

## Annex 9: Approaches to missing data

This section contains reports for stocks on deviations from stock annexes caused by missing information from Covid-19 disruption in 2020/2021.

### **bll.27.3a47de (brill)**

1. Stock: **Bll.27.3a47de**

2. Missing or deteriorated survey data: (Also indicate the reliance of the assessment on this data i.e. which other survey data was available)

**All necessary survey data was available.**

3. Missing or deteriorated catch data: (Indicate proportion of total catch reported/sampled, by métier if appropriate)

**The overall discard ratio coverage was 59% in 2020 which is comparable to previous years. The proportion of imported discards was however lower than in 2019 (44% in 2020 versus 68% in 2019). It is unclear whether this is due to Covid-19. Age and length distributions are so far not used in the assessment.**

4. Missing or deteriorated commercial *LPUE/CPUE* data: (where commercial *LPUE/CPUE* are used in the assessment indicate the impact of the disruption on these data)

**All necessary commercial lpue data was available.**

5. Missing or deteriorated biological data: (e.g. maturity data)

**No maturity data is needed for the assessment.**

6. Brief description of methods explored to remedy the challenge:

**No methods were explored.**

7. Suggested solution to the challenge, including reason for this selecting this solution: (clearly document changes from the normal procedures in the stock annex)

**Stock annex was followed.**

8. Was there an evaluation of the loss of certainty caused by the solution that was carried out? (Please describe)

**Not applicable.**

**cod.27.47d20 (cod)**

1. Stock: cod.27.47d20

2. Missing or deteriorated survey data: (Also indicate also the reliance of the assessment on this data i.e. which other survey data was available)

No missing data: both Q1 and Q3 data from the NS-IBTS were used to derive delta-GAM indices as usual.

3. Missing or deteriorated catch data: (Indicate proportion of total catch reported/sampled, by métier if appropriate)

Lower discard ratio coverage (57% of the landings in comparison to 76% in 2019). Lower proportion of landings sampled for age (75% in 2020 vs 89% in 2019), particularly in Subarea 4 in Q2 (only 36% of landings sampled). A high proportion of discard strata were still sampled although this was lower in Subarea 4 in Q2 (71% compared to >90% for the other quarters).

No deviations from the stock annex with regards to InterCatch raising.

4. Missing or deteriorated commercial LPUE/CPUE data: (where commercial LPUE/CPUE are used in the assessment indicate the impact of the disruption on these data)

N/A

5. Missing or deteriorated biological data: (e.g. maturity data)

Biological sampling of the NS-IBTS-Q1 in the South was extremely low (6 fish), although this is not unique to 2021 and is also a consequence of reduced abundance of cod in that area. Samples from the South were pooled with the Northwest according to the stock annex for low sample size (and has been done in other years). Raw maturities calculated for 2021 were extremely low and could be a consequence of covid or reduced abundance in some subareas. The assessment estimates maturity, rather than taking it as a fixed input, and is therefore able to compensate for this to some extent.

6. Brief description of methods explored to remedy the challenge:

N/A

7. Suggested solution to the challenge, including reason for this selecting this solution: (clearly document changes from the normal procedures in the stock annex)

N/A

8. Was there an evaluation of the loss of certainty caused by the solution that was carried out? (Please describe)

N/A

## **mur.27.3a47d (red mullet)**

1. Stock: **mur.27.3a47d**

2. Missing or deteriorated survey data: (Also indicate the reliance of the assessment on this data i.e. which other survey data was available)

**Due to the pandemic, trawling authorization in UK EEZ were not delivered in time, consequently CGFS survey was not allowed to sample station within UK water in 2020. This index is the only one used in the assessment.**

3. Missing or deteriorated catch data: (Indicate proportion of total catch reported/sampled, by métier if appropriate)

**Discard are considered negligible. Assessment already suffer from low age and length sampling coverage. Age sampling usually covered around 20-30% of landings and is coming from sampling of French fleets and mostly in 7d. Length samples are uploaded by FR, UK and NL with the same coverage. In 2020, the coverage was down to 8% for age and length data.**

4. Missing or deteriorated commercial *LPUE/CPUE* data: (where commercial *LPUE/CPUE* are used in the assessment indicate the impact of the disruption on these data)

**Not applicable.**

5. Missing or deteriorated biological data: (e.g. maturity data)

**Not applicable.**

6. Brief description of methods explored to remedy the challenge:

**Due to the lack of sample, all missing strata from Q1, Q2, Q3 and 2020 were allocated using all the data available (1 stratum for Q1 and 4 from Q4). Missing strata from Q4 were allocated with Q4. For length data, Q1 samples were used to allocated Q1 and Q2 missing strata. Q3-Q4 samples were used for Q3 missing strata as only one stratum was available for Q3. Q4 was allocated with Q4. All the strata were used to allocated 2020 strata.**

7. Suggested solution to the challenge, including reason for this selecting this solution: (clearly document changes from the normal procedures in the stock annex)

**Stock annex was followed.**

8. Was there an evaluation of the loss of certainty caused by the solution that was carried out? (Please describe)

**Issues with survey indices at age, lack of age sampling and issue with benchmark model formulation led the group to decide to reject the assessment model. The stock was downgraded to category 5.**

**ple.27.420 (plaice)**

1. Stock: ple27.420
2. Missing or deteriorated survey data: reduced sampled hauls from UK in 2020 in BTS survey. However, we used glm-like method to calculate indices, so the impact on assessment is small. We use BTS, IBTSQ1, IBTSQ3, SNS surveys in assessment.
3. Missing or deteriorated catch data: 72% landing were sampled in area 4 and 58% landing were sampled in 320. The sampling coverage rate was similar to previous year. The largest fleet that under-sampled for both landing and discards is Beamtraler with large mesh size (TBB >120mm).
4. None CPUE data used
5. Biological data were fixed across years
6. No change of process caused by covid19
7. N/A
8. N/A

## ple.27.7d (plaice in the eastern English Channel)

1. Stock: **ple.7d**

2. Missing or deteriorated survey data: (Also indicate the reliance of the assessment on this data i.e. which other survey data was available)

**Due to the pandemic, trawling authorization in UK EEZ were not delivered in time, consequently CGFS survey was not allowed to sample station within UK water in 2020 which could affect the FR GFS index.**

3. Missing or deteriorated catch data: (Indicate proportion of total catch reported/sampled, by métier if appropriate)

**Because of the pandemic, there was a lack of sampling for discards of trawlers during the quarters 2, 3 and 4.**

4. Missing or deteriorated commercial *LPUE/CPUE* data: (where commercial *LPUE/CPUE* are used in the assessment indicate the impact of the disruption on these data)

**Not applicable.**

5. Missing or deteriorated biological data: (e.g. maturity data)

**Not applicable.**

6. Brief description of methods explored to remedy the challenge:

**Missing strata from Q2, Q3, Q4 of trawl discards were allocated using available samples from Q1.**

7. Suggested solution to the challenge, including reason for this selecting this solution: (clearly document changes from the normal procedures in the stock annex)

**The issue related to the FR GFS index have been investigated during the group by i/ testing the impact of removing the index, and ii/ the calculation of a new index without UK sampling stations. Since the results did not show significant impacts on assessment outputs, we kept using the normal procedure.**

8. Was there an evaluation of the loss of certainty caused by the solution that was carried out? (Please describe)

**We evaluated the lack of sampling by testing different scenarios : i/ testing the impact of removing the index, and ii/ the calculation of a new index without UK sampling stations. The results did not show significant impacts on assessment outputs.**

## **pok.27.3a46 (saithe)**

1. Stock: **Pok.27.3a46**

2. Missing or deteriorated survey data: (Also indicate also the reliance of the assessment on this data i.e. which other survey data was available)

**No missing survey data / negligible impact (IBTS Q3)**

3. Missing or deteriorated catch data: (Indicate proportion of total catch reported/sampled, by métier if appropriate)

**Lower proportion of landings sampled for age (<70% in 2020 vs. >90% in 2019). No impact on raising strategy though.**

**Still high proportion of discard strata sampled for age (Scotland and Denmark, where most of the discards originate). But based on very few actual samplings, so most unsampled strata not matchable on area and quarter.**

4. Missing or deteriorated commercial LPUE/CPUE data: (where commercial LPUE/CPUE are used in the assessment indicate the impact of the disruption on these data)

**No deterioration**

5. Missing or deteriorated biological data: (e.g. maturity data)

**Not relevant (constant ogive).**

**No foreseeable future impact (benchmark, etc.): IMR spawning saithe survey going on as expected.**

6. Brief description of methods explored to remedy the challenge:

**Unsampled discards for areas 3a and 6 matched on all available data for raising age structure and weights.**

7. Suggested solution to the challenge, including reason for this selecting this solution: (clearly document changes from the normal procedures in the stock annex)

**No change suggested.**

8. Was there an evaluation of the loss of certainty caused by the solution that was carried out? (Please describe)

**No, but can speculate that likely very low. Mostly affected discard sampling while discards are typically low. Weight-at-age for discards in ranges previously estimated.**

### **sol.27.7d (sole in the eastern English Channel)**

1. Stock: **Sol.27.7d**

2. Missing or deteriorated survey data: (Also indicate the reliance of the assessment on this data i.e. which other survey data was available)

**All necessary survey data was available.**

3. Missing or deteriorated catch data: (Indicate proportion of total catch reported/sampled, by métier if appropriate)

**The overall discard ratio coverage was 54% in 2020 which was the lowest coverage since 2008. The landings with age distributions were in line with previous years (82%). The discards with age distributions were 52%, which is a little bit lower than the average (66%) of the time series available in InterCatch (2004-2020).**

**In previous years, approximately 70% of the imported discards (tonnage) originated from France and around 30% from Belgium. However, due to Covid-19, French sampling was hampered. In 2020, the ratio was reversed: 66% of the imported discards (tonnage) came from Belgium, and 34% from France.**

**Discard (tonnage) for which age distributions were available were also impacted. In previous years both Belgium and France contribute in equal amounts (50%), while in 2020, 99% of the samples were from Belgian sampling.**

**A high discard rate was observed in 2019 and 2020 as a result of the strong 2018 year class. However, the extent of the perceived discard rate in 2020 might be biased by the lower discard ratio coverage.**

4. Missing or deteriorated commercial *LPUE/CPUE* data: (where commercial *LPUE/CPUE* are used in the assessment indicate the impact of the disruption on these data)

**All necessary commercial lpue data was available.**

5. Missing or deteriorated biological data: (e.g. maturity data)

**All necessary maturity data was available.**

6. Brief description of methods explored to remedy the challenge:

**The origin of the poorer discard ratio coverage was investigated but no methods were applied to remedy the challenge as it was believed that following the stock annex was still the best approach.**

7. Suggested solution to the challenge, including reason for this selecting this solution: (clearly document changes from the normal procedures in the stock annex)

**Stock annex was followed.**

8. Was there an evaluation of the loss of certainty caused by the solution that was carried out? (Please describe)

**Not applicable.**

**tur.27.4 (turbot)**

1. Stock: **tur.27.4**

2. Missing or deteriorated survey data: (Also indicate the reliance of the assessment on this data i.e. which other survey data was available)

**All necessary survey data was available, i.e. BTS-ISIS and SNS as well as Dutch commercial LPUE index.**

3. Missing or deteriorated catch data: (Indicate proportion of total catch reported/sampled, by métier if appropriate)

**The overall discard ratio coverage was 67% in 2020 which was higher compared to last year (62%). The landings with age distributions, 57%, were slightly higher with previous year (52%). There were no discards with age distributions since 2019. In 2018 only 4% of the discards had age distributions coming from Belgium and Denmark. In 2020 Belgium did sample the age of discards, however in too small numbers to be uploaded in InterCatch.**

4. Missing or deteriorated commercial *LPUE/CPUE* data: (where commercial *LPUE/CPUE* are used in the assessment indicate the impact of the disruption on these data)

**All necessary commercial lpue data was available.**

5. Missing or deteriorated biological data: (e.g. maturity data)

**All necessary maturity data was available.**

6. Brief description of methods explored to remedy the challenge:

**The lack of age data in the discards was discussed. This is not something which can be solved by the working group.**

7. Suggested solution to the challenge, including reason for this selecting this solution: (clearly document changes from the normal procedures in the stock annex)

**Stock annex was followed.**

8. Was there an evaluation of the loss of certainty caused by the solution that was carried out? (Please describe)

**Not applicable.**



**whg.27.47d (whiting)**

1. Stock: WHG.27.47d

2. Missing or deteriorated survey data: (Also indicate also the reliance of the assessment on this data i.e. which other survey data was available)

None to report: both Q1 and Q3 data from the NS-IBTS data were used as usual.

3. Missing or deteriorated catch data: (Indicate proportion of total catch reported/sampled, by métier if appropriate)

Reduce sampling in 2020 due to COVID-19. In 2020, 50% of landings were sampled across 9 métiers. In comparison, in 2019 68% of landings were sampled across 12 métiers.

4. Missing or deteriorated commercial *LPUE/CPUE* data: (where commercial *LPUE/CPUE* are used in the assessment indicate the impact of the disruption on these data)

N/A

5. Missing or deteriorated biological data: (e.g. maturity data)

None to report: maturity ogives estimated from survey data was usual.

6. Brief description of methods explored to remedy the challenge:

For the 2021 assessment, the raising of discards and age allocations in InterCatch were stratified by gear type (i.e., TR1, TR2 and others), but no stratification by quarter or half-year (as usually done) was performed: for some quarter/gear type, too few discard ratios were available, resulting in high mean values and overestimation of catches.

7. Suggested solution to the challenge, including reason for this selecting this solution: (clearly document changes from the normal procedures in the stock annex)

The deviation from the usual approach in InterCatch raising (i.e., no stratification by quarter or half year) was documented in the report section for the 2021 assessment. As this is expected to be an isolated occurrence, following the stock auditor's feedback the text describing the normal approach (i.e., stratification by gear type, quarter and half year) was left in the report section, but text was added describing the changes applied in 2021.

8. Was there an evaluation of the loss of certainty caused by the solution that was carried out? (Please describe)

No.

**nep.fu.3-4**

1. Stock: *Nephrops* FU 3 and 4

2. Missing or deteriorated survey data: (Also indicate also the reliance of the assessment on this data i.e.

which other survey data was available)

No

3. Missing or deteriorated catch data: (Indicate proportion of total catch reported/sampled, by métier if

appropriate)

No

4. Missing or deteriorated commercial LPUE/CPUE data: (where commercial LPUE/CPUE are used in the

assessment indicate the impact of the disruption on these data)

No

5. Missing or deteriorated biological data: (e.g. maturity data)

On-board sampling of observer trips was interrupted for the Swedish trawl and creel fleets due to covid restrictions. Very few trips were sampled during quarters 2, 3 and 4.

6. Brief description of methods explored to remedy the challenge:

Borrowing data between Denmark/Sweden and between years was investigated with several scenarios. The full procedure is detailed in the WGNSSK report.

7. Suggested solution to the challenge, including reason for this selecting this solution: (clearly document changes from the normal procedures in the stock annex)

It was decided by the group to use Swedish size composition data pooled by fleet for the years 2018-2020 to be raised to landings.

8. Was there an evaluation of the loss of certainty caused by the solution that was carried out? (Please

describe)

Several scenarios were simulated. End result differed with less than 1% on the final catch advice.