

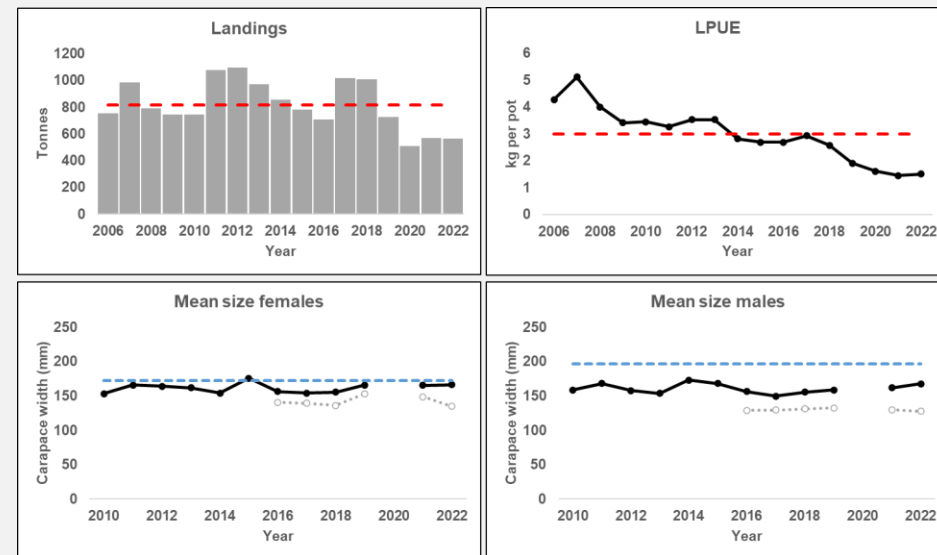
# Brown crab, *Cancer pagurus*

## ADVICE

Landings should be reduced in line with the declining Landings per Unit Effort (LPUE) trend and size indicators of crab. It is advised that **landings in 2024 should be no more than 361 tonnes**.

## FISHERY AND STOCK TRENDS

In 2022, 566.4 tonnes of brown crab were landed by NI registered vessels from the ICES rectangles 37E3, 37E4, 38E4, 39E3 and 39E4 (Fig 1). This is a reduction in landings from a peak in 2012, and the second lowest landings recorded over the time series (2020 had the lowest landings at 509.3 tonnes). The LPUE trend has decreased steadily since the beginning of the time series (Fig 1). The mean size of landed crab indicates that these are below the size at which growth is optimal ( $L_{opt}$ ). Using  $L_{opt}$  as a proxy for Maximum Sustainable Yield (MSY) the stock has been below possible  $MSY_{proxy}$  since the beginning of the time series.



**Fig 1.** Brown crab in ICES rectangles 37E3, 37E4, 38E4, 39E3 and 39E4. Summary of the stock assessment. Landings, Landings Per Unit Effort (LPUE) and length based indicators. Red dashed line represents average over time period. For the length based indicator the solid black line indicates mean size crab landed and the dashed black line is mean size of all crabs measured. The dashed blue lines indicate  $L_{opt}$ .

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

Fishing Pressure				Stock indicator (females)				Stock indicator (males)			
2020	2021	2022		2020	2021	2022		2020	2021	2022	
↓	→	→	Increasing; Below average	-	↓	↓	Increasing; Below $L_{opt}$	-	↓	↓	Increasing; Below $L_{opt}$

## ADVICE BASIS

A commercial LPUE time series is used to indicate stock trends. The advice is based on the ratio of the mean LPUE of the last two index values (Index A) and the mean of the three preceding values (Index B), multiplied by the recent average catch (3 years).

A precautionary reduction is applied as the indicator of size of crabs is below  $L_{opt}$ .

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

Index A (2021 - 2022)	1.47 kg/pot
Index B (2018–2020)	2.03 kg/pot
Index ratio (A/B)	0.73
Recent landings for 2019 – 2022**	621 t
Precautionary Reduction	Applied (0.8)
Landings advice***	361 t
% Advice change ^	-41.9 %

\* 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.

\*\* 2020 landings excluded due to Covid-19 impacts on landings

\*\*\* [Mean recent landings (2019 – 2022)] × [Index Ratio] × [Precautionary buffer].

^ Advice change is based on the current advised landings compared to mean recent landings (2019 – 2022).

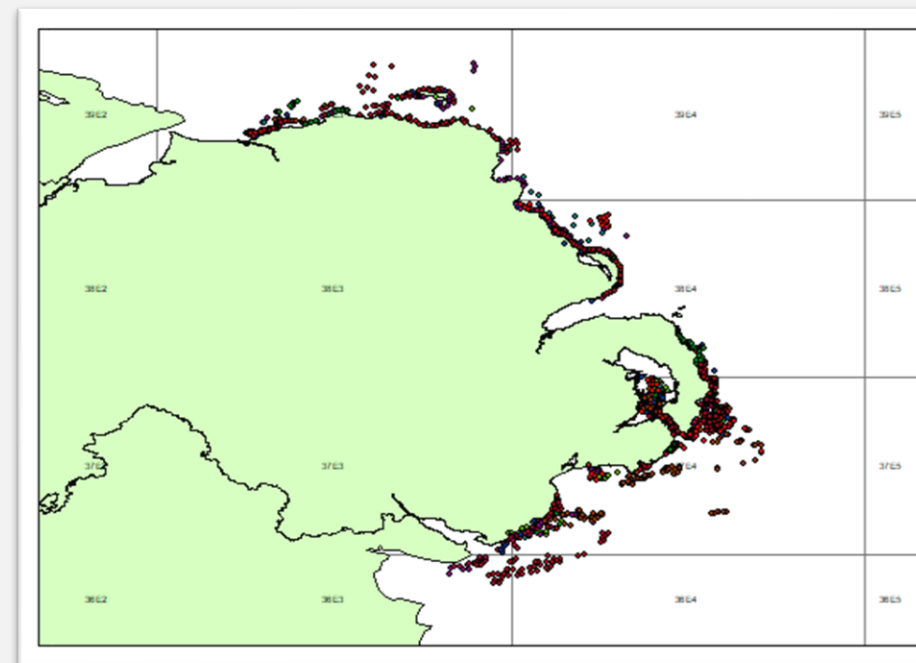
## REFERENCE POINTS

**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 and 39E4) by NI registered vessels. These landings are made into NI, other UK and Irish ports.



**Fig 2.** At-sea observation of pot fishing.

The landings and effort in 2020 may have been impacted by Covid-19 due to market factors and public restrictions to limit Covid-19 spread.

In 2022 AFBI began to gather details crab movement and connectivity by carrying out tagging studies. AFBI hope to carry out genetic studies of brown crab from 2024.

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  $L_{opt}$ . The output of the assessment indicates that both male and female brown crab are overexploited (mean length is below  $L_{opt}$ ).

The data used in the length-based model are collected at-sea, on board fishing vessels. These data are available from 2010 to 2022 (limited data are available in 2020 due to Covid-19). The data used in the assessments exclude lengths from crabs in Strangford Lough which are considered to have different growth characteristics. Between 2010 and 2022, an average of 21 trips have been carried out annually.

The LPUE series is derived from reported landings data. These data are 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 current minimum landing size of brown crab is 150mm.

## SUMMARY OF THE ASSESSMENT

**Table 3** Brown crab in ICES rectangles: 37E3, 37E4, 38E4, 39E3 and 39E4. Assessment summary.

Year	Landings	Effort*	Mean Size Landed Males <sup>^</sup>	Mean Size Landed Females <sup>^</sup>
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	-	-
2021	569.8	18293	162.0	165.5
2022	566.4	20186	167.7	166.1

\* Reported number of pots