

Norway lobster (*Nephrops norvegicus*) in Division 4.a, Functional Unit 7 (northern North Sea, Fladen Ground)

ICES advice on fishing opportunities

Please note: This advice was updated in November 2018 ([ICES, 2018c](#))

ICES advises that when the proposed EU multiannual plan (MAP) for the North Sea is applied, catches in 2019 that correspond to the F ranges in the MAP are between 14 427 tonnes and 16 394 tonnes. The entire range is considered precautionary when applying the ICES advice rule.

In order to ensure the stock in Functional Unit (FU) 7 is exploited sustainably, management should be implemented at the FU level. In recent years, the catch in FU 7 has been lower than advised, and if the difference is transferred to other FUs, this could result in non-precautionary exploitation of those FUs.

Stock development over time

The stock size declined from the highest observed value in 2008 to the lowest abundance estimate in the time-series in 2015. From 2016 the stock size has increased and is currently above $MSY B_{trigger}$. The harvest rate has declined since 2010 and remains well below F_{MSY} .

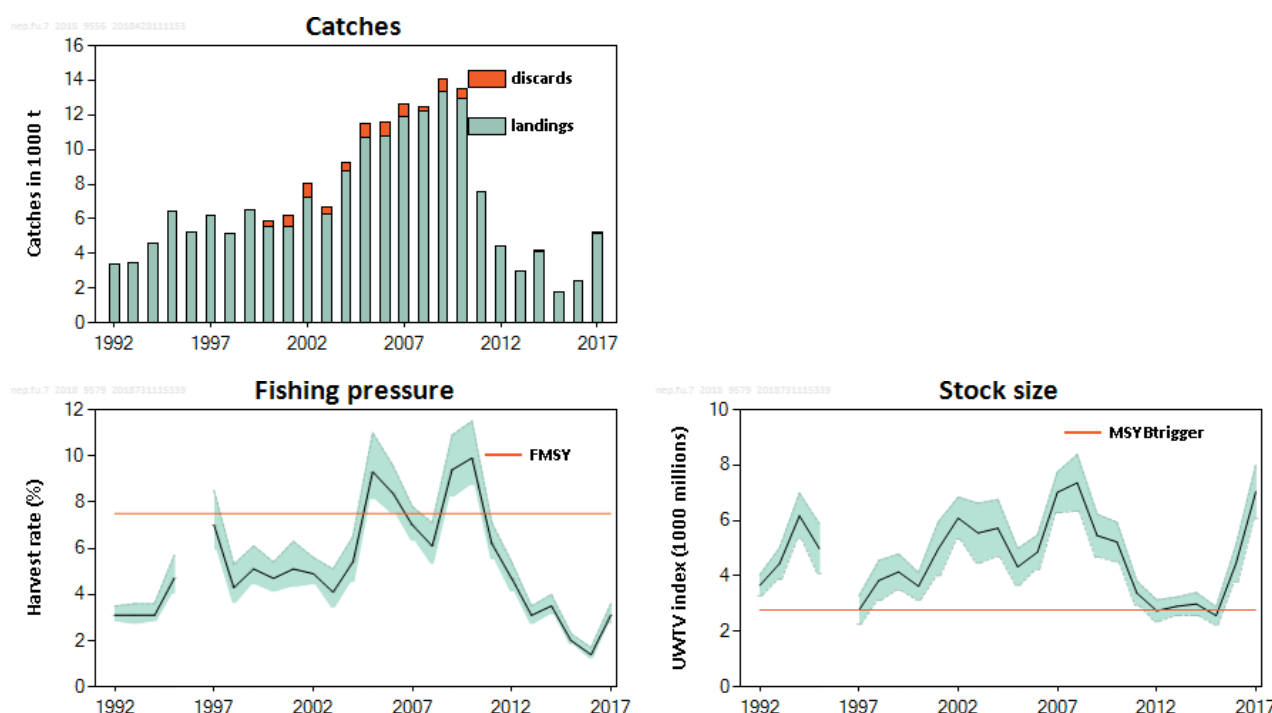


Figure 1 Norway lobster in Division 4.a, Functional Unit 7. Summary of the stock assessment. Long-term trends in catches, harvest rate, and underwater TV survey (UWTV) abundance (for Norway lobster greater than 17 mm carapace) – used as F and SSB proxies. Discard data have only been included since 2000. Orange lines show proxies for $MSY B_{trigger}$ and F_{MSY} . UWTV abundance is calculated using average densities (from a random stratified survey) raised to strata area. Shaded areas for abundance are ± 2 standard deviations (approximately 95% confidence intervals). Confidence intervals for harvest rates are derived from the confidence intervals for abundance. Harvest rates before 2006 may be unreliable due to underreporting of landings.[†]

[†] Version 2: F_{MSY} added to Fishing pressure plot.

Stock and exploitation status

ICES assesses that fishing pressure on the stock is below F_{MSY} and stock size is above MSY $B_{trigger}$.

Table 1 Norway lobster in Division 4.a, Functional Unit 7. State of the stock and fishery relative to reference points.

| | | Fishing pressure | | | | Stock size | | |
|---------------------------|-----------------------|------------------|------|-----------------------------------|--------------------|------------|------|-----------------------------------|
| | | 2015 | 2016 | 2017 | | 2015 | 2016 | 2017 |
| Maximum Sustainable Yield | F_{MSY} | ✓ | ✓ | ✓ Below | MSY | ✗ | ✓ | ✓ Above trigger |
| Precautionary Approach | F_{pa} F_{lim} | ✓ | ✓ | ✓ Below possible reference points | B_{pa} B_{lim} | ? | ✓ | ✓ Above possible reference points |
| Management plan | F_{MGT} | ✓ | ✓ | ✓ Below | B_{MGT} | ✗ | ✓ | ✓ Above |

Catch scenarios

Table 2 Norway lobster in Division 4.a, Functional Unit 7. The basis for the catch scenarios.

| Variable | Value | Notes |
|--|--------------------------|--|
| Stock abundance | 7036 million individuals | UWTV 2017 |
| Mean weight in wanted catch | 32 g | Average 2000–2017 |
| Mean weight in unwanted catch | 14.9 g | Average 2000–2017 |
| Unwanted catch rate (total) | 7.1% | Average 2000–2017 (proportion by number) |
| Unwanted catch survival rate | 25% | Proportion by number |
| Dead unwanted catch discard rate (total) | 5.4% | Average 2000–2017 (proportion by number) |

Table 3 Norway lobster in Division 4.a, Functional Unit 7. Annual catch scenarios. All weights are in tonnes.

| Basis | Total catch | Dead removals | Wanted catch | Dead unwanted catch | Surviving unwanted catch | Harvest rate * | % advice change ** |
|------------------------------------|-------------|---------------|--------------|---------------------|--------------------------|----------------|--------------------|
| | WC+DUC+SUC | WC+DUC | WC | DUC | SUC | for WC+DUC | |
| ICES advice basis | | | | | | | |
| MAP^: F _{MSY} | 16 394 | 16 252 | 15 826 | 426 | 142 | 7.5% | -1.10% |
| F= MAP F _{MSY} lower | 14 427 | 14 302 | 13 927 | 375 | 125 | 6.6% | -13.0% |
| F = MAP F _{MSY} upper *** | 16 394 | 16 252 | 15 826 | 426 | 142 | 7.5% | -1.10% |
| Other scenarios | | | | | | | |
| MSY approach | 16 394 | 16 252 | 15 826 | 426 | 142 | 7.5% | -1.10% |
| F _{2015–2017} | 4 809 | 4 767 | 4 642 | 125 | 42 | 2.2% | -71% |
| F ₂₀₁₇ | 6 777 | 6 718 | 6 542 | 176 | 59 | 3.1% | -59% |
| F _{35%SpR} | 24 482 | 24 270 | 23 634 | 636 | 212 | 11.2% | 48% |
| F _{max} | 35 848 | 35 538 | 34 607 | 931 | 310 | 16.4% | 116% |

[^] Proposed EU multiannual plan (MAP) for the North Sea (EU, 2016)

* Calculated for dead removals.

** Total catch 2019 relative to advice value 2018 (16 577 t).

*** F_{MSY} upper = F_{MSY} for this stock

The minor changes in advice from November 2017 are a result of updating mean weights and discard rates.

Basis of the advice

Table 4 Norway lobster in Division 4.a, Functional Unit 7. The basis of the advice.

| | |
|-----------------|--|
| Advice basis | Proposed EU multiannual plan (MAP) for the North Sea (EU, 2016) |
| Management plan | The EU MAP for the North Sea is currently being finalized and is not yet adopted. The advice based on F_{MSY} range used in the EU MAP are considered precautionary. |

Quality of the assessment

The Fladen Ground functional unit contains several patches of mud to the north of the grounds which are fished, bringing the overall area of substrate to 30 633 km². This northern area is not surveyed but would add to the abundance estimate. The abundance for the total ground is therefore likely to be higher than currently estimated.

Data from the latest UWTV survey (June 2017) have been used as the most up-to-date indicator of stock abundance.

The large abundance increase in 2016–2017 is likely to be related to a strong recruitment event. The size of *Nephrops* burrows is not quantified in the TV surveys, but burrow counters participating in the last survey reported a large number of small burrows in FU 7, in particular in 2016. In 2017, increased amounts of small *Nephrops* were anecdotally reported in the Fladen fishery. Analysis of 2017 sampling catch data showed a large decrease in the mean weight in landings and an increase in the discard rate by number to 4.4%. Discard rates in 2011–2016 were close to zero (Figure 3). Given the recent fluctuations in the mean weights and discard rates, the long-term average (2000–2017) was considered to be most appropriate in the calculation of the catch scenarios for 2019.

Issues relevant for the advice

The EU is finalizing a MAP for the North Sea, and ICES was requested to provide advice based on the proposed MAP.

The results of the 2018 UWTV survey are expected to be available by October 2018 and the advice will be updated before the end of 2018 if there is significant deviation from the 2017 UWTV survey.

Length–frequency of catches in the Fladen Ground area has clearly shifted towards larger individuals from 2010 to 2016 (Figure 3), suggesting a different selection pattern in the fishery and potentially a period of low recruitment. In addition, the discard rate has declined, potentially due to a shift to larger meshes (TR1) and use of highly selective gears (for cod avoidance). Nevertheless, the mean size of catch and landings decreased in 2017, probably due to an increase in recruitment. The larger size of Norway lobster in catches in recent years implies that the L_{50} for both male and female selection is higher than previously estimated. The F_{MSY} reference point for FU 7 was updated in 2015 and takes new selection patterns into account.

In 2017 the EU landing obligation was applied to all catches of Norway lobster fisheries in ICES Subarea 4 with several exemptions. Observations from the 2016–2017 fishery indicate that discarding above the minimum conservation reference size (MCRS) continues and has not changed markedly (Figure 3). Consequently, ICES is providing advice for 2019 assuming average discard rates observed over the last three years, which is considered to be a more realistic assumption.

In 2016 and 2017, no Norway lobster were recorded as below MCRS (BMS category) in FU 7 despite catches having been observed below the MCRS (Figure 3).

A single total allowable catch (TAC) covers the entire ICES Subarea 4, except the Norwegian Deep. The advised catch for the Fladen Ground constitutes a large proportion of the total North Sea advised catch. Catches in the Fladen Ground have declined since 2010 and are well below the advice for this area (Table 7). To avoid other FUs suffering from displacement of unused catch scenarios from Fladen Ground, management should be implemented at the functional unit level. Management should ensure that fishing opportunities are in line with the scale of the resource in each of the stocks.

Mixed fisheries considerations

After years of positive development, North Sea cod is again estimated to be the most limiting stock in the Greater North Sea mixed-fisheries model. For 2019, assuming a strictly implemented discard ban (corresponding to the “Minimum” scenario), cod is estimated to constrain 18 out of 34 fleet segments. Whiting is the second most limiting stock, constraining twelve fleet segments. Conversely, in the “Maximum” scenario, saithe and both plaice stocks (North Sea and Eastern Channel) plaice would be the least limiting for 15, 6, and 3 fleet segments, respectively. Finally, if Norway lobster were managed by separate TACs, Norway lobster in FU 7 would be the least limiting for six fleet segments (ICES, 2018a).

For those demersal fish stocks for which the F_{MSY} range is available, a "range" scenario is presented that minimizes the potential for TAC mismatches in 2019 within the F_{MSY} range. Currently, these range scenarios do not take into account Norway lobster stocks.

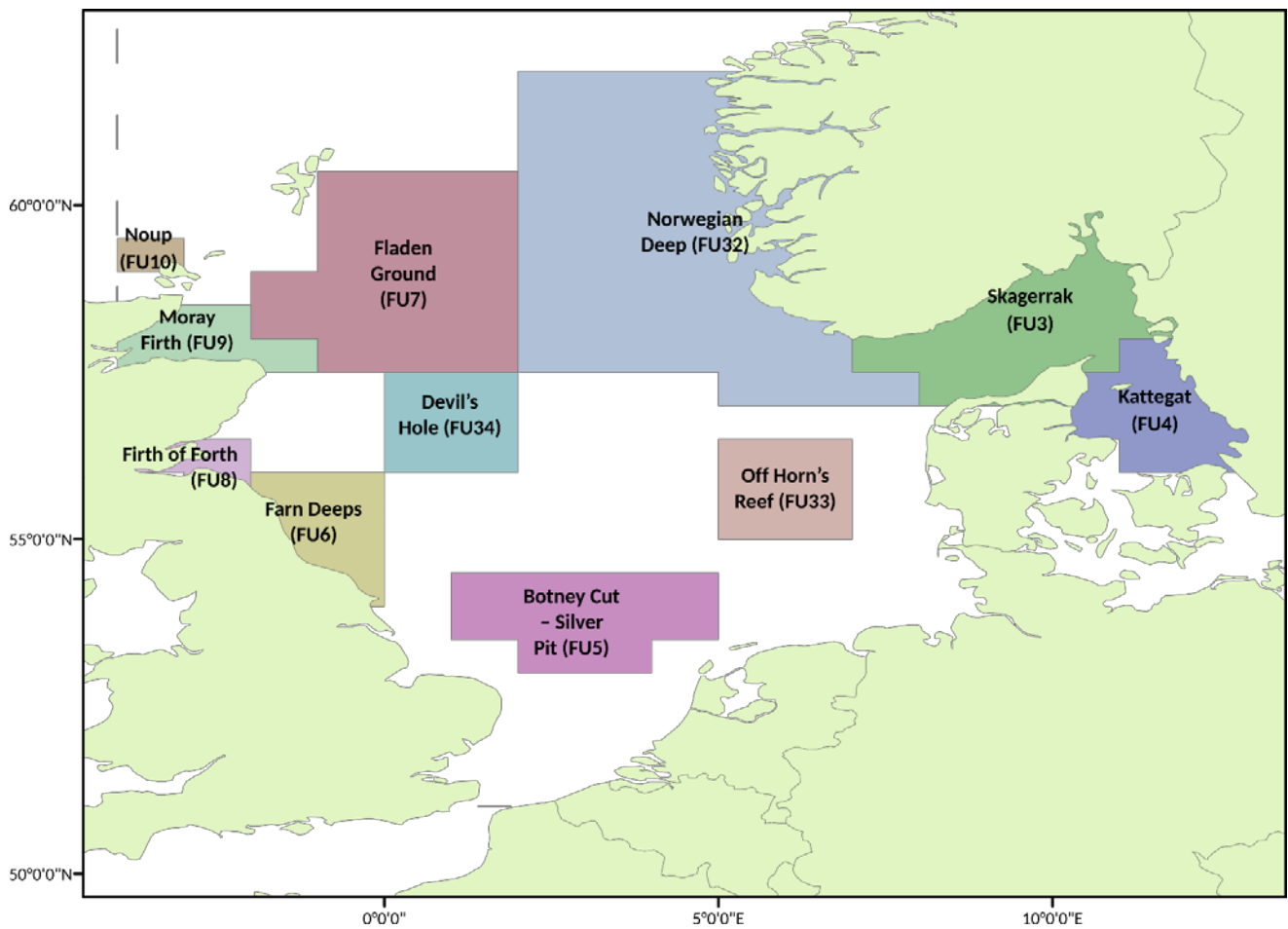


Figure 2 Norway lobster functional units in the North Sea and Skagerrak/Kattegat region.

Reference points

Table 5 Norway lobster in Division 4.a, Functional Unit 7. Reference points, values, and their technical basis.

| Framework | Reference point | Value | Technical basis | Source |
|------------------------|----------------------------|--------------------------|--|--------------|
| MSY approach | MSY $B_{trigger}$ | 2767 million individuals | Lowest observed UWTV survey estimate of abundance (1992–2010) | ICES (2010) |
| | F_{MSY} | Harvest rate 7.5% | Proxy, equivalent to the $F_{0.1}$ for combined sexes | ICES (2015a) |
| Precautionary approach | B_{lim} | Not defined | | |
| | B_{pa} | Not defined | | |
| | F_{lim} | Not defined | | |
| | F_{pa} | Not defined | | |
| Management plan* | MAP MSY $B_{trigger}$ | 2767 million | MSY $B_{trigger}$ | |
| | MAP B_{lim} | Not defined | | |
| | MAP F_{MSY} | Harvest rate 7.5% | F_{MSY} | |
| | MAP range F_{lower} | Harvest rate 6.6–7.5% | Consistent with ranges provided by ICES (2015b), resulting in no more than 5% reduction in long-term yield compared with MSY | |
| | MAP range F_{upper}^{**} | Harvest rate 7.5–7.5% | Consistent with ranges provided by ICES (2015b), resulting in no more than 5% reduction in long-term yield compared with MSY | |

* Proposed EU multiannual plan (MAP) for the North Sea (EU, 2016)

** For this stock, $F_{MSY upper} = F_{MSY}$

Basis of the assessment

Table 6 Norway lobster in Division 4.a, Functional Unit 7. Basis of the assessment and advice.

| | |
|-------------------------------------|--|
| ICES stock data category | 1 (ICES, 2016) |
| Assessment type | Underwater TV survey linked to yield-per-recruit analysis from length data (ICES, 2018b) |
| Input data | Commercial catches (international landings, length frequencies from Scottish catch sampling), one survey index (FU 7 UWTV). Maturity data from commercial catch sampling. Natural mortalities from Morizur (1982): 0.3 for males and immature females, 0.2 for mature females for all years. |
| Discards, BMS landings, and bycatch | Data series from the majority of the fleets/ main fleets (covering 90% of the landings in 2017) were included in the assessment. 90% of the discards were obtained from sampling. BMS landings, where reported, are included as dead removals in the assessments since 2016. |
| Indicators | Sex ratio, length frequencies, mean size, LPUE |
| Other information | The latest benchmark (based on the UWTV survey) took place in 2009 (ICES, 2009) |
| Working groups | Working Group on the Assessment of Demersal Stocks in the North Sea and Skagerrak (WGNSSK) |

Information from stakeholders

In 2017, observer sampling from the Scottish Industry-Science observer sampling scheme was extended to include sampling of Norway lobster catches in FU7.

History of the advice, catch, and management

Table 7 Norway lobster in Division 4.a, Functional Unit 7. ICES advice, official landings and ICES estimates of landings and discards. All weights are in tonnes.

| Year | ICES advice | Landings corresponding to the advice | Catch corresponding to the advice | Official landings | ICES total discards* |
|------|---|--------------------------------------|-----------------------------------|-------------------|----------------------|
| 1992 | | ~2700 | | 3363 | |
| 1993 | | 2700 | | 3492 | |
| 1994 | | 5000 | | 4568 | |
| 1995 | | 5000 | | 6419 | |
| 1996 | | 5000 | | 5210 | |
| 1997 | | 5000 | | 6170 | |
| 1998 | | 7000 | | 5136 | |
| 1999 | | 7000 | | 6518 | |
| 2000 | | 9000 | | 5570 | 340 |
| 2001 | | 9000 | | 5542 | 687 |
| 2002 | | 9000 | | 7245 | 820 |
| 2003 | | 9000 | | 6294 | 349 |
| 2004 | | 12800 | | 8730 | 506 |
| 2005 | | < 12800 | | 10684 | 823 |
| 2006 | No increase of effort | - | | 10791 | 798 |
| 2007 | No increase in effort and harvest rate below 7.5% | < 10900 | | 11911 | 747 |
| 2008 | No new advice, same as for 2007 | < 10900 | | 12239 | 257 |
| 2009 | No increase in effort and recent average landings | < 11300 | | 13327 | 707 |
| 2010 | Harvest rate no greater than that equivalent to fishing at F0.1 | < 16400 | | 12968 | 560 |
| 2011 | MSY approach | < 13300 | | 7559 | 0 |
| 2012 | MSY approach | < 14100 | | 4415 | 0 |
| 2013 | MSY approach | < 10000 | | 2951 | 0 |
| 2014 | MSY approach | < 8959 | | 4147 | 37 |
| 2015 | MSY approach | < 10759 | | 1784 | 0 |
| 2016 | MSY approach | < 6847 | < 6856 ** | 2399 | 0 ^^^ |
| 2017 | MSY approach | | ≤ 12699 *** | 5147 | 115 ^^^ |
| 2018 | MSY approach | | ≤ 16577 ^ | | |
| 2019 | MAP^^ F ranges (Harvest rate=6.6–7.5%) | | 14427–16394 ^ | | |

* Dead + surviving discards.

** Assuming all catches are landed and selection patterns do not change.

*** Assuming discarding below MCS only.

^ Assuming an average discard rate from 2000 .

^^ Proposed EU multiannual plan (MAP) for the North Sea (EU, 2016)

^^^ Since 2016, discards refer to unwanted catches (including BMS).

History of the catch and landings

Table 8 Norway lobster in Division 4.a, Functional Unit 7. Catch distribution by fleet in 2017 as estimated by ICES.

| Catch (2017) | | Wanted catch | | Unwanted catch | |
|--------------|--------------|---|--|----------------|---------------|
| 99% dead | 1% surviving | Directed <i>Nephrops</i> fishery 10% TR2 | Mixed <i>Nephrops</i> /demersal fishery 90% TR1 | 75% dead | 25% surviving |
| 5262 tonnes | | 5147 tonnes | | 115 tonnes | |

Table 9 Norway lobster in Division 4.a, Functional Unit 7. ICES estimates of landings by gear for UK Scotland, total landings for Denmark, total discards and reported BMS. All weights are in tonnes.

| Year | UK Scotland | | | | Denmark | Other countries* | Total landings | Total discards*** | BMS reported to ICES |
|--------|-----------------------|-------------|-------|-----------|---------|------------------|----------------|-------------------|----------------------|
| | <i>Nephrops</i> trawl | Other trawl | Creel | Sub-total | | | | | |
| 1981 | 304 | 68 | 0 | 372 | 0 | 0 | 372 | | |
| 1982 | 381 | 40 | 0 | 421 | 0 | 0 | 421 | | |
| 1983 | 588 | 105 | 0 | 693 | 0 | 0 | 693 | | |
| 1984 | 552 | 94 | 0 | 646 | 0 | 0 | 646 | | |
| 1985 | 1020 | 120 | 0 | 1140 | 7 | 0 | 1147 | | |
| 1986 | 1401 | 92 | 0 | 1493 | 50 | 0 | 1543 | | |
| 1987 | 1023 | 349 | 0 | 1372 | 323 | 0 | 1695 | | |
| 1988 | 1309 | 185 | 0 | 1494 | 81 | 0 | 1575 | | |
| 1989 | 1724 | 410 | 0 | 2134 | 165 | 0 | 2299 | | |
| 1990 | 1703 | 598 | 0 | 2301 | 236 | 3 | 2540 | | |
| 1991 | 3021 | 772 | 0 | 3793 | 424 | 6 | 4223 | | |
| 1992 | 1809 | 1164 | 0 | 2973 | 359 | 31 | 3363 | | |
| 1993 | 2031 | 1234 | 0 | 3265 | 224 | 3 | 3492 | | |
| 1994 | 1816 | 2356 | 0 | 4172 | 390 | 6 | 4568 | | |
| 1995 | 3568 | 2389 | 19 | 5976 | 439 | 4 | 6419 | | |
| 1996 | 2338 | 2578 | 7 | 4923 | 286 | 1 | 5210 | | |
| 1997 | 2712 | 3221 | 0 | 5933 | 235 | 2 | 6170 | | |
| 1998 | 2290 | 2673 | 0 | 4963 | 173 | 0 | 5136 | | |
| 1999 | 2860 | 3546 | 0 | 6406 | 96 | 16 | 6518 | | |
| 2000 | 2916 | 2546 | 0 | 5462 | 103 | 5 | 5570 | 340 | |
| 2001 | 3540 | 1936 | 0 | 5476 | 64 | 2 | 5542 | 687 | |
| 2002 | 4511 | 2546 | 0 | 7057 | 173 | 15 | 7245 | 820 | |
| 2003 | 4175 | 2033 | 0 | 6208 | 82 | 4 | 6294 | 349 | |
| 2004 | 7274 | 1319 | 1 | 8594 | 136 | 0 | 8730 | 506 | |
| 2005 | 8849 | 1508 | 5 | 10362 | 321 | 1 | 10684 | 823 | |
| 2006 | 9470 | 1026 | 1 | 10497 | 283 | 11 | 10791 | 798 | |
| 2007 | 11055 | 734 | 0 | 11789 | 119 | 3 | 11911 | 747 | |
| 2008 | 11432 | 666 | 0 | 12098 | 133 | 8 | 12239 | 257 | |
| 2009 | 12688 | 499 | 0 | 13187 | 130 | 10 | 13327 | 707 | |
| 2010 | 12544 | 288 | 0 | 12832 | 124 | 12 | 12968 | 560 | |
| 2011 | 7367 | 128 | 0 | 7495 | 64 | < 0.5 | 7559 | 0 | |
| 2012 | 4257 | 81 | 0 | 4338 | 75 | 2 | 4415 | 0 | |
| 2013 | 2275 | 663 | 0 | 2938 | 5 | 8 | 2951 | 0 | |
| 2014 | 3928 | 206 | 0 | 4134 | 10 | 3 | 4147 | 37 | |
| 2015 | 1465 | 307 | 0 | 1772 | 8 | 4 | 1784 | 0 | |
| 2016 | 2021 | 374 | 0 | 2395 | 2 | 2 | 2399 | 0^ | 0 |
| 2017** | 2853 | 2291 | 0 | 5144 | 1 | 2 | 5147 | 115^ | 0 |

* "Other countries" includes Belgium, Norway, and UK (England).

** Provisional.

*** Dead + surviving discards.

^ Since 2016, discards refer to unwanted catches (including BMS).

Summary of the assessment

Table 10 Norway lobster in Division 4.a, Functional Unit 7. Assessment summary.

| Year | Adjusted abundance* | 2 standard deviations | Harvest ratio | Landings numbers | Discard numbers | Removals numbers | Landings | Discards | Dead discards | Discard rate | Mean weight in landings | Mean weight in discards | Dead discard rate |
|------|---------------------|-----------------------|---------------|------------------|-----------------|------------------|----------|----------|---------------|--------------|-------------------------|-------------------------|-------------------|
| | millions | | % | millions | | | tonnes | | | % | grammes | | % |
| 1992 | 3661 | 376 | 3.1 | 114 | 0 | 114 | 3363 | 0 | 0 | 0 | 29.61 | NA | 0 |
| 1993 | 4450 | 569 | 3.1 | 138 | 0 | 138 | 3492 | 0 | 0 | 0 | 25.38 | NA | 0 |
| 1994 | 6170 | 814 | 3.1 | 193 | 0 | 193 | 4568 | 0 | 0 | 0 | 23.72 | NA | 0 |
| 1995 | 4987 | 896 | 4.7 | 233 | 0 | 233 | 6419 | 0 | 0 | 0 | 27.51 | NA | 0 |
| 1996 | NA | NA | NA | 175 | 0 | 175 | 5210 | 0 | 0 | 0 | 29.82 | NA | 0 |
| 1997 | 2767 | 510 | 7 | 192 | 0 | 192 | 6170 | 0 | 0 | 0 | 32.08 | NA | 0 |
| 1998 | 3838 | 717 | 4.3 | 164 | 0 | 164 | 5136 | 0 | 0 | 0 | 31.37 | NA | 0 |
| 1999 | 4146 | 649 | 5.1 | 213 | 0 | 213 | 6518 | 0 | 0 | 0 | 30.55 | NA | 0 |
| 2000 | 3628 | 491 | 4.7 | 153 | 21 | 169 | 5570 | 340 | 255 | 12 | 36.35 | 16.24 | 9.3 |
| 2001 | 4981 | 970 | 5.1 | 221 | 43 | 253 | 5542 | 687 | 515 | 16.3 | 25.1 | 15.94 | 12.8 |
| 2002 | 6087 | 757 | 4.9 | 259 | 55 | 301 | 7245 | 820 | 615 | 17.4 | 27.93 | 14.97 | 13.7 |
| 2003 | 5547 | 1076 | 4.1 | 209 | 24 | 226 | 6294 | 349 | 262 | 10.1 | 30.15 | 14.83 | 7.8 |
| 2004 | 5725 | 1030 | 5.4 | 282 | 34 | 307 | 8730 | 506 | 379 | 10.6 | 30.98 | 15.06 | 8.2 |
| 2005 | 4325 | 662 | 9.3 | 368 | 46 | 403 | 10684 | 823 | 617 | 11.2 | 29.05 | 17.74 | 8.6 |
| 2006 | 4862 | 619 | 8.4 | 369 | 54 | 409 | 10791 | 798 | 599 | 12.7 | 29.25 | 14.87 | 9.8 |
| 2007 | 7017 | 730 | 7 | 447 | 55 | 488 | 11911 | 747 | 560 | 10.9 | 26.63 | 13.67 | 8.4 |
| 2008 | 7360 | 1019 | 6.1 | 434 | 18 | 448 | 12239 | 257 | 192 | 3.9 | 28.18 | 14.54 | 3.0 |
| 2009 | 5457 | 772 | 9.4 | 473 | 51 | 511 | 13327 | 707 | 530 | 9.7 | 28.20 | 13.85 | 7.5 |
| 2010 | 5224 | 711 | 9.9 | 492 | 34 | 517 | 12968 | 560 | 420 | 6.5 | 26.38 | 16.44 | 4.9 |
| 2011 | 3382 | 435 | 6.2 | 209 | 0 | 209 | 7559 | 0 | 0 | 0 | 36.17 | NA | 0 |
| 2012 | 2748 | 392 | 4.7 | 128 | 0 | 128 | 4415 | 0 | 0 | 0 | 36.91 | NA | 0 |
| 2013 | 2902 | 335 | 3.1 | 89 | 0 | 89 | 2951 | 0 | 0 | 0 | 34.90 | NA | 0 |
| 2014 | 2990 | 412 | 3.5 | 102 | 3 | 104 | 4147 | 37 | 28 | 2.5 | 43.11 | 13.9 | 1.9 |
| 2015 | 2569 | 320 | 2.0 | 51 | 0 | 51 | 1784 | 0 | 0 | 0 | 36.7 | NA | 0 |
| 2016 | 4449 | 662 | 1.4 | 63 | 0 | 63 | 2399 | 0 | 0 | 0 | 39.43 | NA | 0 |
| 2017 | 7036 | 968 | 3.1 | 212 | 10 | 219 | 5147 | 115 | 86 | 4.4 | 25.37 | 11.66 | 3.4 |

* For animals greater than 17 mm.

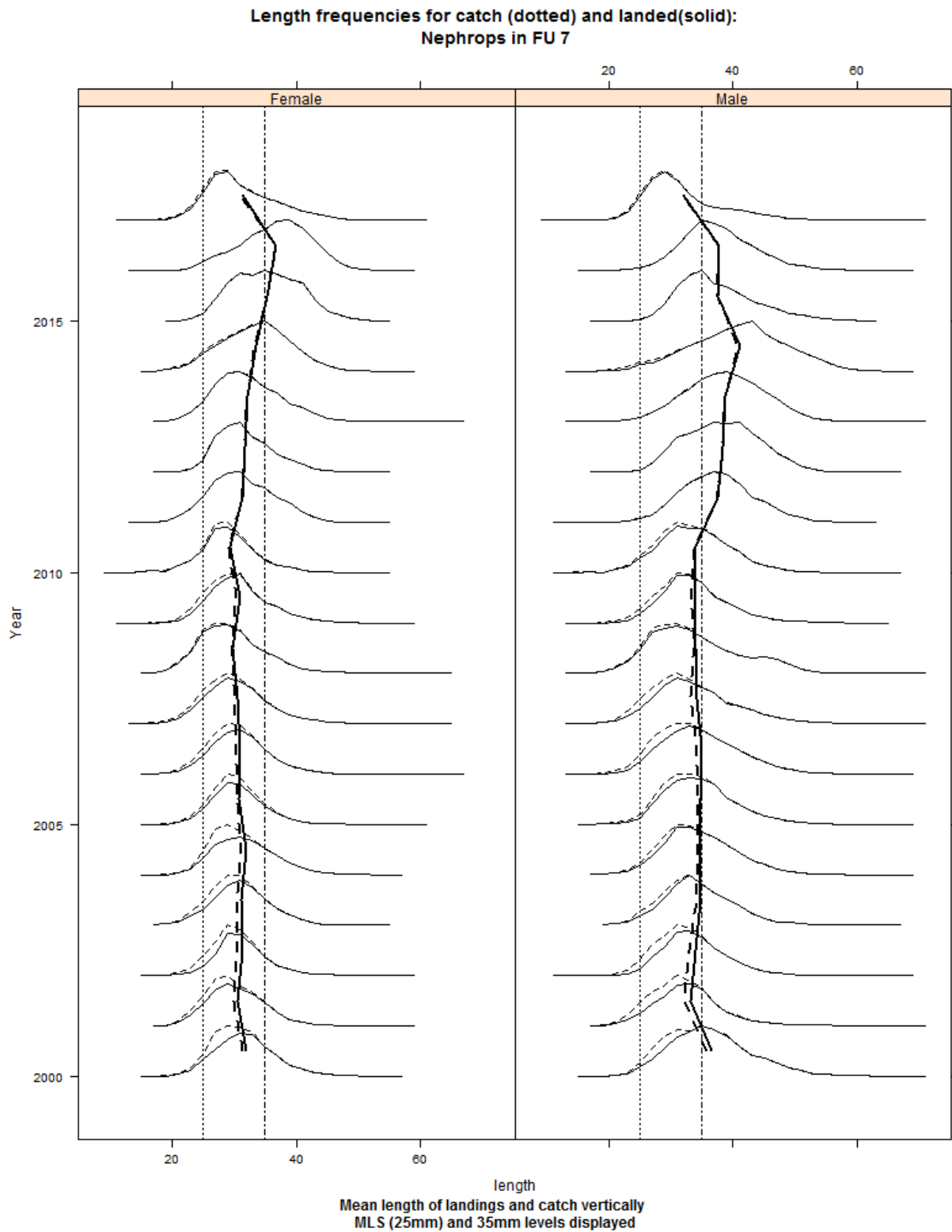


Figure 3 Norway lobster in Fladen Ground (FU 7). Catch length–frequency distribution and mean size in catches and landings. Vertical lines are minimum landing size (25 mm) and 35 mm.

Sources and references

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