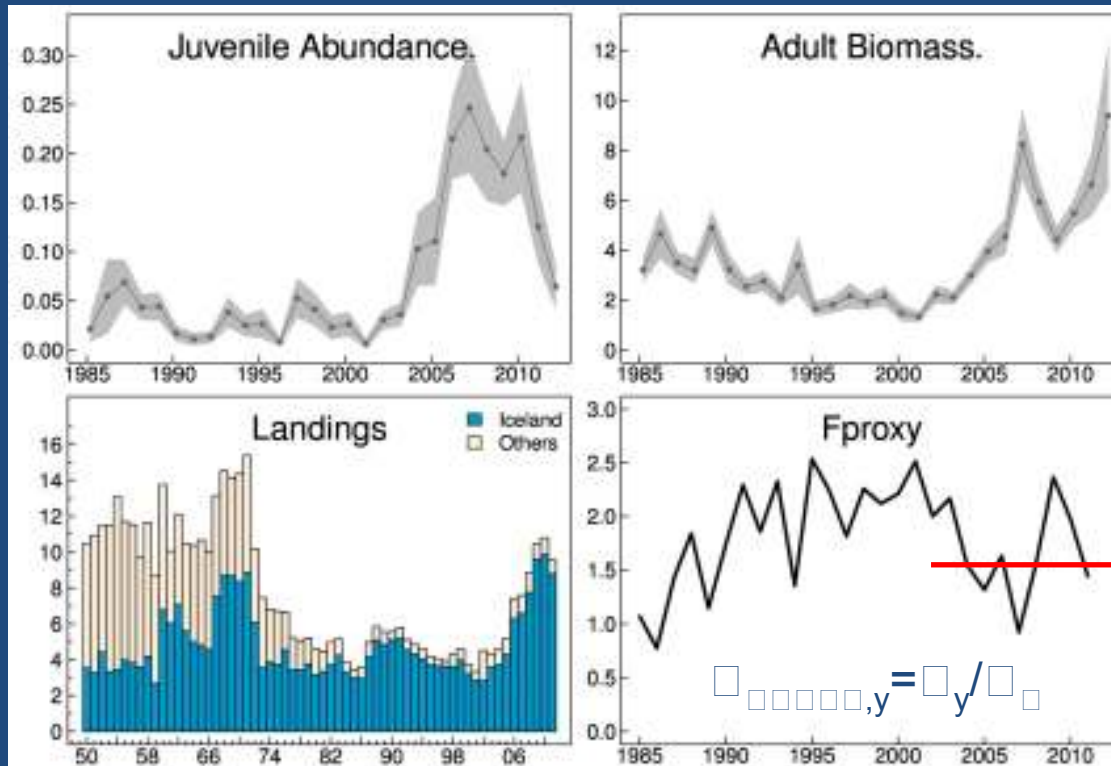
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Example: Ling in division Va

F_{proxy} has had an average value of 1.5 in recent years during which time the stock has increased strongly.

This is therefore proposed as a proxy for F_{MSY}

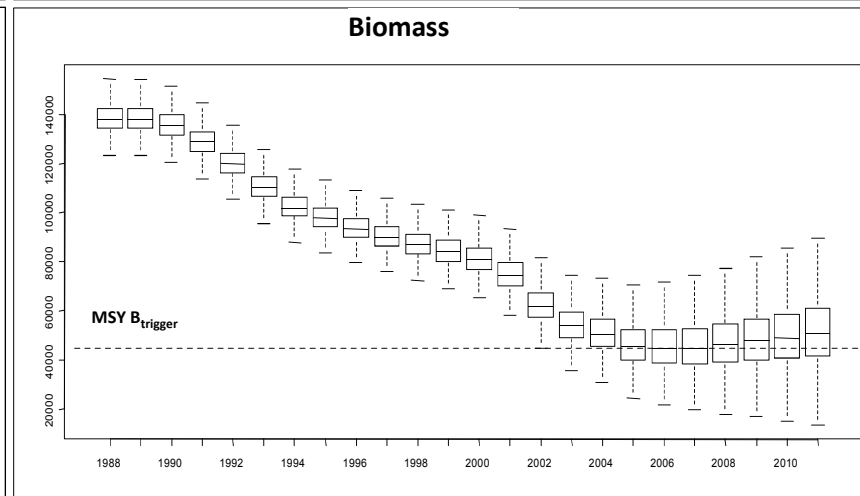
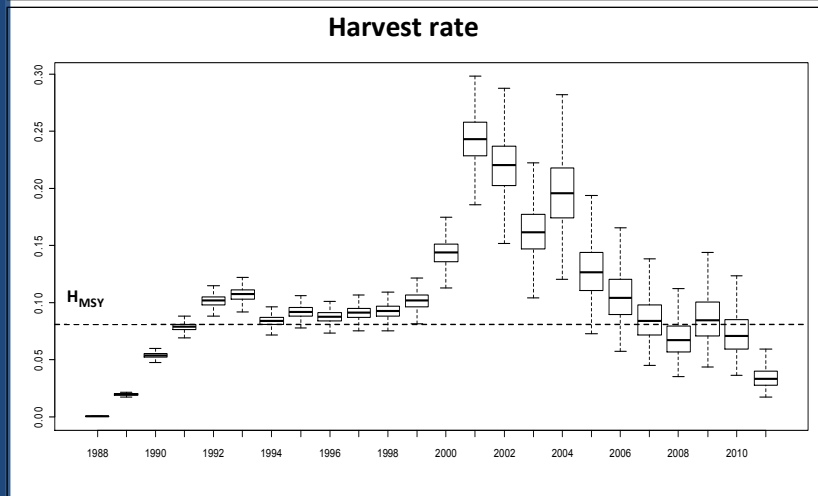
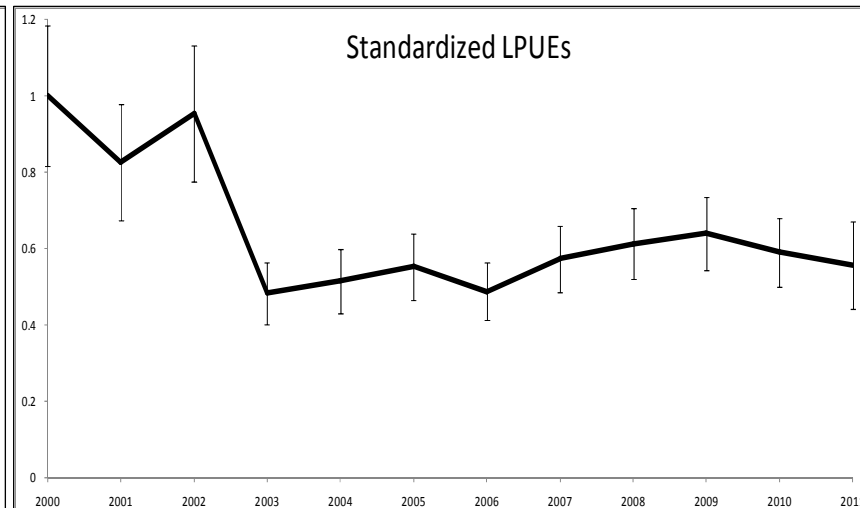
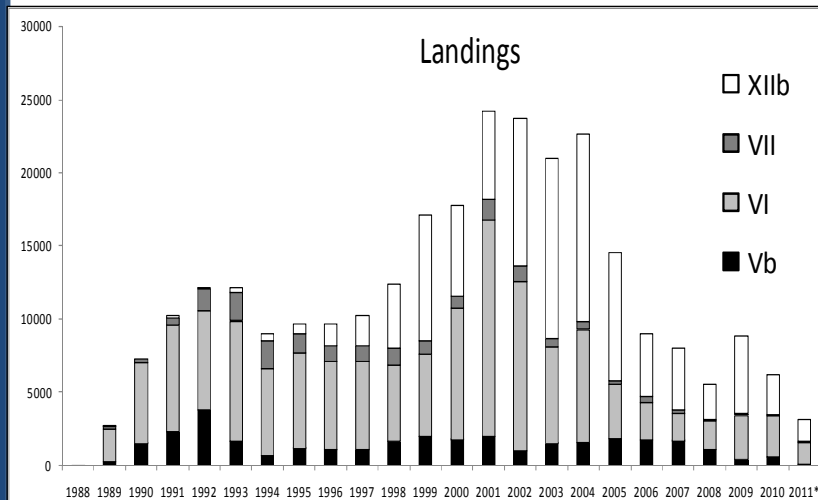


Example: Roundnose grenadier in Vb, VI, VII and XIIb



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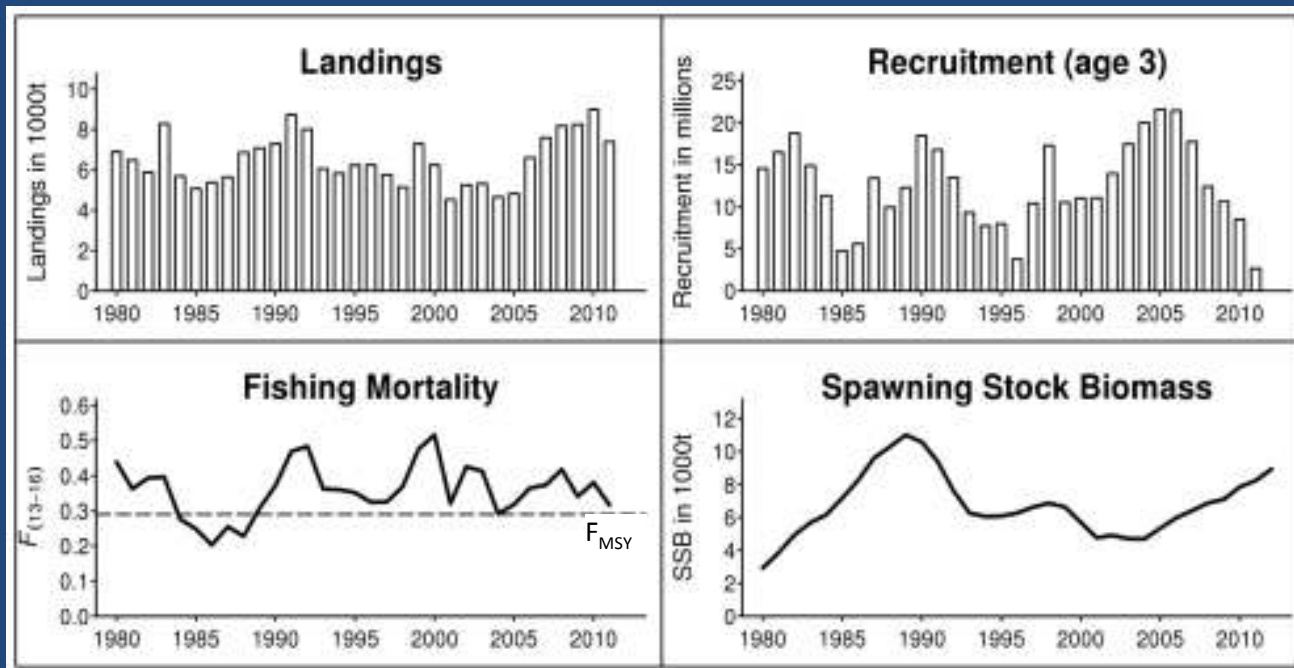




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Example: Tusk in Va and XIV



Assessed using “GADGET”

F is close to F_{MSY} (F_{MAX} used as a F_{MSY} proxy)

B trigger is not estimated but is considered to be above candidate values

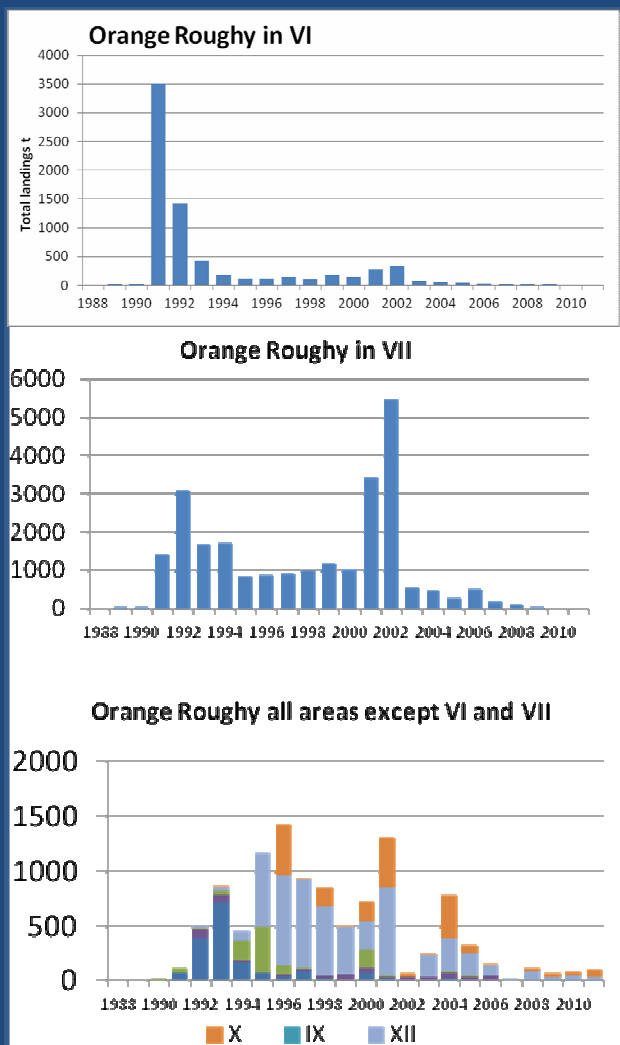
Setting catch at F_{MSY} gives landings for 2013 of 6700 tonnes

Example: Orange Roughy in the NE Atlantic



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Landings data only

In view the very low productivity of this stock, ICES recommends no Directed fishery and bycatch at the lowest possible level.

Summary of ICES single stock advice : Celtic Sea (Vb, VI, VII and XIIb)



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Species	Stock area	Exploitation rate relative to Fmsy		Biomass		Basis for advice	catch advice for 2013	percentage change from 2011 landings
		Analytical	Qualitative	Analytical	Qualitative			
Blue ling	Vb, VI & VII	Below target	Below target	Unknown	Increasing	SRA, MYCC	3900	+32%
Roundnose Grenadier	Vb, VI, VII, XIIb	Below target	Below target	Above target	Above target	Bayesian surplus production model	6000	+94%
Black Scabbardfish	Vb, VI, VII, XIIb	Unknown	Below poss. reference points	Unknown	Above poss. reference points	CPUE of last 2 years/previous 3 * most recent catch	4700	+57%
Orange Roughy	All	Unknown	Unknown	Unknown	Unknown	Precautionary	0	=
Greater Forkbeard	All	Unknown	Unknown	Unknown	Stable	Average catch of last 3 years - 20% precautionary buffer	1000	-17%
Tusk	VIIb (Rockall)	Unknown	Unknown	Unknown	Stable	CPUE of last 2 years/previous 3 * most recent catch - 20% buffer	350	-22%
Tusk	other areas	Unknown	Unknown	Unknown	Above poss. reference points	CPUE of last 2 years/previous 3 * most recent catch	8500	+34%

Summary of ICES single stock advice : Biscay and Iberian shelf (VIII, IX)



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Species	Stock area	Exploitation rate		Biomass		Basis for advice	catch advice for 2013	percentage change from 2011 landings
		Analytical	Qualitative	Analytical	Qualitative			
Black Scabbardfish	VIII & IX	Unknown	Unknown	Unknown	Above poss. reference points	CPUE of last 2 years/previous 3 * most recent catch	3700	+6%
Greater Forkbeard	All	Unknown	Unknown	Unknown	Stable	Average catch of last 3 years - 20% precautinary buffer	1000	-17%
Red seabream	IX	Unknown	Unknown	Unknown	Unknown	Average catch of last 3 years - 20% precautinary buffer	500	3%
Red seabream	IV, VII, VIII	Unknown	Unknown	Unknown	likely to be below Btrigger and Blim	Precautionary	0	-100%

Summary of ICES single stock advice : Azores and Mid-Atlantic Ridge (X, XII excluding XIIb)



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Species	Stock area	Exploitation rate		Biomass		Basis for advice	catch advice for 2013	percentage change from 2011 landings
		Analytical	Qualitative	Analytical	Qualitative			
Alfonsino	All	Unknown	Unknown	Unknown	Unknown	Average catch of last 3 years - 20% precautionary buffer	280	-25%
Red seabream	X	Unknown	Unknown	Unknown	Unknown / decreasing	CPUE of last 2 years/previous 3 * most recent catch -20% buffer	400	-36%
Roundnose Grenadier	Mid-Atlantic Ridge	Unknown	Unknown	Unknown	Unknown	Average catch of last 3 years - 20% precautionary buffer	1350	-60%
Tusk	Mid-Atlantic Ridge	Unknown	Unknown	Unknown	Unknown	Precautionary	-	0%

Summary of ICES single stock advice : Iceland and Greenland (Va and XIV)



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Species	Stock area	Exploitation rate		Biomass		Basis for advice	catch advice for 2013	percentage change from 2011 landings
		Analytical	Qualitative	Analytical	Qualitative			
Blue ling	Va & XIV	Unknown	Increasing	Unknown	Above poss. reference points	Fproxy target * most recent survey biomass	3100	-52%
Greater Silver smelt	Va	Unknown	Increasing	Unknown	Above poss. reference points	Fproxy target * most recent survey biomass	3700	-65%
Ling	Va	Unknown	Stable	Unknown	Above poss. reference points	Fproxy target * most recent survey biomass	12000	26%
Tusk	Va & XIV	Close to target	Close to target	Unknown	Above poss. reference points	Gadget. A decrease in catches to 6700 t or less will result in a fishing mortality close to Fmax in 2013	6700	-9%

Summary of ICES single stock advice : Norway and Arctic (I, II and IIIa)



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Species	Stock area	Exploitation rate		Biomass		Basis for advice	catch advice for 2013	percentage change from 2011 landings
		Analytical	Qualitative	Analytical	Qualitative			
Ling	I & II	Unknown	Stable	Unknown	Stable	-20% precautionary buffer	- (20% effort reduction)	-20%
Tusk	I & II	Unknown	Unknown	Unknown	Unknown	Average catch of last 3 years - 20% precautionary buffer	9040	-22%
Roundnose Grenadier	IIIa	Unknown	Unknown	Unknown	Unknown	Precautionary	0	-0%