

## Tusk (*Brosme brosme*) in subareas 4 and 7–9, and in divisions 3.a, 5.b, 6.a, and 12.b (Northeast Atlantic)

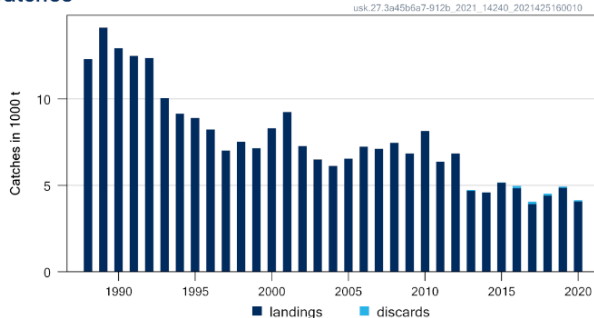
### ICES advice on fishing opportunities

ICES advises that when the precautionary approach is applied, catches should be no more than 7821 tonnes in each of the years 2022 and 2023.

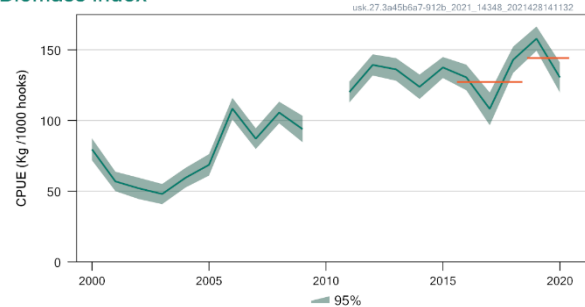
### Stock development over time

ICES cannot assess the stock and exploitation status relative to MSY and precautionary approach (PA) reference points because the reference points are undefined.

Catches



Biomass index



**Figure 1** Tusk in subareas 4 and 7–9, and in divisions 3.a, 5.b, 6.a, and 12.b. Summary of the stock assessment. Left: landings and discards (in thousand tonnes), discard data are only available from 2013 onwards. Right: standardized CPUE (kg per 1000 hooks) from the Norwegian longline fishery (mean and 95% confidence interval). The horizontal orange lines indicate the average of the most recent two years and the previous three years.

### Catch scenarios

ICES framework for category 3 stocks was applied (ICES, 2012). The standardized CPUE series from the Norwegian longline fleet was used as index for the stock development. The advice is based on a comparison of the two latest index values (index A) with the three preceding values (index B), multiplied by the recent (2020–2020) advised catch. The index is estimated to have increased by less than 20%; thus, the uncertainty cap was not applied in estimating the catch advice. The precautionary buffer has never been applied and has therefore, been considered this year. The stock status relative to candidate reference points is unknown; therefore, the precautionary buffer was applied in the advice. The average discard rate over the last three years was 1.8%.

**Table 1** Tusk in subareas 4 and 7–9, and in divisions 3.a, 5.b, 6.a, and 12.b. The basis for the catch scenarios.<sup>^</sup>

|  |             |              |
|--|-------------|--------------|
| Index A (2019–2020)                          |             | 144          |
| Index B (2016–2018)                          |             | 127          |
| Index ratio (A/B)                            |             | 1.13         |
| Uncertainty cap                              | Not applied |              |
| Advised catch for 2020–2021 (issued in 2019) |             | 8 627 tonnes |
| Discard rate                                 |             | 1.8%         |
| Precautionary buffer                         | Applied     | 0.8          |
| Catch advice *                               |             | 7 821 tonnes |
| Projected landings corresponding to advice** |             | 7 684 tonnes |
| % Advice change ***                          |             | -9.3%        |

<sup>^</sup> The figures in the table are rounded. Calculations were done with unrounded inputs, and computed values may not match exactly when calculated using the rounded figures in the table.

\* [Advised catch for 2020 and 2021] × [index ratio] × [precautionary buffer].

\*\* [Catch advice] × [1 - discard rate]

\*\*\* Advice value for 2022 and 2023 relative to advice value for 2020 and 2021.

The catch advice has decreased because of the application of the precautionary buffer.

### Basis of the advice

**Table 2** Tusk in subareas 4 and 7–9, and in divisions 3.a, 5.b, 6.a, and 12.b. The basis of the advice.

|                 |   |
|-----------------|---|
| Advice basis    | Precautionary approach  |
| Management plan | ICES is not aware of any agreed precautionary management plan for tusk in this area |

### Quality of the assessment

The standardized CPUE series from the Norwegian longline fishery show consistent trends between the main areas of the fishery on this stock (divisions 4.a, 5.b, and 6.a).

The SPiCT model used as an indicator of stock status and exploitation in the previous advice was evaluated during a benchmark in 2021 and was no longer considered appropriate (ICES, 2021a).

### Issues relevant for the advice

This stock is classified as Category 4 in the NEAFC categorization of deep-sea species/stocks. This implies that fisheries are primarily restricted to coastal state Exclusive Economic Zones (EEZs) and therefore management measures are not taken by NEAFC unless complementary to coastal state conservation and management measures (NEAFC, 2016).

### Reference points

No reference points are defined for this stock. SPiCT reference points presented in previous advice are no longer considered to be robust (ICES, 2021a).

### Basis of the assessment

**Table 3** Tusk in subareas 4 and 7–9, and in divisions 3.a, 5.b, 6.a, and 12.b. Basis of the assessment and advice.

|                          |  |
|--------------------------|--|
| ICES stock data category | 3 ( <a href="#">ICES, 2021b</a> )  |
| Assessment type          | CPUE trends-based assessment (ICES, 2021c)   |
| Input data               | Total international commercial catches and standardized CPUE data from the Norwegian longline fishery  |
| Discards and bycatch     | Discarding is considered negligible, but included (< 5%)   |
| Indicators               | None   |
| Other information        | None   |
| Working group            | Working Group on the Biology and Assessment of Deep-Sea Fisheries Resources ( <a href="#">WGDEEP</a> ) |

## History of the advice, catch, and management

**Table 4** Tusk in subareas 4 and 7–9, and in divisions 3.a, 5.b, 6.a, and 12.b. ICES advice, TACs, and official landings. All weights are in tonnes.

| Year | ICES advice  | Catch corresponding to advice | TAC EU Subarea 3 | TAC EU Subarea 4 (EU waters) | TAC EU Subarea 4 (Norwegian waters) | TAC EU + Norway subareas 5, 6, and 7 | TAC Norway divisions 2.a and 5.b, and subareas 4, 6, and 7 | ICES landings |
|------|--|-------------------------------|------------------|------------------------------|-------------------------------------|--------------------------------------|--|---------------|
| 2003 | Reduce effort by 30%*  | -                             | 40               | 370                          | 710                                 | -                                    | 6510   | 6500          |
| 2004 | Biennial*  | -                             | 40               | 370                          | 710                                 | -                                    | 6140   | 6125          |
| 2005 | Effort should be reduced by 30% of 1998 effort*                                    | -                             | 40               | 317                          | 604                                 | -                                    | 6700   | 6553          |
| 2006 | Biennial*  | -                             | 40               | 317                          | 604                                 | -                                    | 7260   | 7249          |
| 2007 | Constrain catches to 5 000 t**   | 5000                          | 28               | 231                          | 170                                 | 435                                  | 3350   | 7119          |
| 2008 | Biennial**   | 5000                          | 28               | 231                          | 170                                 | 435                                  | 3350   | 7466          |
| 2009 | Constrain catches to 5 000 t   | 5000                          | 28               | 231                          | 170                                 |                                      | 3350   | 6849          |
| 2010 | Biennial   | 5000                          | 24               | 196                          | 170                                 | 283                                  | 2923   | 8132          |
| 2011 | Less than 6 900 t, and a reduction from recent levels catches should be considered | 6900                          | 24               | 196                          | 170                                 | 283                                  | 2938   | 6365          |
| 2012 | No new advice, same as 2011  | 6900                          | 24               | 196                          | 170                                 | 294                                  | 2923   | 6848          |
| 2013 | No more than a 20% increase in catches   | 8500                          | 24               | 235                          | 170                                 | 353                                  | 2923   | 4673          |
| 2014 | No new advice, same as 2013  | 8500                          | 29               | 235                          | 170                                 | 535                                  | 2923   | 4585          |
| 2015 | No new advice, same as 2013  | 8500                          | 29               | 235                          | 170                                 | 937                                  | 2923   | 5155          |
| 2016 | Precautionary  | 8415                          | 29               | 235                          | 170                                 | 937                                  | 2923   | 4820          |
| 2017 | Biennial   | 8415                          | 29               | 235                          | 170                                 | 937                                  | 2923   | 3916          |
| 2018 | Precautionary approach   | ≤ 8984                        | 31               | 251                          | 170                                 | 1207                                 | 2923   | 4411          |
| 2019 | Precautionary (same catch value as in 2018)  | ≤ 8984                        | 31               | 251                          | 170                                 | 1207                                 | 2923   | 4863          |
| 2020 | Precautionary approach   | ≤ 8627                        | 31               | 251                          | 170                                 | 1207                                 | 2923   | 4065          |
| 2021 | Precautionary approach (same catch value as in 2020)                               | ≤ 8627                        | ***              | ***                          | ***                                 | ***                                  | ***  |               |
| 2022 | Precautionary approach   | ≤ 7821                        |                  |                              |                                     |                                      |  |               |
| 2023 | Precautionary approach (same catch value as in 2022)                               | ≤ 7821                        |                  |                              |                                     |                                      |  |               |

\* Advice for tusk in the Northeast Atlantic.

\*\* Advice for this stock included the Mid-Atlantic Ridge and Division 6.b (Rockall).

\*\*\* TACs were not agreed at the time of publication.

## History of the catch and landings

There are no reported catches in the NEAFC Regulatory Area.

**Table 5** Tusk in subareas 4 and 7–9, and in divisions 3.a, 5.b, 6.a, and 12.b. Catch distribution by fleet in 2020 as estimated by ICES.

| Catch (2020) | Landings     |           |            |           | Discards  |
|--------------|--------------|-----------|------------|-----------|-----------|
|              | Longline 84% | Trawl 13% | Gillnet 2% | Others 1% |           |
| 4134 tonnes  | 4065 tonnes  |           |            |           | 69 tonnes |

**Table 6** Tusk in subareas 4 and 7–9, and in divisions 3.a, 5.b, 6.a, and 12.b. History of official commercial landings by area. All weights are in tonnes.

| Year | 3  | 4.a  | 4.b | 5.b.1 | 5.b.2 | 6.a  | 7.a | 7.b–c | 7.g–k | 8.a | All areas |
|------|----|------|-----|-------|-------|------|-----|-------|-------|-----|-----------|
| 1988 | 61 | 4429 |     | 4059  | 1606  | 2120 |     | 17    | 5     | 1   | 12298     |
| 1989 | 93 | 6418 | 4   | 3722  | 1400  | 2297 | 2   | 108   | 86    |     | 14130     |
| 1990 | 60 | 4254 | 5   | 5202  | 979   | 2256 | 4   | 155   | 33    |     | 12948     |
| 1991 | 84 | 4537 | 2   | 5170  | 1096  | 1543 | 2   | 52    | 14    |     | 12500     |
| 1992 | 85 | 4932 | 12  | 4399  | 992   | 1682 | 3   | 218   | 47    |     | 12370     |
| 1993 | 79 | 5141 | 14  | 2862  | 577   | 1223 |     | 120   | 32    |     | 10048     |
| 1994 | 51 | 3375 | 7   | 3407  | 909   | 1262 |     | 94    | 31    |     | 9136      |
| 1995 | 42 | 3348 | 15  | 3347  | 631   | 1435 | 1   | 48    | 37    |     | 8904      |
| 1996 | 44 | 3369 | 33  | 2728  | 582   | 1391 |     | 58    | 29    |     | 8234      |
| 1997 | 31 | 2272 | 38  | 2742  | 577   | 1261 | 1   | 75    | 19    |     | 7016      |
| 1998 | 21 | 3387 | 66  | 2073  | 637   | 1281 | 1   | 33    | 10    | 1   | 7510      |
| 1999 | 29 | 2435 | 34  | 3517  | 447   | 539  |     | 147   | 8     | 0   | 7156      |
| 2000 | 36 | 3260 | 116 | 2367  | 333   | 2011 |     | 164   | 13    |     | 8300      |
| 2001 | 57 | 3095 | 11  | 3526  | 469   | 1767 | 1   | 263   | 14    |     | 9203      |
| 2002 | 50 | 2961 | 71  | 2722  | 281   | 1124 |     | 66    | 5     |     | 7280      |
| 2003 | 51 | 1997 | 8   | 2733  | 559   | 1128 |     | 21    | 3     |     | 6500      |
| 2004 | 45 | 1666 | 23  | 3536  | 107   | 726  |     | 21    | 1     |     | 6125      |
| 2005 | 44 | 1826 | 7   | 3272  | 360   | 1019 |     | 23    | 2     |     | 6553      |
| 2006 | 29 | 2159 | 32  | 3560  | 317   | 1059 |     | 90    | 3     |     | 7249      |
| 2007 | 21 | 2180 | 15  | 3468  | 344   | 1077 |     | 13    | 1     |     | 7119      |
| 2008 | 46 | 2139 | 71  | 3798  | 61    | 1347 |     | 4     | 0     |     | 7466      |
| 2009 | 19 | 2268 | 17  | 3135  | 164   | 1242 |     | 4     | 0     |     | 6849      |
| 2010 | 21 | 1861 | 15  | 4889  | 127   | 1216 |     | 3     | 0     | 4   | 8136      |
| 2011 | 17 | 1623 | 96  | 3287  | 0     | 1337 |     | 5     | 0     | 0   | 6361      |
| 2012 | 20 | 1749 | 47  | 3793  | 0     | 1174 |     | 63    | 2     |     | 6848      |
| 2013 | 22 | 1510 | 31  | 1500  | 12    | 1594 |     | 4     | 0     |     | 4673      |
| 2014 | 9  | 1463 | 11  | 2310  | 129   | 662  |     | 1     |       |     | 4585      |
| 2015 | 9  | 1530 | 18  | 2081  | 324   | 1193 |     | 0     |       |     | 5155      |
| 2016 | 14 | 1650 | 9   | 2261  | 42    | 844  |     | 0     |       |     | 4820      |
| 2017 | 10 | 1206 | 18  | 2035  | 135   | 511  |     | 1     |       |     | 3916      |
| 2018 | 8  | 1439 | 17  | 1983  | 21    | 940  |     | 3     |       |     | 4411      |
| 2019 | 8  | 1247 | 34  | 1960  | 684   | 927  |     | 3     |       |     | 4863      |
| 2020 | 13 | 1024 | 9   | 2462  | 191   | 359  |     | 5     | 1     | 1   | 4065      |

## Summary of the assessment

**Table 7** Tusk in subareas 4 and 7–9, and in divisions 3.a, 5.b, 6.a, and 12.b. Assessment summary. Combined area standardized CPUE series from the Norwegian longline fishery (kg per 1000 hooks). High and low refer to the 95% confidence bounds.

| Year  | Biomass index | High  | Low   | Landings | Discards |
|-------|---------------|-------|-------|----------|----------|
|       |               |       |       | tonnes   |          |
| 1988  |               |       |       | 12298    |          |
| 1989  |               |       |       | 14130    |          |
| 1990  |               |       |       | 12948    |          |
| 1991  |               |       |       | 12500    |          |
| 1992  |               |       |       | 12370    |          |
| 1993  |               |       |       | 10048    |          |
| 1994  |               |       |       | 9136     |          |
| 1995  |               |       |       | 8904     |          |
| 1996  |               |       |       | 8234     |          |
| 1997  |               |       |       | 7016     |          |
| 1998  |               |       |       | 7510     |          |
| 1999  |               |       |       | 7156     |          |
| 2000  | 79.6          | 87.3  | 71.8  | 8300     |          |
| 2001  | 56.9          | 63.8  | 50.0  | 9248     |          |
| 2002  | 52.0          | 59.5  | 44.4  | 7280     |          |
| 2003  | 48.0          | 55.1  | 40.8  | 6500     |          |
| 2004  | 59.5          | 66.5  | 52.6  | 6125     |          |
| 2005  | 68.6          | 76.2  | 61.0  | 6553     |          |
| 2006  | 108.4         | 116.0 | 100.7 | 7249     |          |
| 2007  | 87.1          | 94.5  | 79.8  | 7119     |          |
| 2008  | 105.6         | 113.3 | 98.0  | 7466     |          |
| 2009  | 93.9          | 103.3 | 84.6  | 6849     |          |
| 2010* |               |       |       | 8136     |          |
| 2011  | 120.1         | 127.5 | 112.7 | 6361     |          |
| 2012  | 139.3         | 146.8 | 131.8 | 6848     |          |
| 2013  | 136.1         | 144.1 | 128.1 | 4673     | 52       |
| 2014  | 123.8         | 132.5 | 115.2 | 4585     | 0        |
| 2015  | 137.5         | 144.9 | 130.0 | 5155     | 18       |
| 2016  | 130.5         | 139.5 | 121.4 | 4820     | 153      |
| 2017  | 108.2         | 119.8 | 96.6  | 3916     | 143      |
| 2018  | 142.9         | 152.2 | 133.6 | 4411     | 96       |
| 2019  | 157.9         | 166.5 | 149.3 | 4863     | 73       |
| 2020  | 130.4         | 141.0 | 119.7 | 4065     | 69       |

\* There was no survey in 2010.

## Sources and references

ICES. 2012. ICES Implementation of Advice for Data-limited Stocks in 2012 in its 2012 Advice. ICES CM 2012/ACOM:68. 42 pp.

ICES. 2021a. Benchmark Workshop on the development of MSY advice for category 3 stocks using Surplus Production Model in Continuous Time; SPiCT (WKMSYSPICT). ICES Scientific Reports, 3:20. 316 pp. <https://doi.org/10.17895/ices.pub.7919>.

ICES. 2021b. Advice on fishing opportunities. *In* Report of the ICES Advisory Committee, 2021. ICES Advice 2021, section 1.1.1. <https://doi.org/10.17895/ices.advice.7720>.

ICES. 2021c. Working Group on the Biology and Assessment of Deep-sea Fisheries Resources (WGDEEP). ICES Scientific Reports. 3:47. 944 pp. <http://doi.org/10.17895/ices.pub.8108>.

[Download the stock assessment data and figures.](#)

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