

## Annex 5: Audits

### Audit of (bss.27.4bc7ad–h)

Date: 12–18 May/2020

Auditor: Jonathan White

#### General

- Input data – complex, multiple sources and types, with time-series starting and stopping.
- Some issues relating to the time-series documented as inputs, and the actual inputs visible in the last assessment – these were oversights in documentation and are being corrected.
- Issue around the uncertainty implemented around survey indices. These were set as normal, while they should be set as lognormal. These were checked with model.

#### For single stock summary sheet advice

1. **Assessment type:** update/SALY
2. **Assessment:** Analytical
3. **Forecast:** Presented
4. **Assessment model:** Stock synthesis 3, with 22 data inputs (including: catch, abundance indices, length comp., age comp., discards):
  - Commercial landings (international landings, ages & length frequencies from catch sampling);
  - Commercial discards (UK bottom otter trawl & nets, combined French fleet, length frequencies from catch sampling) One recruit survey (UK Solent autumn survey, 1986–2019 excluding 2010 & 2012);
  - One bottom trawl survey (Channel Groundfish Survey, 1988–2014);
  - One commercial tuning fleet (2000–2019);
  - Growth & mat. data from sampling of commercial catches & surveys;
  - Natural mortality (inferred from life-history parameters and maximum observed ages).
5. **Data issues:** Some updates. A number of inconsistencies between data IN the model and the data documented as being in the model. These were resolved.
6. **Consistency:** The model and assessment is consistent with last year's model – with some updates to minor issue corrected. Corrections were generally small in magnitude of value changes and their impacts were sensitivity checked, showing small changes, consistent with last year's advice).

#### Updates

- 2019 data incorporated
- Fleet "Other" – correction to 2018 value (61 t to 208 t)
- Corrected UK Lines and UK MWT age sample sizes (typo)
- Recreational fleet – re-estimated as every year based on f multipliers (occurs every year)
- Index and age comp AutBass – adjustment of full time-series of Solent survey
- French LPUE – re-estimated as every year with statistical model (occurs every year)

- French age data – estimates corrected back to 2009 (only 2018–2019 correction used in 2020 assessment update)
- 7. **Stock status:**  $B < MSY_{B_{trigger}}$  / just above  $B_{lim}$ .  $F < F_{MSY}$ , R is low (and forecast for three years in the model 2017–2019 as  $G_{mean}$  (2005 to 2016)).
- 8. **Management Plan:** Part of the EUMAP.

## General comments

This is a complex assessment, the assessor has done well, especially considering this is a first time taking it on, picking up on a number of minor inconsistencies and presenting sensible updates while seeking support from the group. From this a list of issues requiring an inter-benchmark or benchmark to sign off on has been compiled.

## Technical comments

As detailed, the stock coordinator has picked up on several small issues and made appropriate corrections. There are a number of issue outstanding, that are outside the scope of updating in the Celtic Seas Working Group, and are viewed as requiring an Inter-Benchmark to check them over. These are being itemised in the Issues list for this stock and being put forward to the benchmark process.

## Conclusions

The assessment has been performed correctly and the advice is fit for purpose.

## Checklist for audit process

### General aspects

- Has the EG answered those ToRs relevant to providing advice? Yes
- Is the assessment according to the stock annex description? Yes, as intended
- If a management plan is used as the basis of the advice, has been agreed to by the relevant parties and has the plan been evaluated by ICES to be precautionary? EUMAP
- Have the data been used as specified in the stock annex? Yes, as intended
- Has the assessment, recruitment and forecast model been applied as specified in the stock annex? Yes, as intended
- 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 (bss.27.6.a,7.b,7.j)

Date: 02/06/2020

Auditor: Katie Thomas

### General

Precautionary buffer was applied

### For single stock summary sheet advice

1. **Assessment type:** There is no assessment for this stock
2. **Assessment:** NA
3. **Forecast:** NA
4. **Assessment model:** NA
5. **Data issues:** NA
6. **Consistency:** NA
7. **Stock status:** Unknown
8. **Management Plan:** No

### General comments

Abbreviated advice sheet, straightforward. Report section is well written.

### Technical comments

Table 32.2.1 has no units

### Conclusions

NA

### Checklist for audit process

#### General aspects

- Has the EG answered those ToRs relevant to providing advice?
- Is the assessment according to the stock annex description?
- If a management plan is used as the basis of the advice, has been agreed to by the relevant parties and has the plan been evaluated by ICES to be precautionary?
- Have the data been used as specified in the stock annex?
- Has the assessment, recruitment and forecast model been applied as specified in the stock annex?
- Is there any **major** reason to deviate from the standard procedure for this stock?
- Does the update assessment give a valid basis for advice? If not, suggested what other basis should be sought for the advice?

## Audit of Cod 6a

Date: 02/06/20

Auditor: Marianne Robert

### General

#### For single stock summary sheet advice

1. **Assessment type:** SAM – some modification compared to what was agreed at WKDEM in February 2020- This changes are well documented.
2. **Assessment:** analytical – Cat 1
3. **Forecast:** presented - stochastic forecast conducted in SAM
4. **Assessment model:** SAM + five surveys indexes+ time-varying M

The last benchmark in February 2020 resulted in a change of assessment method (TSA to SAM), inclusion of revised catch data from 2003 onwards and updated biological parameters.

5. **Data issues:**

UK VMS data for 2019 were not submitted in accordance with the VMS data call deadline and hence were not available to WGCSE. Therefore, the WG had to revert to making use of area misreported landings estimates provided by Marine Scotland Compliance for 2019.

The input data for this cod assessment are uncertain (both survey indices and commercial data) and furthermore, the estimates of area misreported landings (which account for >40% of total landings in recent years, average 2017–2019) will have uncertainty associated with them which is not included in the assessment.

6. **Consistency:** the stock was benchmarked in 2020
7. **Stock status:** The current spawning–stock biomass (SSB) is extremely low and has been below  $B_{lim}$  since 1993. Recruitment has also been very low since 2001. Fishing mortality (F) has increased since 2016.
8. **Management Plan:** The EU multiannual plan (MAP) for stocks in in the Western Waters and adjacent waters (EU, 2019) takes bycatch of this species into account.

### General comments

This was a well-documented, well-ordered and considered section. It was easy to follow and interpret.

### Technical comments

Minor modifications suggested in the text and figure captions – Stock annex need to be finalized.

### Conclusions

The assessment presented here contains a number of deviations from the benchmark; however, there are well-documented. The forecast procedure was setup at WGCSE 2020.

International allocation procedure, model fit and forecast were not performed by the auditor.

## Checklist for audit process

### General aspects

- Has the EG answered those ToRs relevant to providing advice?
- Is the assessment according to the stock annex description?
- If a management plan is used as the basis of the advice, has been agreed to by the relevant parties and has the plan been evaluated by ICES to be precautionary?
- Have the data been used as specified in the stock annex?
- Has the assessment, recruitment and forecast model been applied as specified in the stock annex?
- Is there any **major** reason to deviate from the standard procedure for this stock?
- Does the update assessment give a valid basis for advice? If not, suggested what other basis should be sought for the advice?

## Audit of cod.27.6b

Date: 29/5/2020

Auditor: H Dobby

### General

#### For single stock summary sheet advice

1. Assessment type: update/SALY
2. Assessment: No assessment – category 6, data limited stock.
3. Forecast: No forecast – category 6 stock. Advice provided on the basis of a precautionary reduction of catches, etc.
4. Assessment model: No model
5. Data issues: *SIAMISS survey data presented for the first time (biomass and numbers-at-length).*
6. Consistency: *Advice in 2017 (for 2018–2020) applied the PA buffer. Not applied this year due to increased survey catch rates since 2018 and stable commercial lpue since 2016 indicating current exploitation to be appropriate for the stock.*
7. Stock status: *Unknown*
8. Management Plan: NA
9. General comments

Report section generally well written.

### Technical comments

Some suggestions to improve clarity made as comments on the document.

Advice sheet: some discrepancies in official landings numbers need to be checked.

### Conclusions

The assessment has been performed correctly.

### Checklist for audit process

#### General aspects

- Has the EG answered those ToRs relevant to providing advice?
- Is the assessment according to the stock annex description?
- If a management plan is used as the basis of the advice, has been agreed to by the relevant parties and has the plan been evaluated by ICES to be precautionary?
- Have the data been used as specified in the stock annex?
- Has the assessment, recruitment and forecast model been applied as specified in the stock annex?
- Is there any **major** reason to deviate from the standard procedure for this stock?
- Does the update assessment give a valid basis for advice? If not, suggested what other basis should be sought for the advice?

## Audit of cod.27.7a

Date: 06/06/2020

Auditor: Dave Stokes

### General

#### For single stock summary sheet advice

1. Assessment type: update after benchmark
2. Assessment: trends
3. Forecast: NA
4. Assessment model: NA – Q1 Northern Ireland Groundfish Survey index used.
5. Data issues:
  - a) Tagging studies suggesting increased migration of older ( $\geq 3$  years) fish out of the 7a area causing significant bias in recent assessment.
  - b) Catch data quality reduced generally since 1990s with restrictive quotas. WG addresses this with sample based estimates, but 2003–2006 data also poor so replaced by modelled output.
6. **Consistency:** This stock was benchmarked in 2017 concluding in an ASAP assessment. The WG downgraded the assessment to Cat 3 in 2019 due to significant Mohn's Rho values and approach in 2020 is consistent with 2019, but deviates from the Stock Annex therefore.
7. **Stock status:** Stock and F, on the relative scale, are both considered very low. There is some recent signs of slight increasing trend in SSB and reduction in F, but again marginal and at a low level.
8. **Management Plan:** Management plan is undefined as this stock is a target stock in the MAP, however it was downgraded to cat 3 last year.

### General comments

#### Technical comments

The assessment has been conducted in line with the recent revised trends based assessment approach taken by WGCSE 2019. The advice given based on the 2-over-3 rule.

### Conclusions

The assessment has been performed correctly

### Checklist for audit process

#### General aspects

- Has the EG answered those ToRs relevant to providing advice?
- Is the assessment according to the stock annex description?
- If a management plan is used as the basis of the advice, has been agreed to by the relevant parties and has the plan been evaluated by ICES to be precautionary?
- Have the data been used as specified in the stock annex?
- Has the assessment, recruitment and forecast model been applied as specified in the stock annex?
- Is there any **major** reason to deviate from the standard procedure for this stock?

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



## Audit of (Had.27.6.b)

Date: 04/06/2020

Auditor: Katie Thomas

### General

#### For single stock summary sheet advice

1. **Assessment type:** XSA
2. **Assessment:** trends
3. **Forecast:** presented
4. **Assessment model:** XSA/ Tuning indices: one survey index (Scottish Rock-IBTS-Q3)
5. **Data issues:** No
6. **Consistency:** Benchmarked in 2019, no changes in data types compared to the previous assessment.
7. **Stock status:** >B<sub>lim</sub>, >F<sub>lim</sub>, >B<sub>trigger</sub>, >F<sub>MSY</sub>
8. **Management Plan:** No

#### General comments

Abbreviated advice sheet, therefore straight forward. Report section edited and needs some revision.

#### Technical comments

If track changes are accepted, plus tables and graphs edited, report should be easier to follow.

#### Conclusions

The assessment has been performed correctly.

#### Checklist for audit process

##### General aspects

- Has the EG answered those ToRs relevant to providing advice?
- Is the assessment according to the stock annex description?
- If a management plan is used as the basis of the advice, has been agreed to by the relevant parties and has the plan been evaluated by ICES to be precautionary?
- Have the data been used as specified in the stock annex?
- Has the assessment, recruitment and forecast model been applied as specified in the stock annex?
- Is there any **major** reason to deviate from the standard procedure for this stock?
- Does the update assessment give a valid basis for advice? If not, suggested what other basis should be sought for the advice?

## Audit of haddock in the Irish Sea (had.27.7a)

Date: 05/06/2020

Auditor: Andrzej Jaworski

### General

ICES provides annual catch advice for this stock based on the MSY approach. A full analytical assessment and forecast were performed in 2020 in accordance with the procedures outlined in the stock annex. The assessment is based on an age-structured model.

### For single stock summary sheet advice

1. **Assessment type:** Update (following the WKIrish3 benchmark assessment). Age-structured assessment. The stock was benchmarked by WKIrish in 2017.
2. **Assessment:** Age-structure assessment. Stock Category 1.
3. **Forecast:** Short-term forecast is presented. Conducted using FLR libraries. The introduction of ASAP has considerably changed the catch advice compared to previous years.
4. **Assessment model:** Age-structured assessment model using Age-Structured Assessment Program (ASAP) with commercial catches and four survey indices.
5. **Consistency:** There is close agreement of the stock trends in the current assessment and the benchmark assessment.
6. **Stock status:** Spawning-stock biomass (SSB) is currently at the highest observed levels in the time-series and above MSY  $B_{\text{trigger}}$ . Fishing mortality (F) has been below  $F_{\text{MSY}}$  since 2012. The stock is characterized by highly variable recruitment. Recent recruitment has been above the time-series mean.
7. **Man. Plan:** No specific management plan has been agreed or proposed.

### General comments

The assessment was conducted correctly and it followed the methods detailed in the stock annex.

### Technical comments

ASAP analysis was correctly performed.

### Conclusions

The assessment has been performed correctly and provides an appropriate basis for providing catch advice.

### 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? **No**

**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 Megrin (*Lepidorhombus* spp.) in divisions 4.a and 6.a (northern North Sea, West of Scotland)**

Date: 27/05/2020

Auditor: Simon Fischer

### **General**

This assessment for megrim in 4.a and 6.a is complex. The Stock Annex and report would benefit from providing more details about the methodologies being deployed.

### **For single stock summary sheet advice**

1. Assessment type: update
2. Assessment: analytical
3. Forecast: presented
4. Assessment model: Custom Bayesian surplus production (Schaefer) model with six survey indices, some of them from delta-gamma GLMs. Discards before 2013 are estimated but used as input for the assessment model.
5. Data issues: No issues
6. Consistency: High consistency of estimates relative to MSY reference points. Absolute values (used for forecast) more variable.
7. Stock status:  $B > MSY B_{trigger}$  and  $F < F_{MSY}$ .
8. Management Plan: EU multiannual plan (MAP) for Western Waters and adjacent waters, using  $F_{MSY}$  ranges and  $MSY B_{trigger}$ .

### **General comments**

The report is concise and could benefit from more detailed descriptions of the assessment and forecast procedure and outcomes.

### **Stock Annex**

The Stock Annex (SA) would benefit from a rewrite and update. There are outdated sections and tables, descriptions of redundant stock assessment results from several years ago. There is a lack of model specifications for the assessment model and the description for the short-term forecast is extremely short and does not give details about how to perform it. The SA lists the  $B_{pa}$  reference point as "not defined", it is however, shown in the advice sheet.

### **Technical comments**

The assessment is run with a model in WinBUGS, which is very slow, particularly for a surplus production model. Also, the forecast takes >0.5 hour to run. The assessment is conducted with numerous R/Markdown scripts, and appears overly complex with several versions run concurrently which makes auditing this stock challenging. The assessment would benefit from cleaning the assessment procedure, e.g. by creating an R package for the model, which would also remove the possibility of accidentally introducing mistakes.

The forecast is conducted by running a wide range of discrete catch options and then selecting them based on catch, F, biomass or risk considerations. There is no documentation (SA or report) on how to derive the scenarios shown in the advice sheet from the numerous catch scenarios.

The assessment and forecast model runs are reproducible in terms of generating the same output files. The derivation of the final forecast is somewhat intransparent but follows the same procedure as last year.

During the audit process, the biomass values in the advice sheet (summary table and figures) were found to be incorrect but were subsequently corrected by the stock assessor.

## Conclusions

The assessment is complex but consistent with the approach used in previous years. Full compliance with the stock annex cannot be evaluated, because the stock annex is vague and does not give comprehensive details about the data, assessment and forecast procedures.

Some minor issues have been found in the presentation of the assessment and forecast in the advice and have already been addressed by the stock assessor or are noted in the advice sheet.

## Checklist for audit process

### General aspects

- Has the EG answered those ToRs relevant to providing advice?
- Is the assessment according to the stock annex description?
- If a management plan is used as the basis of the advice, has been agreed to by the relevant parties and has the plan been evaluated by ICES to be precautionary?
- Have the data been used as specified in the stock annex?
- Has the assessment, recruitment and forecast model been applied as specified in the stock annex?
- Is there any **major** reason to deviate from the standard procedure for this stock?
- Does the update assessment give a valid basis for advice? If not, suggested what other basis should be sought for the advice?

## Audit of Plaice (*Pleuronectes platessa*) in Division 7.a (Irish Sea)

Date: 04/06/2020

Auditor: Claire Moore

### General

#### For single stock summary sheet advice

1. Assessment type: update
2. Assessment: analytical
3. Forecast: presented
4. Assessment model:
  - a) SAM (R using the stock assessment package)
  - b) Tuned using by 3 survey indices
  - c) Not currently on TAF, but assessment successfully reproduced from the SharePoint
5. **Data issues:** no data issues mentioned
6. **Consistency:** same methodology as in recent years
7. **Stock status:** SSB is above MSY  $B_{trigger}$ ,  $B_{PA}$  and  $B_{lim}$  and increasing, F is below all reference points
8. **Management Plan:** ICES is not aware of any agreed precautionary management plan for plaice in this area.

### General comments

- The report is well-structured and informative.
- I was able to reproduce the assessment and figures from the data and code placed on the SharePoint

### Technical comments

- **Report** – All material removed from the advice sheet can be found in the report. 2019 data missing from Table 24.12.

### Conclusions

The assessment and forecast have been performed correctly.

### Checklist for audit process

#### General aspects

- Has the EG answered those ToRs relevant to providing advice? Yes
- Is the assessment according to the stock annex description? Yes
- If a management plan is used as the basis of the advice, has been agreed to by the relevant parties and has the plan been evaluated by ICES to be precautionary? No management plan
- 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 Plaice (*Pleuronectes platessa*) in divisions 7.b and 7.c (West of Ireland)**

Date: 23/05/2020

Auditor: Vladimir Laptikhovsky

### **General**

The assessment was not possible as it is a stock without information on abundance or exploitation. In this situation, ICES advises that when the precautionary approach is applied, catches should be no more than 19 tonnes in each of the years 2021, 2022 and 2023.

### **For single stock summary sheet advice:**

1. Assessment type: Update
2. Assessment: Not presented.
3. Forecast: Not presented.
4. Assessment model: Catches in this area are too low to support the collection of the necessary information for an analytic assessment of the stock status.
5. Data issues: There are no issues relevant for the advice.
6. Consistency: The advice is consistent with the previous advice in the year 2017 for the year 2018.
7. Stock status: Unknown. Landings since 2000 have been low. The commercial lpue time-series may not be reflective of overall stock abundance due to changing fishing practices.
8. Management Plan: No management plan.

### **General comments**

A short comprehensible text easy to follow.

### **Technical comments**

The main title on Figure 23.2 needs to be corrected to be understandable (...012\_2019\_1234 ?). What does the number 1633 mean?

### **Conclusions**

As before, catches in this area are too low to support the collection of the necessary information for an assessment of the stock status.

### **Checklist for audit process**

#### **General aspects**

- Has the EG answered those ToRs relevant to providing advice?
- Is the assessment according to the stock annex description?
- If a management plan is used as the basis of the advice, has been agreed to by the relevant parties and has the plan been evaluated by ICES to be precautionary?
- Have the data been used as specified in the stock annex?



- Has the assessment, recruitment and forecast model been applied as specified in the stock annex?
- Is there any **major** reason to deviate from the standard procedure for this stock?
- Does the update assessment give a valid basis for advice? If not, suggested what other basis should be sought for the advice?

## Audit of (Ple.27.7e)

Date: 25/05/2020

Auditor: Paul Coleman

### General

#### For single stock summary sheet advice:

1. Assessment type: Update
2. Assessment: XSA (landings only), Category 3 trends based
3. Forecast: NA
4. Assessment model: XSA– tuning by 2 Research surveys
5. Data issues: There is a heavy reliance on sampling data from UK sources, Uncertainty exists in migration patterns between the two channel plaice stocks; the current assessment applies a 15% reallocation from 7d to 7e. Discard data are only available from 2012–2019, and are not included in the assessment. Revision and recalculation of the Q1SWBeam survey index in 2020. Revised French 2018 discard data due to an issue with the raising procedure.
6. Consistency: XSA as last year, displaying high consistency with the previous assessment
7. Stock status: Fishing mortality (F) has continues to decline since 2007; the increase in fishing mortality in 2016 indicates that F is above  $F_{MSY}$ , and is above since then. Positive recruitment and a decrease in fishing mortality had increased SSB to its highest level in 2016. However, it has been in decline since; but remains at a high level.
8. Management Plan: None

### General comments

This report is well written, clear and concise

### Technical comments

One duplicate paragraph, in report

No Corrections in Advice sheet

### Conclusions

The assessment has been performed correctly.

### Checklist for audit process

### General aspects

- Has the EG answered those ToRs relevant to providing advice? **Yes**
- Is the assessment according to the stock annex description? **Yes**
- If a management plan is used as the basis of the advice, has been agreed to by the relevant parties and has the plan been evaluated by ICES to be precautionary? **N/A**
- Have the data been used as specified in the stock annex? **SA last updated in 2016**

- 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 (Ple.27.7fg)

Date: 25/05/2020

Auditor: Paul Coleman

### General

#### For single stock summary sheet advice

1. Assessment type: Update
2. Assessment: Category 3 trends based
3. Forecast: Yes
4. Assessment model: SPiCT (Surplus Production model in Continuous Time), using 2 surveys and 2 commercial indices.
5. Data issues: Incorrect Irish discard values were discovered in plenary, stock coordinator corrected the discard values.
6. Consistency: Same methodology as 2018, 2019
7. Stock status: SSB has been above  $B/B_{MSY}$  since 2013, fishing mortality has been below  $F_{MSY}$  since 2010. However, a recent decline in stock size is likely due to low recruitment periods from 2016–2018, though environmental changes cannot be ruled out. Strong 2yo recruitment in 2019 however, may ensure further declines in 2020 and 2021 are unlikely.
8. Management Plan: None

### General comments

This report is well written, clear and concise.

The assessment history is quite detailed, descriptions as to why the Aarts and Poos model (AP) failed to converge are clear. Also described are the reasons for the adoption of the SPiCT model due to unreliability of the AP model results in addition to conflicting trends between commercial vessels IPUEs due to increasing discarding behaviour.

### Technical comments

Some formatting on plots in Figure 1.

### Conclusions

The assessment has been performed correctly.

### Checklist for audit process

#### General aspects

- Has the EG answered those ToRs relevant to providing advice? **Yes**
- Is the assessment according to the stock annex description? **Yes**
- If a management plan is used as the basis of the advice, has been agreed to by the relevant parties and has the plan been evaluated by ICES to be precautionary? **N/A**
- 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 (pol.27.67)

Date: 12–18 May/2020

Auditor: Jonathan White

### General

- Input data – correct, almost all catch is from Subarea 7, very little from Subarea 6.
- Assessment input – straight forward, reported catch only – correct.
- Catch down 9 t and 668 t.
- No reference points – stock is considered to be below any possible RPs.
- Landings in both areas are low and below the lower 95% average DCAC landings.
- No Precautionary Buffer applied in this year’s forecast. It was last applied in 2018 for 2019 fishing advice.
- The WG also noted the stock is due for benchmark next year.
- Though the 2019 catch is below the DCAC, the recent advised catch is above the 2019 catch; consequently there is no change in the advice.

### For single stock summary sheet advice:

1. **Assessment type:** Cat. 4 assessment. Depletion-Corrected Average Catch (DCAC) assessment, very simple.
2. **Assessment:** Catch trends
3. **Forecast:** No forecast, advice base on proceeding years advice, catch 2019 catch was below this, therefore no change to 2020 advice.
4. **Assessment model:** DCAC
5. **Data issues:** None. Need to increase level of the data call to include length data across countries - to enable development of a potential length based data-poor assessment.
6. **Consistency:** Fine – last year’s assessment was accepted and advice given.
7. **Stock status:** B is “?” F is “?” neither are estimated “The fishing mortality is considered to be below possible reference points and the stock size is unknown.”
8. **Management Plan:** Precautionary approach advice, no management plan for this stock.

### General comments

- The assessment is very straightforward, the advice is the same as last year. With the simplified COVID-19 advice sheet there is little to change. The only point of real discussion was the non-application of the precautionary buffer.
- Misreporting of catches is not considered to be extreme, however recreational catches are thought to be significant and are presently not accommodated in the assessment. There are developments being made to estimate the scale of recreational catch, however COVID-19 issues are likely to impact these.

### Technical comments

#### Conclusions

The assessment has been performed correctly.

### Checklist for audit process

- Has the EG answered those ToRs relevant to providing advice? Yes
- Is the assessment according to the stock annex description? Yes
- If a management plan is used as the basis of the advice, has been agreed to by the relevant parties and has the plan been evaluated by ICES to be precautionary? Non
- 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? No forecast model
- 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 Sole (*Solea solea*) in Division 7.a (Irish Sea)

Date: 27/05/2020

Auditor: Simon Fischer

### General

#### For single stock summary sheet advice

1. Assessment type: update
2. Assessment: analytical
3. Forecast: presented / not presented
4. Assessment model: XSA (in FLR: FLXSA) – tuning by 1 survey
5. Data issues: no data issues mentioned
6. Consistency: same methodology as in recent years
7. Stock status: SSB increasing and has now reached  $MSY_{B_{trigger}}$ , sharp increase in last year's  $F$  but still below  $F_{MSY}$ .
8. Management Plan: None

### General comments

Short and concise report.

### Technical comments

Intermediate year short-term assumptions deviate from standard procedure defined in stock annex, but well justified (use shorter period for geometric mean recruitment and use TAC constraint instead of scaled  $F$ ).

Last year (WGCSE 2019), stock weights-at-age (file “upload\_Sol.27.7a.zip/ upload\_Sol.27.7a/XSA\_iris/XSArun/sw.TXT”) for 2000–2017 differed slightly from the values from WGCSE 2018, but only marginally (third decimal digit). This change has now been reverted at WGCSE 2020. Apart from that, historical stock assessment are identical to last year's assessment.

Landings numbers-at-age are currently given in thousands, rounded to the nearest thousand (as integer values). It might be worth considering adding decimal places because recent landings are low and e.g. for 2018, nine of 14 ages considered are below five thousand).

It seems like different discard ratios were used in the forecast for the intermediate year (0.0744786415211759) and the advice year (0.0699864263862369). This has minor effects on the discards and total catch advice (<10t difference) so is probably not a problem.

### Conclusions

The assessment and forecast have been performed correctly and are reproducible.

The short-term forecast assumptions (e.g. calculation of the final discard rate) could be made clearer.

### Checklist for audit process

#### General aspects

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



- Is the assessment according to the stock annex description?
- If a management plan is used as the basis of the advice, has been agreed to by the relevant parties and has the plan been evaluated by ICES to be precautionary?
- Have the data been used as specified in the stock annex?
- Has the assessment, recruitment and forecast model been applied as specified in the stock annex?
- Is there any **major** reason to deviate from the standard procedure for this stock?
- Does the update assessment give a valid basis for advice? If not, suggested what other basis should be sought for the advice?

## **Audit of Sole (*Solea solea*) in divisions 7.b and 7.c (West of Ireland)**

Date: 18/05/2020

Auditor: Vladimir Laptikhovsky

### **General**

The assessment was not possible due to paucity of data. ICES advises that when the precautionary approach is applied, catches should be no more than 19 tonnes in each of the years 2021, 2022 and 2023.

### **For single stock summary sheet advice**

1. Assessment type: Update
2. Assessment: Not presented.
3. Forecast: Not presented. For stocks without information on abundance or exploitation, ICES considers that a precautionary reduction of catches should be implemented unless there is ancillary information clearly indicating that the current level of exploitation is appropriate for the stock.
4. Assessment model: Catches in this area are too low to support the collection of the necessary information for an analytic assessment of the stock status.
5. Data issues: There are no issues relevant for the advice.
6. Consistency: The advice is consistent with the previous advice in the year 2017.
7. Stock status: Catches in this area are too low to support the collection of the necessary information for an assessment of the stock status
8. Management Plan: No management plan.

### **General comments**

A short comprehensible text easy to follow.

### **Technical comments**

The species name should be consistent throughout the text: either sole or black sole. The main title on Figure 32.3 needs to be corrected to be understandable.

### **Conclusions**

As before, the assessment was not performed due to paucity of data.

### **Checklist for audit process**

#### **General aspects**

- Has the EG answered those ToRs relevant to providing advice?
- Is the assessment according to the stock annex description?
- If a management plan is used as the basis of the advice, has been agreed to by the relevant parties and has the plan been evaluated by ICES to be precautionary?
- Have the data been used as specified in the stock annex?

- Has the assessment, recruitment and forecast model been applied as specified in the stock annex?
- Is there any **major** reason to deviate from the standard procedure for this stock?
- Does the update assessment give a valid basis for advice? If not, suggested what other basis should be sought for the advice?

## Audit of Sole 27.7e

Date: 3/06/2020

Auditor: Bart Vanelslander

### General

#### For single stock summary sheet advice

1. Assessment type: update
2. Assessment: analytical
3. Forecast: presented
4. Assessment model: XSA (in FLR: FLXSA) – tuning by 2 survey tuning fleets and 2 commercial tuning fleets executed on the TAF server.
5. Data issues: no data issues mentioned
6. Consistency:
  - a) Changes for the Quarter 1 South West Beam trawl (Q1SWBeam) survey data processing. This year minor changes to the validity of some stations and the survey index calculations were made. In order to evaluate the impact on the stock assessment two runs were performed, one without this revision and one without. The working group agreed to use the revised index for this year's assessment.
  - b) Intermediate year assumptions have changed, but are well explained in the report. Otherwise same methodology as for last assessment in 2019.
7. **Stock status:** SSB is above MSY  $B_{trigger}$ ,  $B_{pa}$  and  $B_{lim}$  and increasing, F is well-below all reference points.
8. **Management Plan:** Advice is given according to the EU MAP.

### General comments

The report is well-structured and contains a series of very informative graphs.

### Technical comments

- Table 33.1: It's unclear if the landing values for 2019 for the different countries are ICES estimates, or if they are preliminary catch statistics (REC12). I get different landing values for France and the UK in the preliminary catch statistics. For the total official landings from the preliminary catch statistics I get 1176 t, which is different from what is mentioned in the report (text 33.1 General, page 1035).
- Page 1044: 33.7 Uncertainties in assessment and forecast/Consistency. "*Temporal trends in recruitment, SSB and F estimates were virtually identical.*" I would say that there was a strong upward revision of the recruitment estimate for 2018. It would be good if you could point the reason for this.
- Table 33.15. The SSB2022 values are slightly different compared to the SSB2022 values in table 3 in the advice sheet.
- Please add an explanation of the much higher discard rate in 2015 to the report.

## Conclusions

The assessment has been performed correctly.

## Checklist for audit process

### General aspects

- Has the EG answered those ToRs relevant to providing advice? yes
- Is the assessment according to the stock annex description? yes
- If a management plan is used as the basis of the advice, has been agreed to by the relevant parties and has the plan been evaluated by ICES to be precautionary? Yes, EU MAP for Western Waters
- 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 Sole (*Solea solea*) in divisions 7.f and 7.g (Bristol Channel, Celtic Sea)

Date: 03/06/2020

Auditor: Tim Earl

### General

#### For single stock summary sheet advice

1. **Assessment type:** New assessment for 2020
2. **Assessment:** analytical
3. **Forecast:** presented
4. **Assessment model:** SAM tuned with one catch-at-age survey and five commercial lpue series.
5. **Data issues:** Data as described in stock annex
6. **Consistency:** Benchmarked in 2020. At the Working Group a discrepancy was discovered between the assessment discard inputs documented in the benchmark report and the input files. The WG proposed a solution, which was agreed to be appropriate by the benchmark reviewers. As a result reference points were recalculated.
7. **Stock status:**  $B > B_{MSY}$ ,  $F < F_{MSY}$
8. **Management Plan:** EU MAP

### General comments

The report, combined with the Working Document and updated stock annex are clearly laid out and outline the assessment that was performed.

### Technical comments

The Stock Annex was updated to reflect discrepancies between the input files used in the benchmark, and the description in the benchmark report. The benchmark reviewers endorsed this correction of the method.

### Conclusions

The assessment has been performed correctly.

### Checklist for audit process

#### General aspects

- Has the EG answered those ToRs relevant to providing advice?
- Is the assessment according to the stock annex description?
- If a management plan is used as the basis of the advice, has been agreed to by the relevant parties and has the plan been evaluated by ICES to be precautionary?
- Have the data been used as specified in the stock annex?
- Has the assessment, recruitment and forecast model been applied as specified in the stock annex?
- Is there any **major** reason to deviate from the standard procedure for this stock?

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

## Audit of Sole (*Solea solea*) in divisions 7.h–k (Celtic Sea South, southwest of Ireland)

Date: 02/06/2020

Auditor: Tim Earl

### General

The advice sheet is calculated correctly, although there is one correction needed in Table 5 to be consistent with the information in Table 4. The advice is consistent with the data presented in the report, and carried out according to the stock annex and ICES approach for category 5 stocks.

### For single stock summary sheet advice

1. **Assessment type:** Category 5 following benchmark in 2020
2. **Assessment:** Catch only
3. **Forecast:** not applicable
4. **Assessment model:** recent catch reduced by precautionary buffer
5. **Data issues:** Catch data were available to complete a category 5 assessment. Data issues were reviewed at WKFlatNSCS in 2020, highlighting lack of sampling from 7h and limited knowledge on stock identity.
6. **Consistency:** The assessment used last year was rejected by the benchmark because it was unlikely to be representative of the whole of 7h–k. There is insufficient data currently available from 7h to assess the state of the stock. The Working Group agreed a workplan to work towards returning the stock to Category 3 in time for next year's advice.
7. **Stock status:** Unknown
8. **Management Plan:** Falls under EU MAP – but status relative to MSY reference points unknown.

### General comments

The stock annex and report have been updated to reflect the substantial changes in the assessment applied to this stock following the WKFlatNSCS benchmark in 2020. It may be useful to retain and update some of the information previously in the report such as the catch-at-age estimates and effort for 7j as these provide information about part of the stock.

### Technical comments

The Landings obligation section should be updated to reflect the changes since 2016. The stock annex does not indicate how discards are raised in InterCatch to get the ICES estimates.

### Conclusions

The assessment has been performed correctly.

### Checklist for audit process

#### General aspects

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

- Is the assessment according to the stock annex description?
- If a management plan is used as the basis of the advice, has been agreed to by the relevant parties and has the plan been evaluated by ICES to be precautionary?
- Have the data been used as specified in the stock annex?
- Has the assessment, recruitment and forecast model been applied as specified in the stock annex?
- Is there any **major** reason to deviate from the standard procedure for this stock?
- Does the update assessment give a valid basis for advice? If not, suggested what other basis should be sought for the advice?



## Audit of whg.27.6a

Date: 26/05/2020

Auditor: Pia Schuchert

### General

#### For single stock summary sheet advice

1. Assessment type: update after benchmark
2. Assessment: trends
3. Forecast: not presented
4. Assessment model: SPiCT model using four surveys, landings and discards
5. Data issues:
  - a) survey data and commercial catch data contain different signals concerning the stock
  - b) Incorrect reporting of landings
6. **Consistency:** The assessment has been benchmarked in 2019. The benchmark decided that the previous model could not cope with the data and changed to a SPiCT model, while downgrading the stock to Category 3.
7. **Stock status:** Stock and F are both considered very low, with high uncertainties.
8. **Management Plan:** There is currently no management plan for this stock, however a plan is currently under development.

### General comments

#### Technical comments

Assessment has been conducted in line with the latest benchmark. Due to the high uncertainty into the stock status, the assessment is only indicative of trends.

The advice is given base on the 2-over-3 rule.

### Conclusions

The assessment has been performed correctly.

### Checklist for audit process

#### General aspects

- Has the EG answered those ToRs relevant to providing advice?
- Is the assessment according to the stock annex description?
- If a management plan is used as the basis of the advice, has been agreed to by the relevant parties and has the plan been evaluated by ICES to be precautionary?
- Have the data been used as specified in the stock annex?
- Has the assessment, recruitment and forecast model been applied as specified in the stock annex?
- Is there any **major** reason to deviate from the standard procedure for this stock?
- Does the update assessment give a valid basis for advice? If not, suggested what other basis should be sought for the advice?