SCIENCE ADVISORY GROUP MEETING
Friday 4 March 2022
Commencing 09:30 am
Virtual meeting via Teams

AGENDA

1. Apologies for absence

2. To take the minutes of the last meeting held on 19 August 2021 as a true record *(pages 1-4)*

3. Tees and North Yorkshire shellfish mortalities *(pages 5-20)*

4. European Lobster Settlement Index project *(pages 21-24)*

5. Annual research plan 2022-23 *(pages 25-40)*

6. Humber fishing byelaw review – Spurn eelgrass *(pages 41-50)*

7. Any other business

8. Date of next meeting

Any other items which the Chairman decides are urgent by reason of special circumstances which must be specified

NORTH EASTERN INSHORE FISHERIES AND CONSERVATION AUTHORITY

SCIENCE ADVISORY GROUP

19 August 2021

Present	**Representing**
Dr Stephen Axford (Chair)	MMO Appointee
Prof Mike Elliott	MMO Appointee
Dr Claire Fitzsimmons	MMO Appointee
Mr Paul Slater	MMO Appointee
Mr Michael Montgomerie	MMO Appointee
Mr Graham Collins	MMO Appointee
Ms Rebecca Lynam	MMO Appointee
Ms Emma Brown	Natural England
Mr Paul Slater	Environment Agency

Environmental & Scientific Manager Tim Smith also attended the meeting.

The group met virtually via Teams. The meeting started at 09:30.

1.	**APOLOGIES**
	None stated.
2.	**MINUTES OF THE MEETING HELD ON THE 11 MARCH 2020**
	Prof Mike Elliot enquired if the planned Mariculture workshop as mentioned in the previous meeting minutes is still going ahead. Tim Smith explained that there has been recent development in the region, the Seaweed farm in Scarborough and various Oyster and restoration projects. The permits for mariculture are issued by the MMO (as marine licenses) and Crown Estate (as sea bed lease agreements). NEIFCA currently have no management in place to manage these activities. Other IFCAs have taken on the management of these activities but the NEIFCA has not made any decisions about this yet.
	Resolved -That the minutes of the Science and Governance Working Group Meeting held on the 11 March 2020 be confirmed and signed as a correct record by the Chair.
3.	**OVERVIEW AND PURPOSE OF THE GROUP**
	A brief overview of the role and remit of the Science Advisory Group was given to inform new members. Given the prolonged break between meetings for the group much of the meeting was focussed on updating members on current priorities.
	Resolved – That all new members were aware of the role of the Science Advisory Group.
4.	**ELECTION OF A NEW CHAIR**
	Resolved – The MMO appointee Prof Mike Elliott has been unanimously elected as the new chair of the North Eastern Inshore and Conservation Authority Science Advisory Group.

5.	**STAFFING POSITION AND IMPACTS OF THE PANDEMIC ON THE SAG**
	A verbal report was given by Environmental and Scientific Manager Tim Smith gave an update on staffing vacancies and the impact of the COVID-19 pandemic on NEIFCAs survey capacity. Vacant positions within the Environmental and Scientific teams had been carried since June 2020. The NEIFCA has now completed the recruitment process and appointed two new members of staff for the Environmental and Scientific team, Samira Anand and Ralf Bublitz, expecting them to start by the end of September. MMO appointee Prof Mike Elliot asked about the planned work patterns in line with COVID-19 restrictions. Environmental and Scientific Manager Tim Smith explained that in the beginning it will be mainly office based to get the team familiarised and up to speed and once the new staff has been issued with laptops there will be a hybrid approach with working from home at times.
	Resolved – Members noted the report.
6.	**SCALLOP DREDGING RESEARCH AND MANAGEMENT**
	An overview of the work undertaken in the development of the scallop dredge fishery was given by Environmental and Scientific Manager Tim Smith. A draft Fishery Management Plan has been developed, however, this needs to be considered in light of the on-going development of national Fishery Management Plans as part of the new Fisheries Act. Discussions were held regarding the frequency of habitat video data collection considering future evidence needs. It was agreed that video surveys would be carried out during alternate years so that analysis could be undertaken if required. Surveys would be undertaken during 2022. The target of 36 observer trips aboard permitted dredge vessels and the impact on staff resources was also discussed. Prof Mike Elliot suggested looking at the data from previous years and assessing the number of surveys required to retain confidence in the data collected. Members discussed the possibility of getting students from the University of Hull doing the offshore sampling for their projects or as part of a module with Ralf Bublitz as the liaison
	Resolved – Members agreed that habitat video footage would be captured in 2022. Members agreed that the number of surveys should be reduced once Tim Smith has looked at the previous data.
	Actions – Video surveys should be added to the 2022/23 survey plan. Review number of observer trips needed to retain confidence in bycatch and stock data.
7.	**NATIONAL WORKSTREAMS**
	Environmental & Scientific Manager Tim Smith explained that the development of Fisheries Management Plans has been put on hold given announcements surrounding national Fisheries Management Plans. At this time it is not clear what the format of the plans or what the role of the IFCAs in their development will be. An update was given to members on engagement in the process to date including representation at the Crab and Lobster science group, which sits under the Shellfish Industry Advisory Group being hosted by Seafish.
	Resolved – Members agreed to endorse Tim Smith's work if needed and to support on guidance to where his time is best spent in this development process for the FMPs.
8.	**IFCA TAG – METRIC AND REPORTING DEVELOPMENT**
	Environmental & Scientific Manager Tim Smith updated members on the metric and reporting development work begun by the AIFCA. This is in response to perceived challenges in

	communicating the work and the value of the IFCAs in fisheries management, evidence collection and novel research to DEFRA. A 'Theory of change' model is being promoted as an appropriate framework to achieve these objectives. Funding has been secured by the AIFCA to develop this workstream.
	Resolved – Members agreed that there is a need for more publicity of IFCA's work e.g. maps for different activities, more visible accessibility for the data the IFCA is collecting and increased presence at important meetings
9.	**IFCA/MMO SIGHTINGS PROJECT, CATCH REPORTING**
	Completed Marine Protected Area assessments highlighted a need for better vessel monitoring and catch recording systems to adequately manage fisheries within the NEIFCA district. The introduction of an Automatic Identification System bylaw had been rejected by central government on grounds of duplication with the planned national Inshore Vessel Monitoring System project. An urgent need for information related to inshore fisheries has been identified by Defra, who have tasked the MMO with undertaking an update of the National Inshore Fishing Data Layer which was produced by analysis of IFCA sightings data. The IFCA TAG and AIFCA are aiding the MMO in this task. Members were informed that the national under 10m catch reporting app was operational but not yet fully enforced. The system does not require band of capture to be reported by fishers, which would distinguish catches made within the NEIFCA district. This issue has been raised with the MMO in multiple forums and may be addressed in the future. A permit specific catch return system is currently being developed by an external supplier. This new database will also act as a replacement for the current FLARE system used for permits. This will be integrated with the new website currently being developed.
	Resolved – Members noted the report. Members requested that the State of the Fisheries report be updated.
10.	**SPURN EELGRASS BYELAW REVIEW**
	Environmental and Scientific Manager Tim Smith that the eelgrass protection area at Spurn Point was in need of revision given the continued recorded presence of the species outside the boundary defined within the Humber Fishing Byelaw.
	Resolved – Members agreed that a revised byelaw should be presented.
11.	**BAIT DIGGING AND SHORE COLLECTION – FISHGIG**
	Environmental and Scientific Manager Tim Smith explained considerations surrounding the management of recreational and bait collection activities within the district, particularly at Bran Sands in the Tees Estuary. A joint IFCA working group had been established to develop a management guidance document for use by IFCA Authorities.
	Resolved – Members noted the report.
12.	**SEA BASS**
	Environmental and Scientific Manager Tim Smith informed members that the shore net fishery had started again. Catch returns would be collected as in previous years however no further work was planned.

	IFCA is not planning any actions for the Sea Bass fisheries. The shore netting fishermen have started again and there doesn't seem to be any need for research as it is a long-established fishery. Only catch return data will be collected.
	Resolved – Members noted the report.
13.	**ANY OTHER BUSINESS**
	• Feeding back on the NE regional fisheries management plan workshop • Establishing an email group and re-activating dropbox
14.	**DATE OF NEXT MEETING**
	TBC
	The meeting closed at 12:47

Agenda Item No.

3

NORTH EASTERN INSHORE FISHERIES AND CONSERVATION AUTHORITY

Report to: Science Advisory Group
4 March 2022

Tees and North Yorkshire shellfish mortalities

Report by Tim Smith, Environmental & Scientific Manager

A. **Purpose of Report**

To present a draft of the Humber Estuary Fishing Byelaw XXIX, which has been revised to include the proposed extension to the Spurn Point Seagrass Area and points to discuss the justification for this extension.

B. **Recommendation**

That members endorse the action and response plan.

1. **Background**

1.1 On 8 October 2021 officers started to receive reports of dead or dying lobsters and crab species coming ashore in the lower and outer Tees Estuary around South Gare. These reports were immediately investigated and verified by the shore operations team. The observed mortalities consisted of mainly smaller edible and velvet crabs with the occasional lobster. Moribund animals were weak and lethargic and demonstrating characteristic 'twitching' behaviour when being handled. Other unconfirmed reports were received from amateur divers who reported observing quantities of dead shellfish on the seabed around the Tees Fairway on the approach to the estuary.

1.2 At the beginning of November 2021 fishermen working to the south of the Tees Estaury started to report reduced catch and 'in pot' mortality above what would be expected. Regional shellfish merchants also reported increased mortality of shellfish within holding tanks and questions around the safety of eating shellfish from the affected inshore area were raised.

1.3 Initial communications between officers of the IFCA, Environment Agency (EA) and the Marine Management Organisation (MMO) evolved into regular meetings to discuss lines of enquiry, update on work undertaken and as a forum to engage with other partner agencies who had either relevant testing capabilities or a specific applicable remit. Of particular aid were the services of the Environment Agencies National Laboratory Service, R/V Humber Guardian and the Fish Health Inspectorate branch of the Centre for Environment, Fisheries and Aquaculture Science (Cefas).

1.4 Officers have been fully engaged with the investigation since its outset. Shellfish samples collected from both the shore and offshore were collected to allow toxicology and histopathology assessments to be undertaken. Offshore surface and sea bed water samples

from the Tees Estuary and surrounding areas were also captured using the Authorities patrol and research vessel North Eastern Guardian III on request. On 24 November underwater video was attempted between the Tees and Kettleness. Water visibility was not favourable and no meaningful conclusions could be drawn. In one video captured near Redcar a high number of a small unidentified shrimp species were observed.

1.5 As no causative terrestrial sources of pollution could be identified, coordination of the multi-agency response involving the EA, Cefas, NEIFCA, MMO, Food Standards Agency (FSA) and UK Health Security Agency (UKHSA) was passed to Defra. Despite a range of testing being undertaken, including chemical contamination, phytoplankton blooms and disease, no conclusive explanation for the incident has been found. Activities in the area, such as discharges and dredge activity, have been considered but no link has been established.

1.6 On Thursday 18 November 2021 fishermen at Whitby called the first open public meeting to express their deepening concerns. The meeting was attended by the Chief and Deputy Chief Officer as well as the Environmental and Scientific Manager. As the only statutory agency in attendance an update was given with the information available to us at the time. Much of the discussion centred around ongoing development works in Tees Port and whether those works have led to the disturbance and resuspension of historical contaminants into the water column.

1.7 At the Authority meeting held on 2 December 2021 members received a comprehensive briefing and update on the ongoing shellfish mortality event surrounding the Tees and North Yorkshire Coast and the associated multi-agency response led by Defra. That update included contributions from key personnel from the CEFAS, the EA and the MMO. The most recent electronic update on the progression of the investigations was released during February 2022 and was circulated to members at the time. The paper is also attached to this report for reference. That update identified the most likely cause of the event as a naturally occurring algal toxin.

1.8 A further independent report, commissioned by the fishing industry and based on an appraisal of data and information collated by the statutory agencies, identified a chemical, pyridine, as the most likely cause of the observed mortalities. Pyridine was excluded at an early stage of the Defra led investigations because it was found in similar concentrations within a shellfish control sample taken off Norfolk and had not been picked up in any water column or sediment sampling surrounding the Tees Estuary. CEFAS Scientists have also advised that given the dilution effects of the North Sea the concentrations of pyridine required to produce such a sustained and widespread impact along the coast would make it a very unlikely cause.

1.9 On Tuesday 14 December 2021 a second meeting was held at the request of the industry. This meeting was attended by the Environmental and Scientific Manager, and by representatives including specialists from the Environment Agency, Cefas and MMO. A detailed briefing of the work undertaken to date, lines of enquiry and preliminary findings was presented. The findings were received with a degree of scepticism and frustrations around the lack of a definitive cause were apparent.

1.10 In February officers received a new report from a Whitby based skipper that lobsters taken in his catch were displaying symptoms typical of the event including lethargy and 'twitching' behaviour with other specimens moribund in pots. The fishermen provided video footage and live samples of the affected lobsters which were dispatched by NEIFCA to the CEFAS fish disease laboratories in Weymouth for further analysis. Further

intelligence reports have also been received relating to the presence of cysts on the livers of cod and whiting caught be recreational fishermen in the Redcar area which may or may not be related to the ongoing event. Weymouth have requested further samples as and when available. The new report from the Whitby skipper indicates that this event is not yet over although, despite the recent storms, no new 'washup' incidents have been reported. Importantly, Defra consider investigations remain ongoing including a commitment to receive further samples for testing and in the medium to longer term further work on the presence of pyridine in shellfish is planned.

1.11 NEIFCA operations have now moved from supporting the live investigations to gaining additional knowledge and understanding of the extent of the impact that the event has had on local crab and lobster stocks. To that end an action and response plan has been produced and is attached for members consideration. This plan includes a desk top review of monthly shellfish catch and effort returns supplemented by further data from the MMO; the completion of questionnaires at the point of landing in key ports; observer trips with fishing vessels operating in the affected area; working pots from NEG III at stations within the affected area and deploying underwater cameras. The resulting analysis and findings from the Authority's work will be incorporated into a report for further consideration. This work will be developed in tandem with the Whitby Fishing Group and a first 'face to face' meeting is planned for 24 February 2022 although discussions have been ongoing with both the Chair and Secretary of the group since November 2021.

Contact Officer

Tim Smith
Environmental & Scientific Manager
Ext 3692

Action and response plan for the crustacean mortality events in the North East

This document outlines the on- and offshore survey and engagement work planned across the Northern part of the district (Scarborough to Seaham) to investigate the ongoing impacts of the incident in the short to medium term. It also outlines communication routes that will be utilised to keep stakeholders up to date with progress made.

1. Catch and effort assessment

In order to understand the impacts of the ongoing situation, we need to assess how catch rates (numbers of lobsters and crabs per pots hauled) have changed. Officers are reviewing sales, landings and effort data for the period October 2021 to present and comparing this to previous years. The introduction of the under 10m catch recording app introduces challenges in making like for like comparisons, so we are also making a call for evidence for any additional data held by fishers. Any information held on plotters or notebooks that allows for a comparison of catch rates with previous years would be extremely useful in quantifying impacts. Officers are available to offer assistance in providing this information.

2. Shellfish health

Based on your feedback we understand that some lobsters and crabs are still exhibiting atypical symptoms including twitching legs and rolling onto their backs. We also understand that mortality in pots, keep pots and holding tanks is above what would be expected. This information is crucial to our understanding of whether there is an ongoing concern surrounding shellfish health compared to a one of event that has reduced the abundance of shellfish in inshore waters. Our Officers are visiting ports in the region to capture this information as well as any catch rate information you have (Annex 1). We are working with specialist staff from the Environment Agency and Cefas including biochemists and ecotoxicologists as part of a joint agency response group investigating the event.

3. Industry led science

Real time data capture is going to be key in the coming months to monitor the fishery, inform the ongoing joint agency investigation and our management response. A simple reporting form has been developed (Appendix 2) to capture information on catch rates and shellfish health. We are asking anybody fishing in the region to use this form to report to us. These can be handed directly to Officers on the quayside, sent via the email address below or to our main office in Bridlington. Officers are handing these forms out at ports or can be requested electronically via the email below.

We want to get out with you and see what is happening on the grounds. We are seeking volunteers willing to take Officers with them during fishing days. We will then be able to capture this vital information directly. During routine boarding operations, Officers may also stay aboard while fleets are hauled to capture this data as well.

4. North Eastern Guardian III

We will also be utilising our patrol and research vessel to capture data on catch rates and shellfish health in the lead up to our standard stock assessment surveys in the spring. These pots do not have escape gaps which allow us to assess the abundance of juvenile lobster and crab. We will also be deploying a range of underwater video systems to gather sea bed imagery.

5. Communication and Engagement

Regular updates from the joint agency investigation group have been circulated, the most recent of which is appended to this document (Appendix 3). These will continue to be circulated via email on request and on the **gov.uk** website. They will also be published on our new website at www.ne-ifca.gov.uk in the news section. With any new information we will also be updating our Facebook page so be sure to follow to get notifications.

An industry working group is being established with representatives from regional fishing associations and collectives to better aid in the dissemination of information and to listen to your views.

We fully recognise your frustration and concern over the ongoing situation and are fully committed to supporting the local industry during this difficult time.

Contact: Tim Smith, Environmental and Scientific Manager

tim.smith@eastriding.gov.uk

01482 393 515

17/02/2022

Annex 1 – Incident questionnaire

Questionnaire

Vessel:

Port:

Date:

1. What areas do you normally fish? (Total range)

2. In what areas have you seen impacts on catch rates or found symptomatic (twitching or dead lobsters/crabs) in your pots since the beginning of October 2021? (Affected area based on direct fishing experience)

3. Are you still finding any twitching or dead lobsters/crabs?

4. Are you still catching/landing significantly less compared to previous years and by how much?

5. Can you provide any data to help quantify these impacts? (Landings data, catch notes, fleet locations)

Annex 2 – Fisher data capture form

NEIFCA SHELLFISH MONITORING FORM			
Vessel name		**DATE**	
PLN		**No of pots per fleet**	

FLEET	**Location (sub-rectangle, GPS, landmarks, distance to shore, depth contours**	**No. LOBSTER**			**No. EDIBLE**			**BYCATCH / COMMENTS**
		Alive	**Symptoms**	**Dead**	**Alive**	**Symptoms**	**Dead**	
1								
2								
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Annex 3 – Joint agency investigation group briefing

Crab and lobster deaths along the North East coast – briefing document

February 2022

Summary of what has happened

- Dead and dying crabs and lobsters were washed ashore along parts of the North East coast between October and December 2021.The first reports were received by the Environment Agency (EA) in October, with reports of impacted crabs out to around 4/5 nautical miles.
- Crabs and lobsters were the only species that appear to have been affected by the incident. Dying crabs and lobsters displayed characteristic 'twitching' and lethargic behaviour.
- Defra took on overall responsibility for the Investigation from the EA, coordinating a multi-agency response, involving the EA, Cefas, NEIFCA, MMO, FSA and the UK Health Security Agency (UKHSA) to investigate what could have caused the event.
- A range of testing was undertaken after the incident had occurred, looking at potential causes including chemical contamination, phytoplankton blooms and disease. Activities in the area, such as discharges and dredge activity, were also considered but no link has been established.
- No conclusive explanation for the incident has been found, but more details of testing and modelling undertaken are set out in the document below. A harmful algal bloom may have caused the incident, with lines of evidence pointing to this.
- There is currently no evidence of a food safety risk from healthy fish and crustacea, including crabs and lobsters caught off the North East coast.
- Businesses should continue to ensure that food placed on the market is safe to eat and meets the relevant requirements in relation to food safety and hygiene.

Latest updates – February 2022

- **Cyanide:** Sediment and water samples collected by the EA from the impacted area around Teesside in early October have now been screened for free cyanide. Results from these samples were below the detection limit of the test.

- **Pyridine:** The chemical pyridine was identified in the crab tissue from impacted areas. Further investigations by the EA established that pyridine was not present in water and surface sediment samples collected off the Tees, but was also detected at low to high levels in crab from non-impacted areas. As such, the presence of pyridine in crab is likely to be linked to biological processes (and not necessarily from the environment). More detail can be found in the section on pyridine below.

- **Dredging:** Cefas completed an indicative 2D tracking model of the potential sediment plume from the dredge disposal site. The model indicates that the plume extents are relatively confined along the tidal excursion at the disposal site and do not have the same geographic extent that would be consistent with the known mortalities.

- **Recent survey activity:** The EA's survey vessel, the Humber Guardian, undertook further testing (benthic invertebrate samples and epifaunal trawls) in the Tees bay area on 18 and 19 Jan. Onboard assessment of the samples showed no obvious impact on animals present in the area. In the epifaunal trawls, healthy swimming crabs (*Liocarcinus holsatus*) were present at 3-4 of the sites.
    - At depth phytoplankton samples were also taken and have been sent to Cefas for analysis.
    - The EA also commissioned preliminary rocky shore intertidal surveys, by Aquatic Environments, to coincide with low spring tides on 20 and 21 January. Having visited six shores it appears that there has been a significant impact on the 'true crab' intertidal populations. No shore crabs or swimming crabs were recorded within the known zone of the event, whilst healthy populations were seen outside the area. Shore hermit crabs and possibly squat lobsters appear to have been less affected by the event, as their populations appear to be recovering and they were found (sometimes in good numbers) on the shores in the south of the area. From the limited observations made on these single post-event visits, it appears that the rest of the 'rocky shore' ecosystem has survived intact. For example the limpet, barnacle, periwinkle and dogwhelk populations, all keystone species, seem to have

been relatively unaffected by the event, as healthy populations were recorded on all of the shores.

- **Algal bloom:** Satellite data from two online platforms (Eutro Viewer (cefas.co.uk) & – s-3 EUROHAB) show that an algal bloom occurred along the coastal area in question from 20 to 26 September (as shown in Figure 1) at high values, but persisting until 1 October, a week prior to the onset of the mortality event.
    - The bloom has unusually high values of chlorophyll (>40 mg/l) for the time of year, and sea temperatures were higher than normal (>15 °C until 26 September).

    - These conditions are conducive to the formation of a particular species of large biomass Harmful Algal Bloom (HAB) called *Karenia mikimotoi*. It has previously been implicated in lobster mortalities in the USA, by causing a crash in near bed dissolved oxygen.

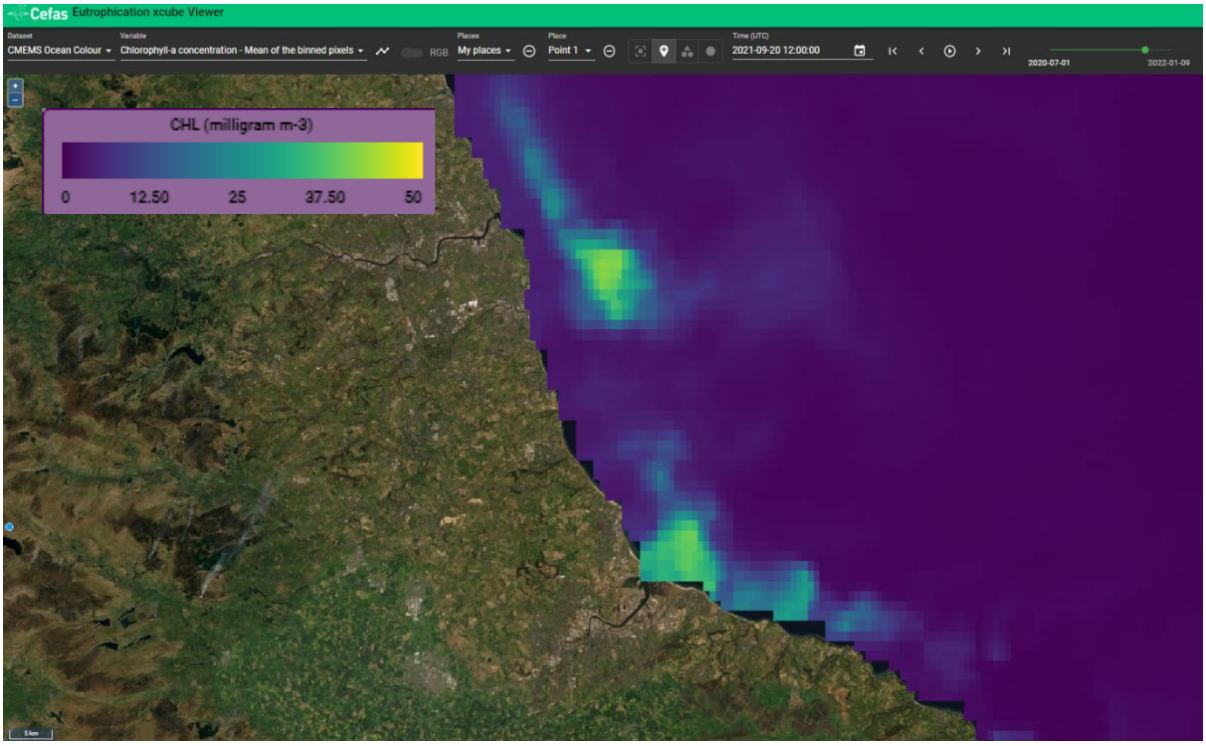
    - Medium/high values of *Karenia mikimotoi* were detected in samples off the Beadnell Bay in early September. Low numbers were found in water samples at depth collected around Teesside in November.

    - Estimates of the effect such a bloom could have on reducing oxygen levels (as the microbial breakdown of dead bloom consumes oxygen) indicate that they could be locally significant and cause mortality directly under the bloom areas – but that effects would not persist beyond the storm that occurred on 6 October. This storm would then bring crabs or lobster that have died inshore, but the bloom would not be expected to last beyond this time.

    - Initially, samples of frozen dead crab and lobster were screened for two classes of marine algae-produced neurotoxins (ASP and PSP) which are known to have impacts on animal health within the marine food web. There was no evidence for these marine neurotoxins (domoic acid and saxitoxins) being present in the samples received at levels which would cause a concern.

    - Further samples of frozen dead crab and lobster from the early washup (8 October) were sent to the Cefas laboratory to be screened for additional algal toxins in light of the new information on the presence of the *Karenia* algal blooms. Additional analysis of the material (collected on 8 October, of dead crab and lobster from beaches) was conducted for toxins in the crab tissue (hepatopancreas / brown meat). Samples were subjected to methanolic extraction to assess the potential presence of brevetoxins – natural lipophilic toxins which have been reported in other countries as produced by various *Karenia* species of phytoplankton. Whilst brevetoxins were not detected, other lipophilic toxins were detected and quantified, specifically the diarrhetic shellfish toxins okadaic acid and dinophysis toxin 2. The significance of these findings in the context of the mortality event is not yet fully understood.

Figure 1- Image of algal bloom in impacted area and to the north on 20 September 2021



Next steps

- The various agencies will continue to collaborate and bring together the evidence that has been collected during the investigation.
- Government scientists will continue to study the long-term effects of the incident and the agencies will work with local fishers to address any concerns they may have.
- Stakeholders will receive future updates where relevant, via meetings and stakeholder/media briefings.
- The public and industry can report any dead or dying crabs and lobsters, or any other incidents of concern via the contact details below.
    - The public can contact the Environment Agency helpline on 0800 80 70 60
    - Industry should contact NE IFCA on:
        - 01482 393 515 or
        - ne-ifca@eastriding.gov.uk

What are the results of the investigation so far?

Pyridine

- As per the update at the top of this document, pyridine was identified in the crab tissue from impacted areas using a novel screening technique. The method provides a starting point only and was employed to screen for any indication of a contaminant that could provide a lead for further investigation.
- The EA used an adapted accredited water screening methodology developed for the identification of substances including Pyridine. In response to the seriousness of this incident the method was adapted for the screening of biota (flora and fauna) and sediment to provide as much information as possible about any potential chemical pollution. It has to be recognised that the outputs are indicative as this is not a fully established/tested analytical method.
- Concentrations are regarded as ‘low’, ‘medium’ and ‘high’ relative values (across the samples) for interpretation purposes. The indicatively high concentrations in the first impacted crab samples immediately initiated several lines of investigation by the Environment Agency:

    - **Line of investigation 1**: It was assumed that pyridine was the cause and a potential source of the contaminant was sought. This included taking a formal water discharge sample

(9/11/2021). No pyridine was found present. No source could be identified. (Note: As the impacted area and length of time of the Incident increased, with no dilution mitigation, a contaminant source became increasing improbable)
    - **Line of investigation 2:** Literature searches for information including the ecotoxicology and background levels of, and impact of, pyridine in crabs and lobsters, were carried out.
    - **Line of investigation 3**: Comparison crabs from outside the known impacted area were sourced to provide an indication of the 'background' levels of pyridine in crab tissues. Comparison crabs were obtained from St. Mary's Lighthouse, North Shields, Norfolk Wash (Eastern IFCA), Cornwall, and analysed using the same indicative screening technique. Levels found ranged from low to medium.
    - **Line of investigation 4:** Pyridine was analysed for in other materials in the area – water, sediment and blue mussels. Pyridine was detected at low levels by the screening method in blue mussels but not in the sediment samples. Pyridine was not detected in the water samples (note: the water screening methodology is an established and accredited lab method). Pyridine is readily soluble in water, and considered to be "mobile" in soil/sediments.
    - **Line of investigation 5:** A laboratory pyridine standard was obtained to validate that the screening technique was identifying pyridine. It has been confirmed that the substance detected was indeed pyridine but the 'concentrations' remain indicative only. A fully validated analytical method would need to be developed to obtain accurate concentration measurements.

- Some literature, and the presence of pyridine in the comparison crabs, may suggest that pyridine is linked to biological processes in the crab tissue, rather than being the cause of the mortalities. Further research into pyridine in crabs (and development in testing methods) is needed to confirm whether biological processes are of significance.

Other chemical pollution and sewage

- The EA do not consider chemical pollution and sewage as likely causes, and EA analysis of water quality detected nothing of concern that could cause this impact.
- They have tested using both traditional and innovative screening methods to analyse samples of water, sediment and crab looking for traces of contamination. They screened for over 1,000 potential chemical contaminants and found no anomalies or levels of contaminants that could lead to an event of this scale.
- Environment Officers also reviewed environmental permits and scrutinised industrial sites in the Teesside area and found no evidence of abnormal discharges that could lead to altered water quality.
- Cefas has also tested for signs of heavy metals in the crab tissue. They have found no clear indications of heavy metals being present in the samples received at levels which would cause concern.
- Sediment and water samples collected by the EA from the impacted area around Teesside in early October have now been screened for free cyanide. Results from these samples were below the detection limit of the test.
- The screening technique used provides a starting point only and was employed to screen for any indication of a contaminant that could provide a lead for further investigation.

Licensed activity (including dredging)

- MMO has reviewed activity that has an MMO marine licence (or deemed licence) and is not aware of any licensed activity that has taken place in the vicinity that would result in mass crustacean mortality.
- Licensed disposal of dredged sediment to designated disposal grounds is not likely to be the cause. All dredged material licensed for deposit at sea undergoes rigorous regulatory testing, in line with international guidance, to ensure that deposit of such material will not cause harm to marine life.
- Disposal of dredged material at sea can only be undertaken following significant testing of sediment samples for a suite of contaminants to ensure the material to be deposited meets these international guidelines.

- Material from ongoing (year-round) dredging operations is deposited in the designated Inner and Outer Tees disposal grounds off Teesmouth and there is no evidence to suggest that these deposits did not meet the required standards.
- The contaminants screened by the EA included those that dredging material is tested for, before sediment is licensed to be deposited at sea.
- Cefas completed an indicative 2D tracking model of the potential sediment plume from the dredge disposal site. The model indicates that the plume extents are relatively confined along the tidal excursion at the disposal site and do not have the same geographic extent that would be consistent with the known mortalities.

Disease and toxins

- Cefas have analysed crab samples for signs of infectious disease and naturally occurring marine harmful algal toxins.
- It has found no clear indications of marine neurotoxins (domoic acid and saxitoxins) being present in the samples received at levels which would cause concern.
- There is also no evidence from the samples that there is an infectious disease agent responsible for the mortalities observed and Cefas therefore do not believe that an aquatic animal disease is the likely cause of this event.

Health and safety

- There is currently no evidence of a food safety risk from healthy fish and crustacea, including crabs and lobsters caught off the North East coast.
- Businesses should continue to ensure that food placed on the market is safe to eat and meets the relevant requirements in relation to food safety and hygiene.
- Members of the public fishing in the affected area should not handle or consume unhealthy fish or crustacea found dead or dying, including crabs and lobsters.

<u>Questions</u>

Is this an ongoing issue? Should levels of catch, more instances of dead or dying shellfish, and other issues continue to be reported and how?

- Anecdotal evidence suggests that dead and dying crabs and lobsters are no longer being found in significant numbers, but local industry and the public should continue to report any instances. This will help us get a better picture of what is still happening.
    - The public can report via the EA phone line
    - Local industry can do this through the NEIFCA office

Has dredging been ruled out as the cause? What testing has been done to reach this conclusion?

- Dredging has been ruled out as a likely cause. Samples of dredge material must meet the highest international standards protecting marine life before it is permitted to be disposed of at sea. If samples analysed for contaminants do not meet the standards, the disposal to sea of that material will not be licensed.
- Nothing in the testing of sediment prior to disposal or evidence from EA sampling suggests a chemical contaminant is a cause. Testing of sediment at the Inner Tees disposal site has already taken place in April 2021 and there was no evidence of significantly elevated contaminants in sediment at locations around and within the disposal site.
- Sediment that is proposed to be dredged in the Tees Estuary is tested and sampled across the footprint of the area to be dredged at least every three years prior to disposal.
- Cefas completed an indicative 2D tracking model of the potential sediment plume from the dredge disposal site. The model indicates that the plume extents are relatively confined along the tidal excursion at the disposal site and do not have the same geographic extent that would be consistent with the known mortalities.

Will the disposal of dredged sediment be stopped?

- No. The MMO uses the best available evidence to inform its decision making. There is no evidence to suggest that the disposal of dredged sediment responsible for the crab and lobster mortality – this has been tested in accordance with international (OSPAR – Oslo/Paris convention (for the Protection of the Marine Environment of the North-East Atlantic)) obligations.

Has cyanide in the sediment/water been tested for?

- Sediment and water samples collected by the EA from the impacted area around Teesside in early October have now been screened for free cyanide. Results from these samples were below the detection limit of the test.

Is it only crabs and lobsters affected? What about other species?

- The incident only appears to have affected crabs and lobsters. Reports of other animals, including octopus, limpets and shrimp found dead in the area appear to be unconnected and are more likely to be a result of storms and bad weather in the area.
- Please continue to report instances of dead or dying animals through the helpline or NEIFCA representative so we can investigate.

Are there links to seabird deaths reported earlier in the year?

- The seabird death incidents were during late August and September and cases have significantly reduced since then. Investigative work to understand the cause is ongoing.

What about dogs which have been reported as falling ill recently?

- Defra and the Animal and Plant Health Agency are aware of these reports and are liaising with veterinary organisations, academia and animal charities. At present no specific cause has been identified by the private vets involved in treating dogs affected.
- If a pet shows clinical signs, then the owner should seek veterinary care from their own private veterinary practice

And seals?

- There is no evidence linking reports of dead seals to the investigation on crab and lobster deaths in the North East.
- If a member of the public observes a seal they deem in danger or distress, they should contact an appropriate helpline for advice and assistance (e.g. the RSPCA hotline in England and Wales; SSPCA hotline in Scotland; and USPCA in Northern Ireland, or the British Divers Marine Life Rescue on 01825 765546).
- The APHA Disease of Wildlife Scheme in conjunction with a network of collaborators from across GB undertake surveillance for new and emerging diseases in seals, however, large die-offs can occur for many reasons, including storm surges, food shortages, trauma, predation or disease outbreaks.
- The APHA Wildlife Expert group has commented that they have carried out post mortems on seal samples, taken from a range of sites in Great Britain, over the last year and not seen any evidence of an emerging disease.
- We will continue to engage with wildlife experts and remind the public not to approach dead or sick seals.

How are you measuring the impact on shellfish stocks in the area?

- We are continuing to work with fishers in the areas. Any information provided – especially in comparison to previous years' catch – will help us get a better picture of the impact on stocks. Please report this via your NE IFCA representative.

Are you sure that crabs and lobsters are safe to eat and sell? What about eating species which feed on crab/lobster?

- There is currently no evidence of food safety risk from fishery products caught off the North East coast, but is unsafe to eat any dead or dying animals, including crabs or lobsters, that are found.
- Businesses should continue to ensure that food placed on the market is safe and meets the relevant legislative requirements in relation to food safety and hygiene.

How are you sure that disease is not the cause?

- Cefas has taken further samples from the area recently, to investigate whether an aquatic animal disease is the cause of this incident. There is no evidence in the samples analysed that there is an infectious disease agent responsible for the mortalities.

What about compensation/support for the industry?

- The priority of the government is to investigate and understand the cause of the issue. At this stage, while investigations into the cause are ongoing, we are not considering financial support.

What about the possibility of natural causes?

- Mass crustacean mortality events can occur from natural causes. For example, a mortality event was evident off the Kent coast in Dec 2011 that was linked to unseasonal low temperatures.
- As referenced above, a harmful algal bloom may have caused the incident, with lines of evidence pointing to this.

NORTH EASTERN INSHORE FISHERIES AND CONSERVATION AUTHORITY

Report to: Science Advisory Group
4 March 2022

European Lobster Settlement Index project

Report by Tim Smith, Environmental & Scientific Manager

A. **Purpose of Report**

To inform members of a successful grant application to the Fisheries Industry Science Partnership (FISP) scheme.

B. **Recommendation**

That members note the report.

1. **Background**

1.1 NEIFCA has been successful in a £264k grant application to the Fisheries Industry Science Partnership (FISP) scheme. The FISP scheme aims to improve and share knowledge of fisheries and aquaculture by funding data collection and research to support sustainable fisheries management. All applications to the scheme must be undertaken though collaboration between the fishing and seafood industry and research organisations. For this project, NEIFCA will be partnering with the Holderness Fishing Industry Group.

1.2 The primary aim of this project is to test and develop a monitoring method that will allow for predictive stock status assessments to be undertaken for lobsters in the future, the results of which can be used to implement input/output controls in order to ensure the long-term sustainability of the fishery, while achieving economic, social and employment benefits.

1.3 The inshore lobster fishery within the North Eastern Inshore Fisheries & Conservation Authority (NEIFCA) district forms a significant proportion of the wider Yorkshire and Humber lobster stock unit as defined by the Centre for Environment, Fisheries and Aquaculture Science (Cefas). Management of the fishery primarily consists of technical conservation measures. There are currently no agreed Harvest Control Rules (HCRs) that form part of a Harvest Strategy, however, monitoring of landings, catch rates and key biometric parameters does occur. Current stock status assessments utilise Length Cohort Analysis, using knowledge of growth rates and assumed rates of natural mortality to infer the rate at which the fishery is removing individuals. While landings remain relatively stable, the exploitation status of the stock is high, above the level required for maximum sustainable yield for both sexes. The biomass status of both sexes is low, close to the minimum reference point limit but is stable for females.

1.4 The disadvantage of monitoring stock status in this way is that management can only be introduced in a reactive manner, often years after changes in key status indicators become evident. Other crustacean fisheries worldwide have successfully implemented monitoring methods for predictive stock status assessments.

1.5 In the mid 1980's Australian fisheries science demonstrated the capacity of using time trends in the abundance of newly settled post-larvae to forecast trends in the commercial harvest of western rock lobster (*Panulirus cygnus*), through the deployment of artificial collectors (Phillips, 1986). This success encouraged fisheries scientists studying the American lobster (*Homarus americanus*) fisheries along the North-East coast of the US and Canada to implement a similar system in the late 1980s (Wahle et al., 2010). This method has since become one of the key indexes utilised in stock assessment and fisheries management decisions amongst these fisheries.

1.6 No such monitoring programme exists in the UK and there is currently no knowledge of the link between the settlement of UK lobster and crab species from their planktonic phases and their subsequent recruitment into a fishery. Understanding this link can provide key data to enhance both the understanding of the settlement/recruitment mechanism and provide evidence to directly support assessment of the stocks. This would align with the scientific evidence objective of the Fisheries Act 2020 to (a) collect data relevant to the management of fish activities, and (c) management of fish activities is based on the best available scientific advice.

1.7 The development of an appropriate index suitable for use as part of a Harvest Strategy is beyond the scope of the project currently proposed. Given the life histories of key regional commercial lobster and crab species, data collected will have to be reviewed considering future catch and landings data, for which data collection systems are already in place. This project aims to develop the monitoring equipment and methodology required to establish a continuous long-term survey programme, assess key parameters such as seasonality of larval settlement and gather baseline data from which future models may be derived.

1.8 The development of a predictive stock indicator will greatly enhance the ability of NEIFCA to implement adaptive fisheries management measures to arguably the UK's largest lobster fishery, helping to achieve the sustainability objective of the Fisheries Act 2020 by ensuring the long-term sustainability of the fishery and contributing to the achievement of economic, social and employment benefits. While not the primary focus of the project, collection of additional juvenile Edible crab data may provide similar sustainability benefits to this co-located fishery, however, the project partners are not currently aware of this method being used for crab fisheries. Additional species captured within the samples may also provide a useful biodiversity measure that could be incorporated into management metrics and help to achieve the ecosystem objective of the Fisheries Act 2020. Analysis of environmental variables (temperature, salinity and water velocity) across sampling sites will provide an indication of environmental niches required for lobster larvae to settle, as well as determining to what extent environmental variables are correlated with the gradients seen in the structure of biological communities in cobble beds.

1.9 A European Lobster Settlement Index, once developed, could form the basis of a co-operative fisheries management model, including stakeholder led sampling and an agreed Harvest Strategy that is described in the Fisheries Management Plans (FMPs) currently under development.

2. Project approach and methodology

2.1 Details of the methodology and selection of suitable habitats for the data collection will be finalised. Existing seabed data will be used to select a total of 10 sampling sites, 4 between Flamborough Head and the Humber Estuary (Holderness Coast) and 6 between Flamborough Head and Tyne mouth. Boat and staff time will be allocated and planned between both project partners for the data collection. The IFCA's patrol vessel "North Eastern Guardian III" will cover the NEIFCA district North of Flamborough Head and the Holderness Fishing Industry Group (HFIG) industry owned and operated research vessel RV Huntress will operate South of Flamborough Head. The IFCA's Environmental Team and the HFIG team will work together collating data in the field and laboratory.

2.2 All the post-settlement larvae boxes will be manufactured in house by the IFCA Engineers and prepared for deployment. Settlement collector boxes will be made of 10-gauge wire mesh (37mm) with dimensions of 61.0 cm x 91.5 cm x 15.0 cm providing 0.55m2 floor area. The inside of the boxes will be lined with a 2mm plastic mesh for retaining newly settled lobsters, crabs and other taxa and a 5mm plastic mesh over the finer mesh to prevent chafing. The boxes are filled with clean rounded cobbles from 10 to 15cm in diameter. Tilt current meters (Lowell Instruments TCM-1 General Purpose Tilt Current Meter) and temperature, conductivity and salinity loggers (HOBO U24-002-C Conductivity Data Logger) will be purchased and calibrated. These additional instruments will then be attached to one post-settlement collector box for each site. Recording environmental parameters will provide additional valuable information to gain a better understanding how they influence the settlement and abundance of the post-settlement lobsters.

2.3 Ovigerous lobsters will be obtained from the fishery under dispensation and kept in the Yorkshire Marine Centre (YMRC). Larvae will be reared until the post-larval stage (Stage V) and weekly growth measurements recorded alongside water parameters. This will act as a proxy for growth of wild settled lobsters for temporal comparisons of settlement within the boxes. In a separate trial, hatchery reared lobsters will be deployed in a settlement box to trial rates of loss over a temporal scale and also during the recovery period.

2.4 Stage IV post-settlement lobster will be placed in 4 settlement boxes and deployed at one of the survey sites. The boxes will be recovered after 24 and 48 hours recording the number of remaining larvae inside the box. This will give an indication of the loss rate caused by hauling of the equipment. Testing the retention rate of passive settlement collectors will be conducted outside of the peak reproductive season in order to avoid the capture of wild lobster post-larvae when recovering the boxes.

2.5 The larvae settlement boxes will be deployed together with the conductivity, temperature and flow meter loggers in April 2022 and 2023 in sets of 4 at each sampling site on suitable habitats. A total of 5 sampling sites will be within the 0-2nm zone and 5 within the 2-6nm zones of the NEIFCA district. One collector box from each sampling site will be retrieved periodically (20 days) throughout the survey season in conjunction with plankton tows for each site. This will provide information on seasonality and timings of the hatching and settlement of lobster larvae. The remaining 3 settlement boxes at each site will be recovered in October 2022 and 2023. Recovered collector boxes will be opened on deck and rinsed down with seawater, cobbles will be removed and inspected individually for any organisms. Individual organisms (lobster, crab and other taxa) will be identified, counted and measured. Lobster and crab species will be preserved and returned to the YMRC in order for carapace length/width to be recorded using microscopy. Remaining taxa will be recorded and returned to sea, if necessary for identification purposes they will be preserved

and returned to the YMRC for processing. Collectors which have accumulated large deposits of sediments will be excluded from the analysis.

2.6 Data will be held following the MEDIN data standards. Data will be formatted for statistical analysis. The larval settlement index for European lobster will be defined as the density of young-of-year (0+) individuals in the population at the point samples were collected, at the end of the settlement season (Wahle et al., 2004). Models for the larval settlement of European lobster will be developed and tested following methodology by Wahle et al., (2004). Multivariate analysis will be conducted to analyse how species diversity indices and community composition varies between sites, and to determine to what extent the environmental variables (temperature, salinity, water velocity and depth) are correlated with the gradients seen in the structure of biological communities and the density of lobster larvae.

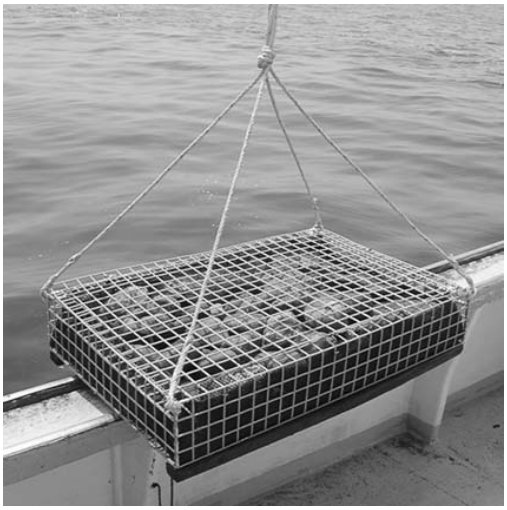


Image 1. Passive collector design.

Contact Officer

Tim Smith
Environmental & Scientific Manager
Ext 3692

NORTH EASTERN INSHORE FISHERIES AND CONSERVATION AUTHORITY

Report to: Science Advisory Group
4 March 2022

Research and evidence annual plan 2022-23

Report by the Senior Environmental & Scientific Officer

A. **Purpose of Report**

To present a revised research and evidence annual plan for the coming year.

B. **Recommendation**

That members note the report.

1. **Background**

1.1 A draft annual research and evidence plan is presented for consideration by members. The plan includes additional evidence gathering in response to the Tees and North Yorkshire shellfish mortalities.

1.2 Some workstreams and projects have been removed from the plan as these are considered development areas with no specific outputs planned over the coming year. These include drone usage for intertidal surveys, MPA effort monitoring and Broad Scale Habitat Classification. The newly funded European Lobster Settlement Index (ELSI) project has been added to the plan.

1.3 Aquaculture is an increasingly important industry within the UK and several trials have been developed or are proposed within the NEIFCA district. Under the Marine and Coastal Access Act 2009, cultivation of sea fisheries resources are included within the IFCAs remit. A need to develop a strategy document has been identified to support the sustainable growth of this developing industry, particularly in regard to those culturing molluscs and seaweed, and to balance the needs of the sector with those of other sea users.

1.4 It has also been recognised that increased communication and feedback from the recreational angling sector would be of benefit. Additional considerations also exist surrounding the management of hand gathering and other recreational activities, particularly with regard to interaction with designated features. As such, work will be undertaken to develop strategy positions for these related sectors.

1.5 A number of legacy bylaws remain in force within the district from the Sea Fishery Committee times. In recent years, a number of other IFCAs have implemented a flexible byelaw model that allows a more dynamic and adaptable management style that is better able to respond to changing environmental and socio-economic conditions. A review of

the shellfish permit byelaw is underway and a new potting byelaw incorporating proposals for an effort limitation scheme will be produced.

Contact Officer

Tim Smith
Senior Environmental & Scientific Officer
Ext 3692

North Eastern IFCA

Inshore Fisheries and Conservation Authority

Research and Evidence Annual Plan

2022-2023

Date submitted:	28/02/2022
Report compiled by:	TS
Quality control by:	
Approved by & date:	
Version:	Draft

North Eastern IFCA
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Acronyms

DHC	Durham Heritage Coast partnership
EA	Environment Agency
EMS	European Marine Site
HFIG	Holderness Fishing Industry Group
IFCA	Inshore Fisheries and Conservation Authority
MCZ	Marine Conservation Zone
MIF	Multiple Indicator Framework
MPA	Marine Protected Area
NE	Natural England
NEG III	North Eastern Guardian III
NEIFCA	North Eastern Inshore Fisheries and Conservation Authority
NTZ	No Take Zone
SAC	Special Area of Conservation
SI	Statutory Instrument
SPA	Special Protection Area
YWT	Yorkshire Wildlife Trust

1. Introduction

North Eastern Inshore Fisheries and Conservation Authority (NEIFCA) is one of ten such Authority's established in October 2010 under provisions contained within the Marine and Coastal Access Act 2009. NEIFCA have a statutory duty under the Marine and Coastal Access Act 2009 to manage the exploitation of sea fisheries resources.

The Authority also has duties as a relevant authority in relation to marine protected areas and European Marine Sites (EMS) under the Conservation of Habitats and Species Regulations 2017 (SI:1012/2017), as such are responsible for monitoring and managing fishing activity within a network of marine protected areas in the district including:

- Teesmouth and Cleveland Coast SPA
- Flamborough Head EMS (SAC & SPA)
- Humber EMS (SAC & SPA)
- Northumbria Coast SPA
- Greater Wash SPA

In addition to two Marine Conservation Zones:

- Holderness Inshore MCZ
- Runswick Bay MCZ

IFCAs are small, multi-functional organisations that carry out a range of work to fulfil these responsibilities including evidence collection and research as well as the implementation and enforcement of legislation. The Research and Evidence Annual Plan is the key planning and operational document where actions and priorities can be agreed in context. The aim of this document is to outline survey, research and evidence gathering priorities for the 2022-2023 period.

2. Research and evidence work streams for 2022-23

Offshore surveys

<table>
<tr><th colspan="2">Shellfish potting – NEG III</th></tr>
<tr><td colspan="2">In order to capture data on lobster and crab population components that are subject to landings restrictions, potting surveys are undertaken from the patrol vessel over the summer months. Data is used to carry out annual stock assessments and is shared with Cefas to inform stock unit level assessments against MSY targets. Additional fleets are worked within and in the vicinity of the permitted dredge areas in order to monitor any impacts arising from the scallop fishery.
Following the shellfish mortalities observed in late 2021, additional surveys were begun in February 2022 to assess catch rates and shellfish health in the inshore (within 3NM) between the Tees and Scarborough. These surveys will continue until the beginning of the standard start of the survey season in May. Additional surveys aboard industry vessels in the impacted region are also being undertaken.</td></tr>
<tr><td>Outputs</td><td></td></tr>
<tr><td rowspan="10">Stock status reports to include:
Length/width frequency data for assessment against MSY targets
Sex ratios
Seasonal trends in catch composition and population structures
CPUE
Proportion V-notched lobsters
Proportion of egg bearing female lobsters
Condition (1 or no claws, prevalence of black spot disease)
Pre-recruit abundance
Shellfish health</td><td>Data Acquisition</td></tr>
<tr><td>May-Oct</td></tr>
<tr><td>Reporting</td></tr>
<tr><td>Stock status reports - Sep</td></tr>
<tr><td>Priority</td></tr>
<tr><td>High</td></tr>
</table>

European Lobster Settlement Index (ELSI) project	
NEIFCA has secured funding for a two year Fisheries Industry Science Partnership (FISP) project in collaboration with the Holderness Fishing Industry Group (HFIG). The project aims to trial the efficacy of using settlement collectors to gather data on the abundance of early benthic phase lobsters and crabs. This method is used in other lobster fisheries around the world and provides a predictive stock indicator by which to manage fisheries sustainably.	
Outputs	
Stock status reports to include: • Abundance, size and development stage of early benthic phase lobsters and edible crabs. • Abundance of other species present.	Data Acquisition Apr-Mar Reporting SAG updates, project reporting. Priority High

Scallop dredging – NEG III	
Following the introduction of a scallop dredge permitting system in 2015, annual assessment of stocks within the permitted dredge areas are required to inform management decisions including the number of permits to be issued. The number of permits to be issued each year is to be published by the 1st of November. Offshore sampling is carried out using industry standard Newhaven dredges from NEG III.	
Outputs	
Stock status reports to include: • Size frequency data • Pre recruit data • Age (ring) frequency data • Catch Per Unit Effort (CPUE) • Bycatch species	Data Acquisition Apr-May, Oct-Nov Reporting Scallop fishery report - Jun Priority High

Scallop dredging – Habitat video	
Habitat video capture will be obtained from around the permitted scallop dredge areas. There is no plan to analyse or quantify the footage at this time, however, the footage may be used when considering future changes to management of the fishery.	
Outputs	
• Video capture	Data Acquisition Jun-Aug Reporting 2022-23 Research report Priority Moderate

Scallop dredging – Permitted vessels	
Surveys aboard permitted vessels are undertaken throughout the season to accurately record bycatch levels and to capture further scallop stock data.	
Outputs	
Stock status reports to include: • Size frequency data • Pre recruit data • Age (ring) frequency data • Catch Per Unit Effort (CPUE) • Bycatch species	Data Acquisition Nov-Apr Reporting Scallop fishery report - Jun Priority High

Sea temperatures	
The patrol vessel continues to maintain a long term data set of sea surface and bottom temperatures taken at stations throughout the district while on routine patrol and as such are not included in the survey Gantt chart.	
Outputs	
• Monthly sea bed and surface temperature	Data Acquisition Apr-Mar Reporting Annual research report - Mar Priority Low

Shore surveys

Quayside sampling	
Quayside sampling of commercial catches provides biometric data on the main species landed within the NEIFCA district. Effort is focussed on lobster and brown crab to inform annual stock assessments with additional sampling of *Nephrops*, velvet crab and whelk undertaken when observed. Data is shared with Cefas to inform stock unit level assessments against MSY targets. Monthly sampling is carried out in the major ports of Bridlington, Scarborough and Whitby with supplementary sampling at other ports.	
Outputs	
Stock status reports to include: • Length/width frequency data for assessment against MSY targets • Sex ratios • Seasonal trends in catch composition and population structures • CPUE	Data Acquisition Apr-Mar Reporting Stock status reports - Sep Priority High

Cockle monitoring	
Since the introduction of byelaw XXIV to manage effort in the district, which stipulates a catch return system, a closed season from 1st May – 21st August, daily catch limits, minimum landing size and technical gear restrictions, the beds had to be closed due to overexploitation. Monitoring in the district to assess whether the closure is benefitting the stock is carried out bi-annually across three sites; Bran Sands, Middleton Basin and Wonderland (Cleethorpes).	
Outputs	
Stock status reports to include: • Identification of bed spatial extent • Population length and age structure • Estimated density and biomass within bed	Data Acquisition Apr-May Reporting Sep Priority High

Humber Estuary EMS eelgrass monitoring	
Monitoring of the eelgrass bed is carried out annually to assess byelaw effectiveness. Officers work closely with other statutory partners to maximise the utility of resources and data collected to address NEIFCA and partner priorities. Partners involved: Natural England, Environment Agency, Yorkshire Wildlife Trust.	
Outputs	
Stock status reports to include: • Identification of bed spatial extent • Population length and age structure • Estimated density and biomass within bed Assessment of byelaw suitability.	Data Acquisition Jul Reporting Mar Priority Moderate

Byelaw and policy development

Aquaculture strategy	
Aquaculture is an increasingly important industry within the UK and several trials have been developed or are proposed within the NEIFCA district. Under the Marine and Coastal Access Act 2009, cultivation of sea fisheries resources are included within the IFCAs remit. A need to develop a strategy document has been identified to support the sustainable growth of this developing industry, particularly in regard to those culturing molluscs and seaweed, and to balance the needs of the sector with those of other sea users.	
Outputs	
• Strategy document, outlining NEIFCA roles and responsibilities in regard to aquaculture.	Development Period Apr-Mar Reporting Policy document- Mar Priority Low

Recreational sea angling/hand gathering strategy	
NEIFCA wishes to increase engagement with the recreational sector to identify evidence requirements and potential management measures. Further work is also required to understand the scale and impacts of hand gathering activities on designated features. Work will follow on from the outputs of the IFCA FISHGIG working group.	
Outputs	
• Strategy document/s, outlining NEIFCA roles and responsibilities in regard to recreational activities, particularly within MPAs.	Development Period Apr-Mar Reporting Policy document- Mar Priority Low

Bylaw Review	
A number of legacy bylaws remain in force within the district from the Sea Fishery Committee times. In recent years, a number of other IFCAs have implemented a flexible byelaw model that allows a more dynamic and adaptable management style that is better able to respond to changing environmental and socio-economic conditions. A review of existing regulations will be undertaken and draft byelaws in the flexible style will be developed.	
Outputs	
• A full review of current NEIFCA bylaws and draft documents of those bylaws in the 'flexible' format. • Initial focus will be on the shellfish potting fishery.	Development Period Apr-Mar Reporting Bylaw review documents - Mar Priority Low

Survey Gantt Chart 2022-23

Workstream	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Jan	Feb	Mar
Shellfish potting – NEG III												
ELSI project												
Scallop dredging – NEG III												
Scallop dredging – Habitat video												
Scallop dredging – Permitted vessels												
Cockle monitoring												
Humber Estuary EMS eelgrass monitoring												

NORTH EASTERN INSHORE FISHERIES AND CONSERVATION AUTHORITY

Report to: Science Advisory Group
4 March 2022

Humber Estuary Byelaw XXIX Review

Report by Tim Smith, Environmental & Scientific Manager

A. Purpose of Report

To present a draft of the Humber Estuary Fishing Byelaw XXIX, which has been revised to include the proposed extension to the Spurn Point Seagrass Area and points to discuss the justification for this extension.

B. Recommendation

That members support the revised extension of the Spurn Point Seagrass Area within the Humber Estuary Fishing Byelaw XXIX.

1. Background

1.1 The Humber Estuary Fishing Byelaw XXIX was introduced in 2014 under the revised approach to protect a bed of dwarf eelgrass *Z. noltei* present along the intertidal grounds at Spurn Point from fishing activity and bait digging. These eelgrass beds provide key ecosystem services including nursery and refuge grounds for fish, foraging grounds for birds, sediment stabilisation, nutrient cycling and carbon sequestration. However, this species is highly sensitive to smothering from shifting sediment which can be caused by disturbance from fishing activity, bait digging and natural erosion.

1.2 Annual surveys of the eelgrass bed have been conducted in conjunction with Yorkshire Wildlife Trust since the introduction of the byelaw, with data compared across years to determine the stability (number of years present) of the eelgrass bed. The initial boundary of the protected areas was defined based on the presence of the eelgrass bed in 2014. There is now sufficient data to indicate stable presence of eelgrass outside the existing protected area. To ensure sufficient protection of the designated feature officers propose altering the offshore extent of the protected area.

1.3 The Conservation of Habitats and Species Regulations 2017 requires that the IFCA exercise its functions, which are relevant to marine conservation, so as to secure compliance with the requirements of the Habitats and Birds Directives. Altering the boundary of the protected area to encompass the known distribution of *Z. noltei* ensures continued compliance with the Regulations.

1.4 The management goal is to continue the effective conservation of the species by extension of the Spurn Point Seagrass Area. The eastern boundary of the area remains to be the Mean High Water Line. Single points of data were identified outside the northern and

southern boundaries, however the increased area of distribution is primarily shifting down the shore to the west. It is proposed that the northern and southern boundaries remain the same to aid in communication of the revised byelaw. Based on advice provided by Natural England, the offshore extent was determined by using twice the distance from the existing boundary and the furthest data point outside the area (Figure 1).

1.5 The intention to revise the byelaw was raised at the meeting of the Authority on 2nd December 2021. At this meeting members delegated oversight of the review of the byelaw to the Science Advisory Group and the formal making of any new replacement regulation to the NEIFCA Executive Committee.

1.6 This revised boundary will provide a buffer for new growth and further expansion of the eelgrass bed in the future and reduce the need to revise the boundary again should the distribution of the species continue to increase. The Humber Estuary Fishing Byelaw XXIX provides a local measure that compliments national regulations in achieving sustainable management, through the protection of designated habitats and species.

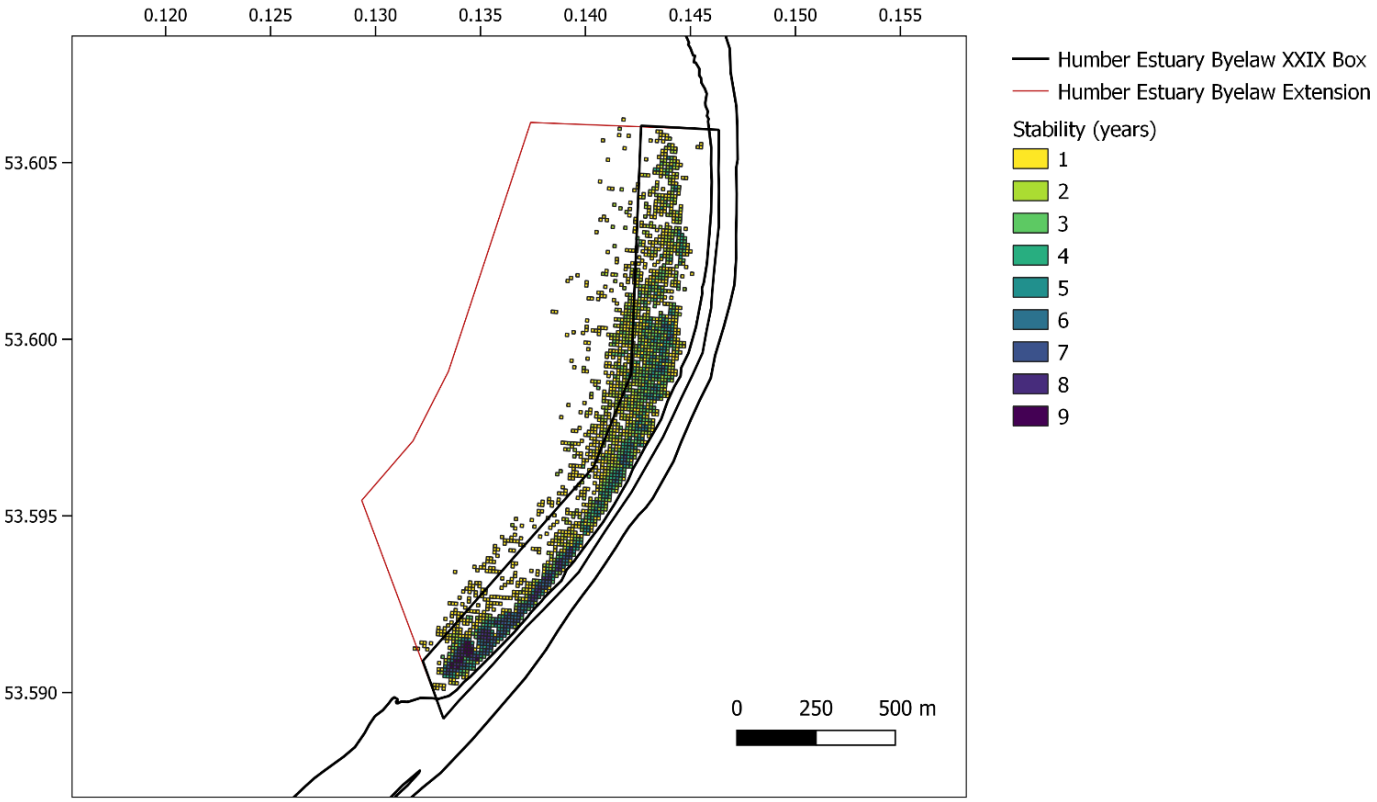

Figure 1. Spurn Point Seagrass Area with the boundary of the current protected area within the Humber Estuary Byelaw XXIX (black), the proposed extension to the Spurn Point Seagrass Area (red) and the stability of eelgrass (*Z. noltei*). Stability shows the number of years that the presence of eelgrass has been recorded in the area, with darker areas displaying the more established areas of eelgrass which have been recorded there for 8-9 years.

Contact Officer
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NORTH EASTERN INSHORE FISHERIES AND CONSERVATION AUTHORITY

MARINE AND COASTAL ACCESS ACT 2009 (c.23)

Humber Estuary Fishing Byelaw XXIX

The Authority for the North Eastern Inshore Fisheries and Conservation District in exercise of its powers under sections 155 and 156 of the Marine and Coastal Access Act 2009 makes the following byelaw for that District.

1. Interpretation

In this byelaw:

(a) all coordinates are derived from the World Geodetic System 1984 datum;

(b) 'the Authority' means the North Eastern Inshore Fisheries and Conservation Authority as defined in articles 2 and 4 of the North Eastern Inshore Fisheries and Conservation Order 2010 (S.I. 2010 No. 2193);

(c) 'the baselines' means the 1983 baselines as defined in the North Eastern Inshore Fisheries and Conservation Order 2010;

(d) 'dig' includes the use of any rake, spade, fork, pump or similar device, hand gathering or collecting;

(e) 'the District' means the North Eastern Inshore Fisheries and Conservation District as defined in articles 2 and 3 of the North Eastern Inshore Fisheries and Conservation Order 2010;

(f) 'existing shareholders' means the shareholders as detailed on a vessel's Certificate of Registry on the date of confirmation of this byelaw;

(g) 'general trawl permit' means a permit issued by the Authority in accordance with the provisions contained within the byelaw with the title 'III Trawling: Prohibition: Exceptions' made by North Eastern Sea Fisheries Committee on 30 July 2002 in exercise of its powers under Section 5 of the Sea Fisheries Regulation Act 1966 (c.38);

(h) ‘Humber Estuary’ means the area as defined in the Schedule;

(i) ‘Humber Estuary Trawling Permit’ means a permit issued by the Authority in accordance with paragraphs 3 and 4;

(i) ‘registered fishing vessel’ means a fishing vessel registered in accordance with the Merchant Shipping Act 1995 (c.21) or registered in the Channel Islands or the Isle of Man, and which holds a current fishing licence issued by the appropriate UK fisheries department;

(j) ‘separator trawl or sorting grid’ means an attachment to the trawl which complies with the provisions contained within Section 3(1) of the Shrimp Fishing Nets Order 2002 (S.I. 2002, No 2870);

(k) ‘Spurn Point Seagrass Area’ means the area as defined in the Schedule;

(l) ‘three nautical mile limit line’ means a line drawn three nautical miles seaward of and running parallel to the baselines;

(m) ‘track record’ means documentary evidence of commercial catch and landings.

2. Prohibitions

(a) A person must not trawl within the Humber Estuary unless that person holds a valid Humber Estuary Trawling Permit.

(b) A person must not trawl, dig, or use a pot, trap, net, longline, dredge or similar device within the Spurn Point Seagrass Area.

(c) A person must not remove sea fisheries resources from the Spurn Point Seagrass Area.

(d) Paragraph (c) does not apply to a person fishing for or removing sea fisheries resources by means of a rod and line.

3. Humber Estuary Trawling Permits – Applications

(a) Vessels may apply for a Humber Estuary Trawling Permit up to six months from the date of this byelaw coming into force.

(b) Applicants must apply using a form obtained from the Authority website.

(c) Applications will only be accepted from the owner of a vessel meeting the following criteria:

(i) the vessel is a registered fishing vessel;

(ii) the overall length of the vessel does not exceed 18.3 metres;

(iii) the engine power of the vessel does not exceed 400 kilowatts;

(iv) the vessel holds a valid general trawl permit; and

(v) the vessel possesses a track record of catching and landing a minimum of 500 kilograms of finfish or shrimp (*Crangon crangon*) from within the Humber Estuary in any three month period between 1 January 2013 and 31 December 2015 (inclusive). It is the responsibility of the applicant to demonstrate the accuracy and validity of such a track record.

4. Humber Estuary Trawling Permits - Conditions

(a) Humber Estuary Trawling Permits expire on the 31 December each year.

(b) Humber Estuary Trawling Permit holders may renew their permit for the following year from 1 December each year.

(c) Humber Estuary Trawling Permit holders must renew their permit within one year of its expiry otherwise the entitlement to renew will be lost.

(d) A fee of £500 will be charged by the Authority for each Humber Estuary Trawling Permit upon each successful application or renewal.

(e) Humber Estuary Trawling Permits will no longer be valid if a formal change of ownership affects the major shareholding of the vessel in respect of which they were issued.

(f) Paragraph (e) does not apply where a change of major shareholding relating to the vessel named on the permit, occurs between parent and child, spouse or civil partner or existing shareholders.

(g) Humber Estuary Trawling Permits must be immediately surrendered to the Authority if no longer required by the permit holder.

5. Permit Suspensions

(a) A permit may be suspended by the Authority for the purposes of environmental protection, fisheries conservation or non-compliance with the provisions of the byelaw;

(b) In deciding whether to suspend a permit the Authority will consider:

(i) all available and current scientific and survey data;

(ii) internal scientific advice from within its membership;

(iii) advice provided by the Centre for Environment, Fisheries and Aquaculture Science;

(iv) advice provided by the Department for the Environment, Food and Rural Affairs, the Marine Management Organisation, Natural England or other external authorities, organisations, persons or bodies as the Authority thinks fit;

(v) information from any other relevant source.

(c) Prior notice of a decision to suspend a Humber Estuary Trawling Permit will be provided in writing to the Humber Estuary Trawling Permit holder and through publication on the Authority's website, at least ten working days prior to any decision being made.

(d) Any representations must be lodged, in writing, to the Authority within five working days of the date of the notice referred to in paragraph (c).

(e) Such representations will be considered by the Authority members and a final decision will be made.

(f) Notification of the final decision, including suspension of permit, will be made in writing to the Humber Estuary Trawling Permit holder and through publication on the Authority's website within five working days of the decision being taken.

(g) The suspension of Humber Estuary Trawling Permit may apply to all or part of the Humber Estuary.

6. Trawl Conditions

(a) Any person using a trawl within a mesh size range of 16 millimetres to 31 millimetres must lift inboard the cod end of the net, inspect it and empty it at least once within every hour of the trawl being in the water.

(b) All trawl nets used within a mesh size range of 16 millimetres to 31 millimetres must have a separator trawl or sorting grid installed.

7. Revocations

The byelaw with the title "XXIX Humber Estuary Fishing Byelaw" made by North Eastern Inshore Fisheries and Conservation Authority on 12 September 2013 in exercise of its power under section 155 and 156 of the Marine and Coastal Assess Act 2009 in force immediately before the making of this byelaw is revoked.

Schedule
Definition of Areas

1. The "Spurn Point Seagrass Area" means the area within the Humber estuary enclosed by a line drawn from:

   (a) Point A (Latitude 53°35.381'N Longitude 000°08.073'E) to
   (b) Point B (Latitude 53°35.746'N Longitude 000°07.814'E) to
   (c) Point C (Latitude 53°35.85'N Longitude 000°07.953'E) to
   (d) Point D (Latitude 53°35.971'N Longitude 000°08.047'E) to
   (e) Point E (Latitude 53°36.399'N Longitude 000°08.253'E) to
   (f) Point F (Latitude 53°36.400'N Longitude 000°08.792'E) and then
   (g) From Point F along the coast at a level of mean high spring water tide to Point A.

2. The "Humber Estuary" means those tidal waters and parts of the sea bounded by the following lines;

   (a) to the north by a line drawn true east from Spurn Head Lighthouse (position 53° 34.490' North, 000° 06.650' East) to the three nautical mile limit line;

   (b) to the east by the three nautical mile limit line;

   (c) to the south by the boundary of the District.

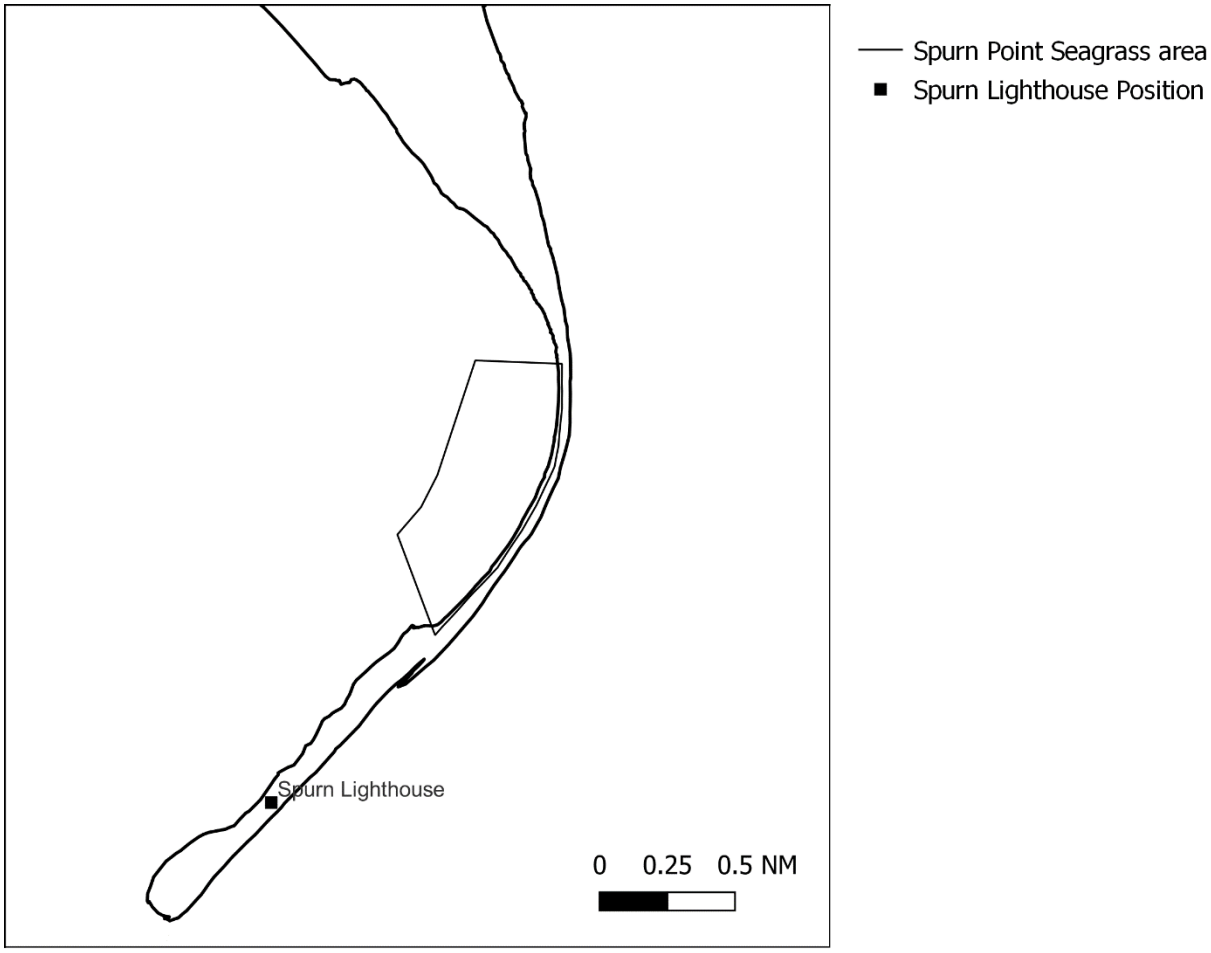
Explanatory note

(This note is not part of the byelaw)

The byelaw prohibits digging, using pots, traps, nets, trawls, dredges or similar devices or removing sea fisheries resources from within the Spurn Point seagrass Area defined in the byelaw, and establishes a permit scheme for demersal trawling within the Humber Estuary. The byelaw allows recreational rod fishing throughout the Humber Estuary. The intention of the XXIX Humber Estuary Fishing Byelaw 2016 is to protect important seagrass and sandbanks, protected –features and sub-features of the Humber Estuary European Marine Site.

Appended chartlets are for illustrative purposes only and are not to be used for navigation.

Spurn Point Seagrass Area



Humber Estuary area as defined in this byelaw