Annex 05 – Assessment Audits

Audit of (NEA mackerel)

Date: 1/9/2014 (15h30)

Auditor: Beatriz Roel (Cefas)

General

This assessment was discussed thoroughly during the WGWIDE meeting.

For single stock summary sheet advice:

1) **Assessment type: update**

2) **Assessment**:   analytical

3) **Forecast**:   presented

4) **Assessment model**: SAM, tuning by 3 survey indices and tagging data

5) **Data issues:** the SSB time-series was revised during the meeting.

6) **Consistency**: last year no assessment was presented. Consistency was evaluated in relation to the May 2014 update assessment. Comparison show consistency in stock trends. The small differences in the estimates of catch, F and SSB for 2012 and 2013 can be explained to a large extent by the revision of the Egg time-series.

7) **Stock status**: B and F estimates are within safe biological limits. There is high uncertainty about 2013 recruitment and has been estimated on the basis of the recruitment index and GM using RCT3. Some strong year classes were estimated in recent years.

8) **Man. Plan.**: The MP in place, although precautionary, needs to be updated and tuned with with the new State Space model assessment.

General comments

This was a thorough assessment of the state of NEA mackerel which was well presented during the meeting. The report was not finalized at the time of writing this Audit so, possible typos and small inconsistencies are not reported.

Technical comments

This assessment has been characterized by substantial underestimation of the catch. Catch estimates for 2013 and 2014 are likely to be under estimated because of limited discards information and no information on slippage.

The Egg production time-series revision was carried out at this meeting and addressed issues raised by WKPELA. The process was well documented in the Report.

Estimates of SSB and F in the final year were reasonably precise however, it was noted that the distribution of the uncertainty about point estimates had a suggestion of bimodality particularly for SSB.

Retrospective patterns. Moderately strong retrospective patterns were noted for F. Although those were interpreted as the result of the late introduction of the IESSNS survey (ages 6+) it did appear peculiar the fact that it did not reflect in the SSB retrospective.

Short-term forecast. The method used to estimate age 0 in 2013 deviated slightly from the one described in the Annex in that the tapered GM was computed over a longer period. The decision made by WGWIDE was justified and was appropriate in my view.

Short-term predictions were done deterministically according to the Annex. Stochastic forecast would be feasible given that the assessment is considered to provide reliable estimates of uncertainty on which to base the predictions.

Conclusions

The assessment has been performed correctly and according to the Stock Annex. Some changes were made to the methods for short-term predictions.

Some suggestions for future consideration/benchmark follow:

Assumptions about stock components need to be revised in light of recent findings.

The observed declining trend in weights at age in the stocks needs to be investigated.

The data used to compute the recruitment index does not fully cover all nursery areas of mackerel. Some modifications of the recruitment index have been suggested and those will need to be evaluated.

Checklist for review process

General aspects

* Has the EG answered those TORs relevant to providing advice?

    o Yes

* Is the assessment according to the stock annex description?

    o Yes

* Is general ecosystem information provided and is it used in the individual stock sections.

    o Yes, as much as it can be used.

* If a management plan has been agreed, has the plan been evaluated?

    o Yes, but a new plan is being evaluated to address new perceptions resulting from the most recent Benchmark.

For update assessments

* Have the data been used as specified in the stock annex?

    o Yes

* Has the assessment, recruitment and forecast model been applied as specified in the stock annex?

    o Yes, an exception is commented in a previous section of this audit.

* Is there any **major** reason to deviate from the standard procedure for this stock?

    o No

- Does the update assessment give a valid basis for advice? If not, suggested what other basis should be sought for the advice?
    - o The update assessment gives a valid basis for advice.

Audit of Northeast Atlantic Mackerel

Date 2014.09.05

Auditor: Eydna í Homrum

General

The stock assessment for NEA mackerel in 2014 has been done according to the stock annex. The assessment for NEA mackerel was last benchmarked in February 2014. All inputs to the assessment were as described in the stock annex.

For single stock summary sheet advice:

1) **Assessment type: update** – was benchmarked February 2014

2) **Assessment**: analytical

3) **Forecast**: presented

4) **Assessment model**: state-space assessment model (SAM). Tuning: 3 surveys (SSB from Triennial Egg Survey, IBTS recruitment abundance index (log transformed) and IESSNS abundance index) and Tagging/Recapture data from Norwegian tagging program

5) **Data issues:** all data described in the stock annex were available for this year's assessment of NEA mackerel.

6) **Consistency**: Last year, NEA mackerel was assessed as a data limited stock. The assessment was benchmarked February 2014.

7) **Stock status**: SSB in 2013 was 4.3 mio tonnes, which is above Bpa – SSB has been stable the most recent years, F_{4-8} (0.22) is below Fpa . Recruitment has shown an increasing trend since the late 1990s.

8) **Man. Plan.**: A management plan, agreed upon in 2008, is in place. The benchmark workshop recommended that the management plan should be revised before advice is released for 2015.

General comments

The NEA mackerel section is well structured and easy to follow. The assessment procedure has been described in sufficient detail.

Technical comments

The assessment and forecast are done according to the stock annex.

References – missing from reference list

Simmonds et al 2010.

Carrera and Riviero – reference incomplete

Tables – No reference to:

Table 2.1.2.1,

Table 2.5.5.2.3

Audit of North Sea Horse Mackerel: Divisions Iva (1st and 2nd quarter), IIIa (excluding Western Skagerrak in 3rd and 4th quarter), IVb, IVc and VIId

Date: September 2014

Auditor: **Nicola Walker**

For the attention of: Advisory drafting group, ACOM and WGWIDE

General

The assessment and suggested advice is based on the ICES data-limited approach (Category 3); adjusting the landings (last three years average) by the ratio of the most recent index values (2 or 3) with the preceding values (3 or 5). The index was derived from the IBTS Q3 survey using a GLM approach.

For single stock summary sheet advice:

1) **Assessment type:** SALY

2) **Assessment**:   Trends

3) **Forecast**:   Not presented

4) **Assessment model**: Category 3 of the ICES data-limited approach (DLS). Input data: IBTS indices of fishable biomass (2006-2013) and total landings data (2011-2013).

5) **Data issues:** The available survey data do not cover the main fishing grounds for the stock. Cohort signals in the catch are weak.

6) **Consistency:** The 2012 and 2013 advice was also based on the DLS approach using IBTS Q3 survey indices. The advice from 2012 remains valid.

7) **Stock status**: Currently at a low biomass. There may be a potential increase in the most recent years but this is highly uncertain.

8) **Man. Plan.:** Currently there is no agreed management plan.

General comments

This was a well documented, well ordered and considered section. The derivation of the survey indices and the explanation of the exploratory assessment model were clear and easy to follow. The DLS approach seems appropriate given the issues with the data. The advice seems appropriate given the high uncertainty around the survey index.

Technical comments

- The age compositions in Figures 4.3.1 and 4.3.2 are for the period 1987-2013, but are stated as 1987-1995 in the text.

- Year numbering 'jumps around' on the x-axis of Figure 4.3.2.

- Typo in the first paragraph of 4.4.3 'int he'.

- Section 4.4.3.1 refers to a dispersion parameter k which is not shown in the GLM equations.

- Reference to ADMB missing in 4.5.1.

- Repeat of the word 'index' in 4.5.1.

- Figure number missing in first sentence of 4.5.2.

Conclusions

The DLS assessment is a good basis for advice.

Audit of North Sea Horse Mackerel: Divisions Iva (1st and 2nd quarter), IIIa (excluding Western Skagerrak in 3rd and 4th quarter), IVb, IVc and VIId

Date September 6, 2014

Auditor: **Anna H Olafsdottir**

Audience: ACOM, Advisory drafting group and WGWIDE

This is a data poor stock and currently there is no approved stock assessment model.

Annual catch limits calculated using data limited approach (Category 5), in 2012, are recommended for 2015.

No forecast is provided.

There is no stock annex for this stock.

General

Date exploration included: calculations of two stock indexes (GLM index and DLN index) from IBTS survey data. Futhermore, four different runs of the JAXass model were executed.

The GLM index preformed best: it was robust to inclusion of new data, it provided appropriate treatment of IBTS survey data, and confidence boundaries of final estimate can be calculated.

Recommend exploring methos of using information from data-rich stocks to help developing stock assessment methods for data-poor stock like the NSHM mackerel stock.

For single stock summary sheet advice:

Advice for this stock provided by WGWIDE, in 2012, according to data limited approact (category 5), adviced an annual catch of 25,500 metric tonnes for the next three years unless there was a clear signal of changes in stock size. The different exploratory analyses executed in 2014 gave highly uncertain stock estimates, hence, the advice from 2012, of an annual catch of 25,500 t remains unchanged.

1) **Assessment type:** Data exploration.

2) **Assessment**: Input data in the DLS approach: IBTS Q3 indices of fishable biomass (2008-2012), total landings data (2010-2012).

3) **Forecast**: not presented

4) **Assessment model**: Data limited approach (Category 5) was preformed in 2012 and remains valid for 2015.

5) **Data issues:**

   There is no information neither on maturity-at-age nor mortality.

   Cohort structure is not clearly detectable in the catch data, speculations this could be caused by age reading issues, geographical shifts in fishing, or mixing of North Sea and Western stocks in the catch samples.

   Highly uncertain Z due to weak cohort signal in catch data.

   IBTS surveys do not cover the main fishing area.

6) **Consistency:** Advice from 2012 remains valid for the third year.

7) **Stock status**: Results from data exploration indicate low stock status but there is high uncertainty associated with estimates.

8) **Man. Plan**.: There is none.

General comments

This was a well documented, well ordered and considered section.

Technical comments

Reference form a midel missing in section 4.5.1

Figure number missing in section 4.5.2

Conclusions

Different methods to estimate stock size using available data were explored and rejected for various reasons, hence, the DLS annual catch advice from 2012 was recommmened for the third year. The assessment has been performed correctly.

Audit of Norwegian Spring Spawning Herring

Date September 2014

Reviewer: **Patrícia Gonçalves, Gersom Costas**

For the attention of: Advisory drafting group, ACOM and WGWIDE

General

The assessment and short term forecast of **Norwegian Spring Spawning Herring** in the NE Atlantic was based on data handling procedures and assessment modeling as described in the last benchmark assessment carried out in 2008 with some exception described below.

- Since 2010 a new maturity-at-age data was used for the whole time-series, following a recommendation from Workshop on estimation of maturity ogive in Norwegian spring spawning herring (WKHERMAT).

- In 2013, an updated algorithm was used to calculating the terminal F-values for last age classes where no data supporting the estimate of terminal stock numbers was available. The same procedure was used this year.

- In 2013 Intercatch was used for the first time to calculate age and size distributions

- Minor discards are known to take place, but cannot be quantified accurately; the proportion of discards in the total catches is considered negligible.

- MSY and PA reference points have been reviewed by ICES in 2013.

The information used in the assessment is catch data and survey data from eight surveys. The analysis was restricted to the years 1988 – 2014, which is regarded as the period representative of the present production and exploitation regimes, and is presumed to be of main interest for the management.

Historically, the size of the stock has shown large variations and dependency on the irregular occurrence of very strong year classes. But it is assumed that future recruitment patterns are similar as observed in the past.

A deterministic short term projection is used.

For single stock summary sheet advice:

1) **Assessment type:** update

2) **Assessment**:   Analytical

3) **Forecast**:   short term forecast presented

4) **Assessment model**: VPA (TASACS toolbox) tuning by 8 surveys series (Norwegian acoustic survey on spawning grounds in Feb./Mar. (NASF), Norwegian acoustic survey in Nov./Dec. (NASN), Norwegian acoustic survey in Jan. (NASJ), 2 International ecosystem surveys in the Nordic Seas (IESNS), 2 Ecosystem surveys in the Barents Sea (Eco-NoRu-Q3 (Aco)), Norwegian herring larvae survey on the Norwegian shelf (NHLS))

5) **Data issues:** Assessment period 1988–2014: Commercial catches (international catches, ages, and weight-at-age from catch sampling). Eight survey indices: one larval survey (NHLS), two recruitment surveys (indices from Eco-NoRu-Q3 (Ace), and for surveys covering the adult stock, including one survey which

provides an index of the abundance of young herring in the Barents Sea (including IESNS). No commercial indices. Maturity ogive variable by year-class strength. Natural mortalities are fixed values from historical analyses.

6) **Consistency**: the assessment of 2013 is consistent with last year's assessment.

7) **Stock status**: The stock is declining and estimated at B_{pa} in 2013. In the last 15 years, five large year classes have been produced (1998, 1999, 2002, 2003, and 2004). However, the available information indicates that year classes born after 2004 have been small. Fishing mortality in 2013 was slightly below F_{pa} and F_{MSY}, but above the management plan target F. The precautionary approach states that should the SSB fall below B_{pa} the fishing mortality should be reduced to ensure a safe and rapid recovery of the B_{pa}. Even zero catches in 2015 is expected to lead to a reduction in SSB in 2016 to 3.4 million tonnes

8) **Man. Plan.**: EU, Faroe Islands, Iceland, Norway, and Russia agreed in 1999 to implement a long-term management plan for Norwegian spring-spawning herring. The management plan aims to constrain harvesting within safe biological limits and is designed to provide sustainable fisheries in the long term. ICES has evaluated the plan and concluded that it is consistent with the precautionary approach.

General comments

Change in maturity-at-age contributes to the change in perception of estimated SSB in the 2010 and later assessments compared to previous assessments.

The new updated algorithm implemented to derive the terminal fishing mortalities on the oldest age groups in the assessment for cohorts where there is insufficient information to estimate these, has increased the stability in the assessment.

There are indications that there are changes in the catchability of herring in tuning survey (feeding area survey in the Norwegian Sea in May). These changes would produce bias in the results of the assessment. Studies on change of catchability of herring in the survey are required.

For the fishing seasons 2013 and 2014, a lack of agreement by the Coastal States on their share in the TAC has led to unilaterally set quotas which together are higher than the TAC indicated by the management plan. In addition, increased unilateral catches in 2013 taken by Greenland were reported to WGWIDE. If this situation continues, the high catches will accelerate the present decline of the stock and increase the risk of the stock going below B_{lim}.

The discards of this stock are considered to be low, slippage occurs. The amount of slippage is unquantified and thus cannot be accounted for in the assessment.

Technical comments

In Section "7.3.1.2 Germany" The reported landings in 2013 were 4242 tonnes taken in IIa and IIb. However, the total landings reported in Table 7.5.1.1 are 4244 tonnes.

In Section **"7.3.1.4 Faroe Islands"** instead of "The majority of the landings was…" must be "The majority of the landings were …"

Figure 7.7.3.2.6 referenced from section 7.7.3.2 is missing.

Figure 7.7.3.2.5 and Figure 7.7.3.2.6 should be named as Figure 7.7.3.2.1 and Figure 7.7.3.2.2 because don't appear Figure 7.7.3.2.1. to Figure 7.7.3.2.4

Table 2 referenced in section 7.5.7.4 is missing.

Table 7.5.7.6.1: there isn't any value Index 2 in 2014. They don't explain why

In section 7.7.1 , 2nd paragraph say "For survey 5 Figure 7.7.1.3 shows the disaggregated catches in numbers plotted on a log scale" but this figure is about "Age disaggregated abundance indices from the acoustic survey on the feeding area in the Norwegian Sea"

In section 7.7.3.1 shoud be cited Figure 7.7.3.1. And this figure should be named Figure 7.7.3.1.1 both in text and figures files

Table 7.7.2.1 (The stock summary of the exploratory TISVPA run) is not referenced in the text.

There is not reference ICES 2013c

There is not reference ICES 2014b

Figure 7.7 3.3 is not referenced in the text

Conclusions

The assessment has been performed correctly.

Audit of Boarfish in the Northeast Atlantic

Date 05-Sep-2014

Auditor: **D. C. M. Miller and M. Payne**

General

The fishery for boarfish in the northeast atlantic is relatively new. Time series of catches are short and the time series of the main survey (the acoustic survey) is shorter. The assessment is supplemented with a number of IBTS indices, though these are noisy and have some conflicting signals since they come from distinct areas of the stock distribution. This year the acoustic survey showed a large drop in estimated biomass compared to last year. This has changed our perception of the stock condition, scaling the biomass 30-40% lower over the whole time series.

For single stock summary sheet advice:

1) **Assessment type**: update

2) **Assessment:** analytical

3) **Forecast**: presented (short term) under Fmsy

4) **Assessment model**: Bayesian state-space surplus production, tuning by acoustic and bottom trawl survey series (SPPGFS, SPINGFS, IGFS, EVHOE and BFAS)

5) **Data issues:** assessment highly influenced by the acoustic surveys for which there are only three data points

6) **Consistency:** same procedures applied as last year, with a fairly large retrospective adjustment down in biomass

7) **Stock status:** SSB is above Blim and F is below Fmsy. There is large uncertainty around current estimate of biomass.

8) **Man. Plan.**: There is currently no agreed management plan

General comments

This is a well written, detailed report. It is a good reflection of all the work that has gone into this stock in recent years. All procedures seem to have been followed as they were in 2013 (the first year with an accepted Category 1 assessment).

Data

Sampling level of catches is OK.

The catch at age data show no strong year classes since the 2005 year class (the 2010 year class looks strong at age 3, but too early to say now). This can almost be seen in the IBTS data too. It seems the increase around 2010 may have come on the back of a period of strong year classes, and the subsequent reduction in biomass has resulted from the poorer recruitment since 2005.

It is difficult to explain the observations of sharp increases and decreases in abundance of this long-lived fish. Perhaps is can be explained by patterns in historic recruitment or changes in the distribution of the stock relative to the survey and fishery. It is argued that the latter is unlikely.

Because the acoustic survey is still new, we are not sure what level of interannual variation to expect. This variation resulting from changes in the availability of the stock

to the acoustic survey could be caused by survey effects, hydrographic conditions, prey availability etc. The model results are sensitive to this survey since it provides an anchor for the assessment, which would be very difficult to fit otherwise.

The noisy IBTS indices are inverse-variance weighted and hence to not contribute much to the model fit.

Assessment

This year's model had lower K and r parameter estimates than last year, and a very slightly higher q estimate for the acoustic survey. This leads to lower biomass estimated over the time series that allows the model to reconcile the sharp reduction in the acoustic survey with the levels of catches that have been taken.

Forecast

SPALY.

Intermediate year TAC assumption may be an over estimate. 2014 TAC, 127 509 t + average discards of 6 371 t. The 2013 TAC of 82000t was not caught completely, and early indications are that the fishery will not be easy this year.

A wide range of forecasts were done.

FMSY has been recalculated by the model (r/2) as 0.17, down from 0.23 in 2013. This ensures consistency between the model outputs and the calculated reference point. It is not standard procedure in ICES to change reference points from year to year. However, it would be inappropriate to remain using the Fmsy value calculated last year which also assumed a higher K and higher r values than the current forecast assumes.

Technical comments

- The "**Advice and management applicable to 2011, 2012 and 2013"** section is usually only for the previous year, but given that this is a new fishery I think it is useful that some more detail on the recent past is provided.

- Overall there are quite a few sections that describe the fish and the fishery that do not change much from year to year (e.g. historical literature sources, fishing technology, details about the surveys. These could be moved to the stock annex and replaced in the report by refernces to the stock annex to make it briefer. But again, given that this is a new fishery it is OK to leave it in there for now.

- Some minor tracked changes and comments made in the draft report.

Conclusions

The assessment and forecast has been performed correctly. The stock assessment method makes use of all available fisheries independent data, as well as landings and discard data.

The short time series of the acoustic survey is of concern, along with whether or not the target F should be fixed or change annually to ensure compatibility with the most recent assessment results.

Checklist for review process

General aspects

- Has the EG answered those TORs relevant to providing advice?

    o **YES**

- Is the assessment according to the stock annex description?

    o **YES**

- Is general ecosystem information provided and is it used in the individual stock sections.

    o **YES**

- If a management plan has been agreed, has the plan been evaluated?

    o **SORT OF**. The management plan, proposed by the Pelagic RAC in 2012, has not been fully evaluated by ICES. However ICES advised in 2013 that the HCR in tier 1 of the plan can be considered in accordance with the precautionary approach if a Category 1 assessment is available.

For update assessments

- Have the data been used as specified in the stock annex?

    o **YES**

- Has the assessment, recruitment and forecast model been applied as specified in the stock annex?

    o **YES**

- Is there any **major** reason to deviate from the standard procedure for this stock?

    o **NO**. The sharp decline in the acoustic survey over two years causes some concern, but not enough to deviate form the agreed method. The survey indicates a decreasing stock, and so too does the assessment method, with appropriate reductions in advised catch.

- Does the update assessment give a valid basis for advice? If not, suggested what other basis should be sought for the advice?

    o **YES**. The assessment make the best use of all available data.

Audit of Western Horse Mackerel in IIa, IVa, Vb, VIa, VIIa-c, e-k, and Sub-area VIII (Western stock)

Date 04.09.2014

Auditor: Are Salthaug

For the attention of: Advisory drafting group, ACOM and WGWIDE

General

The assessment and short term forecast of **Western Horse Mackerel** in **IIa, IVa, Vb, VIa, VIIa-c, e-k, and Subarea VIII (Western stock)** is based on data handling procedures and assessment modeling as described in 2008 when the assessment was accepted by WGWIDE (separable window was increased to 6 years in 2009). The assessment has not been benchmarked.

For single stock summary sheet advice:

1) **Assessment type: SALY**

2) **Assessment**:   analytical

3) **Forecast**:   presented (short term)

4) **Assessment model**: SAD (linked Separable-ADAPT VPA), tuning by 1 survey index (triennial egg survey)

5) **Data issues:** lack of discard information. Lack of age-disaggregated survey data. Lack of annual survey data.

6) **Consistency**: The assessment seems to be consistent with the 2012 assessment.

7) **Stock status**: SSB is estimated to be at 0.61 Mt in 2014, which is the lowest in the time series. F has been increasing since 2007. Recruitment has been low since 2010.

8) **Man. Plan.**: There is currently no agreed management plan.

General comments

The procedure is conducted according to the stock annex. Only available tuning data are based on a triennial survey which is designed for deriving the annual egg production of mackerel but is also used for estimating an egg production index for horse mackerel. Discard data are only available for parts of the fishing fleet, so the total amount cannot be calculated.

Technical comments

Section 5.2.5 and Table 5.2.5.3: mean weights at age in stock were assigned as 0.085kg. A basis for this choice should be given.

The table numberes referred to in section 5.1.1 and 5.1.2 are wrong.

Weight units should be given on the y-axis or in the figure text in figure 5.2.5.1 and 5.2.5.2

Conclusions

Procedures have been carried out in accordance with the stock annex. However, the assessment suffers from the lack of age information in the single available fishery-independent index. This results in a rescaling of the assessment every three years, when a new survey point becomes available and a revision of the reference points.

Checklist for review process

General aspects

- Has the EG answered those TORs relevant to providing advice?

  YES

- Is the assessment according to the stock annex description?

  YES

- Is general ecosystem information provided and is it used in the individual stock sections.

  YES

- If a management plan has been agreed, has the plan been evaluated?

The management plan proposed by the Pelagic RAC in 2007 was used to set the EU TAC for 2008-2010. The plan was evaluated by ICES in 2013 and found to **not** to be consistent with the precautionary approach.

For update assessments

- Have the data been used as specified in the stock annex?

  YES

- Has the assessment, recruitment and forecast model been applied as specified in the stock annex?

  YES

- Is there any **major** reason to deviate from the standard procedure for this stock?

  NO

- Does the update assessment give a valid basis for advice? If not, suggested what other basis should be sought for the advice?

  YES

Audit of Blue Whiting – Subareas I–IX, XII and XIV

Date 04/09/2014

Auditor: **Andrew Campbell, Jens Ulleweit**

General

The assessment and short term forecast of **Blue Whiting - Subareas I–IX, XII and XIV** is based on data handling procedures and assessment modeling following the benchmark of 2012. Re-evaluation of the reference points took place in May and October 2013.

For single stock summary sheet advice:

1) **Assessment type: update**

2) **Assessment**:   analytical

3) **Forecast**:   presented.

4) **Assessment model**: SAM model (with comparative runs in SMS and XSA, all giving similar results)

5) **Data issues:**   There is a lack of juvenile indices leading to a poor estimation of incoming recruitment.

   The population structure of blue whiting in the NE Atlantic appears to be more complex than the current single-stock structure used for management purposes. The assessment model and survey data are assumed to mainly reflect the northern component: there is no recent information available regarding the relative size of the southern component. According to the catch statistic the majority of the stock seems however to be covered.

   Blue whiting otoliths have proven to be quite difficult to age and a evaluation at the latest workshop shows that the experience of the reader determines the interpretation of the otolith structure. This strongly indicates that biased readings might have been present in many cases for the historical data used in the assessment, even for experienced age-readers. Here is a need for more regular exchanges.

   Discards are not included but are considered negligible.

6) **Consistency**: After benchmark in 2012 this is the third year that the SAM model has been applied for this stock. Comparison of the final assessment results from the last 6 years show stable and consistent output, except for the 2010 assessment which was flawed by low survey coverage in this year. However, the 2014 new advice is based on a deterministic forecast while a stochastic forecast has been applied in the previous two years. This change is made to match the assumption made by the management strategy evaluation of an alternative management plan. The deterministic forecast gives a 5-6 % lower TAC than the stochastic forecast previously applied.

7) **Stock status:** SSB has almost doubled from 2010 (2.9 million tonnes) to 2014 (5.5 million tonnes) and is clearly above Bpa (2.25 million tonnes). This increase is due to historical low F since 2011 in combination with a higher recruitment (age 1) since 2010. The uncertainty around the recruitment in the most recent year is high.

8) **Man. Plan.**: Agreed by Norway, the EU, the Faroe Islands, and Iceland in 2008. The plan uses i) a target fishing mortality (F = 0.18) if SSB is above SSBMP (= Bpa), ii) a linear reduction to F = 0.05 if SSB is between Bpa and Blim, and iii) F = 0.05 if SSB is below Blim. ICES evaluated the plan in 2008 and concluded that it is in accordance with the precautionary approach.

ICES evaluated a NEAFC request concerning an alternative management plan in May 2013 and further in October 2013. No agreement on the application of a new management plan has been obtained.

General comments

Procedures have been carried out in accordance with the stock annex with the exception of the forecast which is based on determistic projections instead of stochastic projections.

Technical comments

Annex Issues

Stock weights – there is no discussion on the stock weights (in section titled 'Weight at age in the catch and Weight at age in the stock). For the assessment these are assumed the same but there is no explanation as to why this is a valid assumption. Additionally, the table of input data in the annex implies that the two are different.

Surveys used in the assessment – the annex implies 3 surveys are used in the assessment whereas only the IBWSS is used quantitatively.

Link to stockassessment.org in annex out of date

Some information is missing on model options in annex (from model.cfg file). The flags for 'max age a plus group?' and 'use correlated random walks' are not printed.

Annex considers deterministic forecast inappropriate, yet this was used in 2014. Needs to be updated to reflect this.

Reference points table requires updating

Tables need updating with most recent information

Draft Report Issues

Tables

Table 8.3.1.1 – no footnote provided for **** label

Table 8.3.3.1 – there are two tables with this number (Catch weight at age and Natural Mortality & Proportion Mature at Age)

Tables 8.3.4.1.1 and 8.4.1 both contain IBWSS data. The data for 2008 differs. That shown in 8.4.1 matches that used in the assessment

Table 8.8.2.1.1 Input to short term projections – the footnotes are incorrectly annotated (second one needs additional * and spelling corrected). These notes indicated that stock numbers for ages 1 and 2 were updated using alternative values. However, there alternatives are not the numbers in the table.

Table 8.8.2.2.2 – Stochastic forecast. The numbers in this table do not match those on stockassessment.org

Figures

Figure 8.2.2-3 referenced from section 8.2 but could not find them

Text

Section 8.3.1.2 states that 977 samples were collected. Table 8.3.1.2.2 indicates the total was 915.

Section 8.3.1.3 references table 8.3.1.3.4 as the catch numbers at age. This data is in table 8.3.1.4.1

Section 8.3.1.4 refers to table 8.3.1.4.1 as showing the mean weight at age in the catch. This table contains the number at age.

Section 8.3.3 refers to table 8.3.3.1. There are two tables with this number. A reference should be included for the cited working document.

Section 8.3.4.1 refers to tanle 8.3.4.1.1 as containing the spawning stock estimates whereas the table quotes total stock biomass.

Need to use superscripts when quoting numbers in scientific format (paragraph 2 of 'Results' subsection)

The third paragraph in the Results subsection is unclear and subsequently difficult to understand.

Section 8.3.4.2. Final paragraph should refer to six years of data, not five.

Section 8.4. Paragraph 2 should indicated which year the 'year effects' refer to. Paragraph 3 contains several typos.

Conclusions

The assessment has been performed correctly

Checklist for review process

General aspects

- Has the EG answered those TORs relevant to providing advice? **Yes**

- Is the assessment according to the stock annex description? **Yes, but annex requires updating**

- Is general ecosystem information provided and is it used in the individual stock sections.**In general: yes. Clarifying need in terms of the population structure of blue whiting**

- If a management plan has been agreed, has the plan been evaluated? **Yes.**

For update assessments

- Have the data been used as specified in the stock annex? **Yes, but annex requires updating with the most recent information**

- Has the assessment, recruitment and forecast model been applied as specified in the stock annex? **Yes, with the exception of the forecast. The annex requires updating in this respect**

- Is there any **major** reason to deviate from the standard procedure for this stock? **No major reason**

- Does the update assessment give a valid basis for advice? If not, suggested what other basis should be sought for the advice? **yes**