

<b>Title:</b> Blackwater, Crouch, Roach and Colne Estuaries Marine Conservation Zone Native Oyster Fishery Flexible Permit Byelaw  <b>IA No:</b> 1  <b>Lead department or agency:</b> Kent and Essex Inshore Fisheries and Conservation Authority (IFCA)  <b>Other departments or agencies:</b> Marine Management Organisation (MMO), Defra	<b>Impact Assessment (IA)</b>
	<b>Date:</b> 03/05/2018
	<b>Stage:</b> Consultation
	<b>Source of intervention:</b>
	<b>Type of measure:</b> Secondary Legislation
	<b>Contact for enquiries:</b> Dominic.bailey@kentandessex-ifca.gov.uk
<b>Summary: Intervention and Options</b>	RPC Opinion: N/A

Cost of Preferred (or more likely) Option (£)				
Total Net Present Value	Business Net Present Value	Net cost to business per year (EANDCB on 2016 prices)	In scope of One-In, Three-Out?	Business Impact Target Status
-436479	-436479	45459	N/A	N/A

#### What is the problem under consideration?

Native oyster stocks across Europe have declined dramatically over the last 200 years and oysters and oyster beds are now on the Convention for the Protection of the Marine Environment of the North-East Atlantic (OSPAR) list of threatened and/or declining species and habitats. Native oysters' low growth rates and poor recruitment success make it a particularly vulnerable species and as such have been designated as a 'recover' feature in the Blackwater, Crouch, Roach and Colne Estuaries Marine Conservation Zone (MCZ). A flexible permit byelaw can provide a framework and process by which the local community (that are actively engaged in the recovery of native oysters on the site) can help develop a tailored management measures package, under which oyster harvesting could take place once recovery has been achieved.

#### Why is government intervention necessary?

Two of the three designated features of the Blackwater, Crouch, Roach and Colne Estuaries MCZ (native oysters and native oyster beds) have a general management approach of 'recover to favourable condition'. Flexible management is required to further the conservation objectives of the MCZ, whilst providing a future framework and management process for oyster harvesting once the recover objectives have been met.

Government intervention is required to redress market failure in the marine environment by implementing appropriate management measures (e.g. this byelaw) to conserve features to ensure negative externalities are reduced or suitably mitigated. Implementing this byelaw will support continued provision of public goods in the marine environment.

#### What are the policy objectives and the intended effects?

- To further the conservation objectives stated for the Blackwater, Crouch, Roach and Colne (BCRC) Estuaries MCZ by ensuring that the protected features of the MCZ are protected from the risk from damage and obligations under the Marine and Coastal Access Act 2009 (MaCAA) will have been met;
- To manage the exploitation of native oyster stocks within the BCRC Estuaries MCZ to ensure a

sustainable fishery and continued socio-economic benefits, while conserving the marine environment;

- To further the conservation objectives stated for the Essex Estuaries European Marine Site (EMS) and ensure compliance with the Habitats Directive in line with Defra's revised approach;
- To conserve stocks through a permit scheme and a range of technical measures including a Total Allowable Catch (TAC) and a range of flexible technical measures.
- To provide information from the management process of annual surveys, and when open catch returns, to inform native oyster population assessments, and the sites conservation objectives.
- To protect the wider marine ecosystem that relies on oyster stocks as food source.
- To reduce external negativities and ensure continued provision of public goods.

**What policy options have been considered, including any alternatives to regulation? Please justify preferred option (further details in Evidence Base)**

Option 0. Do nothing.

Option 1. KEIFCA byelaw - Blackwater, Crouch, Roach and Colne Estuaries Marine Conservation Zone Native Oyster Fishery Flexible Permit Byelaw.

Option 2. KEIFCA byelaw - Blackwater, Crouch, Roach and Colne Estuaries Marine Conservation Zone native oyster beds closure byelaw.

Option 3. KEIFCA byelaw - KEIFCA Blackwater, Crouch, Roach and Colne Estuaries Marine Conservation Zone Native Oyster Fishery Flexible Permit Byelaw with fixed management measures.

Option 4. Voluntary agreement.

All options are compared to option 0. The preferred option is option 1 which will promote both sustainable fisheries and conserve the marine environment and will ensure compliance with MCZ conservation objectives (Blackwater, Crouch, Roach and Colne Estuaries MCZ Designation Order 2013) and obligations under Article 6 of the Habitats Directive.

**Will the policy be reviewed? It will be reviewed. If applicable, set review date: 2022**

Does implementation go beyond minimum EU requirements?			No		
Are any of these organisations in scope?	<b>Micro</b> Yes	<b>&lt; 20</b> Yes	<b>Small</b> Yes	<b>Medium</b> Yes	<b>Large</b> Yes
What is the CO <sub>2</sub> equivalent change in greenhouse gas emissions? (Million tonnes CO <sub>2</sub> equivalent)			<b>Traded:</b> N/A	<b>Non-traded:</b> N/A	

I have read the impact assessment and I am satisfied that, given the available evidence, it represents a reasonable view of the likely costs, benefits and impact of the leading options.

Signed by the responsible Chief Executive: Will Wright Date: 03/05/2018

**Summary: Analysis & Evidence**  
Policy Option 1

**FULL ECONOMIC ASSESSMENT**

<b>Price Base Year:</b> 2017	<b>PV Base Year:</b> 2017	<b>Time Period Years:</b> 10	<b>Net Benefit (Present Value (PV) (£))</b>		
			<b>Low:</b> -180761	<b>High:</b> -129115	<b>Best Estimate:</b> -436479

<b>COSTS (£)</b>	<b>Total Transition (Constant Price) Years</b>		<b>Average Annual (excluding transition) (Constant Price)</b>	<b>Total Cost (Present Value)</b>
<b>Low</b>	500	1	15000	129615
<b>High</b>	10000		21000	190761
<b>Best Estimate</b>	4000		<b>50650</b>	<b>439979</b>

**Description and scale of key monetised costs by 'main affected groups'**

**Direct cost to the fishing industry from introducing a permit fee.**

The proposed permits would come with a fee. This fee can be up to an amount which achieves full cost recovery however, as there was previously no permit, and thus no permit charge, it is difficult to predict the number of vessels that would apply. In addition, following consultation with all stakeholders a figure was agreed which is representative of the economics for operating within the fishery. The fee of £150 per permit would be an additional cost to fishers entering the fishery, however this would only be borne by the permit holder if the fishery was opened and thus the permit holder would be able to make money from the fishery. The price of the permit was consulted upon as part of the initial consultation process.

**Costs associated with purchasing and fitting a new dredge head and blade**

Costs can vary depending on the dredge that fishermen already use (most fishermen already use dredges that comply with the byelaw). There will however be a proportion of fishermen who have to purchase new dredges, with an estimated cost of £300 - £500 per operator.

**KEIFCA costs**

Estimated annual survey costs to be faced by KEIFCA range between £15,000 and £21,000. Annual additional compliance costs faced by KEIFCA are estimated at £32,500. This is a good estimate of the compliance costs, based on the predicted number of patrols necessary and associated enforcement management. This is based on experience of permit fishery enforcement in other parts of the KEIFCA District and assumed to be the mid-point of the low and high cost scenarios and results in a present value of costs over 10 years of £279,749. One-off costs are not anticipated.

**Other key non-monetised costs by 'main affected groups'**

KEIFCA proposes to work closely with other enforcement bodies such as the MMO and the Police in order to fully utilise their resources for surveillance and enforcement. These costs cannot be monetised at present as they are requested on an ad hoc basis and costs can vary.

<b>BENEFITS (£)</b>	<b>Total Transition (Constant Price) Years</b>		<b>Average Annual (excl. Transition) (Constant Price)</b>	<b>Total Benefit (Present Value)</b>
<b>Low</b>	Optional	1	Optional	<b>Optional</b>
<b>High</b>	Optional		Optional	<b>Optional</b>
<b>Best Estimate</b>	0		0	<b>0</b>
<b>Description and scale of key monetised benefits by 'main affected groups'</b>				
No monetised figures are available for the benefits of the recommended closure. However, significant potential benefits are described below.				
<b>Other key non-monetised benefits by 'main affected groups'</b>				
The introduction of a new oyster permit byelaw would help prevent over exploitation of the oyster stocks and result in the following benefits:				
<ul style="list-style-type: none"> <li>• The environmental benefits of maintaining healthy oyster stocks</li> <li>• The economic benefits to fishermen of having a stable sustainable fishery</li> <li>• The future benefits of maintaining a healthy ecosystem by providing additional protection to benthic habitats/communities</li> <li>• The ability to help provide a sustainable fishery that gives a wide range of fishermen options not to target quota species, thus reducing the pressure on quota species.</li> </ul>				
<b>Key assumptions/sensitivities/risks</b>			<b>Discount rate (%)</b>	3.5
Average cost estimates for the fishing industry are based on anecdotal evidence supplemented with personal diary entries from a very limited number of fishermen. In addition, the fishery has not operated now for a significant number of years. As a result, benefits from the fishery as well as potential financial gains are difficult to quantify. Information gathered from fishers and other stakeholders during the pre-consultation meetings is used to support the evidence base and assumptions with the caveat that it is anecdotal evidence only.				

**BUSINESS ASSESSMENT (Option 1)**

<b>Direct impact on business (Equivalent Annual) £:</b>			<b>In scope of OI30?</b>	<b>Score for business impact target:</b>
<b>Costs:</b> 45823	<b>Benefits:</b> 0	<b>Net:-</b> 45823	N/A	N/A

## Evidence base

### 1. Introduction

#### **Managing fisheries within Marine Protected Areas**

The Marine and Coastal Access Act (MaCAA) 2009, places a duty on Government to establish a network of conservation sites which contributes to the conservation or improvement of the marine environment in the UK marine area, is representative of the range of features present in the UK marine area and reflects the fact that conservation of a feature may require the designation of more than one site. The network will include marine protected areas (MPA) designated under European legislation such as special areas of conservation (SAC) and special protection areas (SPA) also known as European Marine Sites (EMS); marine components of Ramsar sites, sites of special scientific interest (SSSI) and marine conservation zones (MCZ).

IFCAs have been established as the lead regulator for the sustainable management of inshore fisheries. As such, the KEIFCA is the appropriate Authority to implement, manage and enforce fisheries management measures within 6 nautical miles. Under section 153 of the MaCAA, KEIFCA has been given the duty to ensure the sustainable exploitation of marine resources in its District.

As a 'Competent and Relevant Authority' KEIFCA has responsibilities to ensure that the conservation objectives of MCZs and EMSs are furthered and is required to manage the impacts of fishing on these sites. Whilst the KEIFCA role in MCZ management is to lead on developing sustainable fisheries management within the site, Natural England's (NE) role is to provide conservation advice and to leading on oyster recovery work.

#### **Why are the Essex Estuaries Marine Protected Areas important?**

As part of the wider Outer Thames estuary, the Blackwater, Crouch, Roach, Colne estuaries and adjoining coastal waters support a mosaic of habitats and are a relatively undeveloped estuary complex. The estuaries make up the second largest estuarine site on the east coast of England and are the best example of a coastal plain in the UK. It is the productive sub-littoral and intertidal habitats that secure their designations for species and habitats of national and international importance. The estuaries vary from wide and shallow with sand banks leading to a low 'flushing rate', to long and narrow with relatively high flushing rates.

There are already a number of designations within the area including multiple SSSIs, the Essex Estuaries SAC and Mid Essex coast SPA. These existing sites protect extensive areas of mudflats and saltmarsh, which support a wide range of species including internationally and nationally important numbers of waterfowl such as brent goose and curlew. The BCRC Estuaries MCZ builds upon these existing designations, by offering protection to additional features such as the native oyster which were not previously protected.

#### **An iconic local species - native oysters**

There has been a long history dating back to the Romans of native oyster fishing and cultivation along the Essex coast. This reached levels where about 89% of the 22.9

million oysters landed in the UK in 1914 (about 2,250 tonnes), were from the east coast, mainly from Essex and Kent ports (Edwards 1997). Unfortunately, over the last 80 years there has been a steady decline in wild and cultivated native oyster stocks along the Essex coast, which has mirrored a decline in the local native oyster industry. However, since the early 1990s the local oyster industry based at West Mersea has made considerable progress with the revival of native oyster stocks on their Several Order in the Blackwater estuary.

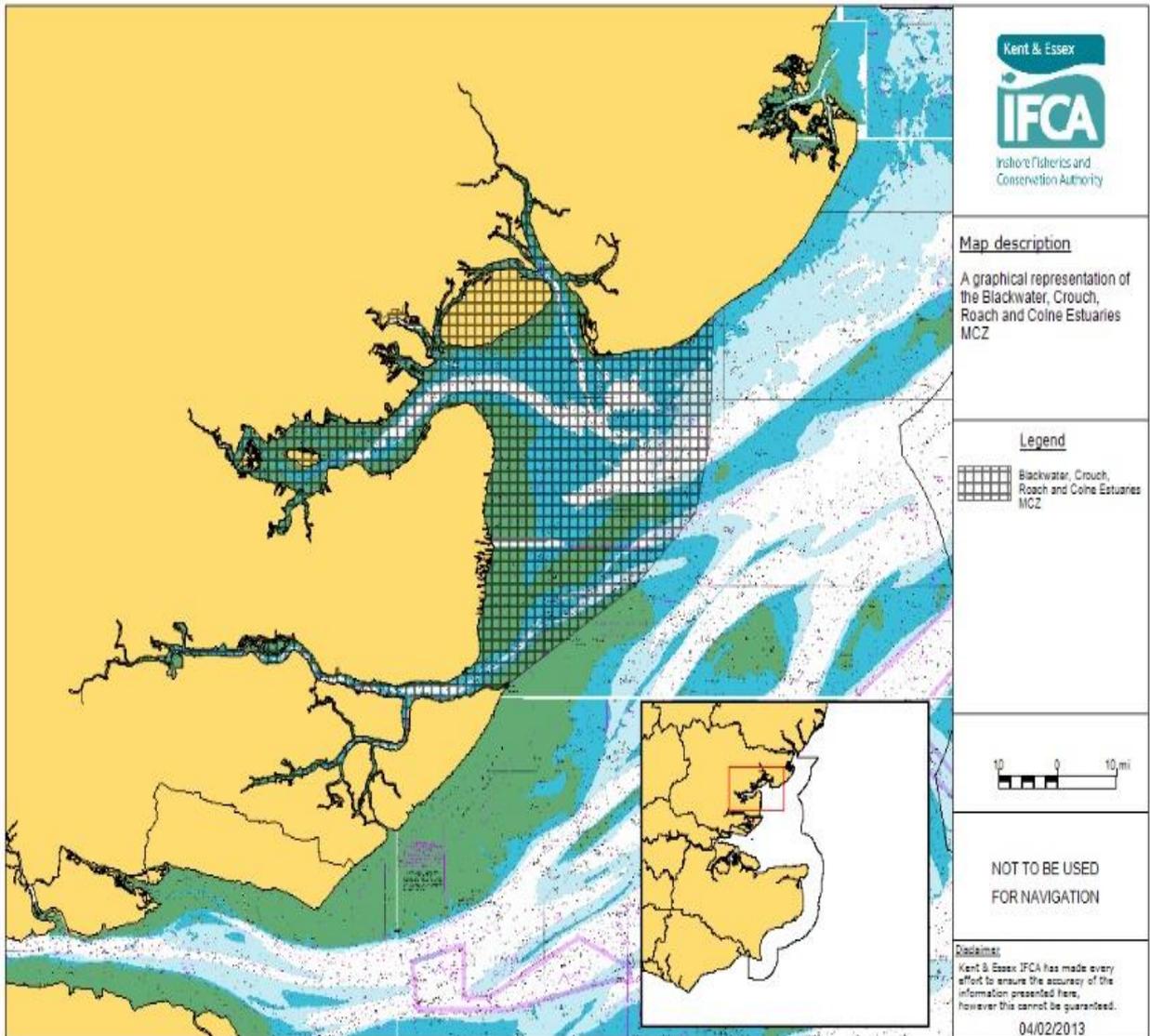
### **Blackwater, Crouch, Roach and Colne Estuaries Marine Conservation Zone**

By engaging with the regional 'Balanced Seas' Marine Conservation Zone project, the local oyster industry and the Essex Wildlife Trust (EWT) gathered data to help support the creation of the Blackwater, Crouch, Roach and Colne Estuaries MCZ (BCRC Estuaries MCZ), with the aim of recovering and rejuvenating local native oyster stocks. Following public consultation, the BCRC Estuaries MCZ was designated in November 2013 and the site extends from the mean high-water mark to where the estuary mouths join the North Sea, and is the largest inshore MCZ covering an area of 284 km<sup>2</sup> (Sub-tidal seabed (below LW chart datum) covers approximately 168 km<sup>2</sup>).

The BCRC Estuaries MCZ (Fig. 1) comprises the most important area for both wild and cultivated native oyster (*Ostrea edulis*) in the south-east region. Where native oysters are found in large numbers they form beds made up of the oysters themselves and dead shells. Many marine species such as sea snails, crabs and sea urchins live amongst these beds, with some using them as a place of shelter whereas others attach themselves to the surface. Oysters are susceptible to a range of threats including pollution, invasive species, disease and overfishing.

#### **Features**

Intertidal mixed sediments	Maintain in favourable condition
Native oyster ( <i>Ostrea edulis</i> ) beds	Recover to favourable condition
Native oyster ( <i>Ostrea edulis</i> )	Recover to favourable condition
Clacton Cliffs and Foreshore	Maintain in favourable condition



**Fig. 1 Chart of the BCRC Estuaries MCZ site**

**Native oysters**

The native oyster, commonly known as the flat oyster or European oyster, *Ostrea edulis*, is a sessile, filter-feeding bivalve mollusc associated with highly productive estuarine and shallow coastal water habitats. The native oyster starts life as male, becoming mature at around 3 years of age (larvae are seldom produced by oysters under 50 mm), then after spawning the oyster becomes a functional female. A lifespan of 5-10 years is probably typical as the majority of individuals in populations are 2-6 years old. However, individuals can grow up to 11 cm long and may reach in excess of 15 years old.

Native oyster populations are found naturally from the Norwegian Sea south through the North Sea down to the Iberian Peninsula and the Atlantic coast of Morocco and in the Mediterranean and Black Seas (UKBAP, 1999). The main British and Irish

stocks are now in the west coast of Scotland, the south-east and Thames estuary, the Solent, the River Fal, and Lough Foyle.

*Ostrea edulis* is associated with highly productive estuarine and shallow coastal water habitats on firm bottoms of mud, rocks, muddy sand, muddy gravel with shells and hard silt. In exploited areas, suitable habitat has been created in the form of 'cultch' - broken shells and other hard substrata. Natural oyster beds of the species *O.edulis* are found in estuarine areas from 0 - 6 m depth on sheltered but not muddy sediments, where clean and hard substrates are available for settlement. They have also historically occurred in deeper waters and offshore, down to 50m, for example in the North Sea and the eastern Channel, but these beds are now mostly depleted.

The role of the flat oyster and oyster beds in the ecology of marine communities has led to it being considered a keystone species (Coen et al. 1998). These functions include providing a solid surface for settlement by other species, providing a cryptic habitat for several associated species and serving as an effective nursery ground for small fish. Therefore, maintaining healthy populations that can act as nuclei for the survival of the associated species and the fauna.

Dead oyster shell also makes up a substantial portion of the substratum and clumps of dead shells and oysters can support large numbers of the ascidians (sea squirts-tunicates), several large polychaetes, including suspension-feeding polychaetes; a turf of seaweeds such as *Plocamium cartilagineum*, *Nitophyllum punctatum* and *Spyridia filamentosa* may also be present (Connor et al, 2004).

### **Current native oyster management measures**

Kent and Essex Sea Fisheries Committee and now KEIFCA have for several decades limited fishing effort upon the oyster fishery in the district by using byelaws which restricted the size of vessel to 17 m, limited engine power to 221 kilowatts, a maximum aggregate dredge size of 4 m and minimum native oyster landing size of 70 mm (please see website for full byelaw details).

The removal of native oysters from the public grounds on the BCRC MCZ site has been banned using the shellfish bed closure byelaw until May 2020

May 2012	KEIFCA used shellfish bed closure byelaw to close the public fishery in the proposed BCRC MCZ site.
April 2013	Under byelaw 4 vessels fished for a week each. Tightly regulated. Showed lack of young oysters. Closed for rest of year.
Nov 2013	The Blackwater, Couch, Roach, Colne and adjacent area had been made an MCZ.
April 2014	Fishery opened 2 vessels fished. Tightly regulated. Showed lack of young oysters. Closed for rest of year.
May 2015	Fishery closed from 31 May 2015 until 31 May 2018.
May 2018	Fishery closed from 31 May 2018 until new byelaw is signed by Defra

## 2. Rationale for intervention

IFCAs have a duty to ensure that fish stocks are exploited in a sustainable manner, and that any impacts from that exploitation on designated features in the marine environment are reduced or suitably mitigated by implementing appropriate management measures (e.g. this byelaw). Implementing this byelaw will ensure that fishing activities are conducted in a sustainable manner and that the marine environment is suitably protected.

Fishing activities can potentially cause negative outcomes because of 'market failures'. These failures can be described as:

- Public goods and services – a number of goods and services provided by the marine environment such as biological diversity are 'public goods' (no-one can be excluded from benefiting from them, but use of the goods does not diminish the goods being available to others). The characteristics of public goods, being available to all but belonging to no-one, mean that individuals do not necessarily have an incentive to voluntarily ensure the continued existence of these goods which can lead to under-protection/provision.
- Negative externalities – negative externalities occur when the cost of damage to the marine environment is not fully borne by the users causing the damage. In many cases no monetary value is attached to the goods and services provided by the marine environment and this can lead to more damage occurring than would occur if the users had to pay the price of damage. Even for those marine harvestable goods that are traded (such as wild fish), market prices often do not reflect the full economic cost of the exploitation or of any damage caused to the environment by that exploitation.
- Common goods - a number of goods and services provided by the marine environment such as populations of wild fish are 'common goods' (no-one can be excluded from benefiting from those goods, however consumption of the goods does diminish that available to others). The characteristics of common goods (being available but belonging to no-one, and of a diminishing quantity), mean that individuals do not necessarily have an individual economic incentive to ensure the long term existence of these goods which can lead, in fisheries terms, to potential overfishing. Furthermore, it is in the interest of each individual to catch as much as possible as quickly as possible so that competitors do not take all the benefits. This can lead to an inefficient amount of effort and unsustainable exploitation.

KEIFCA byelaws aim to redress these sources of market failure in the marine environment through the following ways:

- Management measures to conserve designated features of EMS and MCZ will ensure negative externalities are reduced or suitably mitigated.
- Management measures will support continued existence of public goods in the marine environment, for example conserving the range of biodiversity in the sea of the IFCA District.

Management measures will also support continued existence of common goods in the marine environment, for example ensuring the long-term sustainability of shellfish stocks in the IFCA District.

### **3. Policy objectives and intended effects**

The policy objective pertinent to this Impact Assessment (IA) is to seek to ensure that the exploitation of the native oyster is carried out in a sustainable way within the Blackwater, Crouch, Roach and Colne Estuaries MCZ, and to balance the social and economic benefits of exploiting this resource with the need to protect the marine environment from, or promote its recovery from, the effects of such exploitation.

The intended effects are that the risk of over exploration of this resource would be reduced and obligations under Section 153 of the MaCAA 2009 would be met. In addition, the economic impacts of management intervention would be minimised where possible.

The policy also looks to further the conservation objectives of this site by ensuring that the Annex 1 habitat features and MCZ features are protected from the risk of damage. In addition, the economic impacts of management intervention will be minimised where possible.

### **4. Background**

#### **Why is it important to protect native oysters?**

Natural beds of native oysters have become increasingly rare in the North Sea and the species is extremely rare in parts of its former range (Scandinavia to North Africa). Unfortunately, the species low growth rates and poor recruitment success make it a particularly vulnerable species and it is now mainly found in specific strong holds in Denmark, Ireland, the UK and France.

Stock abundance was probably greatest in the 18<sup>th</sup> and 19<sup>th</sup> centuries, when there were large offshore oyster grounds in the southern North Sea and the Channel. During this period the native oyster industry is estimated to have produced up to 100 times more than today's 100-200 tonnes (UKBAP, 1999) and it is estimated that in 1864 around 700 million oysters were consumed in London alone (Edwards, 1997).

During the 20<sup>th</sup> century native oyster abundance continued to significantly decline in European waters. Examples from Belgium and Germany illustrate this and where once natural oyster beds occurred and were considered common, apart from a handful of oysters they are now considered virtually extinct in the wild and have been for over 80 years. Analysis of UK landings, highlights this trend and shows that landings fell from 40 million in 1920 to 3 million in the 1960s, and to date landings have never returned to former levels (Edwards, 1997).

In a response to this massive population decline across Europe, native oysters and native oyster beds have been added to the OSPAR List of Threatened and/or Declining Species and Habitats (OSPAR 2008) and are included as a UK BAP (UKBAP, 2009) priority species and habitat. The creation of the BCRC MCZ as well

as other MCZ sites provides protection for native oysters, and creates a framework, whereby key English oyster populations are starting to stabilise and recover, which will in turn help wider European stocks.

### **History of oyster harvesting within the MCZ**

The Blackwater, Crouch, Roach and Colne estuaries have a long history of oyster cultivation, records show that Colchester's rights over the Colne may be traced back to the 11<sup>th</sup> century and oyster byelaws were first enacted in 1697 by the company of free fishermen covering the whole of the Thames estuary when oyster dredging in the Thames estuary was prohibited for several months of the year (Spencer 1990). In these early times, the fishing on oyster beds was light and the area's oyster smacks were renowned for their skill in small scale local oyster cultivation harvesting, particularly at West Mersea.

Native oyster cultivation reached a peak in the mid-19<sup>th</sup> century. The boom came with phenomenal spat-falls in 1857, 1858 and 1859 after four bad years. These harvests were coming on the market in 1862 when the wholesale price dropped to two guineas a bushel (Benham *et. al.* 1993). Production never again reached the levels of the 1860's, and to satisfy the continuing demand the merchants turned increasingly to relaying foreign oysters so half –grown oysters were imported from the USA, Portugal and France. These were on-grown and then marketed. After that time, regeneration of stocks was not able to meet demand and by the late 19<sup>th</sup> and early 20<sup>th</sup> centuries, with improved road and rail links to inland towns, fishing pressure was also increasing.

After patiently building up stocks, and heavy investment in Ports, the diminishing number of growers survived the Second World War only to see the fruits of their labours reduced to ruin by the winter of 1945. A few tried yet again, only for the winter of 1962/63 to wreak a still more complete havoc, which brought cultivation in the Colne to a halt for the first time in a thousand years, causing the Roach River company to wind up (Benham *et. al.* 1993).

The Native Oyster industry continued to decline during the 1960's and 70's due to contamination of Tributyltin (TBT) causing stunted growth and probably reduced reproductive capacity (UKBAP 1999). After 1972 oysters were brought from the Solent and approximately 70-90 tons were relayed in the creeks each year. Pacific oysters were introduced in the early 1970's and after the banning of TBT they flourished along the Essex coast. Commercially, harvesting and management of pacific oysters enabled the Oystermen to support and cultivate the Native Oyster.

In 1982, a parasitic organism (*Bonamia ostreae*) was found in Native Oysters causing lethal infections leading to increased mortality. By 1987 a new initiative had begun, the ground was cleaned, more oysters were brought from the Solent and relayed, and their spat started to rejuvenate the River Blackwater and beyond with an increase in both the number and area of native oysters. This success is attributed to cleaning of cultch and new dredging methods. Today, although the problems of *Bonamia* are still being felt, oysters are being harvested from these areas and it is hoped that they will develop an increased resistance to *Bonamia*.

### Essex Estuaries Special Area of Conservation (SAC)

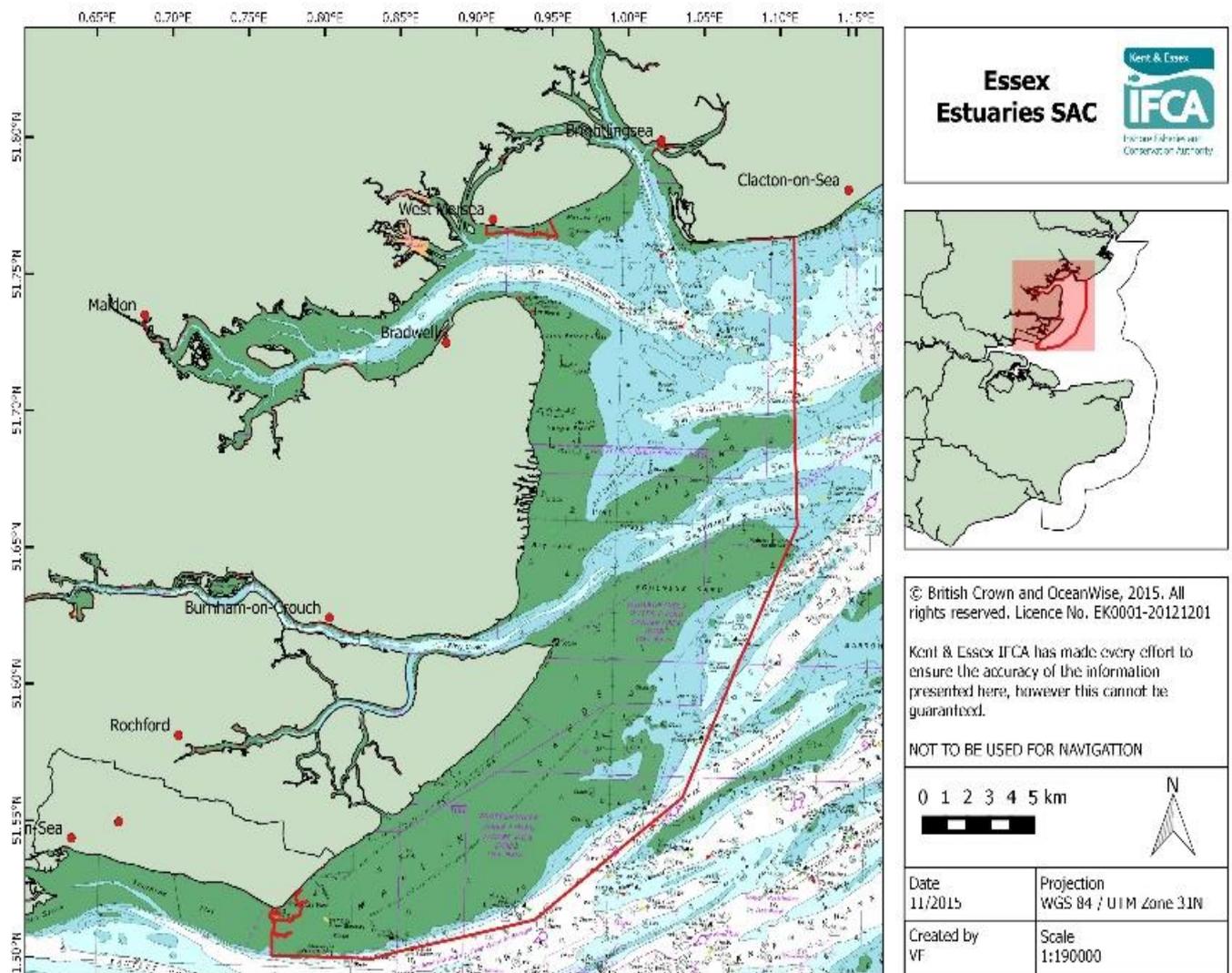
There are already a number of designations underlying the BCRC Estuaries MCZ site including SSSI, the Essex Estuaries SAC and Mid Essex coast SPA. However, it is the Essex Estuaries SAC site and its features that interact most with the BCRC Estuaries MCZ site features (i.e. the native oysters). The Essex Estuaries SAC is a 461 km<sup>2</sup> and was designated for six Annex I habitat features under the EU habitats directive (Table 1).

**Table 1. Features and sub-features of Essex Estuaries SAC (Natural England, 2000)**

Feature	Generic sub-feature	Site specific sub-feature
<b>H1330 Atlantic salt meadows</b>	Saltmarsh spp, Salicornia and Seablite	Saltmarsh
<b>H1420 Mediterranean and thermo-Atlantic halophilous scrub</b>	Saltmarsh spp, Salicornia and Seablite	Saltmarsh
<b>H1310 Salicornia and other annuals colonizing mud and sand</b>	Saltmarsh spp, Salicornia and Seablite	Saltmarsh
<b>H1320 Spartina swards (<i>Spartinion maritimae</i>)</b>	Saltmarsh spp, Salicornia and Seablite	Saltmarsh
<b>H1140 Mudflats and sandflats not covered by sea at low tide</b>	Intertidal mud and sand	Intertidal mud
	Intertidal mud and sand	Intertidal sand and muddy sand
	Intertidal mud and sand	Intertidal sand
	Intertidal mud and sand	Intertidal mixed sediment
	Intertidal mud and sand	Intertidal coarse sediment
	Intertidal mud and sand	Intertidal eelgrass
<b>H1130 Estuaries</b>	Estuarine rock (boulder, cobble and bedrock)	Intertidal rock
	Subtidal mud	Subtidal mud communities
	Subtidal mixed sediments	Subtidal mixed sediment communities
	Intertidal mud	Intertidal mudflat and sandflat communities
	Seagrass (SACs)	Eelgrass bed communities
<b>1110 Sandbanks which are slightly covered by sea water all the time</b>	Subtidal sandbanks	Subtidal sand (high energy)
	Subtidal sandbanks	Subtidal coarse sediment
	Subtidal sandbanks	Subtidal eelgrass

The important features with regard to native oyster management are the subtidal mud and mixed sediment habitats, and are key habitat types within the estuary

feature, supporting an array of species and providing important ecosystem functions. Much of the estuary floor is characterised by shallow subtidal mud communities dominated by marine worms and baltic tellins (Natural England, 2000). The long history of oyster cultivation in Essex Estuaries has resulted in the presence of oyster ‘cultch’ (oyster, cockle or slipper limpet shells) covering large areas of the seabed (Natural England, 2000). These areas of mixed sediment, where the cultch overlies mud, support diverse communities as sedentary species including hydroids and sponges can gain a foothold.



**Figure 3. Location of Essex Estuaries SAC**

**Legislative requirements**

**Background**

The Essex Estuaries site has many different overlaying designations, protecting a very wide range of features and species. The site is very large and the detailed interactions between features with different levels of sensitivity and the spatial, temporal and socio-economic variability of different fishing activities makes this site very complex and challenging to manage. The BCRC estuaries MCZ site was designated in November 2013, and was widely supported by a wide group of

stakeholders (including environmental NGOs, local fishermen), with a significant amount of momentum and purpose to regenerate an iconic local species and fishery. It is within this context that the BCRC Estuaries MCZ operates and its conservation objectives need to function. The BCRC MCZ order sets out the important legal factors that need to be considered and assessed when developing any form of management.

The recover objective of the site (5(1)b of the designation order means that the first management action needs to be to bring the native oyster population and the native oyster beds on the site to a favourable condition. We know that the native oysters low growth rates and poor recruitment success make it a particularly vulnerable species and due to recruitment failure populations have been recorded declining naturally, in areas with no fishing (Spärck, 1951). Research by Spärck (1951) concluded that a long series of favourable years even within or from established populations was required for recovery, and showed that oyster stocks in the Limfjord, did not recover their fishery potential until 20 years after they were first closed to fishing. The legislation clearly suggests that native oysters need to be closely managed until the stock is in a favourable condition and that during this phase removal of oysters from fishing would need to be stopped.

#### **Developing an approach to managing oyster beds as a habitat**

The focus so far in the Impact Assessment has been on manging oysters as a species, oyster beds as a habitat are also a protected 'recover' feature and any management will also need to consider the management needs of oyster beds as a habitat as well.

***NE advice on native oyster beds:*** *The definition of a recovered native oyster bed will remain in line with the OSPAR definition of a density at five per m<sup>2</sup>. However, this density is neither the only, nor key, defining element of the bed. Instead, the associated community is determined to be of greater value to this definition given the site-specific issues. We are aware that currently no quantitative definitions of these communities exist especially not for the BCRC MCZ site, but we feel we have a valuable opportunity with the BCRC MCZ site through proposed work streams to collect more site-specific data. We hope this will allow us both (NE and KEIFCA) to have high confidence in providing further context to our definition.*

*We can also advise that scale and ground type are also of equal importance when distinguishing the presence or the potential presence of beds within an area and with that in mind, agree that under natural conditions native oyster beds will solely be associated with the subtidal mixed sediment. However, not all subtidal mixed sediment within the public grounds is ideally suitable for the development of large scale beds. Within this MCZ, this is expected to be further influenced by the 'natural' manifestation of the feature given the current state of the site and its associated conditions (substrate, water movement etc.). Our advice would be that management is focused on where evidence of historic beds exists, where the substrate is subtidal mixed sediment and where wider conditions of the site could potentially facilitate the re-establishment of these beds. Based on this, a bed will be able to be considered favourable if it achieves this density of five per m<sup>2</sup> and has optimal associated communities (which we still need to define).*

### **Applying NE advice**

The development of the restoration box (Area 2a), within an area of mixed sediment and on grounds that are regarded as most suitable and likely to support oyster beds has been developed to meet the criteria laid out by NE. Within the permit byelaw and the management plan this area would be regarded as helping meet the recover objective for native oyster beds.

### **Recover native oyster stocks - a community working together**

In late 2009 and a meeting was held between the Blackwater Oystermen's Association (BOA), Essex Wildlife Trust (EWT) and Kent and Essex Sea Fisheries Committee officers (K&ESFC, now KEIFCA) to discuss how BOA were working with EWT to develop the native oyster fishery and how they would like to work with K&ESFC to progress this regeneration project. As plans developed the project fed into the MCZ 'balanced seas' MPA designation process and the site was put forward at an early stage, with an implicit agreement for stakeholders to work together to restore the native oyster populations.

Whilst the MCZ designation process was slowly moving forwards, in 2011 a range of meetings were held to review future possible oyster management options (including the possibility of introducing a hybrid order to manage native oysters). In May 2012 KEIFCA used data provided by BOA as evidence that the native oyster stock on the BCRC Estuaries MCZ site was "so severely depleted as to require temporary closure in order to ensure recovery" and used shellfish bed closure byelaw to close the public native oyster fishery on the proposed BCRC Estuaries MCZ site. Although the management occurred before the BCRC Estuaries MCZ sites designation in November 2013, it was felt that it was important to progress with management measures that could help the recovery of native oyster stocks on the site.

During 2013 work commenced with trying to consider objectives and management options to aid the regeneration of oysters on the site and a wide stakeholder consultation was initiated with a follow-up stakeholder workshop. This resulted in a working group being set up, Essex-Native Oyster Restoration Initiative (Essex-NORI), to consider restoration and management options and make recommendations to further annual stakeholder groups and from there to statutory bodies.

Essex-NORI working group meets regularly (once a quarter) and is identifying, developing and coordinating projects to help recover the native oyster stocks on the site. The following organisations are members on ENORI:

- Blackwater Oysterman's Association
- Crouch and Roach Oyster Fishermen
- London Zoological Society
- KEIFCA
- Essex University
- Essex Wildlife Trust
- Cambridge University
- Blue Marine Foundation
- Natural England

KEIFCA and its officers have worked closely with the local community in trying to progress the recovery of the native oyster stocks on the BCRC Estuaries MCZ site and are currently running a number of projects aimed at restoring native oyster

stocks on the site: an annual oyster stock survey, harrowing trials to assess the effectiveness of this technique, as well as funding and supporting a PhD.

### **After recovery has been reached**

Throughout the initial MCZ 'balanced seas' designation process there was a wide expectation that human involvement would probably be required to regenerate and recover the native oyster stocks on the BCRC Estuaries MCZ site and that harvesting native oysters in responsible manner could be a divided from recovery. Section 5 (5) indicates a route by which fishing could be allowed once the population is in a favourable condition; 'that any temporary reduction of numbers is to be disregarded if the population is sufficiently thriving and resilient to enable its recovery'.

Taking this into account any management measure developed would need to be adaptive, iterative and responsive to oyster population fluctuations and changing conditions and pressures. A flexible byelaw with an underpinning fisheries management plan would provide, within agreed limits, this type of flexibility. The flexible byelaw would work in the same manner as the KEIFCA cockle fishery flexible permit byelaw (which NE are happy meets the underlying Essex Estuaries SAC, Habitat Regulations Assessment (HRA) requirements).

Within the flexible permit byelaw there are management conditions that would be fixed (e.g. the requirement for vessel tracking, landings returns etc.), and those that are flexible either as a permit condition or as part of an associated fisheries management plan. Within a fisheries management plan, more complex and detailed fisheries management policy is kept and used to describe the detail behind arriving at management outcome (opening or closing a fishery/ detailed management response to different stock or environmental conditions). The fisheries management plan is a more flexible document that can be updated and reviewed as new evidence emerges, but clearly lays out what different stakeholders can expect given specific scenarios. The development of a fisheries management plan is also a useful additional vehicle for helping the fishery meet the requirements of the Appropriate Assessment process.

### **Opening the fishery**

As the native oysters and oyster beds have a 'recover' general management approach under the BCRC MCZ, one of the key component of the plan would be to establish if the features had adequately recovered. To achieve this objective, it is envisaged that there would be a more detailed process to open the fishery the first time than there would once it is opened. It is suggested that once the surveys show the native oyster stocks have met or are likely to meet the criteria in the fisheries management plan a detailed report would be written summarising all the key evidence (including an agreed management measures package and an Appropriate Assessment), Meetings with KEIFCA, NE and representatives of interested parties would also be held to discuss the evidence (the expert group). Following this NE would advise KEIFCA as to whether the fishery could be opened. Although the fisheries management plan will provide a vital framework to inform decision making, the final decision will come down to weighing up a range of evidence and expert

judgement, and the steps of process and the checks and balances are likely to be as important as the plan.

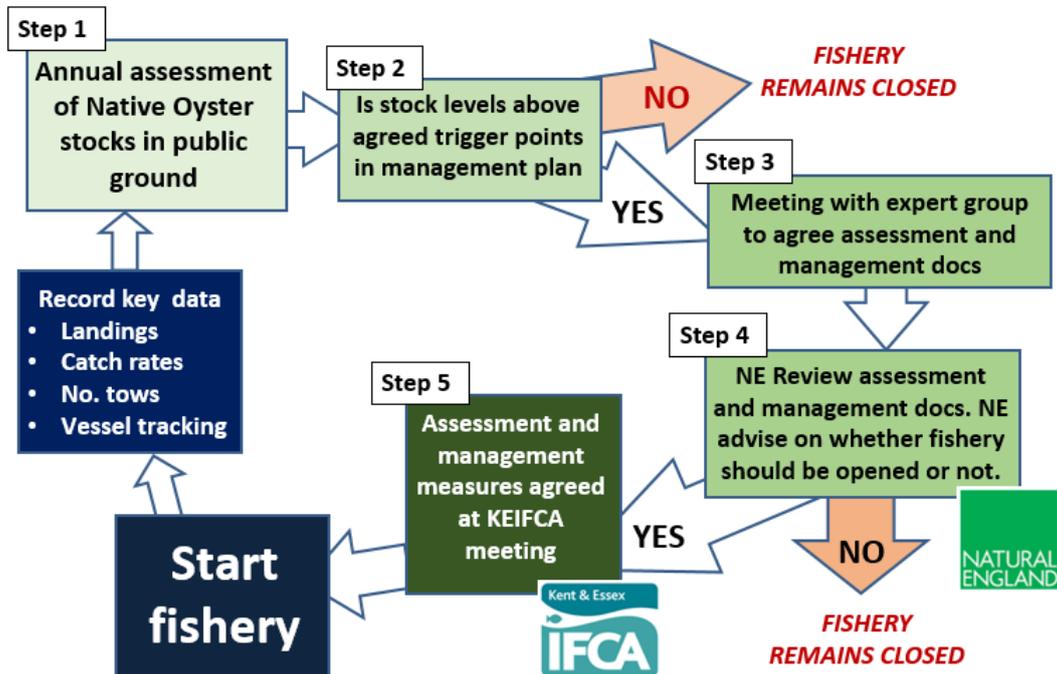
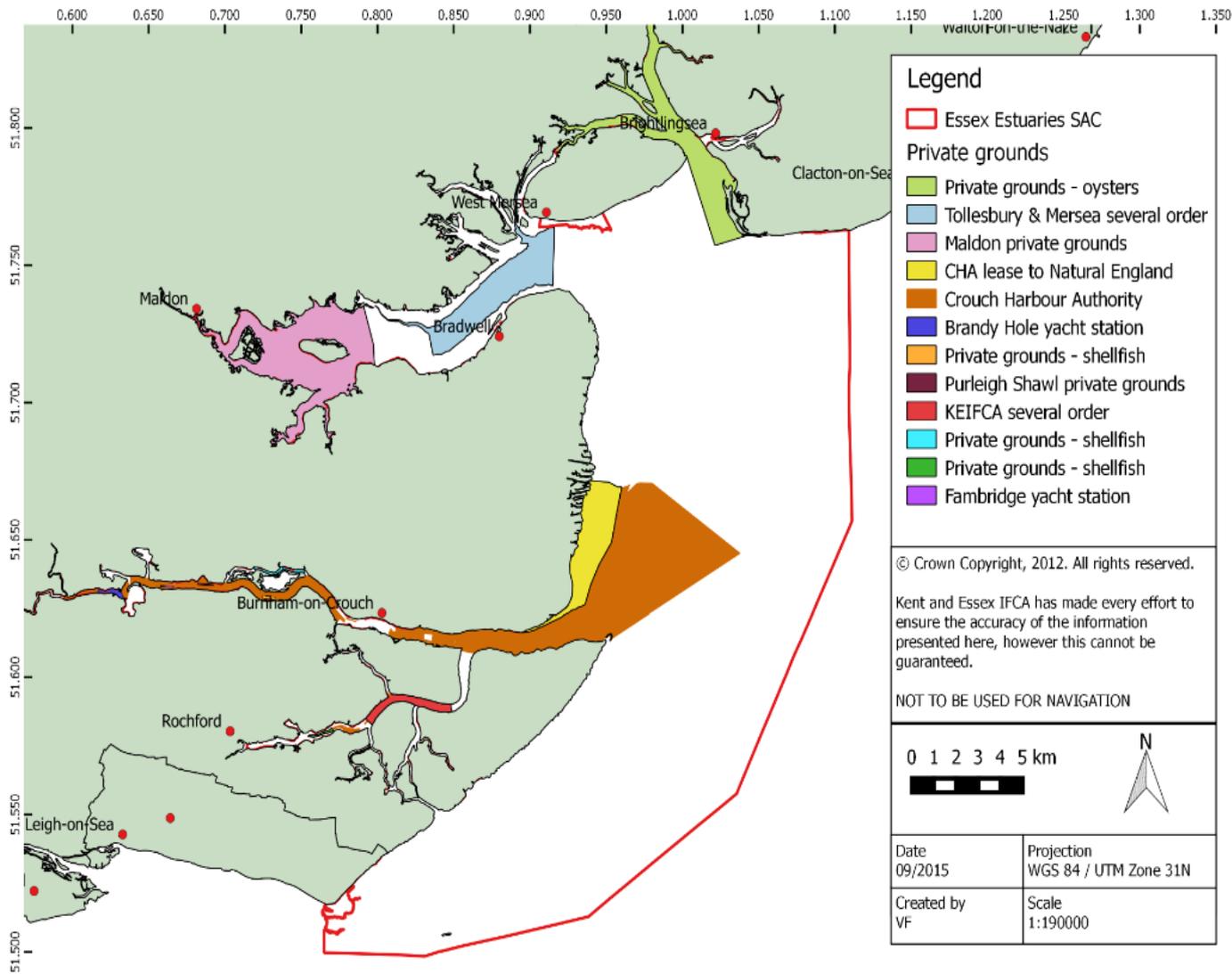


Fig. 4 The management cycle to open the native oyster fishery in the BCRC Estuaries MCZ

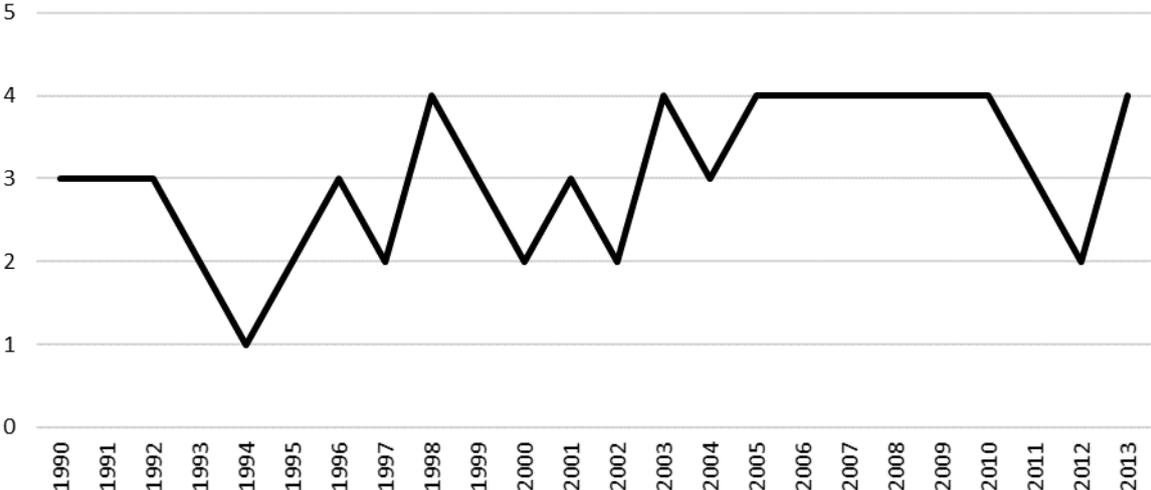
**Sectors affected by this proposal**

**Commercial fishing industry:** The main vessels affected are oyster dredgers which primarily include vessels based in the Essex Estuaries (West Mersea, and the smaller ports within the BCRC Estuaries MCZ site). The majority of these vessels are under 10 m long and target native and pacific oysters. A high percentage of vessels harvest oysters to rely on private grounds and grow-on for further sale. Although vessels from the Thames (Leigh-on-Sea, Queenborough and Whitstable) have historically rarely fished these grounds, there is potential for them to do so more in the future.



**Fig. 5 Chart of Private grounds in the BCRC Estuaries MCZ site**

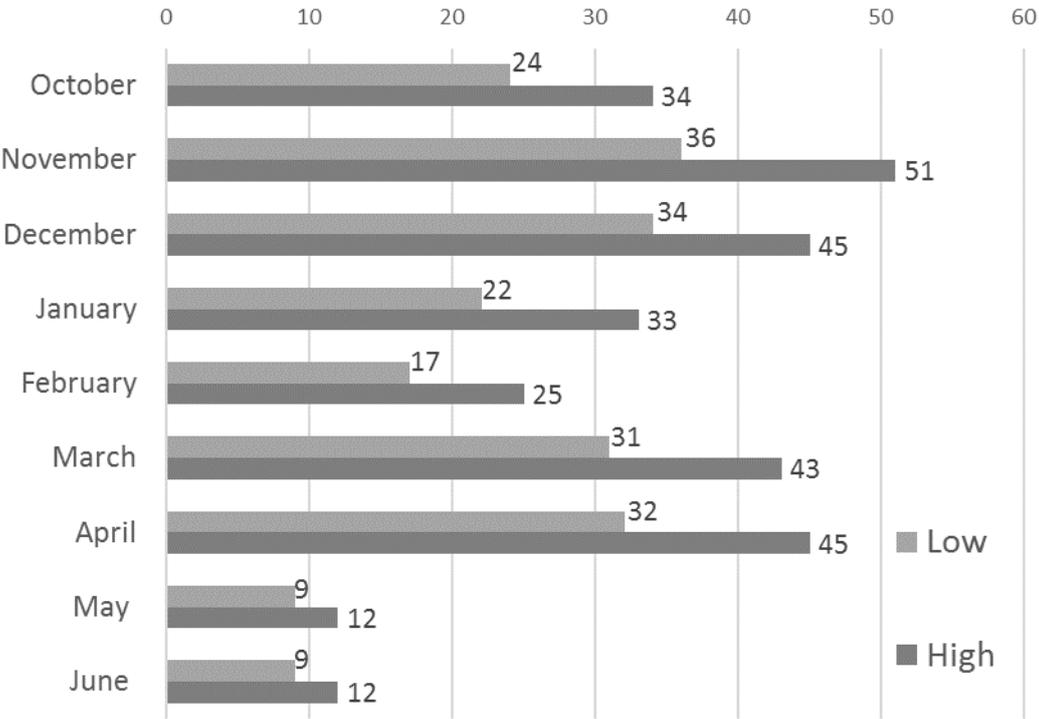
As part of the pre-consultation for the byelaw, a meeting with the oyster industry was held and questionnaires were used to gather effort and economic data about the native oyster fishery within the BCRC Estuaries MCZ site. The feedback showed that seven vessels indicated that they had previously fished for native oysters on the site but that the number of vessels fishing for native oysters on the site, stretching back to 1990, was generally low (Fig. 6). Feedback from the questionnaires also showed that the native oyster fishery on the BCRC Estuaries MCZ site was a small-scale fishery (historically 4 - 7 boats) that generally took small quantities of oysters (150 - 200 kg) per trip (Fig. 7) and fish regularly between October and April (Fig. 8). The feedback also highlighted that there were a number of different business models being used by the industry with some vessels harvesting for on-growing, some for first sale and some for both.



**Fig.6. Number of vessels fishing for native oysters on the BCRC Estuaries MCZ site per year**

Estimate of no. washes taken	wash per day						
	1-2	3-5	6-8	9-12	13-16	17-20	20+
Estimated weight of oysters taken (kg)	17-34	51-85	102-136	153-204	221-272	289-340	340+
No. fishermen's replies	1	1	0	3	1	0	1

**Fig.7 Estimates of the average quantity of native oysters harvested from the BCRC Estuaries MCZ site per vessel trip (17kg≈wash)**



### **Fig.8 The estimated aggregated total number of days fished on the BCRC MCZ site per month**

**Local economies and society:** The local economies of West Mersea and other small fishing coastal towns in the BCRC Estuaries MCZ site as well as some ports in North Kent (e.g. Whitstable, Queenborough) are impacted indirectly via the revenue and services generated by the sustainable exploration of the native oyster stocks in the district.

**Other types of fishing in the BCRC Estuaries MCZ site:** The site is large and a variety of fishing methods are undertaken across the site. Commercial fishing, including year-round potting, netting and trawling, occurs within the site. The site also has an extensive cockle fishery which has been managed under the Thames Estuary Cockle Fishery Order since 1994. Bivalve mollusc mariculture occurs on the site, specifically for oysters (both native and Pacific) and mussels, as well as some low-level culture of clams in the river Crouch. Harvesting of bait and shellfish occurs on the shores. There is one known area of commercial crab tiling within the SAC.

**Enforcement bodies:** The lead responsibility of enforcing any measures in the area would fall to KEIFCA and therefore the additional enforcement cost would impact on this authority as the regulator.

## **5. Options including the preferred option**

**Option 0. Do nothing:** This option would not involve introducing any permanent management measure and removing the current protection to the native oyster features on the site by removing the protection given by applying the shellfish beds closure byelaw. This option would mean that risks to the site from damaging activities would not be addressed and that the MCZ conservation objectives (BCRC Estuaries MCZ Designation Order 2013) and the obligations under Article 6 of the Habitats Directive would not be met. Therefore, this option is not considered further.

**Option 1. KEIFCA Blackwater, Crouch, Roach and Colne Estuaries Marine Conservation Zone Native Oyster Fishery Flexible Permit Byelaw.** Developing a byelaw that creates a framework where by the native oyster stock in the BCRC site can be harvested whilst at the same time meeting the conservation objectives for the site is challenging. The restoration and recovery of the native oyster stocks on the BCRC Estuaries MCZ site has been lead and championed by the local community, including the local oyster industry. Developing a flexible permit byelaw with a management plan helps create a framework and process by which local community involvement can engage and help sculpt management. The proposed process uses annual oyster stock data to help inform the development of a tailored management package that clearly lays out the conditions and the controls under which oyster harvesting could take place on the site. This is therefore the preferred option.

**Option 2. KEIFCA byelaw - Blackwater, Crouch, Roach and Colne Estuaries Marine Conservation Zone native oyster beds closure byelaw.** This option would be based on rolling over the current management protection given by the application of the shellfish beds closure byelaw. Unfortunately, while this byelaw offers protection to the features while they are recovering, and oyster dredging is prohibited, it does not provide a long-term management framework that could

support a sustainable and responsible native oyster fishery that would meet the conservation objectives of the site or, more than likely pass an appropriate assessment. A further option available to KEIFCA could be to make a specific byelaw that closes the whole native oyster fishery, and once the native oysters has recovered, areas within the fishery could be opened for specific periods. This option whilst providing protection to the features when the fishery was closed, would not adequately put in place enough specific controls to manage the fishing effort once the fishery was opened and could lead to excessive removal of native oysters from the site. Therefore, these options are not considered further.

**Option 3. KEIFCA Blackwater, Crouch, Roach and Colne Estuaries Marine Conservation Zone Native Oyster Fishery Flexible Permit Byelaw with fixed management measures.** Another option available for management would be to develop a more prescriptive byelaw with less flexibility in its ability to respond to changing and recovering oyster populations. Such a byelaw would look to set much more rigid mechanisms for opening and closing the BCRC Estuaries MCZ site to oyster dredging and setting management measures (TAC, number of trips, minimum size etc). Such a byelaw would have much less community involvement and input. Variations of this option were discussed throughout the byelaw development process, however there was considerably less support from all stakeholders for reduced flexibility in the legislation and a feeling that such a byelaw could fail to respond as quickly and adequately to a fluctuating stock. Therefore, this option is not considered further.

**Option 4. Voluntary agreement: This option would involve the development of voluntary codes of practice to protect features. KEIFCA has considered this option considering Better Regulation Principles, which require that new regulation is introduced only as a last resort, and Defra's revised approach, under which there is an expectation that management measures will need to be regulatory in nature to ensure adequate protection of the MPA network is achieved. KEIFCA considers that due to the need to protect 'recover' conservation features and the risk of non-compliance, voluntary measures are not appropriate in this case. Therefore, this option is not considered further.**

**5.1 Pre-consultation**

The BCRC MCZ project has been a community led project from the start and KEIFCA has tried to work closely with key stakeholders to shape and develop this long-term management approach. Developing appropriate management for this site and these features has been complex and difficult, and it is only through working together and using practical experience in combination with scientific knowledge that we can recover this stock.

Prior to this byelaw being drafted, options were discussed with a wide range of stakeholders over an extended period. KEIFCA officers engaged with the local oyster industry as well as the wider community via a series of stakeholder meetings, questionnaires, a written consultation and technical panels, as well as several informal discussions with interested parties. Key stakeholder meetings included;

- Industry meeting - 20<sup>th</sup> Feb 2017 - Industry questionnaire
- Stakeholder workshop - 30<sup>th</sup> March 2017

- Feedback to the May Authority meeting - 23<sup>rd</sup> May 2017
- Follow-up stakeholder meeting (detail of a potential management plan and to apply the management plan to specific native oyster stock scenarios) – 6<sup>th</sup> July
- Follow-up industry meeting – 16<sup>th</sup> August
- Written consultation – Sept-Oct 2017
- Feedback to the September Authority meeting – 15<sup>th</sup> September 2017
- Technical Panel – 30<sup>th</sup> November 2017
- Management of the restoration box - local stakeholder meeting – 11<sup>th</sup> December 2017
- Technical Panel – 7<sup>th</sup> February 2018
- Draft byelaw May Authority meeting – 22<sup>nd</sup> May 2018

## **6. Analysis of costs and benefits (Option 1)**

### **6.1 Costs for recommended option**

Direct costs to the fishing industry, including permit fee costs, costs of potentially purchasing a new dredge and iVMS equipment as well as costs to the industry of the continued closure of the BCRC Estuaries MCZ site to oyster dredging. Administrative and enforcement costs can also be monetised and these estimated values have been collated and presented as part of the IA. Environmental costs due to increased damage of habitats are difficult to value and are therefore described here as non-monetised costs.

The proposed native oyster permit byelaw would result in the following costs:

- Direct cost to the fishing industry from introducing a permit fee
- Costs associated with purchasing a new dredge and blade
- Costs associated with purchasing and fitting electronic monitoring equipment
- Administrative and enforcement costs
- Surveying and data collection costs
- Costs to the industry of the closure of the BCRC Estuaries MCZ site to oyster dredging.

#### **Direct cost to the fishing industry from introducing a permit fee.**

The proposed permits would come with a fee. This fee can be up to an amount which achieves full cost recovery however, as there was previously no permit, and thus no permit charge, it is difficult to predict the number of vessels that would apply. In addition, following consultation with all stakeholders a figure was agreed which is representative of the economics for operating within the fishery. The fee of £150 per permit would be an additional cost to fishers entering the fishery, however this would only be borne by the permit holder if the fishery was opened and thus the permit holder would be able to make money from the fishery. The price of the permit was consulted upon as part of the pre-consultation process.

#### **Costs associated with purchasing a new dredge and blade**

Costs can vary depending on the dredge that fishermen already use (most fishermen already use dredges that comply with the byelaw). There will however be a proportion of fishermen who have to purchase new dredges, with an estimated cost of £300- £500 per operator.

**Costs associated with purchasing and fitting electronic monitoring equipment.**

Costs will be dependent upon the system fitted, with over 12 m vessels now being required to fit EU specification VMS to their vessels. Under 12 m vessels are not currently required to fit VMS, however there is a national project currently underway to develop an inshore VMS (IVMS) for smaller vessels. The costs for this fall into three groupings; unit purchase, fitting and running costs. Unit purchase will be in the region of £600, fitting price by an approved installer approximately £200 and running costs of approximately £180 per year. IVMS is likely to become an industry standard for electronic monitoring and will likely become used to monitor vessel movements and activities within Marine Protected Areas and other closed sites.

**Administrative and enforcement costs**

The lead responsibility of enforcing an IFCA byelaw under section 155 of the Marine and Coastal Access Act 2009 will fall to the KEIFCA. Specific patrols undertaken by the KEIFCA in its district would be the most likely method of enforcement as gear and volumes of oysters would need to be inspected at sea to prove that they have been used within KEIFCAs district. When the fishery is closed KEIFCA would undertake enforcement patrols from their patrol vessel as the primary method of enforcement.

There would also be a potential administration cost to the IFCA with regards to the setting up of and issuing of a permit scheme. There would be a potential administration cost to the IFCA with regards to the setting up of and issuing of a permit scheme. Part of this cost is offset by charging for a permit.

**Table 2. Annual additional costs of enforcement of recommended option**

Activity	Cost per Unit (£)	Number of Units per year	Total cost per year (£)
Routine Estuary/Sea Patrols *	£1,500	9	£13,500
Additional IFCA surveillance**	£2,250	4	£9,000
Additional compliance/admin costs	£10,000	1	£10,000
<b>TOTAL</b>			<b>£32,500</b>

\* Patrol Vessel running costs per day based on 2017 IFCA stats

\*\* Intelligence led surveillance involving several IFCOs and one patrol vessel per day

\*\*\* Including IFCO and Patrol Vessel time, administration and legal fees. Not guilty pleas could substantially increase court costs

**Surveying and data collection costs**

Every year before the fishery is opened KEIFCA undertake a survey of the oyster stocks to calculate the number and size of different year classes of oysters. This information is used to then calculate a Total Allowable Catch, which helps ensure sustainable amounts of oysters are fished as well as available to the wider ecosystem. Due to the location of the stocks the surveys are predominantly undertaken by sea using a standard dredge. Usually surveying takes between 10 and 14 sea survey days (£1,500 per day) with a total cost of to KEIFCA of about £15,000 - £21,000. This information then contributes to an annual Habitat

Regulations Assessment as the fishery occurs within several Marine Protected Areas. Depending on any issues arising that HRA costs between £500-£1000 for the HRA carried out for dredge-fishing activities. Any additional gear types would need their own HRA.

### Costs to the industry of the closure of the BCRC Estuaries MCZ site to oyster dredging

There may be potential increased costs in terms of fuel and operating costs for vessels travelling further afield to access alternative fishing grounds and to compensate for potential loss of catch if the fishery does not open and remains closed. These costs are difficult to predict and quantify, and so values are not included, as the fishery has not been open for over 3 years prior to the making of the proposed byelaw.

#### Summary of costs over 10 years

		2019	2020	2021	2022	2023	2024	2025	2026	2027	2028	2029
<b>Permit fee</b>	<i>Only if fishery opened</i>	150	150	150	150	150	150	150	150	150	150	150
<b>Costs associated with meeting the technical requirements</b>	<i>Purchasing and fitting a new dredge</i>	500-1000	0	0	0	0	0	0	0	0	0	0
	<i>Vessel monitoring requirement</i>	980	180	180	180	180	180	180	180	180	180	180
<b>KEIFCA Costs</b>	<i>Administration and enforcement</i>	31,600-40,600	31,600-40,600	31,600-40,600	31,600-40,600	31,600-40,600	31,600-40,600	31,600-40,600	31,600-40,600	31,600-40,600	31,600-40,600	31,600-40,600
	<i>Completion of HRA</i>	500-1000	500-1000	500-1000	500-1000	500-1000	500-1000	500-1000	500-1000	500-1000	500-1000	500-1000
	<i>Surveying and data collection</i>	15,000-21,000	15,000-21,000	15,000-21,000	15,000-21,000	15,000-21,000	15,000-21,000	15,000-21,000	15,000-21,000	15,000-21,000	15,000-21,000	15,000-21,000

### 6.2 Benefits of recommended option

Environmental benefits and related ecosystem services can be valued but this is difficult to apply and the techniques required are beyond the scope of this impact assessment. Therefore, the benefits are described here as non-monetised benefits. The introduction of a new oyster permit byelaw would help prevent over exploitation of the oyster stocks and result in the following benefits:

- A comprehensive package of flexible management tools (including Total Allowable Catch limits) that allows close and responsive management of the fishery

- The long-term economic benefits of having a stable sustainable non-quota fishery
- Gathering annual population data provides evidence for the MCZ features, forms part of a regional seas/ OSPAR restoration programme and helps record recovery that can inform other projects
- The wider ecosystem benefits of maintaining healthy oyster stocks

**A comprehensive package of flexible management tools (including Total Allowable Catch limits) that allows close and responsive management of the fishery**

As the fishery take place within a European Marine Site and a Marine Conservation Zone an Appropriate Assessment will need to be undertaken before the fishery is opened. Total Allowable Catch (TAC) limits help provide key information on the impact of the fishery to NE, and can help demonstrate and reassure that the fishery would have no significant impact upon either the MCZ or the EMS conservation objectives. The suggested management plan's management measures mean that the TAC would be set in consultation with the local oyster industry and stakeholders and in the context of the MCZ conservation objectives and stock management criteria.

**The long-term economic benefits of having a stable sustainable non-quota fishery**

Native oyster fishing in KEIFCA district and especially around the Essex coast could provide a seasonal income for a number of fishermen and local business. Oyster harvesting fishing is a traditional fishery within the Essex Estuaries and although is a relatively small fishery compared to other local shellfisheries, it has the potential to develop into an important fishery that could provide a livelihood for generations of small local businesses. KEIFCA has shown with other shellfisheries that developing a long term sustainable fishery helps local fishermen become more confident and invest in delivering a better quality higher value product.

At present there is a huge pressure on fisheries quota especially in the local under 10m fleet. The lack of quota has made the economics of running a fishing boat especially difficult and has led some members of the fishing industry either to give up fishing or look to diversify into other non-quota species. Helping facilitate a sustainable oyster fishery in KEIFCA District, whilst not solving the problem, does help local fishermen diversify at key times of year and take the pressure off key stocks. It is this mix of fisheries that helps reduce the pressure on all stocks, and means that if catch rates are starting to decline in a specific fishery then fishermen can change fisheries and target a different stock.

**Gathering annual population data provides evidence for the MCZ features, forms part of a regional seas/ OSPAR restoration programme and helps record recovery that can inform other projects**

Gathering data about the status of the native stocks, through an annual survey is a vital component in KEIFCA helping to monitor a key MCZ feature, as well as ensuring that the stock can be exploited in a sustainable way. Gathering annual population data not only provides evidence for the MCZ site management but also provides important native oyster species information at a national level (UK BAP

1999) and at a regional seas level (OSPAR list of threatened and/or declining species and habitats (OSPAR 2008)). By introducing a logbook requirement as part of the byelaw, once the fishery is opened, key information (like catch per unit effort data) can be reliably gathered and cross checked. This information can then be used by KEIFCA as part of its ongoing assessment of the fishery and can help support the wider evidence base.

### **The wider ecosystem benefits of maintaining healthy oyster stocks**

The role of *O.edulis* and *O. edulis* beds in the ecology of marine communities has led to it being considered a keystone species (Coen et al., 1998). These functions include providing a solid surface for settlement by other species, providing a cryptic habitat that serves as a nursery ground for, and protects, small fish and other species, stabilising sediments which may in turn provide some protection from shoreline erosion, and filtration of large quantities of water.

### **6.3 One In Three Out (OI3O)**

OI3O is not applicable for byelaws as they are local government byelaws introducing local regulation and therefore not subject to central government processes.

### **6.4 Small firms impact test and competition assessment**

No firms are exempt from this byelaw as it applies to all firms who use the area, it does not have a disproportionate impact on small firms. It also has no impact on competition as it applies equally to all businesses that utilise the area.

## **7. Conclusion**

***Recommended option: KEIFCA Blackwater, Crouch, Roach and Colne Estuaries Marine Conservation Zone Native Oyster Fishery Flexible Permit Byelaw.***

KEIFCA is the most appropriate Authority to take forward fisheries management measures between 0 and 6nm. The key management measures were determined considering the best available existing evidence and best practice from previous byelaw legislation (Thames Estuary Cockle Fishery Order 1994) as well as statutory advice from NE.

This option is recommended because it is the most cost-effective option for managing the potential risks at the same time as developing a sustainable fishery for local native oyster business. This option is the most proportionate, flexible and responsive, and aims to involve a community in achieving a balance between meeting the sites conservation objectives and supporting a local community harvest and iconic local species. This option is recommended following extensive consultation with the local fishing community. The local community felt strongly that managing the site using flexible legislative measures would ensure a high level of compliance and engagement in helping to restore the native oyster populations

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