



Agenda Item B6

Success Criteria: 2, 3, 4, 5 & 6

By: Lead Scientific and Conservation Officer

To: Kent and Essex Inshore Fisheries and Conservation Authority – 24 November 2015

Subject: **Blackwater, Crouch, Roach and Colne MCZ**

Classification Unrestricted

Summary: To report on progress on specific research in the Blackwater, Crouch Roach and Colne MCZ.

1.1 Native Oyster stock Assessment

2.1.1 Introduction

In August 2014, KEIFCA undertook an extensive oyster dredge survey over all of the public fishing grounds in the Blackwater, Crouch Roach and Colne (BCRC) MCZ; approximately 78% of the total MCZ area. This survey conducted one 100m dredge tow in each grid rectangle measuring 0.5' latitude x 1' longitude (927 x 1170 metres). Grid rectangles where native oyster were found were further divided into quarters (0.25' lat x 0.5' long – 464m x 585m) and additional dredge tows were undertaken so that there was 1 dredge tow in each of the smaller sub-rectangles. Native oysters were found in areas in the river Crouch, river Roach, the river Blackwater and the Ray Sand channel.

In September 2015 KEIFCA re-sampled the areas where native oysters were found last year to assess the stocks of native oysters in these areas.

2.1.2 Methods

The same experimental oyster dredge was deployed from FPV Tamesis as in 2014 and duplicate 100 m long dredge tows were made at each sample point where native oysters were present in 2014. This was a total of 68 samples at 34

points. The contents of the dredge were photographed, sorted and native oysters and associated species counted, weighed and measured.

2.1.3 Results

31 of the 34 points where native oysters were found in 2014 also contained native oysters in 2015. Although native oysters were found at fewer sample locations, the average density of oysters was higher in 2015. Of the sites which contained native oysters, the average density of oysters in 2014 was 0.06 per m² compared to 0.09 oyster per m² this year. Assuming a dredge efficiency of 25%, this equates to a density on the ground of 0.24 oysters m² in 2014 compared to 0.36 oysters m² in 2015. It is important to note that this average density only applies to the sample locations and not the whole site and closer inspection of data reveals 16 sample locations with a greater and 16 with a lower abundance of oysters in 2015 compared to 2014.

One sample point in 2015 had a much greater density of 0.95 oysters m⁻² compared to 0.06 m⁻² in 2014 and this considerably influences the overall increase in density observed over the entire area. This difference is probably due to the patchy distribution of oysters and continued sampling in future years will provide greater confidence in this data.

2.1.4 Future planning

Further analysis of both the 2014 and 2015 data will be carried out to show finer scale changes.

It is planned that these stocks will be surveyed annually to provide data to assess whether the conservation objectives of the MCZ are being met and to inform further management decisions.

2.2 Oyster restoration project in the Ray Sand Channel and the Blackwater

2.2.1 Introduction

The Blackwater, Crouch, Roach and Colne Estuaries Marine Conservation Zone (BCRC MCZ) was designated in November 2013 with conservation objectives to recover native oysters and native oyster beds to favourable condition.

Following the approval by the authority at the previous meeting in May 2015 to invest £7,500 per annum for the next three years to undertake oyster restoration trials, work began on 25th June 2015. In order to test the effectiveness of harrowing in removing silt from underlying oyster cultch, test areas in the mouth of the river Blackwater and in the Ray Sand channel were used.

2.2.2 Method

Three test areas in the river Blackwater and three test areas in the Ray Sand channel were harrowed for 20 hours each in June and July 2015 by the oystermen and paid for by KEIFCA. Adjacent to all six harrow test sites were six control sites of the same size where no harrowing took place. All test and control sites were surveyed using day grab, underwater cameras and side scan sonar before and after harrowing and the vessels undertaking harrowing used GPS plotters to track the harrow tracks. So far, one initial pre-harrowing survey and two post-harrowing surveys (at one week and six weeks after harrowing) have been conducted by KEIFCA officers using FPV Tamesis.

2.2.3 Preliminary Results

There was no considerable visible change in the surface sediment type, or the sieved contents of the grabs before and after harrowing. Unfortunately, visibility was not sufficient to gather any useable video or camera footage. Immediately after harrowing (within 4 days), side scan sonar revealed furrows in the sediment in lines of 4 parallel grooves. These scour marks covered the entire test boxes but were absent from all control boxes in both the Ray Sand channel and the river Blackwater. The pattern of 4 parallel grooves was made by the rows of 4 looped chains that hang down on the harrow.

Side scan sonar surveys 6 weeks later showed that the furrows made by the oyster harrows were no longer visible in the Ray Sand channel, however they remained present in the river Blackwater test boxes. The persistence of the furrows in the river Blackwater in contrast to the Ray Sand channel probably reflects the location of these two sites. The river Blackwater site is more sheltered whereas the Ray Sand channel is more exposed and is likely to have higher wave energy, causing a greater natural disturbance to the sediment.

Therefore, initial results indicate that harrowing causes alterations in the topography of the seabed and this effect is longer lasting in more sheltered, low energy environments. Although infaunal analyses were not made in this study, coarse visual analyses of grab samples revealed no obvious differences in epifauna or infauna pre- and post-harrowing.

Further analysis of the results, in particular the side scan sonar data, will be undertaken in the coming months using specialist software and knowledge from other IFCAs. A report on the first year's work will be available in February 2016.

2.2.4 Future planning

The work at test sites provides baseline data upon which future work to restore native oyster populations and habitat will be compared and this data will also inform further management decisions. The ongoing work forms part of a management plan drafted by KEIFCA in conjunction with the oyster fishermen and with approval from the Essex Native Oyster Restoration Initiative (E-NORI).

It was stated at the September Authority meeting that throughout the duration of the project, annual surveys will be conducted by KEIFCA on the sites and adjacent areas to monitor the effect of the restoration works. It was also anticipated that results from this study would help to attract further external funding for future restoration work. Currently KEIFCA is awaiting further MCZ conservation advice from Natural England regarding native oysters on the site and any future work will reflect the latest advice from NE.

2.3 PhD project on Native Oyster restoration

In 2014, two funding proposals were submitted in collaboration with the University of Essex for funds to support a PhD student project to work on native oyster restoration in the Blackwater, Crouch, Roach and Colne MCZ. One of these bids to the Natural Environment Research Council (NERC) through the EnvEast Doctoral Training Partnership for approximately £80,000 was successful and the student, Miss Lown, started in October 2015. KEIFCA is a CASE (collaborative awards in science and engineering) partner, contributing £3,000 to the project in addition to training, providing fieldwork opportunities and co-supervision. Miss Lown will investigate factors affecting native oyster stocks in Essex including predation, competition and spat densities. This will include participation in the annual native oyster stock assessment currently conducted by KEIFCA along with additional surveys which are proposed to be carried out in collaboration with KEIFCA. Details of these future surveys will be decided upon in the coming months.

Members are asked to **NOTE** these reports and make **COMMENT** on them