ICES WKMSYREF REPORT 2013

ICES ADVISORY COMMITTEE

ICES CM 2013/ACOM:37

Report of the Workshop to consider reference points for all stocks (WKMSYREF)

23 – 25 January 2013

ICES Headquarters, Copenhagen

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

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Contents

1 Terms of Reference

WKMSYREF – Workshop to consider reference points for all stocks

2012/2/ACOM37 The **Workshop to consider reference points for all stocks** (WKMSYREF), chaired by Carl O'Brien, UK, will meet at ICES Headquarters, 23–25 January 2013, for the stocks covered by the working groups AFWG, HAWG, NWWG, NIPAG, WGWIDE, WGBAST, WGBFAS, WGNSSK, WGCSE, WGEF, WGDEEP, WGHMM, and WGANSA, to:

a) On basis of work in WKFRAME2 and WGMSE, evaluate the basis for reference points for fish stocks for which ICES is requested to provide advice and propose operational definitions. This relates to the reference points within the ICES MSY framework (MSY $B_{trigger}$, F_{MSY}) and B_{lim} and, where relevant, Bescapement. For F_{MSY}, consider principles for identifying F_{MSY} as a range which can be used for instance when advising on fisheries options in a mixed fisheries context.
b) Evaluate the consistency of these reference points for stocks for which such reference points have been identified and propose modifications wherever such reference points are found to be inconsistent.
c) Evaluate the options and propose candidate reference points for stocks for which no MSY reference points were indentified in the 2012 advice.

The Workshop will be open to stakeholders.

WKMSYREF will report by 28 February 2013 for the attention of ACOM.

Supporting information

c) Priority	d) This work is a prerequisite for the further implementation of the MSY approach in ICES advice
e) Scientific justificatio	f) The group will apply the approach produced by WKFRAME, WKFRAME2 and WKMSE
g) Resource requirements	h) Members of stock assessment working groups attending
i) Participants	j) The Group is expected to be attended by some 20–25 members and observers.
k) Secretariat facilities	l) None.
m) Financial	n) No financial implications.
o) Linkages to advisor committees	p) ACOM
q) Linkages to other committees or groups	r) Based on WKFRAME2 and WKMSE, forms basis for MSY implementation in 2013 in all stock assessment working groups.
s) Linkages to other organizations	t)

The following is the WKMSYREF Report 2013 in a powerpoint presentation:

ToRs:

a) Based on work in WKFRAME2 and WKGMSE, evaluate the basis for reference points for fish stocks for which ICES is requested to provide advice and propose operational definitions. This relates to the reference points within the ICES MSY framework (MSY $B_{trigger}$, F_{MSY}) and B_{lim} and, where relevant, Bescapement.

For F_{MSY}, consider principles for identifying F_{MSY} as a range which can be used for instance when advising on fisheries options in a mixed fisheries context.

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ToRs:

b) Evaluate the consistency of these reference points for stocks for which such reference points have been identified and propose modifications wherever such reference points are found to be inconsistent.

c) Evaluate the options and propose candidate reference points for stocks for which no MSY reference points were identified in the 2012 advice.

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Evaluation of reference points:

- MSYPlot software developed at Cefas will be available for WGs this year
- WKMSYREF report will contain a full description of approach + user manual
- Makes use of .sen and .sum files
- Calculates YPR, SSBPR and fits 3 S-R functions (Ricker, Beverton-Holt, Hockey-stick) . Incorporates uncertainty in biological, fishery parameters and S-R.
- Deterministic combinations of YPR, SSBPR and S-R curves to estimate reference points (with uncertainty)

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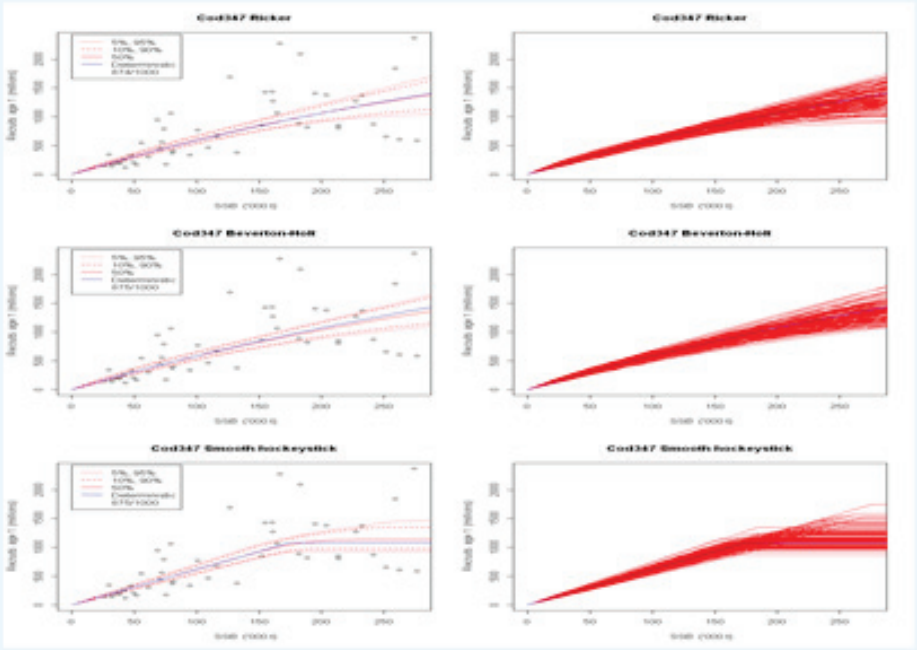
Output example:



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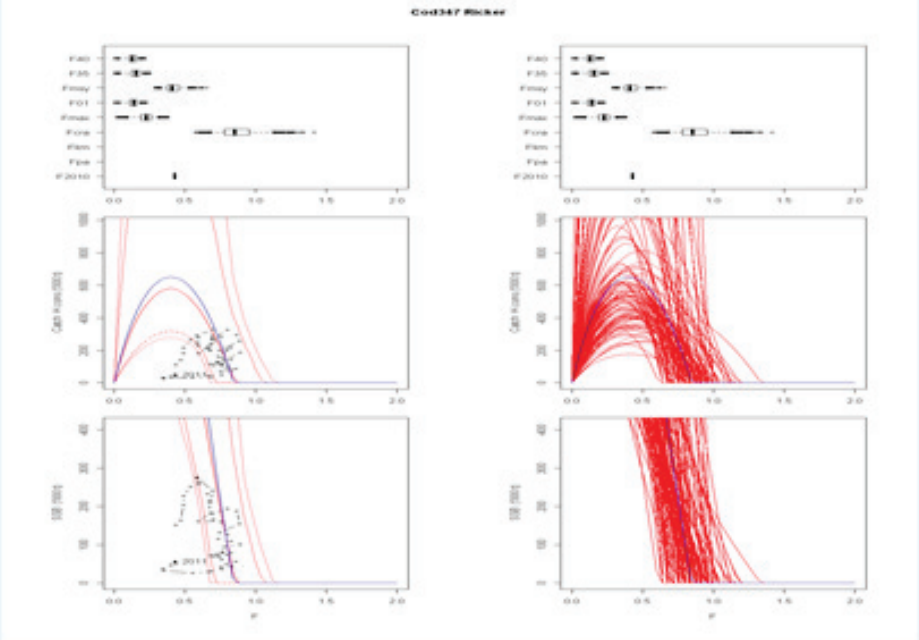
Output example:



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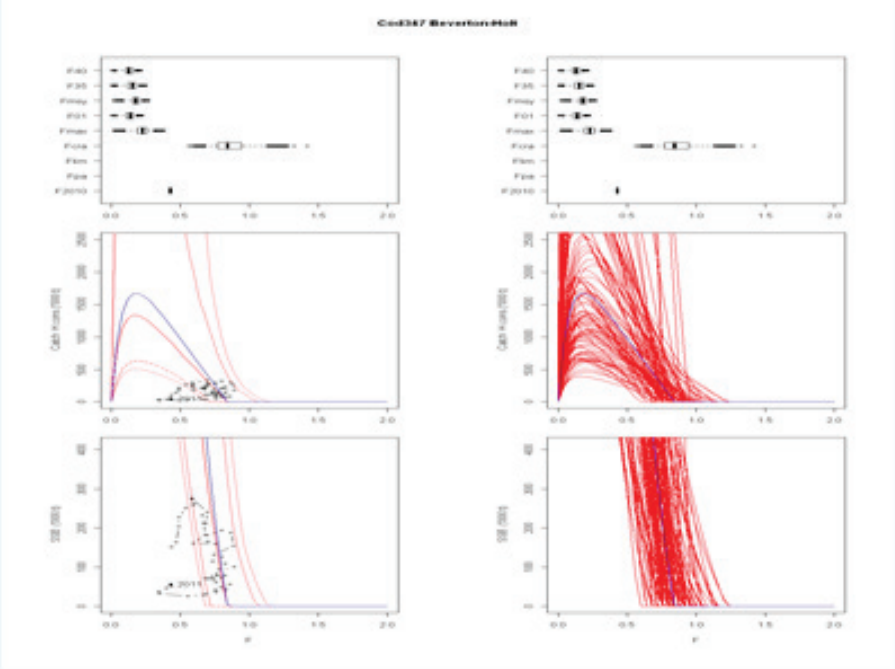
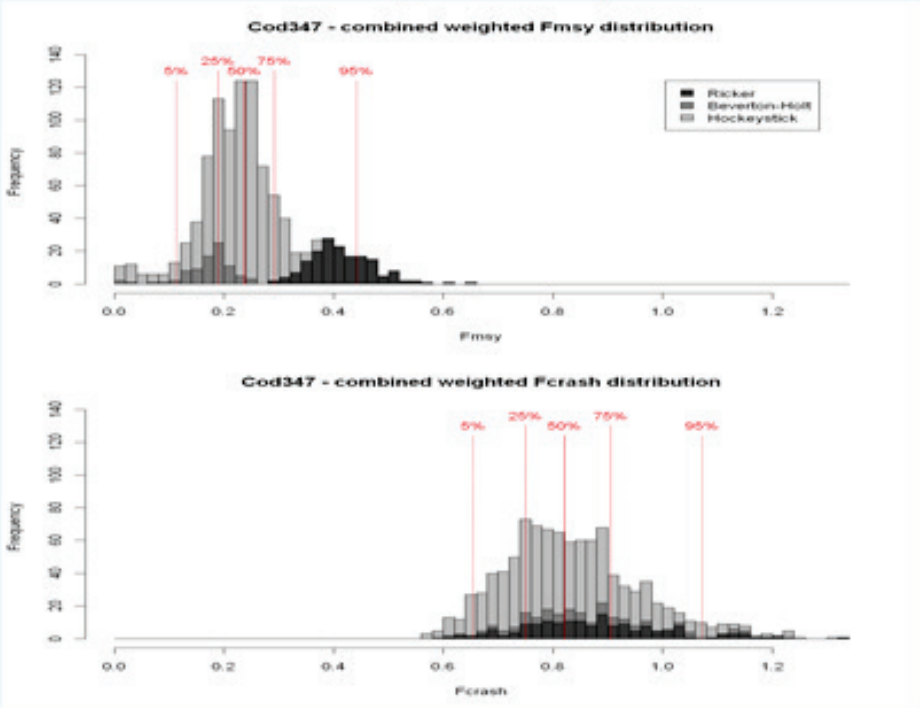
Output example:



Output example:



Outputs:

- Distribution of Fmax, F0.1, F%SPR, Fcrash, Fmsy
- Distribution of Fmsy obtained combining YPR with the 3 S-R functional forms . Weight given to each of the 3 S-R is
  proportional to likelihood fit to the S-R data
- If some S-R functional form is not considered appropriate for a stock, analysis can be done based on 2 or just 1 S-R
- Also an option to enter weights manually
- Select Fmsy as median of distribution

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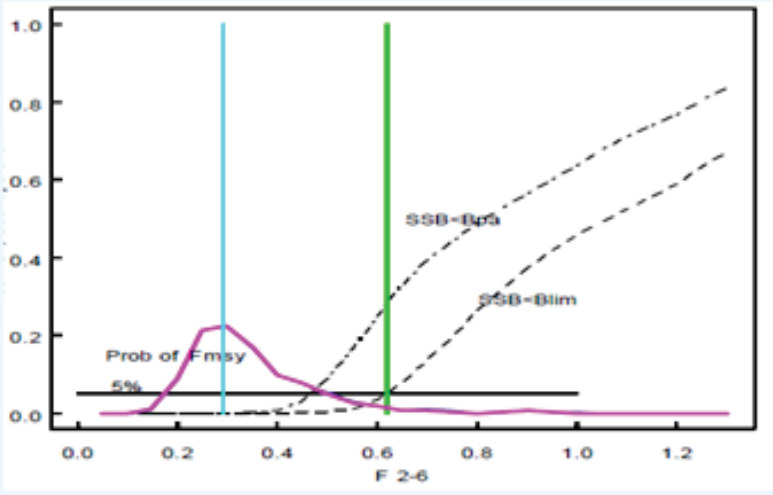
Outputs:

- Options may be added to examine consistency of F reference points with Blim. In particular, long-term probability that SSB < Blim under different Fs.



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Procedure to follow for Fmsy:

- WGs/Benchmarks should consider Fmsy
- Present Fmsy value, explain how it was derived and justify choices made
- Confirm validity of current Fmsy value or propose better alternative
- Evaluations to derive Fmsy, or to evaluate the appropriateness of a particular Fmsy value, should not include estimation / assessment error but can (and should, whenever possible) include stochastic variability in biology and fishery
- Select Fmsy value as a point (expected to remain unchanged for some years, but not forever)

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- If available, give indication of spread of *plausible* values around Fmsy based on the stock biology and fishery characteristics, e.g.
  a. 25 and 75 percentiles of Fmsy distribution
  b. Fmsy obtained deterministically with different S-R forms or different fishery selections
  c. set of appropriate proxies (F0.1, Fmax, F%SPR)

- WGs/Benchmarks reports should have a section for each stock on "Biological Reference Points", presenting the above.

- Information must be readily available.

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Ranges for Fmsy:

1. Ranges based on precision of Fmsy estimate

- Express the uncertainty around the point estimate of Fmsy
- Not suitable to define ranges from which to choose the exploitation value in any year.
- Could potentially lead to perverse incentives to reduce knowledge to have bigger intervals
- Fmsy estimate provided by ICES is intended as the "best point estimate available"
- Ranges useful for understanding, so please include them in reports

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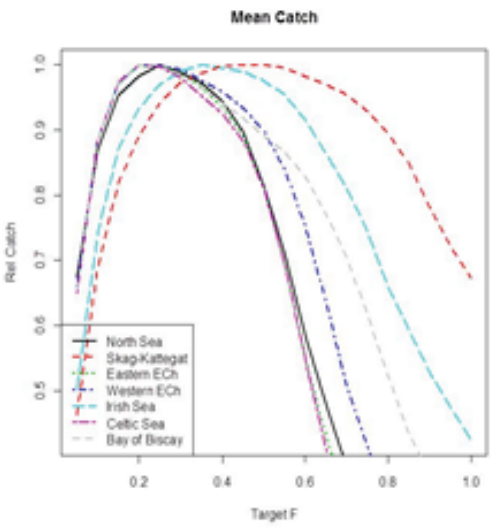
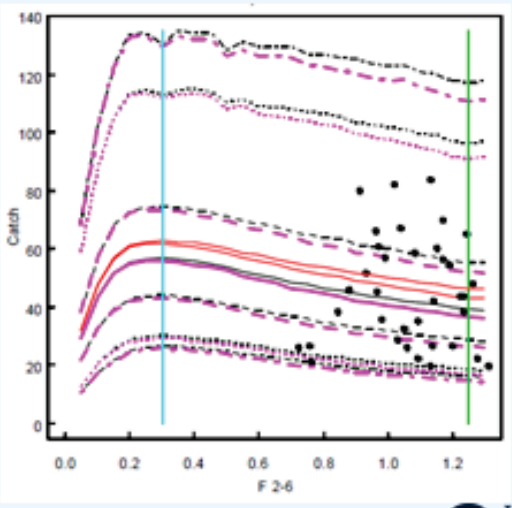
2. Ranges based on high long-term yield

- Average long-term yield as a function of F.

  Tends to reduce slowly as F moves away from Fmsy





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- **F > Fmsy**:

  Higher probab of low SSB, lower long-term yields, greater variability in yield.

- **F < Fmsy**:

  Lower probab of low SSB, lower long-term yields, potential to give lower variability in yield.

  Trade-offs between high yield and stability of yield.

  "Pretty good yield" region could be defined (e.g. where yield ≥ 0.95 maximum yield), but managers domain

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Mixed fisheries considerations for ranges:

- Stocks fished together at Fs that are at different distances from Fmsy.
- "Pretty good yield" interval with F≤Fmsy could be used to allow some further 'space' to reconcile these differences (but manager's domain)
- If this 'space' insufficient and Fs of some stocks < lower limit of interval, managers may wish to seek some further flexibility above Fmsy.

  Fs should be < Fpa or a rate that implies a low probab of SSB < Blim.

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Multispecies considerations in derivation of Fmsy:

- Multispecies considerations (predator, prey, competition, cannibalism, density-dependent growth …) in selecting Fmsy. These cannot be decided on a scientific basis alone.
- Lively discussion at WKMSYREF
- Work is on-going in ICES on

  how to define MSY targets in a multispecies environment

  providing targets for ecosystem health indicators , e.g. for MSFD Desc 3.3: *Healthy stocks are characterised by high proportion of old, large*

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For WGs this year:

- Calculate Fmsy for stocks where the information exists but the calculations have not been done yet
- Resolve inconsistencies between Fmsy and MSY $B_{trigger}$/Blim
- If possible, fill in the Precautionary Approach reference points where they are missing (Blim from SGPRP 2003)

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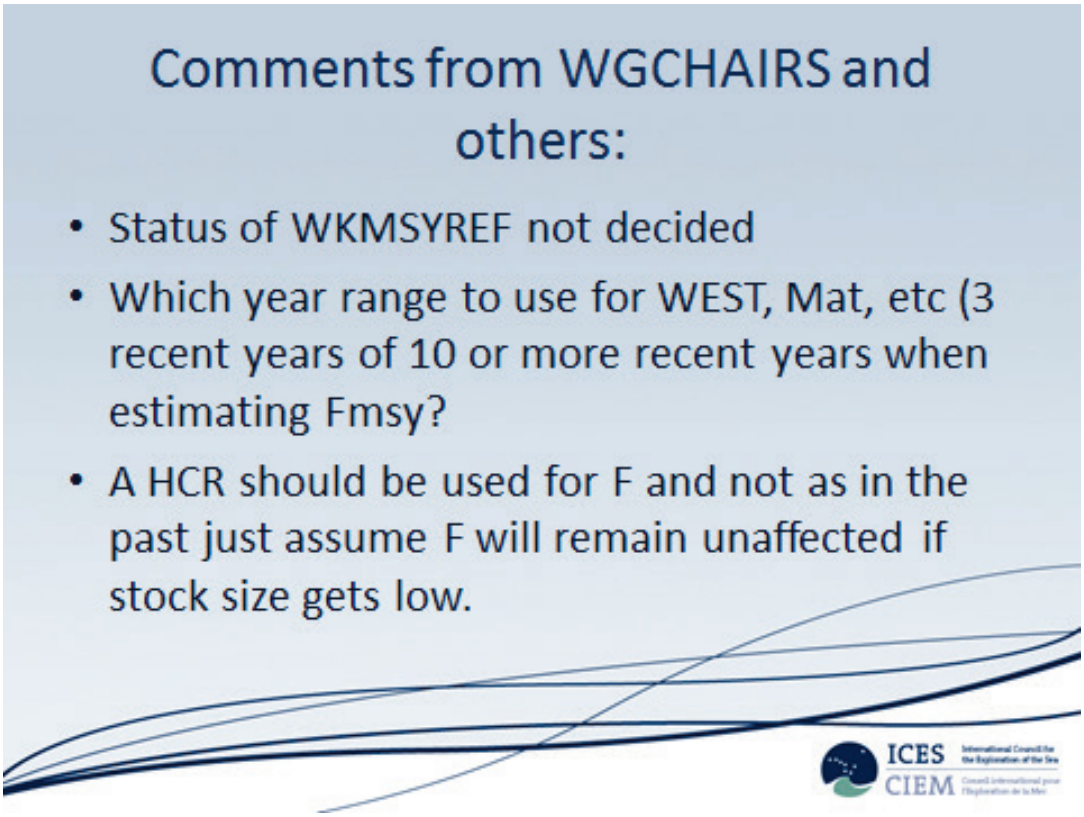
Comments from WGCHAIRS and others:
• Status of WKMSYREF not decided
• Which year range to use for WEST, Mat, etc (3 recent years of 10 or more recent years when estimating Fmsy?
• A HCR should be used for F and not as in the past just assume F will remain unaffected if stock size gets low.
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Annex 1 List of Participants

Workshop to consider reference points for all stocks (WKMSYREF)

23 – 25 January 2013

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