



Agenda item B5

From: Lead Scientific and Conservation Officer

To: Kent and Essex Inshore Fisheries and Conservation Authority – 22  
November 2022

Subject: Update on native oyster research in Kent and Essex

Classification: **Unrestricted**

**Summary:**

This report shows that the native oyster stock has substantially (77 %) declined between 2019 and 2022 and strongly recommends that the native fishery in Blackwater, Crouch, Roach and Colne Estuaries Marine Conservation Zone (BCRC MCZ) remains closed. A brief overview of a native oyster survey carried out for the Zoological Society of London in the River Medway is reported and future research plans are briefly stated. Members are then asked to review and approve the following recommendations for management.

**Recommendation(s):**

1. The Authority is asked to **APPROVE** the following management measures:
  - (a) It is **RECOMMENDED** that the BCRC MCZ Native Oyster Fishery remains closed in 2022/2023 because the requirements for the fishery to open have not been met, namely, a minimum of 800 tonnes biomass and evidence of sustained levels recovery in native oyster populations are required) in Blackwater, Crouch, Roach and Colne Estuaries (KEIFCA 2019 Oyster Survey Report);
  - (b) It is **RECOMMENDED** that the Authority continues to review the recommendations regarding the current closure of the native oyster fishery within the BCRC MCZ site on an annual basis, with the next review scheduled for the November 2023 KEIFCA meeting.

**1. The 2022 native oyster survey**

In 2022 the annual oyster survey was carried out in the BCRC MCZ. One hundred and thirty-two samples were collected using a ladder dredge towed (100 m/tow) behind FPV Tamesis in the grid-cells where native oysters were found during the

2019 survey in the BCRC MCZ. This represents the first complete survey since 2019 whereafter COVID-19 restrictions prevented surveys from taking place.

Analysis of the results of the 2022 survey show that there has been a very substantial decline in the total number of oysters in the MCZ overall since 2019. A total of 98 native oysters were found in 33 of the 132 (25%) dredge tows during the 2022 survey. The mean native oyster abundance declined by 77 % when comparing this survey's mean of 1.3/tow to the longer-term (2016 – 2018) summer mean of 5.55/tow (see Figure 1). The median values per tow (sample) of native oysters also declined from 1.2/tow to 0.1/tow. Indicative that declines were not purely driven by a drop in a few sites that previously had many oysters, but there has been widespread decline across most sampling sites in addition to the drop at previously productive sites.

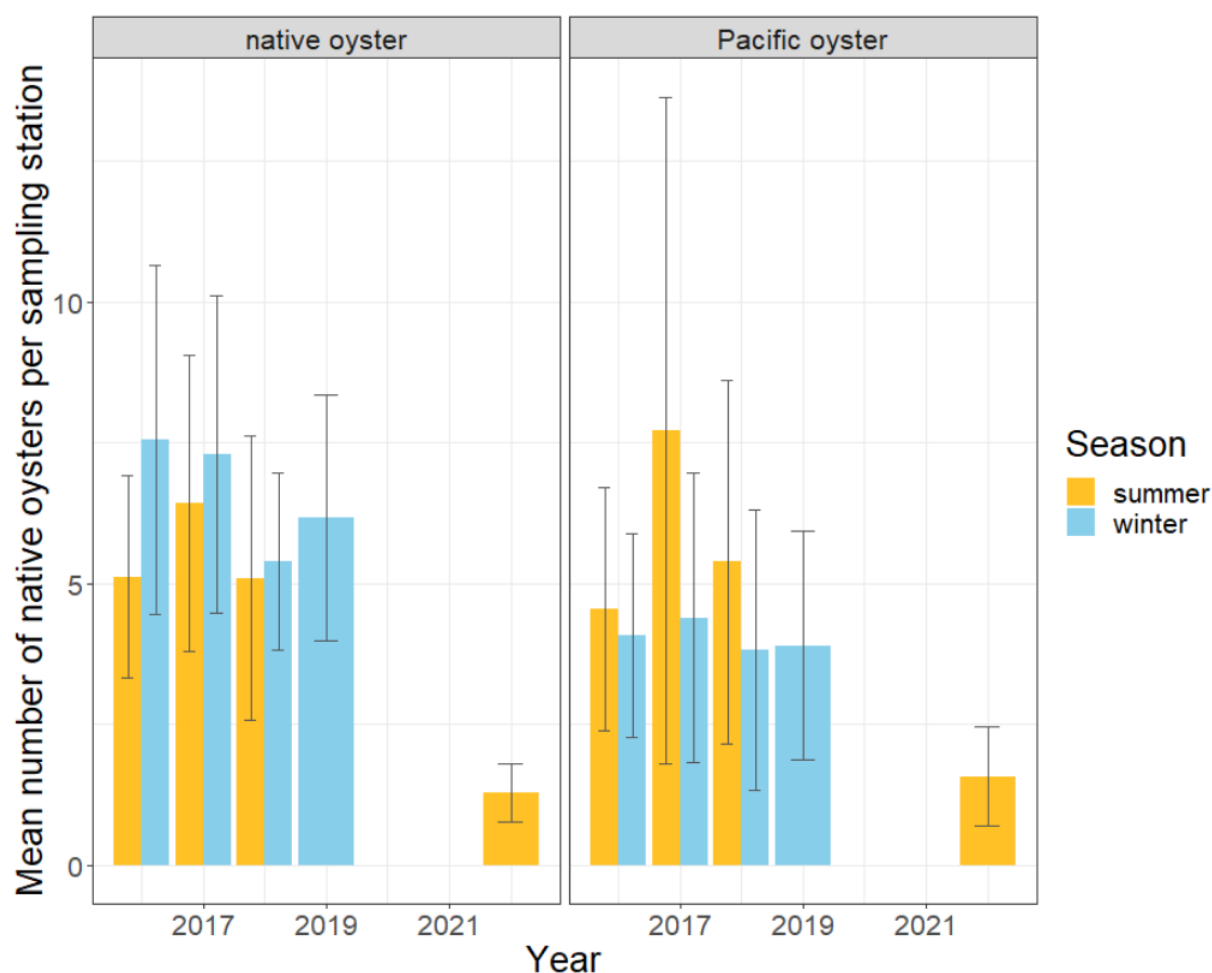


Figure 1. Mean number of native oysters ( $\pm$  standard errors) and Pacific oysters per sample (i.e., tow of the dredge) for years 2016 - 2022 (missing years, 2020 and 2021, are due to no surveys carried out during COVID-19). Wide blue bars represent winter-only survey for a given year (i.e., no survey was carried out in winter of that year.) Large standard error bars indicate high variability of oyster abundances between sites during a survey.

For comparison:

- in 2016 September, a total of 443 native oysters were recorded from 102 tows,
- in September 2017, a total of 483 native oysters were recorded from 99 tows,
- in September 2018, a total of 385 native oyster were recorded from 99 tows in,
- In March 2019, a total of 596 native oysters were recorded from 99 tows.

The most significant declines were from the Crouch where in previous years a single tow would catch up to 100 oysters while this year one site had 18 oysters and other sites fewer. Furthermore, the Ray Sand subpopulation has suffered a substantial decline and other areas, like the Blackwater, Outer Colne Eagle Bank, Wallet and Whitaker had very low (1) or no oysters present (see Figure 2).

Dr Lown's PhD study with the University of Essex in the BCRC MCZ showed that the mean native oyster biomass estimates ranged between 134 tonnes to 412.5 tonnes between 2016 and 2018 based on densities of more than 5 native oysters per tow (sample) on average. Consequently, the significant decline of the current population biomass is well below the 800-ton requirement when projected using the Inverse Weighted Distance (IWD) models to project a biomass from the survey results. Consequently, no Habitat Regulations Assessment (HRA) or MCZ equivalent were carried out and under the byelaw it was therefore determined that the fishery should remain closed.

Reasons for the declines are likely to be environmentally driven because the declines were observed across the entire study area. Shellfish mortality is a common phenomenon, and indeed declines in cockles and whelks have been reported in the district in 2022. Meteorological data indicated high air and water temperatures and low levels of runoff owing to low rainfall during a particularly dry summer in 2022. The native oyster population in the Ray Sands channel is vulnerable to sedimentation population, but no data has been collected on what the probable causes might be driving observed declines of native oyster stocks.

Management recommendations from this work are to continue our commitment to long-term monitoring of the population to provide important information for making decisions about this potential fishery. Furthermore, it would be sensible to carry out multiple pass surveys in the Ray sand to better understand dredge efficiency which might reveal whether oysters are buried deeper or have been lost to recent sediment deposition in this area. Increased surveillance of the Crouch by IFCA officers may be required to identify causes of population loss from this area which is less well understood.

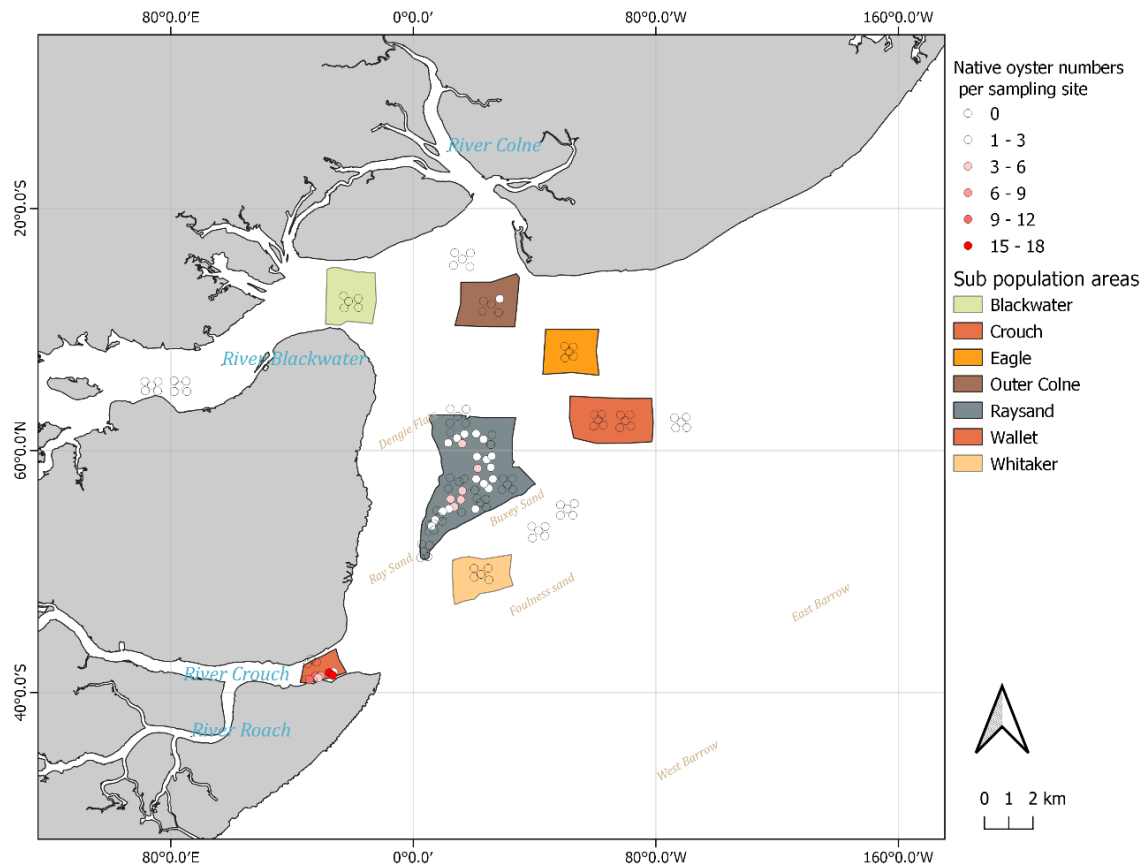


Figure 2. Number of native oysters recorded at each sampling station in 2022 survey in the BCRC.

## 2. Medway oyster survey

KEIFCA's FPV vessel Tamesis, was chartered by the Zoological Society of London (ZSL) to carry out a native oyster survey in the Medway MCZ in September 2022 as part of a study to identify sites for potential restoration projects in future. This study was made up of members from ZSL, KEIFCA and ROFF (Rochester Oyster Floating Fishery). The survey was carried out from Queenborough Harbour and was completed over 3½ days during which 32 samples (100 m tows of the dredge) were obtained. Twenty-six native oysters and 100 Pacific oysters were recorded, clearly showing presence but at lower densities (0.81 / tow) of native oysters in the Medway compared to the depauperate population in the BCRC MCZ.

## 3. Data base work

KEIFCA has developed a new database to allow improved standardized data capture for native oyster surveys. The database allows improved mapping and data analysis routines to take place and provides better data security and improved access than previously.

#### 4. Planned work for 2023

In 2023, the annual spring and autumn surveys are to be continued to monitor stock levels and include additional sampling sites in the MCZ. If resources allow, a joint study with Essex University may be tied to either of these surveys to assess dredge efficiency from multiple passes in the Ray Sand Channel to better understand the causes of the low number of native oysters recorded in this area.

#### 2022/2023 Fishery Management Recommendations

The Authority is asked to **APPROVE** the following management measures:

- (a) the Blackwater, Crouch, Roach and Colne Estuaries MCZ Native Oyster Fishery remains closed in 2022/2023 because the requirements for the fishery to open have not been met namely, 800 tonnes biomass and evidence of sustained levels recovery in native oyster populations are required) in Blackwater, Crouch, Roach and Colne Estuaries (KEIFCA 2019 Oyster Survey Report);
- (b) KEIFCA will endeavor to carry out the annual oyster survey in 2023 to inform the November 2023 KEIFCA meeting when consideration will be given to the future management and opening of the native oyster fishery within the BCRC MCZ site.

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#### *Annex – Background to understand decision making process for opening the native oyster fishery in the BCRC MCZ*

The native oyster fishery in the BCRC MCZ was closed on 31<sup>st</sup> May 2015. Subsequently the BCRC MCZ Native Oyster Fishery Flexible Permit Byelaw came into effect in 2019. The purpose of this flexible permit byelaw is to continue the protection afforded to the depleted native oyster stocks in the BCRC MCZ. The byelaw therefore provides the opportunity for native oysters to recover from fishing pressure while retaining the option to open the fishery if stocks are deemed to show a significant and sustained recovery in future. For the BCRC MCZ oyster fishery to be opened, stock levels are required to show a 1) sustained recovery trend and 2) a biomass estimation exceeding 800 tonnes (based on the model developed during Alice Lown’s PhD thesis). The process is around opening the fishery is shown in (Figure 3). The committee approved the decision to keep the native oyster fishery in the BCRC MCZ closed in 2020 and 2021 based primarily on the evidence provided in the 2019 oyster report when COVID-91 prevented annual surveys from taking place. In 2022 the annual oyster survey was carried out in the BCRC MCZ providing new evidence to support keeping the fishery closed.

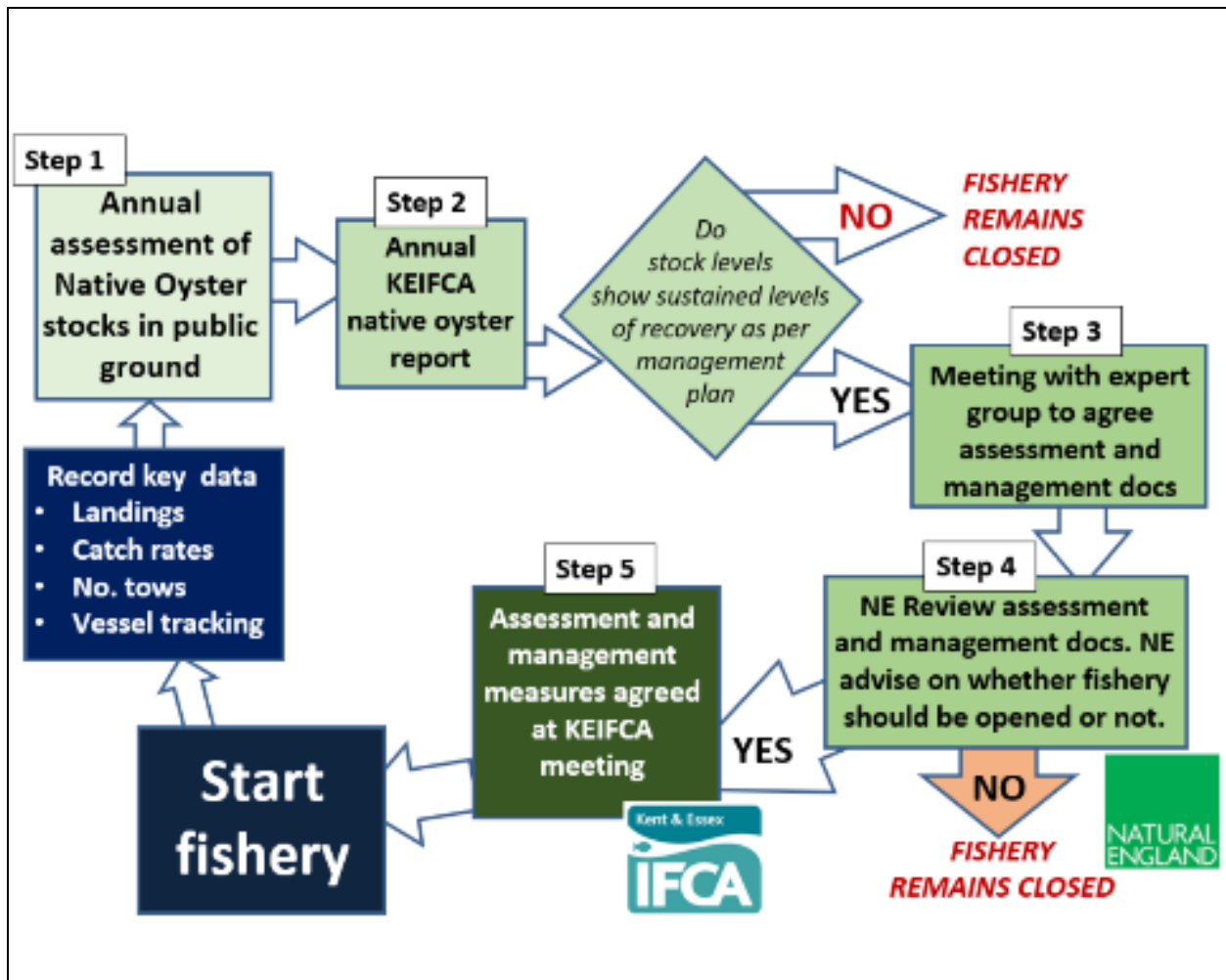


Figure 3. Decision tree describing the process used to open or close the fishery