SmartDots Summary for event 160

# Executive summary

The Planning Group on Commercial Catch, Discards and Biological Sampling (PGCCDBS) meeting in Vienna in March 2011, identified Megrim as one of the species requiring confirmation of the ages being assigned by Fisheries Institutes. The last workshop on megrim otoliths was in 2004.

The planning group indicated that Marine Scotland Science (Aberdeen, Scotland) should be responsible for organising an otolith exchange in the summer of 2014, but for several reasons it was not possible to proceed with the exchange until 2018. The exchange was initially started by Gordon Henderson sending round the hard otoliths to participating countries. However before the exchange could be completed the coordinator retired and the remaining aspects of collating the data and uploading images to SmartDots was taken up by his colleague.

Agreement between readers of megrim is poor, as the otolith thickens with increasing age and annual rings become difficult to distinguish, particularly, on the otolith edge. PGCCDBS suggested in 2014 that a trial of breaking and burning otoliths older than 6 years should comprise part of the exchange, but this will not be possible on this occasion.

The objectives of the exchange are:

To investigate the levels of agreement on age readings.

To analyse the relative differences between reader ages

# Overview of samples and advanced readers

**Table 1:** Overview of samples used for the xxx exchange. The modal age range for all samples is 3-13.

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| **Year** | **ICES area** | **Quarter** | **Number of samples** | **Modal age range** | **Length range** |
| 2013 | 27.4.a | 1 | 30 | 3-9 | 280-550 mm |
| 2013 | 27.4.a | 2 | 30 | 4-10 | 290-580 mm |
| 2013 | 27.4.a | 3 | 15 | 4-10 | 400-570 mm |
| 2013 | 27.4.a | 4 | 29 | 3-9 | 300-500 mm |
| 2013 | 27.6.a | 1 | 15 | 6-10 | 390-530 mm |
| 2013 | 27.6.a | 2 | 15 | 6-9 | 330-470 mm |
| 2013 | 27.6.a | 3 | 30 | 5-13 | 370-540 mm |
| 2013 | 27.6.a | 4 | 15 | 6-11 | 410-550 mm |

**Table 2:** Overview of advanced readers.

|  |  |
| --- | --- |
| **Reader code** | **Expertise** |
| R02 FR | Advanced |
| R04 FR | Advanced |
| R06 IS | Advanced |
| R08 BE | Advanced |

# Results overview

## Age readings

**Table 3:** Age reading table presents the number of readings made per expert reader for each modal age.

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| **Modal age** | **R02 FR** | **R04 FR** | **R06 IS** | **R08 BE** | **total** |
| 3 | 7 | 6 | 7 | 8 | **28** |
| 4 | 11 | 9 | 12 | 12 | **44** |
| 5 | 35 | 34 | 37 | 39 | **145** |
| 6 | 61 | 55 | 61 | 64 | **241** |
| 7 | 31 | 28 | 32 | 33 | **124** |
| 8 | 11 | 11 | 12 | 12 | **46** |
| 9 | 6 | 6 | 6 | 6 | **24** |
| 10 | 1 | 1 | 1 | 1 | **4** |
| 11 | 1 | 1 | 3 | 2 | **7** |
| 12 | 0 | 0 | 0 | 0 | **0** |
| 13 | 0 | 0 | 0 | 0 | **0** |
| **Total** | **164** | **151** | **171** | **177** | **663** |

## CV table

**Table 4:** Coefficient of Variation (CV) table presents the CV per modal age and advanced reader, the CV of all advanced readers combined per modal age and a weighted mean of the CV per reader.

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| **Modal age** | **R02 FR** | **R04 FR** | **R06 IS** | **R08 BE** | **all** |
| 3 | 13 % | 21 % | 30 % | 22 % | **25 %** |
| 4 | 23 % | 12 % | 33 % | 37 % | **34 %** |
| 5 | 11 % | 9 % | 24 % | 25 % | **24 %** |
| 6 | 12 % | 9 % | 18 % | 22 % | **21 %** |
| 7 | 11 % | 15 % | 17 % | 19 % | **20 %** |
| 8 | 5 % | 7 % | 16 % | 18 % | **17 %** |
| 9 | 12 % | 18 % | 0 % | 12 % | **15 %** |
| 10 | - | - | - | - | **13 %** |
| 11 | - | - | 0 % | 0 % | **23 %** |
| 12 | - | - | - | - | **-** |
| 13 | - | - | - | - | **-** |
| **Weighted Mean** | **12 %** | **11 %** | **19 %** | **22 %** | **22 %** |

## PA table

**Table 5:** Percentage agreement (PA) table represents the PA per modal age and reader, advanced the PA of all advanced readers combined per modal age and a weighted mean of the PA per reader.

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| **Modal age** | **R02 FR** | **R04 FR** | **R06 IS** | **R08 BE** | **all** |
| 3 | 86 % | 67 % | 57 % | 75 % | **71 %** |
| 4 | 82 % | 78 % | 33 % | 50 % | **59 %** |
| 5 | 83 % | 88 % | 35 % | 23 % | **56 %** |
| 6 | 70 % | 82 % | 41 % | 34 % | **56 %** |
| 7 | 61 % | 64 % | 53 % | 36 % | **53 %** |
| 8 | 82 % | 73 % | 42 % | 17 % | **52 %** |
| 9 | 67 % | 33 % | 100 % | 50 % | **62 %** |
| 10 | 100 % | 0 % | 0 % | 100 % | **50 %** |
| 11 | 0 % | 0 % | 100 % | 100 % | **71 %** |
| 12 | - | - | - | - | **-** |
| 13 | - | - | - | - | **-** |
| **Weighted Mean** | **73 %** | **75 %** | **45 %** | **36 %** | **56 %** |

## Relative bias table

**Table 6:** Relative bias table represents the relative bias per modal age and advanced reader, the relative bias of all advanced readers combined per modal age and a weighted mean of the relative bias per reader.

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| **Modal age** | **R02 FR** | **R04 FR** | **R06 IS** | **R08 BE** | **all** |
| 3 | -0.14 | 0.00 | 0.71 | 0.38 | **0.24** |
| 4 | 0.45 | -0.22 | 1.75 | 1.00 | **0.75** |
| 5 | 0.17 | 0.03 | 1.51 | 1.72 | **0.86** |
| 6 | -0.16 | 0.00 | 1.25 | 1.52 | **0.65** |
| 7 | -0.32 | -0.29 | 1.03 | 1.67 | **0.52** |
| 8 | -0.18 | -0.09 | 1.00 | 2.08 | **0.70** |
| 9 | -0.67 | -1.50 | 0.00 | 0.83 | **-0.33** |
| 10 | 0.00 | -2.00 | 1.00 | 0.00 | **-0.25** |
| 11 | -5.00 | -4.00 | 0.00 | 0.00 | **-2.25** |
| 12 | - | - | - | - | **-** |
| 13 | - | - | - | - | **-** |
| **Weighted Mean** | **-0.13** | **-0.17** | **1.19** | **1.49** | **0.59** |

## Bias plot



**Figure 1:** Age bias plot for advanced readers.

## Age error matrices

**Table 6:** Age error matrix (AEM) for .

|  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| **Modal age** | **3** | **4** | **5** | **6** | **7** | **8** | **9** | **10** | **11** |
| **Age 2** | 0.07143 | 0.02273 | - | - | - | - | - | - | - |
| **Age 3** | 0.71429 | 0.04545 | - | - | - | - | - | - | - |
| **Age 4** | 0.14286 | 0.59091 | 0.027586 | 0.020747 | 0.008065 | - | - | - | - |
| **Age 5** | 0.03571 | 0.06818 | 0.558621 | 0.053942 | 0.040323 | - | - | - | - |
| **Age 6** | 0.03571 | 0.11364 | 0.165517 | 0.560166 | 0.088710 | - | 0.08333 | - | 0.1429 |
| **Age 7** | - | 0.09091 | 0.110345 | 0.145228 | 0.532258 | 0.08696 | 0.12500 | - | 0.1429 |
| **Age 8** | - | 0.02273 | 0.055172 | 0.107884 | 0.112903 | 0.52174 | 0.04167 | 0.25 | - |
| **Age 9** | - | 0.02273 | 0.048276 | 0.070539 | 0.096774 | 0.21739 | 0.62500 | - | - |
| **Age 10** | - | 0.02273 | 0.027586 | 0.020747 | 0.064516 | 0.06522 | 0.08333 | 0.50 | - |
| **Age 11** | - | - | 0.006897 | 0.012448 | 0.024194 | 0.02174 | - | 0.25 | 0.7143 |
| **Age 12** | - | - | - | 0.004149 | 0.032258 | 0.02174 | 0.04167 | - | - |
| **Age 13** | - | - | - | 0.004149 | - | 0.06522 | - | - | - |

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