

Brown crab, *Cancer pagurus*

ADVICE

Catches should be reduced in line with declining Landings per Unit Effort (LPUE) trends and size indicators of crab catches. This supports that catches in 2021, 2022 should be no more than 482 tonnes.

FISHERY AND STOCK TRENDS

In 2020, 509.3 tonnes of brown crab were landed by NI registered vessels from the ICES rectangles 37E3, 37E4, 38E4 and 39E3 and 39E4. This is a reduction in landings from a peak in 2012. The LPUE trend has decreased steadily since the beginning of the time series. The mean size of individual crab measured in the catches indicate that these are below the size at which growth is optimum (Lopt), with male and female crab both below Lopt since 2015.

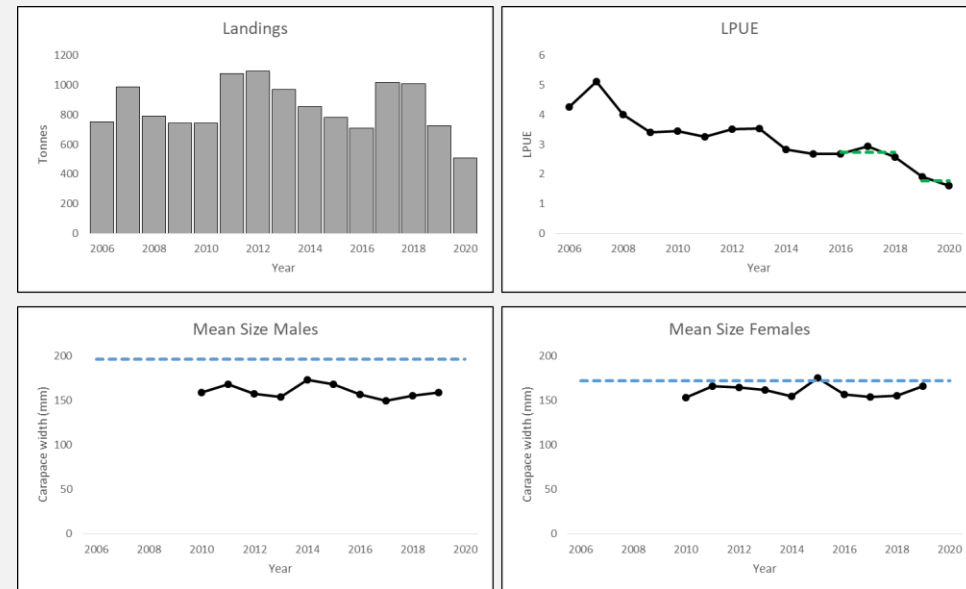


Fig 1. Brown crab in ICES rectangles: 37E3, 37E4, 38E4, 39E3, 39E4. Summary of the stock assessment. Catches, LPUE, length based indicators. The dashed green lines indicate the average of the most recent two years and the previous three years. The dashed blue lines indicate Lopt.

Table 1. Brown crab in ICES rectangles: 37E3, 37E4, 38E4, 39E3, 39E4. State of the stock relative to reference points and qualitative fishing pressure.

| Fishing Pressure | | | | Stock Indicator (males) | | | Stock Indicator (females) | | | | |
|------------------|------|------|-----------|-------------------------|------|------|---------------------------|------|------|------|------------------|
| 2018 | 2019 | 2020 | Declining | 2018 | 2019 | 2020 | Below; improving | 2018 | 2019 | 2020 | Below; improving |
| ↗ | ↗ | ↘ | Declining | ↗ | ↗ | - | Below; improving | ↗ | ↗ | - | Below; improving |

ADVICE BASIS

A commercial LPUE time series is used to indicate stock trends. The advice is based on the ratio of the mean of the last two index values (Index A) and the mean of the three preceding values (Index B), multiplied by the recent average catch.

A precautionary reduction was applied for this stock due to the indicator of size of landed crabs being below Lopt.

An average of 62% of males and 76% of females having a carapace width of 130mm or greater. However, only an average of 46% of catch are actually landed, giving a discard rate of 64%.

Table 2 Brown crab in ICES rectangles: 37E3, 37E4, 38E4, 39E3, 39E4. Basis for advice.*

| | |
|------------------------------|---------------|
| Index A (2019 - 2020) | 1.76kg/pot |
| Index B (2016–2018) | 2.73 kg/pot |
| Index ratio (A/B) | 0.64 |
| Recent catch for 2017 - 2019 | 748 t |
| Precautionary Reduction | Applied (0.8) |
| Catch advice** | 482 t |
| % Advice change ^ | -35.5 % |

* 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.

** [Mean recent catch (2018 – 2020)] × [Index Ratio] × [Precautionary buffer].

^Advice change is based on the current advised catch compared to mean recent catch (2018 – 2020).

REFERENCE POINTS

Table 2. Reference points

| Reference point | Value | Technical basis |
|--------------------------|-------|--|
| L _{opt} Males | 196.3 | Length at which growth rate is maximum |
| L _{opt} Females | 172.4 | Length at which growth rate is maximum |

QUALITY OF THE ASSESSMENT

The assessment is based on landings from NI waters (ICES rectangles 37E3, 37E4, 38E4, 39E3, 39E4) by NI registered vessels. These landings are made into NI, other UK and Irish ports.

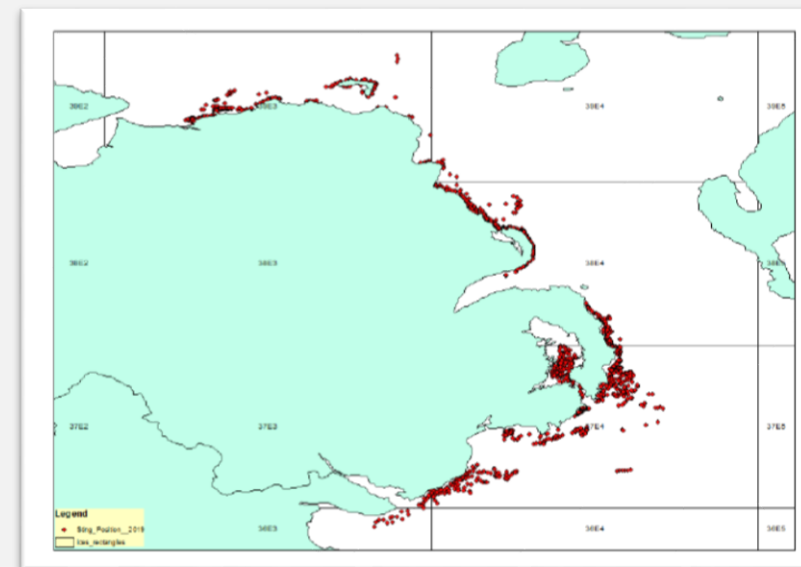


Fig 2. At-sea observation of Brown crab pot fishing.

2020 landings and effort may have been impacted by Covid-19 which impacted fishing and markets due to lockdown within UK and Europe.

Whilst details are currently unavailable on the connectivity and movement of brown crab within and outwith NI waters, AFBI aim to gather details on this by carrying out tagging studies during 2021.

A length based model was used to examine the health of the brown crab stock. For a stock to be healthy the mean length should be at Lopt. The output of the assessment indicates that both male and female brown crab are shown to be overexploited (mean length is below Lopt).

The data used in the length based model is collected through an observer programme. Observer data is available from 2010 to 2019 (no data is available in 2020 due to Covid-19 which meant observer trips could not take place). The data used in the assessments excludes lengths from crabs in Strangford Lough which are felt to have a different growth rate. Between 2010 and 2019, an average of 18 trips have been carried out annually.

The LPUE series is derived from reported landings data. This data is reliant on accurate self-reporting from commercial fishers. Methods for automated data collection would provide more detail on effort trends, including the duration over which pots are deployed.

ISSUES RELEVANT FOR THE FISHERY

The assessment is based on a length based model but excludes Strangford Lough data as brown crab from the Lough are thought to have a different growth rate. A minimum landing size of 130mm which has been increased to 140mm in August 2020.

SUMMARY OF THE ASSESSMENT

Table 3 *Cancer pagurus* in ICES rectangles: 37E3, 37E4, 38E4, 39E3, 39E4. Assessment summary.

| Year | Landings | Effort* | Mean Size Males | Mean Size Females |
|------|----------|---------|-----------------|-------------------|
| 2006 | 752.4 | 15204 | - | - |
| 2007 | 985.9 | 16141 | - | - |
| 2008 | 788.7 | 20659 | - | - |
| 2009 | 744.2 | 19754 | - | - |
| 2010 | 743.2 | 22196 | 158.7 | 153.4 |
| 2011 | 1077.7 | 22347 | 168.0 | 165.7 |
| 2012 | 1095.4 | 23307 | 157.8 | 164.3 |
| 2013 | 968.9 | 23669 | 153.9 | 162.0 |
| 2014 | 854.7 | 24661 | 173.0 | 154.3 |
| 2015 | 781.5 | 17618 | 168.1 | 175.6 |
| 2016 | 707.5 | 20430 | 156.6 | 156.5 |
| 2017 | 1016.8 | 22801 | 149.6 | 154.1 |
| 2018 | 1007.2 | 24390 | 155.5 | 155.6 |
| 2019 | 726.5 | 27200 | 158.9 | 166.0 |
| 2020 | 509.3 | 17802 | - | - |

*This is the reported number of pots fishing not the number of hauls