University of Essex

Kent and Essex Inshore Fishing & Conservation Authority

19th Oct 2017

Re: KEIFCA Native Oyster Permit Byelaw Consultation

Dear Debbie

We are writing to respond to your consultation on the future of a fishery on the European flat oyster in the Blackwater, Crouch, Roach and Colne estuaries Marine Conservation Zone. We thank you for the opportunities to have been involved in the workshops to date and for the opportunity to respond to this consultation.

In summary, we are supportive of the conservation of the species and the utility of that species as a harvestable resource are fully compatible. Indeed, we see this as the norm in much of modern conservation, especially in terrestrial and freshwater environments with permitted abstraction of river beds, seasonal harvest of otherwise protected vertebrates and selective harvest of timber from otherwise protected forests. A key context is that we support this provided appropriate checks and balances are put in place to secure long term sustainability of any recovery of the species of conservation concern, and the ecosystem services it provides – in this case the fishery.

We have highlighted some concerns we have about philosophical approaches to the application of the conservation objectives for the Marine Conservation Zone that has the potential to reduce the compatibility of ongoing conservation and future fishery objectives. To summarise this point we would consider fishing in areas of higher oyster density that some might wish to classify as "Oyster beds" to be permissible, provided that at any one point in time there were recovering, thriving and in favourable condition oyster beds within the BCRC MCZ, and that this depletion were considered temporary – by for example a spatio-temporal opening of an area for fishing which is then closed for some period of time.

Our full responses on these points and to each of the questions in your consultation follow. We are happy for our responses to be included in the open published summary document to the consultation.

Yours Sincerely

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**What time of year should the fishery be opened?**

The proposed opening times and the approach to opening at a given time appears appropriate provided there is a mix of closed and open areas with strong broodstock to reproduce each year. We have a suggestion regarding the size of oysters that are caught that is relevant to whether the oysters are to be caught for direct sale.

We do have a concern about promoting the competition for oysters by having very short periods of open seasons. We understand that this provides a concern to enforcers. Given the plan to incorporate some level of automation of recording fishing activity, we would urge the byelaw to be more flexible in its approach to the fishery opening period - allowing plenty of time for fishermen to catch their intended TAC. This should be combined with a TAC assigned to a boat, not assigned across boats which will promote competition. Of course if a boat does not catch its TAC over the whole opening period, then they have lost potential income.

**Do you have any views how the site is divided up into harvest areas?**

The site needs to be divided up into harvest areas. This is to accommodate an adaptive harvest management approach to the site features and where possible a future fishery. Such sub-areas can also be used to undertake more stringent protection of the site and its features from development, fisheries (e.g. cockles) and other activities that are not part of the current consultation. In terms of larger scale management zones, the zones set out in the consultation are sound. However we do have some thought on the management approach to these zones.

There is some guidance from the current distribution of the native oysters, or rather their aggregations, where these sub-areas could be. However we would recommend a flexible approach to allow fine tuning of areas given the management plan objectives to restore subtidal mixed sediment habitats in the estuary and support population growth of the native oyster across the site. An adaptive approach would allow the sub-areas to be decided upon at periodic reviews and perhaps be considered as smaller scale units (e.g. 1-5km$^2$) that can be added, removed and swapped between management units. There is no urgency in determining the management units at this point, only that there need be a plan that incorporates the allowance of differing regulations across the site at any one point in time.

**Managing harvest areas. Do you have any comments or views on how sub-areas should be opened or closed and the process behind making this decision?**

This question is related to the overall question of trigger points in the management plan for a potential future fishery. In principle we argue that there should be two forms of spatial management in the MCZ. The first should permanently protect subtidal areas within the site from any and all activities others than conservation and some forms of recreation (e.g. recreational finfish fishing with rod and line, watersports but no anchors etc.). These should be in areas where there is greatest potential to see recovery of long term broodstock that can maintain oyster recruitment throughout the site and therefore contribute to the

favourable status of the site and the potential for a future fishery. These sites do not have to be large, and they do not have to protect all of a given feature in a given area. We can see benefits to the site features and the sustainability of any potential future fishery of having a protected area - such as the current restoration box - on the Ray Sands for example. The placement of these areas need not be where evidence of "current" subtidal mixed sediment is, as the habitat across the estuary appears to us to be increasingly homogenous, suggesting to us that mixed sediment is very patchy and is being buried in many areas by fine silts and muds. However, these areas can be identified for promoting the habitat to allow recovery of the MCZ features and the potential for a future fishery.

Likewise, as in our answer to the first question above, the byelaw does not need to exclude the possibility that the position of these protected areas could shift. As an example, much protected old forest can be managed for biodiversity by having a ban on clearfall but rotational selective harvest of timber that helps to meet the management objectives. Where this rotational harvest occurs, it can shift between years and decades.
Secondly, there can be areas of the MCZ that do not have semi-permanent closure to fishing or activities but where management for site features can continue. These areas are where oyster fishing is likely to occur and they could be, for example, adjacent to closed areas.

The decision making for opening and closing sub-areas should be based on the final management plan for the MCZ site features, the population size, density and -age/size-structure of the oysters and the needs and concerns of local stakeholders including the public. It seems reasonable to have a series of trigger points based on the oysters abundance at different spatial scales, with taking of oysters allowed when recovery is witnessed in a given sub-area, provided that it is a sustained recovery and is also occurring elsewhere in the MCZ. We acknowledge the argument to have an overall trigger point and the example given is 800 tonnes. But if that 800 tonnes is confined to only one sub-area, is that evidence of recovery throughout the site? Likewise if there is strong evidence of recovery throughout the site but the population only ever reaches 700 tonnes it would seem improper to not consider fishing for oysters. Therefore the byelaw is best to be adaptive so that it is possible to adjust the trigger points, even if we agree on one overall trigger point at the outset. The biology of the MCZ area has changed from what it once was and we currently do not know the likelihood of the population reaching 800 tonnes within a given timeframe.

Another point to consider in setting sub-area trigger points related to our point above about thriving and recovering site features is whether taking of oysters should be permitted when a given sub-area is recovering but others are not, in order to help replenish stock and improve the habitat at the sites doing less well. There should be an allowance for the oyster stock within the site to be used, either as collected in spatfall collectors or as larger individuals, to seed and improve recovery throughout the site.

**What should be the minimum size be set at?**

The management proposed is appropriate. It could also be seen to be appropriate to protect larger (90-120mm) oysters that are normally taken for direct sale, over smaller oysters that are normally taken to grow on, given the likelihood they are maintaining survival, growth and reproduction in an estuary that is undergoing significant environmental change, particularly regarding summer temperatures. It is not that they contribute most in reproduction per se - but they may be locally adapted to the Essex MCZ conditions which are warming significantly.

However, if we were in a position of a long term sustained recovery of the stock from its current low to at least a doubling of stock then this consideration is less likely to be important if a sustainable harvest is being taken.

**What should the permit fee be and why?**

We do not have an opinion on what the fee should be. We do have an opinion on how the fee should be related to the conservation features of the site. The fee for any fishing in the site, whether for oysters, cockles or fin fish (including recreational) should be contributing to the recovery of the site or the local community in some way. This could be to recover KEIFCA costs and/or to promote education, improve fishermen's facilities or undertake restoration activities.

We are in agreement with some of the local industry responses on what should moderate the fee. We agree that the fee should either be proportional to the TAC or a fixed % of the point-of-sale value of landings. This allows the fees to increase if the fishery does. But we also agree that fishermen engaged with the conservation objectives of the site should gain from their involvement in some way. Exactly how to do this is unclear but we allude to such a benefit below.

**Vessel size. Do you have any comments or views on the maximum size of vessel that could fish for native oysters under the permit?**

We agree with the principle of limiting vessel size. But by regulating gear and TAC to a boat this should also self-regulate vessel size or the potential concerns of the effects of a larger vessel undertaking more fishing.

We would also urge KEIFCA to consider limiting landing locations of all commercial fishery products caught in the MCZ to the local communities that are investing in the MCZ. This would need further consultation but would seem appropriate so that there is again a level of self-policing of landings and regulation of boat sizes.

**Do you have comments or views on the gear controls being suggested?**

The gear controls being suggested seem appropriate. It could be argued that whether one or two dredges are permitted in any given year should be considered as an adaptive management tool and in light of further works undertaken to consider the likely significant effect of this dredge design on the estuary subtidal habitat.

There is a balance to be struck between having a dredge that has limited effect on habitats but has very low efficiency in catching oysters, therefore promoting more dredging, and a dredge that has more of an effect on the habitat but catches oysters quickly and the dredging can stop affording a shorter season length. It is not clear we have the evidence to make an informed judgement between this proposed gear design or others at this point in relation to the efficiency-effort trade-off.

**Will conforming with these potential requirements incur any additional costs on your business?**

None.

**Tracking systems. Do you have any comments or views on using vessel tracking systems as a management tool within the fishery?**
The proposal on vessel tracking is sound. We fully support the DEFRA initiative to develop a national iVMS Instrument.

**<u>Fisheries Management plan</u>**
**Do you have any comments or views on:**

- **The detail of the proposed management plan?**

  The management plan approach as outlined in the consultation document, steps 1-4 and the five key considerations listed, are appropriate. We will provide some feedback on the key considerations below.

  We feel that after this initial period of intensive research in the estuary (2013-2018/19) there may be enough data to avoid conducting such intensive surveys annually until we are closer to seeing a recovery. The resources saved by moving to surveys every two or three years could be better spent on other activities that support the recovery of the site features - for example habitat assessment, trialling large scale spat collection of local stock, research on risks of *Bonamia* to recovering stock and risks from climate change.

  Once significant trends of increasing stock are observed then annual surveys could start again. Surveys of areas that have not been surveyed since 2014 or earlier should occur on a three to five year cycle, particularly if habitat improvement intervention has been undertaken in these areas.

- **Using 800 tonnes as the starting point?**

  We are in agreement with the justification for the 800 tonnes trigger point outlined on page 13 of the consultation document. In particular we highlight the text "*widely recognised by all parties that using a figure of 800 tonnes is a starting point and that efforts will be made to gather more data regarding this figure using historic local knowledge and new research.*". The 800 tonnes in itself is a good aim as it is of spawner biomass with evidence of sustained recruitment. And the case has been made that other relevant data will be used in conjunction with any proposed trigger points to come to a decision about whether the fishery could withstand fishing pressure. Based on the harvest levels that have been proposed at previous workshops, the 800 tonnes trigger point seems reasonable and perhaps even too restrictive.

  All that being said it is important that we use the data coming from the research project on native oysters and their communities in the Essex estuaries by our University of Essex PhD students Sarah Allison & Alice Lown to build an appropriate simulation model of the MCZ oyster population to ask a

range of questions. These could include, how long can we expect until the oyster population reaches threshold population sizes given no change in the available habitat in the estuary?; What would annual recruitment to age 1yr need to be to see increases in population growth?; How sensitive would a recovered population be to different TACs at different population sizes?

These questions are important as they provide information to all stakeholders on the reality of the challenges ahead to see a recovery take place and what actions are likely to be required to secure such a recovery - for example by improving habitat on such a scale as to improve MCZ-wide recruitment or improving spawning stock to see increases in spatfall.

- **The management plan process?**

The process is appropriate. What is unclear at present is the role of any one member of the stakeholder community and this includes Natural England. As it is currently stated in key consideration 5 (on page 12) Natural England would provide formal advice on the assessment made by KEIFCA on whether the fishery would be opened or closed. Whether this represents best practice or not is not clear as it has the potential to politicize the decision to either open or indeed to not open the fishery. Given the long time between now and some point in the future when the MCZ may support an oyster fishery, the rules for any trigger points and decision should be refined and secured in legislation for a given period of time. This, including the precautionary and experimental approach to any opening of the MCZ to oyster fishing, will best serve a transparent and evidence-led fishery management plan. To repeat - we are suggesting the decision to open should be based on the consideration points 1-3, and that then points 1-5 should be used to determine the TAC and rules.

- **The criteria used to reach decisions?**

Overall the criteria that have been mentioned, including the economics and disease management, are appropriate. Also see our answers to other questions. We have some concerns and thoughts on the use of oyster density and how this relates to the definition of an oyster bed which we alluded to in our opening cover letter. We will address this below.

- **The make-up of the expert group?**

Staff and research students at the University, based in the School of Biological Sciences, have been working in the BCRC MCZ estuaries for over 40 years and continue to invest in local communities, business and collaborations with local government agencies to provide expertise on a range of issues from water quality, conservation, fisheries and land management.

The University was involved in the data collection and evidence gathering for the case for designation of the MCZ as well as being part of the Balanced Seas Regional Stakeholder Group.

It is our intention that this investment by the University will continue.

The expert group should contain representation from across stakeholders, taking care to avoid bias in representation. This should include both government (e.g. KEIFCA, NE and CEFAS) and from fishery industry expertise but also expertise from the non-government academic sector. The expert group should not be politicized, but that does not exclude policy and legal expertise being members. Likewise there should be both government and independent conservation representation (e.g. NE and The Nature Conservancy).

- **Do you think anything else should be added or removed from the proposed management process, plan or criteria?**

We have a concern about the emphasis placed on an undefined "oyster bed" as a feature. While it is already part of the MCZ legislation, protecting oyster beds as a site feature, there is a danger of a conflict arising between conservation and potential future fishery objectives if the byelaw legislation does not take an equally adaptive approach to "bed" protection as it would to sub-area protection. Below we suggest an approach to oyster beds and their protection that, based on our current research, should accommodate the protection of conservation features and the ecological communities which are dependent upon them.

**The restoration box: Do you have any comments or views based on the closure of the restoration box (area 2a) applying to fishing gears that could interact with the sea bed (e.g. trawling)?**

The restoration box is a key component of the plan to re-establish a large and extensive native oyster population across the BCRC MCZ. From the work undertaken by the University of Essex and Essex Wildlife Trust in the past and the work undertaken by the University, KEIFCA and ENORI now, it is clear that the MCZ site is habitat limited with respect to the native European Oyster. While significant broodstock is present in the Blackwater estuary private grounds, and spring and summer conditions have been appropriate for reproduction, downstream colonisation of the subtidal habitat has been lacking. Investigations have identified that even areas that are thought to be formed of subtidal mixed sediment are largely shallow deposits of fine silts, colonised by biofilms on top of deep anaerobic species poor muds mixed with old dead slipper limpet shells. We are of the opinion that the habitat quality is relatively poor for shellfish settlement throughout the MCZ - though there are certainly local patches of better quality habitat. Nothing short of an ambitious restoration programme for the MCZ habitats, now increasingly formed of subtidal muds, is likely to improve the extent of available settlement and growth habitat for the European flat oyster - or other shellfish for that matter. Numerous hypotheses have been discussed as to why there is a shift of the BCRC MCZ habitats from shellfish supporting mixed sediments and reefs to high rates of mud deposition, and over what timescales. These discussions do not need to form a response to the current consultation, other than to state that the BCRC MCZ is not in favourable condition for supporting best shellfish restoration and actions to restore self-supporting mixed sediments such as the restoration box should be supported.

All this said, there is no reason why fixed gill or trammel netting low impact fishing methods could not be trialled within or around the restoration box. Certainly experimental fishing by this and other methods would be useful at some point to better understand how any restoration activities influence how fish use the habitat.

**Developing native oyster bed protection outside the restoration box:**
**Do you have any comments or views on the concept of identifying smaller set-a-side areas in preferred oyster bed habitat?**

As discussed above, when considering how to determine spatial sub-areas and units of management - yes we would argue it wise to allow the formation of active interventions areas or stock protection areas for periods of time at any point in the MCZ - providing it is in line with the shared management objectives of a recovering native oyster population and potential for a sustainable fishery at some point in the future.

Our concern lies in differentiating between oyster habitat and oyster beds. It is likely that even within the OSPAR definition of a native oyster bed, significant shifting of the potential baseline has occurred. Before modern fishing and management of coastal native oyster populations there is archaeological and deposit evidence that native oysters could form huge aggregations of 3D reefs. Evidence of this exists with the BCRC MCZ but also in other flat oyster strongholds around the British coast. There is consensus about this amongst those researchers working on native oysters in the South and South East of England. So there could be an argument that an oyster bed is something much more complex than finding five oysters per meter squared.

There is another concern with using a fixed definition based on density for oyster beds, and that is conflict with any future fisheries management objectives. If the conservation advice for the MCZ site were to be interpreted as having to protect all beds, actions by researchers, fishermen and charities to support restoration and recovery could soon see the entire MCZ area classed as "bed" habitat and these areas removed from a pool of potential harvestable sites once they reach average densities of 5 oysters per $m^2$. This density may well be reduced given concerns about the role of oyster density and *Bonamia*.

We are proposing instead that the MCZ site be managed to always support a thriving native oyster population across its range and this includes a range of local population densities. When appropriate, and taking into account the effects of repeat visit dredging on habitats and their ability to recover, fishing can be allowed to happen in areas with relatively high oyster density provided other areas are also fully protected and the overall stock is sustainably managed.

To address concerns that may arise about the role that these oyster "beds" may have that is different from habitats that otherwise contain oysters at a lower density - the University can advise that there is no significant change in associated ecological communities within the BCRC MCZ as oyster density varies from 0.25 to 4 oysters per $m^2$ (Lown *et al.* unpublished, funder Natural Environment Research Council, EnvEast DTP with KEIFCA as CASE partner).

This must be caveated as our survey work and analysis are not yet complete and has not differentiated between seasonal sampling or oyster biomass. Nor have we yet looked at whether the composition of those

communities change in response to oyster density predictable ways – this work is ongoing. But it still clear that declines of the diversity of associated communities occur below appx. 0.25 oysters $m^2$, according to this preliminary analysis. It is as yet unclear whether the effect of biodiversity gains from oyster presence in the Essex estuaries are a function of live oysters, the structure that live oysters provide or the correlation between oyster presence and other habitat characteristics such as dead shell budget. We are currently undertaking further analysis to resolve this and will publish the work in an open-access journal in due course.

The consequences of this finding to management for oyster beds in the BCRC MCZ is that there are biodiversity gains to be had even when oysters are found in relatively low abundance, such that fishing activity that reduces oyster abundance from 4 to 0.25 $m^2$ is likely to have little effect on the species richness of that site provided it is then left to recover.

When this work concludes and we can provide a full analysis it will be important to consider any lower oyster density threshold where biodiversity is affected as a potential trigger point to close an area to fishing.

But we do refer you to our other point on not having all areas designated as beds just because they are higher in oyster density. And similarly so, we ask you to consider that the densities we observe in the MCZ of 0-4 oysters per $m^2$ (assuming 25% dredge efficiency) are likely to all be much lower than what a native oyster bed looked like in the Essex estuaries centuries ago and when *Bonamia* was not of the concern as it is now. At much higher densities, or indeed in a more mixed sediment restored environment, it may be the case that the relationships between oysters and associated biodiversity are different.

**Do you have any comments or views regarding the location or design of the proposed additional set-a-side areas?**

We refer you to our earlier points supporting more flexible and adaptive approaches to protection and restoration activities throughout the MCZ.