Mr Fokion Fotiadis
European Commission
Directorate General - Mare
Office J-99; 0/07
B-1049 BRUSSELS
Belgium

Pelagic RAC
Treubstraat 17
PO Box 72
2280 AB Rijswijk
The Netherlands

Tel: +31 (0)70 336 9624
Fax: +31 (0)70 399 3004
E-mail: info@pelagic-rac.org
http://www.pelagic-rac.org

Date: 27 May 2010
Our reference: 0910PRAC77/AC
Subject: A LTM plan for WBSS herring
CC: Ms Stefanie Schmidt, Ms Isabelle Viallon (by e-mail)

Dear Mr Fotiadis,

The Pelagic RAC is pleased to present its unanimous recommendation on a LTM plan for Western Baltic spring-spawning (WBSS) herring. Our views presented here are based on discussions held in the context of an EU-funded scientific project (JAKFISH), where stakeholders from the Pelagic RAC and the Baltic Sea RAC and scientists from DTU aqua (DK) collaboratively discussed several possibilities and strategies for management of this stock.

In conclusion, the PRAC recommends that the LTM plan for WBSS should be built upon the following corner stones.

The Harvest Control Rule (see figure 1 and annex 1) should be based on:

- a target F of 0,25 for the adult herring (ages 3-6);
- a biomass trigger point (B_{trig}) of 110 kT, under which F is gradually reduced along a sloped line to zero at SSB=0 (based on ICES' MSY approach);
- a limitation of ± 15% in inter annual variation in TAC at all times;

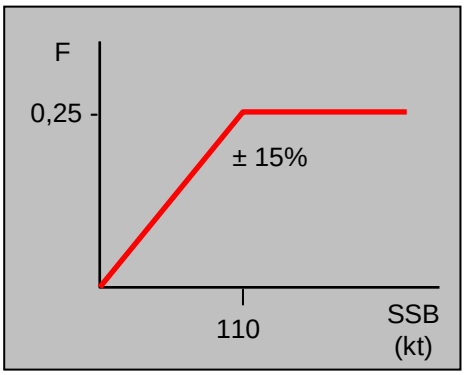


Figure 1: Graphical representation of the HCR based on:

- a target F of 0,25 for the adult herring (ages 3-6)
- a biomass trigger point (B_{trig}) of 110 kT, under which F should be gradually reduced along a sloped line to zero at SSB=0
- 15% limitation on IAV in TAC at all times

TAC setting procedures should include:

- a fixed split in the fishing opportunities for adult herring: with 50% for the IIIa area and 50% for the 22-24 area;
- a TAC for the F-fleet corresponding to the 50% allocation for the 22-24 area;
- a TAC for the C-fleet that corresponds to the 50% allocation for the IIIa area, with the subsequent addition of tons from the NSAS herring. The volume from the NSAS should be based on the average mix ratio over the past 3 years;
- a TAC for the D-fleet based on an overall F_{0-1}=0,075;
- a year-to-year flexibility of ± 10% to bank or borrow quota.

Implementation of the LTM plan should take into account:

- a transition period of three years in order to gradually move from the current situation into the HCR, in three equal reductions in F;
- no further decrease of SSB;
- no reductions in TAC of more then 50%.

Please find further explanation on the choice of the HCR in annex 1 and question-by-questions answers to the non-paper in annex 2. The Pelagic RAC much appreciated the set-up of the non-paper and the way in which this consultation document has provided guidance in the discussions in the RAC.

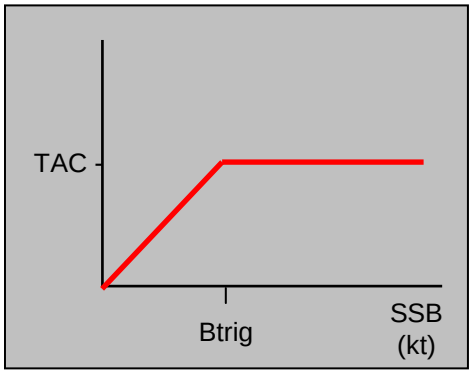
If you have any questions, please contact the secretariat. Looking forward to your response,

Yours sincerely,

Ms Aukje Coers
Pelagic RAC secretariat

Annex 1: background information and justification on Harvest Control Rule

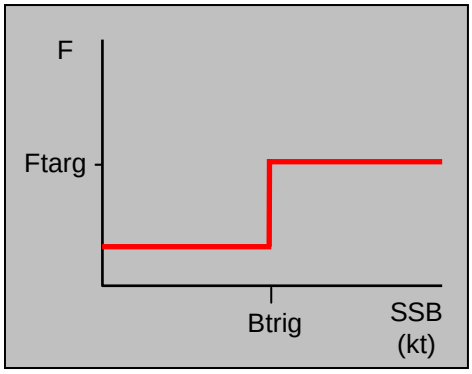
During a first meeting among stakeholders from the BSRAC and the PRAC and scientists from DTU aqua to discuss the JAKFISH project, the meeting agreed that the project should aim for developing a LTM plan for WBSS herring which was based on the optimally performing HCR, which predicts maximum yield in the middle and long term; which avoids the fishery from having to close altogether; which avoids large inter-annual changes in the TAC and which would be considered precautionary by scientists. Having agreed that the TAC should, at all times, be split equally (50-50%) between the areas IIIa and 22-24, there was a solid basis for discussion of HCRs. 40 different HCRs based on three different 'types' were investigated and the results discussed (figure 2). The second type was included for comparison, based on the Commission's request to ICES.



Constant TAC approach

- Decrease TAC gradually when SSB < B_{trig}
- Fix B_{trig} at 110 kT
- Vary the constant TAC level;
- Use values for target TAC (kT):
    - 40 – 50 – 60 – 70 – 100 – 130 – 160 - 190

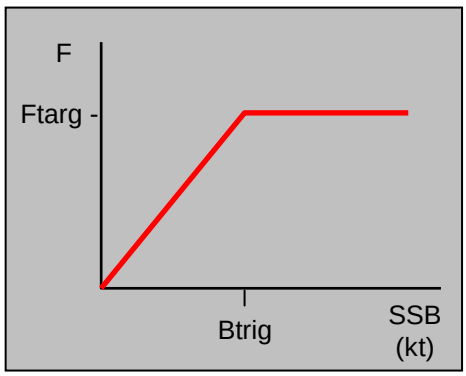
8 HCRs



Target F 'stepwise approach'

- Use F=0.10 when SSB < B_{trig};
- IAV rule of ± 15% that applies above the trigger point;
- Vary target F (with fixed B_{trig}=110) for values:
    - 0.20 – 0.25 – 0.30 – 0.35
- Vary B_{trig} (with fixed F=0.25) for values:
    - 80 – 100 – 110 – 120 – 150

8 HCRs



Target F 'sloped approach'

- IAV rule of ± 15% that applies at all times;
- Vary target F and B_{trig} for (all combinations):
    - F = 0.20 – 0.25 – 0.30 – 0.35
    - B_{trig} = 80 – 100 – 110 – 120 – 150
- In addition, vary target F for values:
    - F = 0,26 – 0,27 – 0,28 – 0,29

24 HCRs

Figure 2: Three types of HCRs that were examined with indication of value ranges.

For consideration of the simulation results, it was decided to focus on average yield, Inter Annual Variation (IAV) in TAC and risk to the stock. Initial simulations showed that it was likely that SSB would be below B_{lim} in 2011. Any simulation with any type of HCR 'brought' the stock below B_{lim} in the first (few) year(s). In other words, the starting point had a major effect on the risk related to the HCRs. It was therefore decided to separate short term and long term results, in order to make this more transparent and be able to assess the risk on the longer term as more directly related to the performance of the HCR then to the present situation of the stock.

The results (table 2) showed that the Constant TAC approach much restricted the average yield in the long term. This option was therefore discarded. The target F stepwise approach surprisingly showed that HCRs with a target F of 0,35 were still precautionary, but considering that this type prescribed reductions of F to extremely low values when SSB would fall below B_{lim}, this type was discarded as well. The target F sloped approach gave comparable results as the stepwise approach, in terms of long term average yield (despite the fact that it would not be precautionary any more with an F of 0,3) and low risk, but much better results in terms of providing stability in the TAC. It was therefore agreed that this was the most preferred approach.

In an additional round of simulations, HCRs with the sloped approach were examined including target F values between 0,25 and 0,30 in order to find the maximum precautionary value. Despite the fact that a HCR with a target F of 0,28 (with a B_{trig} of 123 kT) was still considered precautionary, it was agreed that an F of 0,25 was acceptable, and in line with ICES' identification of 0,25 being a candidate for F_{msy} for this stock.

The simulation results did not show a differentiation in results for different trigger points in terms of risk. Even when an additional simulation was done for a HCR with no trigger point, and effectively the HCR was a fixed target F of 0,25, the results were precautionary. It was agreed, however, that for political reasons, it would not be acceptable to not have a biomass trigger point. Considering that 110 kT has been labelled as B_{lim} by ICES because it is the lowest observed biomass, and there is uncertainty about what would happen below that point, extra precautionary action beyond it seemed reasonable. It was therefore concluded that a B_{trig} of 110 kT was most appropriate.

The final HCR decided upon (figure 1) was finally tested with 1000 iterations instead of 100, which confirmed the results. It showed that it was robust to a juvenile target F of between 0,05 and 0,1, which supports that setting a TAC for the D-fleet based on an expected juvenile mortality of 0,075 is precautionary. Finally, the robustness of the model, and this HCR in particular, to various set-ups of the error derived from the stock assessment process was tested, which showed that regardless of the choice of model and error set-up, the HCR was precautionary.

Table 1: Selection of simulation results of 28 HCRs. Un-precautionary HCRs (where the risk of SSB<B_{lim} is > 5%) are highlighted in pink.

	HCR			Average Fishery 2018-2032				Stock results 2018-2032			Fishery in 2012		Stock in 2012	
	nr	target	Btrig	LTavgYield	LTavgF	%Juv	MeanIAV	LTavgSSB	SSB2032	P(SSB<Blim)	Yield2012	F2012	SSB2012	P(SSB<Blim09-12)
Const. TAC	11	40	110	40	0,09	0,09	0	400	414	0,0	38	0,20	129	14
	12	70	110	60	0,41	0,20	1	116	114	49,3	56	0,45	84	45
	17	50	110	50	0,14	0,11	0	318	332	1,4	46	0,27	114	28
	18	60	110	59	0,23	0,14	0	228	238	11,0	53	0,35	99	39
target F stepwise	21	0,2	110	61	0,17	0,10	5	329	254	0,1	19	0,09	142	9
	22	0,25	110	64	0,20	0,11	5	315	222	0,5	18	0,09	135	15
	23	0,3	110	67	0,21	0,11	6	311	191	1,8	17	0,09	131	19
	24	0,35	110	67	0,23	0,12	7	307	167	3,4	17	0,09	127	21
	25	0,25	80	64	0,23	0,13	2	257	222	1,0	39	0,22	125	20
	26	0,25	100	63	0,20	0,11	6	302	225	0,9	31	0,13	131	16
	27	0,25	120	65	0,20	0,11	5	302	221	0,7	18	0,09	141	14
	28	0,25	150	64	0,21	0,12	4	273	240	0,5	23	0,11	143	10
	29	0,5	150	63	0,25	0,14	7	245	223	9,1	22	0,11	132	19
Target F sloped	30	0,2	80	62	0,20	0,12	2	276	255	0,0	37	0,19	130	15
	31	0,2	100	62	0,20	0,12	2	278	255	0,0	37	0,19	130	15
	32	0,2	110	62	0,20	0,12	2	278	255	0,0	37	0,19	130	14
	33	0,2	120	62	0,20	0,11	2	278	256	0,0	37	0,19	130	14
	34	0,2	150	62	0,20	0,11	2	288	256	0,0	35	0,18	130	14
	35	0,25	80	66	0,25	0,13	1	232	214	1,6	42	0,24	123	21
	36	0,25	100	66	0,25	0,13	1	232	214	1,5	42	0,24	123	21
	37	0,25	110	66	0,25	0,13	2	232	213	1,5	42	0,24	123	21
	38	0,25	120	66	0,25	0,13	2	233	212	1,5	41	0,23	123	21
	39	0,25	150	66	0,25	0,13	2	238	214	1,7	38	0,20	127	19
	40	0,3	80	67	0,30	0,15	1	195	181	8,1	47	0,28	113	26
	41	0,3	100	67	0,29	0,15	1	198	177	7,6	47	0,28	114	26
	42	0,3	110	67	0,29	0,15	1	198	184	7,5	47	0,28	114	26
	43	0,3	120	68	0,29	0,15	1	199	182	7,0	46	0,27	114	26
	44	0,3	150	69	0,29	0,14	0	206	189	7,3	41	0,24	117	24

Table 2: abbreviations used in the results tables.

Target	Target TAC (type 1) or target F (type 2 and 3)
B_{trig}	Biomass trigger point which indicates a change in action
LTavgYield	Average yield in kT
LTavgF	average fishing mortality that is realised with the HCR
%juv	Fraction of juveniles in the catch
Mean IAV	Realised average variation in the TAC between years
LTavgSSB	Average stock size (kT)
SSB 2032	The final SSB at the end of the time series in 2025
$p(SSB<B_{lim})$	Risk of SSB going below B_{lim} as percentage

The following assumptions were used in the model for running the simulations for all different HCRs:

- Recruitment was based on a hockey stick function calculated with recruitment figures for 2003-2007 with added random deviation
- Assessment uncertainty with CV 0.3 on year effect but no bias
- TAC fixed share between area IIIa and 22-24 of 50-50%
- Up to 25% variability of the mixing with NSAS in IIIa catches was accounted for
- The TAC is considered to be constraining the short-term forecast in the intermediate year
- The reference SSB is the one estimated out of the assessment (i.e. at spawning in the current year)
- No variability in growth and selectivity were included
- 100 iterations, all the same across all HCR
- Results are computed as calculating the mean (i.e. mean yield 2012-2027) within each iteration, and then taking the median (value in the middle) value of it across all iterations, in order to keep the internal variability

Annex 2: answers to individual questions in the non-paper

General remarks

The MRAG report does not distinguish between the different stocks, and it is thus difficult to take it into account when regarding management of the WBSS herring specifically. It does also not address the fleets in IIIa, and was therefore not used by the PRAC in preparing this recommendation.

1. Should a management plan only identify biological management objectives or should it also specify economic and social objectives?

A LTM plan should always clearly specify its objectives, whether biological, social and/or economical. In terms of economic and social aspects, stability means predictability, which greatly serves industry and market needs. Stability is thus logically one of the most advocated economic objectives by the industry, and the PRAC. In relation to WBSS herring, an important feature that could address stability, is a firm agreement on a constant split of the TAC between the two management areas 22-24 and IIIa. The 50/50% split that has been the basis for years should continue to be used and should be one of the cornerstones in the LTMP. This would also ensure a level playing field among the fleets. When reductions in fishing opportunities are needed to protect the stock, the burden will be carried equally by all, and as soon as the stock recovers, all will profit.

Second, for a long time a limit on IAV, typically of ±15%, has been part of new LTM plans. The rationale behind industry requests for the ±15% rule is the assumption that markets require stability. 15% was seen as an appropriate proxy for the changes in volume that the markets can absorb without damaging demand or prices too much. It is not a scientifically based figure but it is a best estimate with broad stakeholder support.

And finally in order to smooth the fishery from one year to the next, the PRAC supports the inclusion of a 10% banking/borrowing rule in the LTMP. This rule helps the fishermen in their planning of the fishery, and it helps against discards when quotas are exhausted.

There is currently no over-capacity in the fleet, and restructuring is not needed. Neither do other aspects of the social or economic situation of the fleets active in IIIa area demand any actions from the EC. If, in the future, problems arise, then they should be left to be resolved by the Member States.

2. How could economic and social sustainability be ensured based on ecological sustainability?

A stock that is exploited sustainably, and with a management regime that addresses stability in TACs consequently provides sustainability in economical and social terms as well. Considering that the above described rules were included in the scientific simulations in the JAKFISH project, and the results of the simulations were in line with the Precautionary Approach principle, these rules *are* based on ecological sustainability.

3. Should action plans be established in relation to economic and/or social objectives?

N.a.

4. Are targets in addition to target fishing mortality rates for example in relation to discards and by-catch needed?

There is no problem with cod by-catch in the fleet targeting herring in IIIa, so no specific measures aiming at by-catch are needed in that area. However, a target F should be specifically established for the juvenile part of the stock. Explorative simulation results under the JAKFISH project showed that a target F for juveniles around 0.075 would lead to sensibly the same juvenile catches as currently, but with some small benefits for the stock. This would roughly correspond to a target of 0.05 for the area IIIa, i.e. for both catches from the fleets C and D. Therefore, a TAC for the D-fleet should be set in line with this objective.

5. Should trigger levels in terms of fishing mortality and/or biomass be established? How should management measures differ in relation to trigger level?

Establishing a biomass trigger point (B_{trig}), under which measures should be taken to avoid depletion of a stock, is an appropriate measure in any LTM plan, and thus also in the one for WBSS herring. The JAKFISH project elaborately investigated the effects of different trigger points. The results did not identify an optimal value. The PRAC proposes B_{trig} = 110.000 tons. This is the lowest observed biomass meaning that any value below that would be in unknown territory. At the same time, simulation results showed a B_{trig} of 110.000 tons to be precautionary. The action to be taken when SSB < B_{trig} should be to decrease F following a sloped line from the target to zero at SSB=0. This approach is in accordance with the ICES MSY framework that is currently being developed.

6. Should the Western Baltic Herring be included in the management plan for pelagics in the Baltic or integrated in the one for North Sea herring?

First and foremost, there should be agreement on a constant split (50-50%) of fishing opportunities between the two areas. Subsequently, the TAC setting procedure and the management rules for the fishery in 22-24 can be incorporated in the Baltic MP and similarly, in light of Norway exploiting the stock in the IIIa area, the TAC setting procedure and the management rules for the IIIa fishery should be included in the EU/Norway agreement on regulation of fisheries in Skagerrak and Kattegat. This implies that Norway would have to subscribe to the overall LTMP for WBSS.

7. On which aspects should collaboration with Russia focus with regards to the management plan?

This is not applicable for the management of the WBSS stock. However, in light of Norway exploiting the stock in the IIIa area, the management plan should be recognised by Norway.

8. In which steps should F be reduced in order to reach F_{MSY} by 2015?

The target F in the HCR proposed by PRAC equals F_{MSY}. The LTM plan should be adopted a.s.a.p. but it should take account of the transition between the present situation and the target. The PRAC proposes that the target F is reached by reducing F gradually in equal steps over three years.

9. Should the existing management areas be revised for some stocks?

During discussions in the JAKFISH project on this issue, it became clear that there is no scientific basis for making any changes to the present management areas for WBSS herring as regards the division between areas IIIa and 22-24. The PRAC has recently been made aware that the herring assessment working group of ICES (HAWG) has discussed the potential implications of WBSS herring being caught in the eastern part of area IVa by the A-fleet. Although this is a relevant issue to address, it might take considerable time before sufficient data is available to assess the extend of this potential problem and decide on the need for designing appropriate management measures. The PRAC is of the opinion that implementing this management plan without delay, in order to avoid further decline of the stock, has priority, however. The current JAKFISH simulations for our proposed HCR (which proved precautionary) take into account a substantial level of uncertainty (up to ± 25%) on catches in IIIa, indicating that the stock can sustain some variability in catches. Therefore the PRAC strongly advises that the present management areas are maintained for now and the Commission moves forward with the implementation of this management plan as soon as possible. When at a later stage, the discussion on WBSS herring catches in VIa has been resolved, it can be taken into account in the TAC setting for area IIIa.

10. Which areas and how?

N.a.

11. If current management areas are maintained for the Western Herring, how could consistency in the TAC setting for SD IIIa and SD 22-24 be ensured?

The key point for ensuring consistency is the agreement on a constant split of 50-50% between the areas 22-24 and IIIa. For a more detailed explanation, see the answer to Q6.

12. Are the existing technical measures comprehensive and effective?

For the C-fleet minimum landing sizes and minimum mesh sizes are established. There are no reports of problems with by-catches. Therefore, the measures that are currently in place for IIIa fleet are considered sufficient.

13. Are further measures needed to improve selectivity for target/non-target stocks/species?

Scientists in the JAKFISH project addressed the issue of mixing between WBSS and NSAS herring in the IIIa area and found patterns, but they were extremely variable, and thus very unpredictable. Therefore, one could never include closed areas or seasons in a management system with any confidence that it would have a positive effect in terms of stock conservation. On the other hand, it would most definitely have a negative effect to the operation of the fleet. This is why the scientists accepted this unpredictability as a given, and took it into account in their simulations for HCRs by introducing up to 25% uncertainty on the actual catches of WBSS herring in IIIa (some years the WBSS catches in IIIa are higher than the ICES forecasted catches and some years they are lower). The HCR recommended by the PRAC proved robust to this uncertainty and managers should thus comfortably accept that. If in the future more reliable information becomes available, this issue could naturally be reconsidered.

14. Which measures would you suggest?

Following the above, for the fisheries in IIIa, no supporting measures are required.

15. Are the existing measures on control and inspection comprehensive and effective?

Regarding the fishery in area IIIa, the existing measures are sufficient.

16. What kind of further measures might be needed to monitor compliance with harvest control rules, technical measures and any other provisions to be established in the plan?

N.a. See answer to Q15.

17. How can it be ensured that all data necessary for stock and industry analysis and monitoring of the plan implementation are generated?

The PRAC finds that industry analysis is unnecessary at present, considering that there are no observed economic problems such as over-capacity in the fleet or non-profitability. Neither does the PRAC see a need for additional monitoring efforts. Regarding stock analysis, however, ICES has indicated clear benefits from strengthening the cooperation between science and industry in order to improve the stocks assessments and scientific advice. One of the possibilities would be for the industry to participate in the establishment of a reference fleet. The PRAC is much in favor of such initiatives and encourages the EC to facilitate this.

18. Can you identify further need for research or scientific analysis?

Despite the fact that the currently proposed HCR is robust to uncertainty in the level of mixing between WBSS and NSAS in IIIa, better forecast estimates could be useful. However, it is unclear to the PRAC what would be necessary to enable this. In addition, the PRAC understands that the recruitment estimates are currently rather unreliable. The PRAC understands that one of the reasons for this is that the fishery targeting juveniles has greatly decreased over recent years, and ICES used to use catch data from that fleet

in its assessment. If setting up a reference fleet could help in providing information in relation to the above, then it should focus on that.

19. Should research or science related objectives be part of the management plan?

Needs for research and science should not be translated into objectives and included in a LTM plan. Not only is it extremely difficult to plan progress in scientific results, but the research needs change continuously as well.

20. What would be needed to develop a fishery based management for the pelagic stocks as a next step. Should this be an objective of this plan?

For the IIIa area, a fishery based management system is currently in place, which works fine. Therefore the PRAC does not see any reason for changes in this respect.

21. What would be needed to develop an EBM based management approach for the Baltic Sea. Should this be an objective of this plan?

In principle, the PRAC is not opposed to an EBM approach, although it is often not clear what this means, and the specifics should always be studied carefully on a case-to-case basis. In a confined sea such as the Baltic Sea species interactions are likely an important aspect to consider. In line with that, ICES has made a number of statements and suggestions on the meaning of those in the Baltic Sea. The PRAC feels that it might be too early to define EBM based objectives at this point, because current stock levels are likely substantially different from what they might be when the LTM plan, which is based on F_{MSY}, has been in place for a number of years. When that 'new' situation is reached, the timing is more appropriate to consider the magnitude of interactions between different (commercially targeted) species. Based on that, a more realistic discussion can then be held on trade-offs between different species and effects of managing stocks at certain biomass levels.

22. How can we address the interaction of cod and pelagic stocks in future management?

N.a. for the IIIa area.