



**Strategic Assessment
2016**

Strategic Assessment 2016

Executive summary

This document is the first update of the Strategic Assessment 2015 – a status report of fisheries in the Eastern IFCA district, which incorporates environmental, social and economic factors, to guide Eastern IFCA’s decision-making. This risk based assessment for 2016 included two new criteria to better reflect the overall risk of fishery species groups. These criteria were i) current regulation and ii) ecosystem effects of fishing gears.

The 2016 assessment indicated that the risk rating for sustainability of whelk and bass fisheries has declined since 2015. In the case of whelks this was primarily the result of new Eastern IFCA management measures and in the case of bass, the measures implemented by the European Commission. In contrast, the shrimp and crustacean fisheries were both assessed as being at a higher risk (ranked first and second respectively) in 2016.

The application of additional criteria and contextual issues indicated that the shrimp fishery should be given the highest priority in 2016. Key work streams relating to this fishery should include management measures for the protection of sensitive habitats, and improved fisheries data collection and usage. The Crustacean fisheries are also regarded as a high priority. Related work-streams should be designed to complement Defra work on crab and lobster management and should reflect the designation of the Marine Conservation Zone at North Norfolk – the Cromer Shoal Chalk Beds and the new conservation advice regarding potting impacts on *Sabellaria* reef and boulder and cobble communities.

Further key gaps were identified in the demersal, flatfish and skate and rays groups (which could collectively be regarded as demersal fisheries) with regards to the impacts of non-commercial fishing, particularly netting. Given the importance of inshore nursery grounds and the impact this issue is having on several groups, the development of management measures for non-commercial fishing activity has been highlighted to be of high priority.

The 2016 assessment also identified key gaps in bass management, relating to Defra’s identification of bass nursery grounds – a project which Eastern IFCA is assisting. Furthermore, two workstreams were identified for the district’s most valuable fishery, bivalve molluscs – a robust biosecurity / contingency plan and development of the mussel bed regeneration project in The Wash.

It is important to acknowledge that where high value fisheries have been identified as having a lower risk, this is as a result of considerable resource already dedicated to the management of these fisheries (including research and impact assessments). An obvious consequence of reducing input into existing work streams for these fishery species groups would be that risk would likely increase.

Version History

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1.0 Introduction

1.1 Requirement for a strategic assessment

The inshore fishing sector is varied and dynamic with many different fisheries targeting a range of species using a spectrum of fishing gears. The inshore environment is also varied; the Eastern IFCA district hosts an array of marine protected areas (MPAs); it contains important spawning and nursery grounds for a variety of species and supports a wide range of industries in addition to the fishing sector. Effective fisheries regulation requires more than simple stock management – it needs a holistic approach encompassing environmental, social and economic issues.

IFCAs strive to maintain an effective regulatory framework capable of ensuring sustainable fisheries, healthy seas and a viable industry. This Strategic Assessment is conducted to identify fisheries related issues using a risk-based approach. The focus is on commercial fisheries, although recreational fishing activity is recognised for its importance in the district and issues relating to recreational fisheries have been incorporated into the assessment. Best available evidence is used to prioritise fisheries and environmental features which may require management measures and regulations which may need further development.

The inshore fishing sector is relatively data-limited – the under-ten metre fishing vessels which make up the vast majority of the inshore fleet are exempt from completing log books and carrying vessel monitoring systems. As such, this assessment is intended to be a live, dynamic document which will be reviewed and reissued in accordance with the best available evidence and with changing social and political drivers.

1.2 Approach

Fisheries were identified within Eastern IFCA's district using Marine Management Organisation (MMO) landings data. Species were grouped based on similarities with regards to biology, fishing methods and fisheries management approaches. Ten groups were identified (Annex 1) encompassing all the species landed commercially within the district. The grouping of fisheries in this 2016 edition has been refined compared to 2015 – rationale for the groupings is presented in Annex 1.

Each group was ordered and ranked according to criteria described in 1.2.1 below. In addition to the four criteria used in the 2015 assessment (landed weight, value, ICES¹ fisheries advice and available evidence), two new criteria were used in the initial assessment: i) existing regulatory structure and ii) ecosystem interactions of fishing gear associated with each species.

The initial assessment provides a list of fisheries in order of priority for management action according to the criteria (Section 2.3). A further assessment is then carried out which explores additional criteria which are not available for all species (for example presence and absence of spawning grounds) and other contextual drivers (for example concerns from the fishing industry). These contextual drivers are explored further at an internal meeting to determine priority based on the collective knowledge of Eastern IFCA's research, environment and enforcement teams.

1.2.1 Initial assessment

¹ International Council for the Exploration of the Sea – expert group providing regional seas fisheries advice

Each species was initially assessed against six criteria. The combined scores for each group was used to order groups with regards to each criterion and ranked accordingly. The mean rank after all criteria were applied was used to determine an overall rank for each group based on risk of sustainability issues. Criteria for the initial assessment were chosen on the basis that the assessment could be applied to all species (i.e. there was sufficient data) and on their relevance to determining the importance of a fishery and its sustainability. Criteria are detailed below.

1. Mean annual landed weight

Annual landed weight is used as an indicator of social and economic importance and as an indicator for effort. The assumption is that, the greater the annual landings, the more it represents a priority as a larger section of the fishing industry will rely on it and more effort is directed towards it. MMO data only were used as the methods of data collection have been consistent for at least the last five years and present a time series which can be used to determine trends and means. MMO landings data were selected only for those ICES statistical areas which correspond to inshore fisheries.

Limitations: MMO and Eastern IFCA landings data were used initially however only MMO data were used to prioritise fisheries by annual landed weight. MMO landings data have significant limitations in that there is no requirement to report landings of under 30kg. Within the inshore sector, particularly Suffolk, this could represent a significant amount of unreported fishing mortality. However, MMO data are thought to be more consistent and have a much greater coverage (i.e. include landings of most vessels) than Eastern IFCA landings data. Landed weight does not equate to effort, however in the absence of effort data (as is the case for almost all species) landings data can be used as a broad indicator of effort. In addition, these figures have not been considered in the context of total landings or stock sizes – i.e. whilst annual landed weight may be low for a certain species; it may still represent a significant proportion of that stock (this is however scrutinised in the additional criteria). Landings data was selected by area fished such that it corresponds with fisheries within Eastern IFCA's district, however reported fishing areas correspond with areas which do not sit entirely within the district and as such, there may be over-reporting with regards to landings of some species.

2. Mean annual value of landings

Annual value of landings is used as an indicator of social and economic importance. More risk is associated with greater annual value of landings. The rationale for this is that the species associated with greater annual landed values will likely be associated with a greater number of vessels and fishers. Furthermore, there is a greater potential risk to local economies from the inappropriate management of a fishery that has a greater economic value. When used in conjunction with landed weights, it can also provide an insight into the market worth of species (i.e. where landed weights are low but annual landed value is high).

Limitations: Higher economic value may not necessarily translate into more jobs/a greater number of fishers involved in fishing that species if landings are dominated by a few large vessels. The vast majority of vessels active in the

Eastern IFCA district are under 15m (most are under 10m) which are unlikely to be able to dominate landings in this way.

3. ICES advice

ICES advice pertinent at least to ecoregion IV was sought for all the species identified as being landed within the Eastern IFCA district. Advice was summarised as either favourable, not available/maintain effort or unfavourable and the associated species was given a score of 1, 2 or 3 respectively. The mean score was taken for species within a group, which was then ordered by score (highest mean score to lowest) and ranked accordingly. The assumption is that, the less favourable the advice, the higher the risk associated with that group.

Limitations: ICES advice represents a standardised method for providing advice to the European Commission on a yearly basis. It represents the most up-to-date indication of the well-being of a fishery stock or species. Where advice was available for a species, a 'favourable' was assigned when the advice was maintain or increase landings/catch. An 'unfavourable' was assigned to any species where a reduction was advised. Where advice was not available a score between favourable and unfavourable was given – the rationale for this is that, if no assessment has been produced, the species is less likely to have high effort associated with its capture and is at less immediate risk than if an assessment has concluded an unfavourable status. That said, if no assessment has been carried out, there is the potential that the status could be unfavourable or favourable, thus there is a greater risk than for species/stocks where the advice was favourable. In the case of crustaceans (brown crab and European lobsters) CEFAS² advice was used as ICES advice does not exist. The Whelk fishery was not assessed by ICES or Cefas but was given a score of 3 (unfavourable) as a result of an Eastern IFCA assessment conducted in 2015.

4. Available evidence

The available information for each species was considered. A subjective score of 1 (high confidence/sufficient data available) to 3 (Low confidence/little to no data available) was assigned to each of the following categories of information: Stock data (e.g. state of stock, size of stock etc.), Landings data and fishing effort. Scores for each data category are combined and a mean is taken for each group. Groups are ordered by combined mean (highest to lowest) and a rank was assigned accordingly.

Limitations: Where little information exists regarding the fishing activity of a species, it is considered at a greater risk from sustainability issues. Eastern IFCA's regulation and compliance strategy places an emphasis on evidence based regulation. Without sufficient and accurate information, management measures cannot effectively improve sustainability nor have a protective effect on the environment. This category is intended to increase the priority of groups where information is lacking to the extent that management measures would likely be less effective.

5. Fisheries management

² Centre for Environment, Fisheries and Aquaculture Science – the UK Government's fisheries advisor

This criterion is used to prioritise the risk of fisheries based on the current fisheries management. Three elements of fisheries management were used to determine risk associated with each species – protection of pre-spawning individuals (i.e. minimum landing size etc.), gear management or specification (e.g. mesh sizes, use of certain gears) and effort or landings restrictions (e.g. total allowable catches and quotas). The assumption is, where a species is managed for all of these aspects, the risk of sustainability issues is lower.

Limitations: Management of fisheries according to these criteria is only likely to reduce the risk of sustainability issues if the measures are appropriate. In several cases it could be argued that current management of the fishery is insufficient. For example, recent whelk management measures have been implemented which cover all three criteria and as such, scored highly in this assessment, however minimum landing size of whelk is still thought to be too low and is part of an ongoing research project to address this. The appropriateness of existing regulations is discussed further in the additional assessment (1.2.2) and applied as a contextual criterion.

6. Ecosystem impacts of fishing gear

This criterion assesses each fishery against six factors relating to gear impacts – fish size selectivity, species selectivity, by-catch mortality, ghost fishing, habitats effects, energy efficiency and catch quality. The assessment uses scores based on an assessment carried out by the FAO³ to determine the impacts of fishing gears in this wider sense. The scores relating to fishing gears associated with each species (which in most cases is a combination of gears) were used to order fishers by risk associated with gear impacts.

Limitations: The scoring system used from the FAO research takes a wide range of criteria into account, some of which have more political context than others – for example by-catch and habitat damage were weighted the same as energy efficiency and catch quality. Additional emphasis is placed on certain factors within the additional assessment in accordance with the contextual issues surrounding each fishery. In addition, where a species is thought to be targeted by more than one gear, the mean score from both of those gears was used; this is unlikely to reflect the proportion of fishing activity relating to each gear.

1.2.2 Priorities in the context of other drivers and additional criteria

The initial assessment provides an indication of the risk posed by the fishing activities on a limited number of criteria. To more fully explore the risk associated with each fishery, additional criteria are applied where the data is available for a fishery and other contextual issues are explored. Below is an explanation of the additional factors and contextual issues which are also taken into consideration.

Spawning and nursery grounds – Inshore fisheries tend to be small scale (vessels mostly under 10 metres) and inefficient – making up the majority of the UK fishing fleet with only a fraction of the landings. However, where spawning or nursery grounds occur (as is often the case for inshore areas), even small scale fishing activities can have a disproportionate effect on the wider stock dynamics of a species. The assumption is that there is a greater risk to fisheries sustainability and wider ecosystem impacts where fishing effort overlaps spatially with spawning or nursery grounds.

³ Food & Agriculture Organisation, a United Nations advisory body

The primary sources of spawning and nursery ground evidence is found within Ellis *et al* 2010⁴ and an Eastern IFCA research report on the composition of commercial catches (2014)⁵.

Fisheries trends – MMO data has been used to assess whether a trend can be observed from landings data for the period 2010-2014 (five years). A strong positive or negative trend is associated with a higher risk and a greater priority.

Recreational activity – Data on recreational activity is limited for most species. The outputs of the Angling 2012 project have been used to judge important recreational species. Recreational landings are not included in MMO landings figures however recreational landings are thought to contribute a significant amount of fishing mortality to certain species. Furthermore, recreational fishing plays an important economic role within the district although this is not reflected in the MMO landings figures.

The primary source of recreational angling evidence is found within Armstrong *et al*. 2013⁶.

Gear related impacts – Fishing activity has impacts beyond the effects on the targeted species. By-catch and damage to habits for example varies from gear to gear with some gears known to have greater 'ecosystem' level impacts than others.

Eastern IFCA is currently undertaking an assessment of all commercial fisheries in European Marine Sites (a type of MPA) within the district. This assessment will determine where fishing activity may be having a detrimental effect on features associated with protected areas and consequently where management measures are required. This is primarily a political driver and leads to a greater weighting of habitat effects of fishing gear when considering associated risk.

General biology – General population dynamics are known for most commercially important species. Aspects of the general biology (for example age at sexual maturity) are also taken into account as an indicator of sustainability.

Political/social context – In addition to prioritising fisheries and regulations by risk, there are also political and social drivers for change, for example Defra's revised approach to fisheries management, landings obligations and the Common Fisheries Policy reform. In some cases, the requirement to act through these drivers outweighs other perceived risks to fisheries.

⁴ J.R.Ellis, S.Milligan, L.Readdy, A.South, N.Taylor and M.Brown: 2010. MB5301 Mapping spawning and nursery areas of species to be considered in Marine Protected Areas (Marine Conservation Zones); Report No 1: Final Report on development of derived data layers for 40 mobile species considered to be of conservation importance.

⁵ S. Thompson: 2014 Composition of commercial finfish catches. Eastern IFCA Research Report.

⁶ M.Armstrong, A.Brown, J.Hargreaves, K.Hyder, S.Pilgrim-Morrison, M.Munday, S.Proctor, A.Roberts, K.Williamson: 2013. Sea Angling 2012 – a survey of recreational sea angling activity and economic value in England.

2. Results

2.1 Initial assessment

A mean rank across all six initial criteria was used to determine the relative risk associated with each fishery (table 1). The intention is that the fisheries as listed below are also viewed in the context of additional criteria and wider political and social drivers to determine their ultimate priority for 2016.

Group	Annual landings weight rank	Annual value rank	ICES advice rank	Available information rank	Fisheries management rank	Gear impact rank	Mean Rank	Overall Rank
Shrimp/prawns	3	1	5	6	3	1	3.2	1
Crab and lobsters	4	2	1	8	1	10	4.3	2
Skate/Ray	7	7	2	1	6	4	4.5	3
Demersal	5	6	3	4	5	5	4.7	4
Flatfish	6	5	4	5	8	2	5	5
Dogfish/sharks	9	9	5	1	4	2	5	5
Cephalopods	10	10	5	1	2	6	5.7	7
Bivalve Mollusc	1	3	5	10	9	7	5.8	8
Whelks	2	4	5	9	10	9	6.5	9
Pelagic	8	8	5	7	7	8	7.2	10

Table 1. Fisheries are ordered by the risk of sustainability issues associated with the initial criteria. A fishery is ranked higher if it a higher risk according to the assessment of each category (i.e. 1 = highest risk and 10 = lowest risk).

There are marked differences in the order of fisheries in comparison to last year. The two new criteria used in the initial assessment have had an effect on this order. In addition, work implemented as a result of the 2015 strategic assessment has also had an effect. Notable changes to the order of fisheries compared to last year are highlighted below.

Whelks – in 2015 the whelk fishery was ranked 1st overall as a result of the initial assessment. The 2016 scores associated with annual landings, value and ICES advice have not changed markedly from 2015. However, the available evidence associated with the whelk fishery has improved since the implementation of whelk management measures. In addition, the whelk fishery scored well in 2016 with regards to gear impact (being a potting fishery) and fisheries management (as a result of Eastern IFCA management measures).

Bivalve molluscs – Bivalve molluscs were ranked second in the 2015 assessment primarily as a result of high landings and value. Through the application of additional criteria during the 2015 assessment, bivalve mollusc fisheries were given a medium priority despite ranking so highly in the initial assessment to reflect Eastern IFCA's management measures, including use of Habitat Regulations Assessments to open each fishery. The position of the fishery in the present assessment after the initial assessment better reflects the reality of the situation. That said, there are still issues which have been flagged up in the additional criteria.

Bass – bass fisheries were not considered in isolation in the present assessment. Bass fisheries were considered separately from other demersal species in 2015 due to the

differences in management structure. During 2015, bass measures have been implemented by the European Union which reflects management of other demersal species; the monthly catch limits for bass for example are similar to monthly quotas although administered in a very different way. As such, from a strategic point of view, key elements of bass fisheries management have been administered by the European Commission so for the current assessment they are considered as part of the group 'demersal'. Ongoing stock sustainability risks associated with the bass fisheries have resulted in risk of this demersal species group increasing in comparison to last year.

2.2 Fisheries management in MPAs

The majority of the Eastern IFCA district is protected by marine protected area designations (Table 3). These sites contain a range of species and habitat features that require protection. IFCAs have a duty to ensure fisheries are managed in accordance with MPA conservation targets. An on-going work-stream to assess the impacts of commercial fishing activities within MPAs has delivered a better understanding of where management is required. Assessments account for the current levels of fishing activity but these will potentially change over time.

Eastern IFCA routinely collects data to monitor fishing activity and compliance within managed areas. However, additional work is required to demonstrate Eastern IFCA's responsive monitoring and management of fisheries in MPAs. Following the completion of fisheries assessments in MPAs, plans will be developed to show how Eastern IFCA will monitor and respond to changes in fishing activity, which could lead to significant impacts on MPAs.

The protection of MPAs from potentially damaging fishing activities is a key role and obligation of Eastern IFCA's work. This is factored in to the additional assessment for each fishery (Section 2.3).

Table 3 (below) shows marine protected areas within the district and indicates the key fisheries management issues for each site.

Site name	Key issues for fisheries management
Humber Estuary Special Protection Area (SPA) <i>and</i> Humber Estuary Special Area of Conservation (SAC)	North-Eastern IFCA leading assessment of these two sites. Management measures in place for the protection of eelgrass (Eastern IFCA Protected Areas byelaw: Regulatory Notice 4). Other features have been provisionally assessed and no adverse effects determined at current levels of activity. Potential cockle fisheries (Horse Shoe Point) will have to take into account of bird food dynamics and bird disturbance.
Gibraltar Point SPA	Has been provisionally assessed; no adverse effects determined at current levels of activity.
The Wash and North Norfolk Coast SAC	Fishing activity assessments are on-going. Annual cockle and mussel fisheries managed under the Wash Fishery Order are assessed and managed in accordance with the site's conservation objectives. Management measures in place for the protection of <i>Sabellaria</i> reef (Regulatory Notice 1), cobble and boulder communities (Regulatory Notice 2) in The Wash and eelgrass on the North Norfolk Coast (Regulatory Notice 3).

	<p>Management measures are required in relation to bottom towed gears (primarily shrimp fishing) on sensitive habitats (sub-tidal mixed sediments and sub-tidal mud).</p> <p>Management measures are also potentially required for the protection of <i>Sabellaria</i> reef and boulder and cobble communities from damaging levels of pot fishing activity.</p>
The Wash SPA	<p>Annual cockle and mussel fisheries managed under the Wash Fishery Order are assessed and managed in accordance with the site's conservation objectives.</p> <p>Other, non-Wash Fishery Order fisheries has been provisionally assessed and no adverse effects determined at current levels of activity.</p>
North Norfolk Coast SPA	Has been provisionally assessed and no adverse effect determined at current levels of activity.
Cromer Shoal Chalk Beds Marine Conservation Zone (MCZ)	The site was designated in January 2016 – assessments are required to determine if fishing activity could have an impact on the designated features. Any management measures would be developed through dialogue with stakeholders.
Breydon Water SPA	Has been provisionally assessed; no adverse effects determined at current levels of activity.
Alde, Ore & Butley Estuaries SAC	Has been provisionally assessed; no adverse effects determined at current levels of activity.
Alde & Ore Estuaries SPA	Has been provisionally assessed; no adverse effects determined at current levels of activity.
Orfordness to Shingle Street SAC	Has been provisionally assessed; no adverse effects determined at current levels of activity.
Deben Estuary SPA	Has been provisionally assessed; no adverse effects determined at current levels of activity.
Stour and Orwell Estuaries SPA	Bait digging highlighted as potential cause of disturbance to over-wintering birds. Voluntary code of conduct in place which limits bait digging activity to less sensitive areas during winter. Eastern IFCA monitor compliance. Natural England lead on management of the bait digging activity at this site.
Inner Dowsing, Race Bank & North Ridge Site of Community Importance (SCI)	Eastern IFCA to manage the 0-6nm part of this site, which extends beyond 12mn offshore. <i>Sabellaria</i> reef requires protection from towed demersal gear; Eastern IFCA to implement Regulatory Notice for this purpose. Other fishing impacts (including potting) to be assessed.
Haisborough, Hammond & Winterton SCI	Eastern IFCA to manage the 0-6nm part of this site, which extends beyond 12mn offshore. <i>Sabellaria</i> reef requires protection from towed demersal gear; Eastern IFCA to implement Regulatory Notice for this purpose. Other fishing impacts (including potting) to be assessed.
Outer Thames Estuary SPA	MMO undertook assessment of this site, which extends from the coast to beyond 12nm. No adverse effects identified at current levels of activity.

In January 2016 Defra opened consultations on the extension of the Outer Thames Estuary SPA to include the Rivers Yare, Bure and Blyth, and the designation of a new SAC for the protection of Harbour porpoise in the North Sea. In addition a new SPA to protect certain seabirds in the southern North Sea is anticipated to be announced in

spring 2016. Each of these new/extended MPAs will require fisheries assessment and management should adverse effects be identified.

2.3 Priorities in the context of other drivers and additional criteria

The outputs of the initial assessment are a starting point to further explore the risk associated with each group and ultimately determine the priorities for 2016. Each group is discussed below with regards to additional criteria and contextual issues. A risk profile is produced for each group which is determined to be of a high or medium priority (section 3.1).

2.3.1 Bivalve molluscs

Bivalve molluscs encompass some of the largest and most valuable fisheries in Eastern IFCA's district. The main molluscan shellfisheries are the Wash Fishery Order (WFO) 1992 cockle and mussel fisheries, although locally important fisheries are also operated outside of The Wash. Eastern IFCA has an established regulatory structure and research programme aimed at maintaining long-term, sustainable fisheries in the Wash Fishery Order area. Bivalve mollusc fisheries were ranked eighth in the initial assessment which reflects our understanding of the fishery and the measures in place to ensure sustainability. In addition, Eastern IFCA completes a Habitat Regulations Assessment each year for cockle and mussel fisheries in The Wash to ensure protected habitats and species are not detrimentally impacted by the activity.

The regulations made under the Wash Fishery Order 1992, which is used to manage the fisheries within The Wash, are currently under review with a view to improve the enforceability of the Order. WFO management policies are also being reviewed (by virtue of their expiry date). In addition, three byelaws inherited from Eastern Sea Fisheries Joint Committee and one from North Eastern Sea Fisheries Committee relate to bivalve mollusc fisheries outside of The Wash and are under review as part of the wider byelaw review. Furthermore, the cockle fishers within The Wash are very active and have raised concerns regarding the sustainability of the fishery on many occasions. As such, it should be considered that whilst the bivalve mollusc fisheries scored well in terms of existing regulation, such regulation is being reviewed for its effectiveness and this is warranted given the size (in terms of vessels and landings) and value of the fisheries.

There are also two work streams currently on-going with regards to sustainability of shellfish fisheries within the Wash: the biosecurity review and the mussel regeneration project. Biosecurity planning and contingency measures are outdated in The Wash and work is being undertaken to remedy this. This is not reflected in the initial assessment and should be considered as a serious risk especially given the value of the shellfish fisheries. Potentially linked to this is the poor stock status of mussels within The Wash. Mussel stocks have been declining over the last four years, despite a lack of fishing activity, and are currently unable to support a fishery. A research project is currently underway to investigate methods of re-establishing mussel beds within The Wash. In addition, concerns from the industry have been received regarding mortality seen in 2 to 3-year old mussels in The Wash.

An unknown mortality has also been identified in The Wash cockle stocks, but has not had such a drastic effect on the population, or on fisheries, because of abundant natural recruitment.

There is also a potential large scale cockle fishery in the Humber Estuary at Horse Shoe Point. Eastern IFCA has inherited a byelaw from North Eastern Sea Fisheries Committee

(Byelaw XXIV. Humber Estuary Cockle Fishery Byelaw) which is currently being used to maintain a closure on the fishery.

An Eastern IFCA cockle survey concluded that there was a viable stock from which a fishery could occur in 2015 however, concerns regarding damage to the environment as a result of landward access to the fishery were raised by Natural England and a viable solution was not found. Interest in exploiting the fishery has not continued since possibly as a result of the good Wash cockle fishery in 2015/16. There may be scope for a fishery if access to the fishery was from the sea.

The inherited byelaw which would enable Eastern IFCA to manage the fishery requires review but would suffice to manage the fishery (probably in combination with other Eastern IFCA byelaws) in the short term. To more effectively manage the fishery going forward, and to future-proof Eastern IFCA byelaws against any other shellfish fisheries, the inherited byelaw requires review.

The bivalve mollusc fishery is overall considered a medium priority, not at immediate threat of sustainability issues but requiring further action to ensure that the existing measures and management policies are adequate. In addition, important gaps are identified in the management of these fisheries regarding biosecurity and the poor performance of the mussel fishery including die-off and poor settlement. It should also be noted that the low risk associated with this fishery is a reflection of the high resource input (i.e. annual stock assessment, Habitat Regulations Assessment and existing regulatory framework).

2.3.2 Crabs and lobsters

Crustacean fisheries relate primarily to the edible crab and European lobster fisheries. Both of these species have recently been assessed as being in “unfavourable condition” by Cefas and an Eastern IFCA research project, meaning action may be required to reduce fishing mortality.

Initial assessments of fishing activities in European Marine Sites have found there is potentially a risk of the fishing gear (pots) having a detrimental impact on certain habitats (despite static fishing gear – pots and traps – being recognised as less impacting than towed demersal fishing gear). Management measures may be required in The Wash for the protection of *Sabellaria* reef and cobble and boulder communities (subtidal stony reef) which are currently protected from bottom-towed gear. This is also applicable for the newly designated Cromer Shoal Chalk Beds Marine Conservation Zone on the North Norfolk Coast) where there is concern that any increases in fishing effort may have a detrimental impact on the seabed habitats.

Crustaceans ranked second in the initial assessment which is a reflection of the factors outlined above and the importance of the fishery with regards to the quantity landed and the value of that catch. In addition, there are limited regulations in place for their protection (minimum landing size only). Eastern IFCA inherited four byelaws relevant to crustacean fisheries which require review as part of the wider byelaw review. None of these byelaws encompass either effort, landings or gear controls which may benefit the fishery. In addition, there is limited confidence on the data relating to the fishing activity for these species.

Defra are currently evaluating the fishing effort within the crab and lobster fisheries and are likely to implement regional management plans. Conflict between emerging Defra

measures and the implementation of Eastern IFCA measures should be avoided by ensuring a coordinated approach is taken.

The Crustacean fisheries are considered a high priority as a result of the recent unfavourable assessments and lack of suitable management measures. However, they are not considered at an immediate risk and work being undertaken by Defra may lead to a resolution in the coming year. Whilst it is a high priority to address the gaps associated with this fishery, it may be achieved through a collaborative approach with Defra (including for example the review of the Eastern IFCA crab and lobster byelaws). Regard must also be given to pending advice relating to the conservation status of the Cromer Shoal Chalk Beds MCZ and the protection of sensitive habitats in The Wash

2.3.3 Demersal

Demersal species were ranked fourth in the initial assessment which is primarily a reflection of unfavourable ICES advice. The group includes the species bass which has been included on the basis that it is managed in a similar manner to other demersal species now – in contrast to 2014 (the 2015 assessment) where it was determined as a high priority primarily as a result of a lack of management and unfavourable ICES advice. It is important to note that the European Commission has now implemented measures it feels are appropriate to mitigate the risk to the bass fisheries but that they are still at risk of over-fishing. Defra are also working towards implementing further bass nursery areas within Eastern IFCA's district – work officers are actively participating in and providing crucial evidence bases. Many demersal species (including flatfish and skates and rays) have important nursery and spawning grounds within the inshore environment, and impacts on these can have disproportionately large effects on the adult / recruitment stock further offshore. As such, work relating to the protection of these juvenile fish and associated habitats will likely have a disproportionately large beneficial effect on fisheries.

Demersal species are heavily regulated by European measures and do not constitute a significant fishery in relation to MMO landings data. That said, under-reporting of landings is suspected and some species (including bass) are thought to suffer from high fishing mortality from unregulated netting – a form of Illegal, Unreported and Unregulated (IUU) fishing activity. Whilst Eastern IFCA can enforce certain measures relating to this issue (for example minimum landing size) there is currently limited regulation in place to limit effort of unlicensed (non-commercial) fishers. As much of this activity is unreported, there is a significant gap in our understanding of the resultant fishing mortality. Furthermore, some fishing methods (such as fixed and drift nets) are capable of taking significant amount of fish, possibly to the detriment of wider stocks given the importance of the inshore region as a nursery area.

Eastern IFCA is currently investigating the levels of unregulated netting within the district in an attempt to quantify the issue (which cannot be highlighted in the initial assessment due to an inherent lack of data) with a view to proportionately mitigate the risks posed by the activity, potentially through the implementation of new byelaws.

Grey Mulletts and John Dory both show strong positive trends indicating that landings are increasing although, landings from within the district account for less than 0.5% of the UK's landings (5.2 tonnes of mullet in 2014 and 42kg of John Dory landed in 2014). Whilst landed weights are low, there is likely to be an element of under-reporting particularly in Mullet and landed fish associated with recreational fishing. The demersal

group in general has several species which are prone to unquantifiable risk to recreational fishing (particularly mullet, bass and cod). Certain species which were previously not particularly desirable may also become more so from a recreational point of view in response to prohibition on landing bass recreationally for the first six months of 2016. Continued monitoring will be required to detect any shifts in which species are targeted.

Commonly used fishing methods include bottom towed trawls – a method which is already partially restricted in The Wash due to its detrimental interaction with sensitive habitats. Assessments into the impacts of bottom towed trawls throughout the EMS within the district have not concluded likely significant effects in many areas due to low or no fishing effort. However, any areas to be closed to shrimp trawling are likely to require restrictions on bottom towed trawls also.

In addition, this group is the most likely to be effected by recreational angling. There are no reporting mechanisms for recreational fishing and as such the impact on the stocks is unknown. Generally the recreational sector is considered to have limited gear impacts however, are capable of taking a large amount of fish. Recreational use of some gears – i.e. fixed nets – have a high risk associated with them due to their ability to remove large numbers of fish.

The demersal fisheries are considered a medium priority which reflects that the highest risk species within the group is now being managed through European Measures but that a risk of sustainability issues still exists, primarily through a lack of regulation with regards to inshore unregulated netting. Gear management may be necessary as a result of assessments of fishing activity in European Marine Sites.

2.3.4 Dogfish/sharks

Landings of lesser spotted dogfish show a strong upward trend, increasing from 1 tonne in 2010 to 12 tonnes in 2014. Despite this relatively low catch this does account for more than 2% of UK landings. Dogfish are primarily a by-catch species and as such, increased catches may indicate a healthy population which is reflected in the favourable ICES advice. Dogfish are often used as bait in potting fisheries and as such do not have a particularly high value in the industry.

Prohibitions on landings are in place for most shark species (including for example the Eastern IFCA Tope byelaw) and as such are protected via national and European legislation.

Dogfish/sharks are considered a low priority which reflects favourable ICES advice and low levels of catch and value.

2.3.5 Flatfish

Mean annual landings of sole account for 3.4% of total UK landings and value of landings into the district in 2014 was £379,666 making sole an important species. Whilst sole is managed under European TACs and quota regulations, there are important nursery grounds within Eastern IFCA's district including in the Humber, The Wash and estuaries around the East Coast for which there is no additional management except for an inherited byelaw (NESFC Byelaw – fixed engines) which requires review by virtue of the byelaw review.

The weight of flounders landed in 2014 increased significantly on 2013 (from 4 tonnes to 19 tonnes) and the proportion of UK catch landed within the district doubled but is still low (from 0.2% to 0.4%).

Flatfish species are also often targeted by recreational anglers for which there is limited data for fishing mortality. Furthermore, unregulated netting (I, U Ufishing) is likely to be having an impact particularly in estuaries where nursery grounds also exist.

Flatfish fisheries often deploy bottom towed gears which can cause significant levels of habitat damage and have been restricted over certain sensitive habitats within the district already. Despite low levels of activity suggested by relatively low landed weights, significant ecosystem damage can still be caused by this gear. In addition, there is little available information regarding the location and levels of activity of bottom towed gears within the district.

Flatfish fisheries are considered medium priority primarily as a result of the presence of important sole and other flatfish nursery grounds within the district and the relatively high economic importance of sole. The inherited byelaw from NESFC has a protective effect however requires review by virtue of the byelaw review. The fishery is also targeted by recreational anglers and unregulated fishing activity for which no data exists. Gear management may be necessary as a result of assessments of fishing activity in European Marine Sites.

2.3.6 Cephalopods

Landings of Cephalopods are the lowest of any fishery within the Eastern IFCA district. This fishery includes species not often targeted and is not associated with gears which are thought to be of significant impact.

Cephalopods are considered a low priority as a result of low activity and low impacting fishing practices.

2.3.7 Pelagic

Pelagic fisheries were ranked last after the initial assessment as a result of low landed weight, low value, relatively favourable ICES advice and a relatively good understanding of the fisheries at least at a stock level. In addition, fishing activities are thought to have a low ecosystem impact with the exception of netting within rivers – particularly for smaller species. Gill netting for herring and sprat is very unselective due to the small mesh size used and is thought to potentially have an impact on other species including juvenile/pre-spawning individuals.

Pelagic fisheries are considered a low priority as a result of low activity, low economic importance and low impact gear except in the case of Illegal, Unregulated and Unreported netting.

2.3.8 Shrimp/prawns

Over the last five years, brown shrimp landed within the district represents 94% of UK landings – as such, this fishery is a nationally important fishery which also has a high economic value and high activity which is concentrated within The Wash – one of the most important and heavily designated conservation sites in the UK. Shrimp trawls are also thought to have a detrimental impact on sensitive habitats and have been restricted

in certain areas of The Wash already. Impacts of shrimp fishing on habitats within The Wash have been assessed and have been found to require additional management measures.

In addition to potential impacts on habitats, gear associated with shrimp fisheries is thought to have wider ecosystem impacts, particularly as a result of bycatch of juvenile fish due to very low mesh sizes. There is national legislation in place for the protection of flatfish and some demersal species with regards to bycatch, however, the landings obligation is likely to increase the amount of juvenile fish removed as a result of shrimp fisheries, particularly where they occur within estuaries. Concerns have been raised by the industry regarding small (yet legal) mesh sizes which are taking smaller, lower quality shrimps and having a detrimental effect on the fishery. There is also limited information on the levels of activity although this is being addressed in The Wash by the introduction of mandatory catch returns. Additional information is required in other parts of the district.

The above also relates to the viability of the shrimp fishery in the long-term with regards to MSC accreditation – accreditation will likely require progress with the issues identified – without accreditation the shrimp fisheries within the district could potentially lose market share of the Dutch markets the majority of the shrimp is sold to.

Landings of pink shrimps within the district have declined over the last 5 years but still represent 2.5% of UK landings. Much of the pink shrimp landed is likely to be as a result of brown shrimp by-catch and the reduction in landings is likely to be partly as a result of closures on shrimp grounds to protect sensitive habitats.

Shrimp fisheries are considered a high priority as a result of high economic importance but also due to the potential impacts on habitats which are also of national value and wider ecosystem impacts (particularly bycatch) – more fisheries information is required as a priority.

2.3.9 Skates and rays

Skate and ray fisheries ranked third in the initial assessment primarily as a result of unfavourable ICES advice and limited information. Skates and rays have biology which makes them particularly sensitive to overfishing (primarily slow maturation and low fecundity). Nursery grounds are thought to be present within Eastern IFCA's district. There is currently no minimum landing size for skates or rays.

Skates and rays do not represent a particularly important fishery in an economic sense and activity is likely to be low and is managed in part by European catch limitations (quotas and TACs). That said, landed weight of thornback rays have showed an increasing trend over the last five years and represented 2.6% of UK landings in 2014. There have also been reports of thornback rays being landed but not reported.

There is a continuing need to collect more information regarding the fishing activity of skates and rays within the district.

The skate and ray fisheries within the district are considered a medium priority as a result poor ICES advice and a lack of available evidence. There are limited regulations in place and the biology of this species makes it vulnerable to overfishing. This fishery is not considered a high priority primarily due to the limited economic importance of the group and assumed low levels of activity.

2.3.10 Whelks

The whelk fisheries within Eastern IFCA’s district were ranked highest in the 2015 Strategic Assessment and prioritised as high. During 2015 the gaps identified in the management of the whelk fisheries were addressed and as a result, the risk associated with this fishery has reduced. This is reflected in the initial assessment which ranked whelk fisheries ninth overall.

Whilst landings and economic worth has not reduced since the 2015 assessment, the available evidence and regulations in place have reduced the risk associated with this fishery. One key aspect of the whelk fishery which has not yet been addressed is the understanding of stock status which is also being addressed by a current research project.

Whelk fisheries are considered a low priority as a result of a relatively good understanding of the fishery and the regulatory measures in place. Gaps in the 2015 assessment are currently being addressed. Management of potting (for whelk, crab & lobster) may be required in The Wash for the protection of sensitive features as per the fisheries in MPAs project.

2.3.11 Overview of priorities

The initial assessment gives a broad indication of the risks associated with each fishery. The wider contextual issues and additional assessment enables prioritisation of these fisheries to support planning of Eastern IFCA’s annual work streams.

Table 3 (below) indicates the priority which has been allocated to each fishery after the additional assessment and internal discussions.

Group	Annual landings weight rank	Annual value rank	ICES advice rank	Available information rank	Fisheries management rank	Gear impact rank	Mean Rank	Overall Rank
Shrimp/prawns	3	1	5	6	3	1	3.2	1
Crabs and lobsters	4	2	1	8	1	10	4.3	2
Skate/Ray	7	7	2	1	6	4	4.5	3
Demersal	5	6	3	4	5	5	4.7	4
Flatfish	6	5	4	5	8	2	5	5
Dogfish/sharks	9	9	5	1	4	2	5	5
Cephalopods	10	10	5	1	2	6	5.7	7
Bivalve Mollusc	1	3	5	10	9	7	5.8	8
Whelks	2	4	5	9	10	9	6.5	9
Pelagic	8	8	5	7	7	8	7.2	10

Table 3. Strategic priority is indicated by colour – red = high, amber = medium and green = low.

2.4 Key Sustainability Issues for 2016

The above contextual issues and risks determined the sustainability risks for 2016/17. Table 4 indicates the key issues and provides rationale for their allocated priority.

Table 4. Key sustainability issues identified for 2016/17			
Sustainability issue	Fishery	Priority	Rationale
Eastern IFCA bottom towed gear management	Shrimp fishery (and other bottom towed gear fisheries)	High	Associated with the highest risk and highest priority fishery. Required outputs are the protection of sensitive MPA habitats, gear trials and support for industry viability towards accreditation.
Shrimp fishery information gathering	Shrimp fishery	High	Gather data and evidence to better understand fishing effort both spatially and temporally to inform wider management of the shrimp fishery.
Potting fisheries in The Wash (Wash and North Norfolk Coast EMS) over cobble and boulder communities and <i>Sabellaria</i> reef.	Crab and Lobster, whelks	High	After an initial assessment, it has been concluded that there may be adverse effects on cobble and boulder communities and <i>Sabellaria</i> reefs within the Wash and North Norfolk Coast SAC. Management measures may be required by December 2016.
Crab and lobster fisheries management / review inherited byelaws in line with wider management needs	Crustaceans	High	The crab and lobster fisheries within the district are highly valuable and recent scientific evidence suggests that they are in need of greater management. Defra are presently leading on a project to further the sustainability of crab and lobster fisheries and a partnership approach with Defra is required. Eastern IFCA crustacean byelaws need to be reviewed in line with this Defra project.
Potting fisheries on the North Norfolk Coast in relation to protection of Cromer Shoal Chalk Beds MCZ	Crustaceans	High	The Cromer Shoal Chalk Beds MCZ has been designated. Management measures (if required) to protect the features need to be in place by Dec 2018. Early assessment will highlight data needs to build a robust conclusion.
Unregulated netting / fishing management	Demersal Skate and rays Flatfish	High	Associated with three medium risk fisheries – this output is likely to have wide-ranging benefits. Eastern IFCA is currently unable to enforce unregulated fisheries and a two-year evidence gathering project has provided limited data. In addition, the inherited NESFC 'fixed engine' byelaw requires review in line with a wider management approach to non-commercial netting.
Mussel die-off	Bivalve molluscs	High	High degree of concern from the industry regarding die-off of mussels in The Wash. Research into the cause has been conducted ad-hoc over the last couple of years but tests (conducted by Cefas) have

			been inconclusive. Additional investigation is required.
Lack of fisheries data	Skate and rays, Demersal Flatfish	Medium	Three groups identified as medium may present a higher risk in future assessments. All three fishery groups suffer from a lack of data, particularly in relation to spatial data and effort.
New conservation designations within district	All	Medium	In addition to the newly designated MCZ, two new EMS and extensions to an existing EMS are anticipated within the district over the next year. Evidence will be required to inform Habitat Regulations Assessments for fisheries in these sites. A key data gap is information on fixed and drift netting.
Mussel regeneration	Bivalve molluscs	Medium	Associated with the medium priority bivalve mollusc fisheries – in particular the Wash Fishery Order regulated mussel fishery. This output will have both economic and wider environmental benefits.
Biosecurity measures	All species (primarily bivalve molluscs)	Medium	A robust biosecurity plan / contingency plan will have a protective effect on the most valuable fishery in the district (the cockle fishery) and the private shellfish fisheries in The Wash.
Review trawling restriction (inherited byelaw)	Demersal / flatfish	Medium	An inherited byelaw relating to trawling restrictions for certain sized vessels is currently in place for the former North-Eastern Sea Fisheries Committee part of the district, which is at odds with an Eastern IFCA byelaw for the rest of the district. This byelaw requires review taking into account the sensitive sole nursery grounds on the Humber Estuary and the risks associated with demersal fisheries in general.
Review Regulatory Notices	Shrimps/prawns (also demersal) and hand gathering.	Medium	The four existing Regulatory Notices created under Eastern IFCA's Protected Area Byelaw in 2014 were designed to be reviewed at set intervals. The first review must be completed by March 2017.
Monitoring fishing activity in MPAs	All	Medium	The majority of fisheries assessed for impacts on EMSs were found to not cause adverse effect at current levels of activity. Fishing activity monitoring plans are required to demonstrate how changes in spatial distribution, gear types and effort levels will be recorded. The plans also need to show how Eastern IFCA will respond to changes in fishing activities in relation to potential impacts on designated MPAs.

Wash Fishery Order 1992	Bivalve molluscs	Medium	The Wash Fishery Order 1992 expires in 2022. The making of a new Order will take considerable time and as such needs to be considered well in advance of the expiry date.
Horse Shoe Point cockle fishery – shellfish fisheries outside The Wash	Bivalve molluscs	Medium	Shellfish fisheries outside of the Wash are managed through several Eastern IFCA and inherited byelaws. Management of shellfish fisheries would benefit from a review of these byelaws to allow for management more in line with modern practices. Furthermore, there is potential for a cockle fishery at Horse Shoe Point which could be managed through existing measures but would benefit from new measures.

3. Conclusions

3.1 Summary

Two fisheries have emerged as high priority for 2016: the Shrimp/prawn fishery (particularly The Wash brown shrimp fishery) and the crustacean (crab and lobster) fisheries. Work conducted in 2015 filled the gaps identified in the previous high priority fishery: whelks – an emergency byelaw was used initially to manage the at-risk fishery, permanent measures are being implemented and a research project is underway to inform flexible management measures.

The bass fishery was regarded separately in 2015 as it was managed at odds with other demersal species in the UK and was prioritised as high in 2015. During the year management at a European level has seen the implementation of measures for the protection of bass and the species is now managed more in line with other demersal species. In addition, Defra is working to introduce new nursery areas for the protection of juvenile bass. Bass are still at risk given advice from ICES that stocks are in very poor condition, but the issue is now more operational (that is, ensuring compliance with the new measures) than strategic with the exception of unregulated netting for which there is no specific regulation – new regulation may be of benefit regarding this issue.

The high priority fisheries for 2016 are both highly valuable fisheries in the Eastern IFCA district, which have limited regulation for ensuring sustainable levels of effort. In addition, both the shrimp and crab and lobster fisheries are associated with potentially damaging fishing practices (particularly shrimp beam trawls) and are linked with the ongoing 'fishing activity in European Marine Sites' assessments. In the case of the shrimp fishery, gear impacts are likely to be wider ranging, potentially impacting on the juvenile fish species through bycatch. The crustacean fisheries in north Norfolk require assessment in relation to the new MCZ designation.

Skate and rays, demersal, flatfish and bivalve molluscs were all identified as of medium priority. The risk associated with the skate and rays fisheries is largely due to the lack of regulation and understanding of the biologically vulnerable species. Flatfish and bivalve mollusc fisheries are both more important economically but also have regulation currently in place for their protection – albeit regulation which has also been identified as requiring review.

It is important to highlight that the low risk associated with some of the high value fisheries (i.e. bivalve molluscs and whelks) is a result of the resources used to manage the fishery – including the research involved. An obvious consequence of reducing the resource input in these fisheries would likely result in a higher risk of fisheries sustainability.

3.2 Risk profiles

Risk profiles for the high and medium priority groups are presented below.

December 2015

Group: Shrimps & Prawns

Relative Risk Rank: 1

Priority: High

ICES Advice: N/A
Nursery areas within District: yes
Spawning areas within District: Yes

Main concerns:

Landings (high weight and value), ecosystem impacts of shrimp beams, by-catch (particularly juvenile fin fish in nursery habitats), damage to sensitive habitats, the fishery is very data limited (particularly effort).

Current Regulations:

None specifically related to shrimp stock sustainability; Excluded area (Protected Areas byelaw) for protection of EMS features. Eastern IFCA Inshore trawling restriction prohibits trawling in small parts of the district and sets vessel size restrictions (also restrict gear size) in other parts of the district. Technical conservation measures relate to mesh sizes, beam widths and the use of veil nets (primarily designed to protect by-catch species).

Group Biology:

Little is known about population dynamics of shrimp species except that they can withstand high levels of fishing effort. They are sexually mature after a year and have high fecundity.

Gear:

Shrimp trawls (beam trawls) are unique to shrimp fisheries, are smaller and lighter than beam trawls used in flatfish fisheries. They have small mesh sizes which makes them very unselective and can have high levels of by-catch including juvenile fish species. Impacts on associated habitats (particularly soft sediments) occur primarily as a result of beam 'shoes' penetrating the surface of sediments.

Justification:

Despite scoring highly in terms of landed weight and value, landings and effort are relatively well understood although effort cannot be quantified thus preventing the development of harvest control rules in line with MSC accreditation and ICES shrimp working group advice. Stock dynamics are poorly understood but a productive fishery has been accomplished for many years. There is no strong trend in landings over the last five years, however the landings are highly variable; brown shrimp landings declined by almost 500 tonnes over the period 2010-2011 - it is not known whether this reflects reduced biomass or effort (many fishers targeting brown shrimps also target bivalve molluscs so landings vary according to economic as well as stock availability factors).

Because of its economic importance and the lack of information available this fishery should not be classified as low risk. Its relative stability as a fishery over the last decade suggest that fishery is capable of being sustainable in the long-term; however, Eastern IFCA do not currently have the data required to provide evidence of sustainability (as required by MSFD and MSC accreditation). In addition, Eastern IFCA has no mechanism to manage the fishery should sustainability issues occur.

Suggested actions:

Implement measures to obtain better data on effort and spatial distribution with a view to develop CPUE-based reference points, and to inform the design of proportionate measures for the protection of The Wash and North Norfolk Coast SAC features.

Implement closed areas in line with the Habitats Regulation Assessment. Design and implement management mechanisms (e.g. permitting) to enable the implementation of measures should these be required (e.g. mesh size regulation).

Continue to engage with fishing industry to ascertain an understanding of the current pressures and sustainability issues relating to the shrimp industry.

December 2015

Group: Crustaceans	Relative Risk Rank: 2	Priority: High
ICES Advice:		Unfavourable
Nursery areas within District:		Yes
Spawning areas within District:		Yes

Main concerns:

Landings (high weight and value), unfavourable stock assessment, no current mechanism for Eastern IFCA to control effort.

Current Regulations:

Four Eastern IFCA byelaws currently in place (which require review), national minimum landing size legislation, MMO limit Kw days for vessels over 15m.

Group Biology:

Population dynamics are not well understood although limited modelling has been undertaken. Eastern IFCA is thought to host the youngest parts of the edible crab stock and as such, management here is likely to have an impact on fisheries further North.

Gear:

Pots are generally used (except in the case of *Nephrops* where benthic trawls are also used, but these are not seen within Eastern IFCA district). Pots are generally considered as having a low impact in terms of by-catch and habitat damage, although site-specific assessment is required for MPAs

Justification:

Recent analysis of edible crab and European lobster landings from the North Norfolk Coast (the primary fishery within Eastern IFCA's district) indicate that the fishery is potentially operating at above MSY⁷ with regards to vessels under 10m, which is in contrast to the report conducted in 2013⁸. This is also reflected in Cefas advice for these fisheries which is unfavourable. Potting is also known to occur off the Lincolnshire Coast and within The Wash – levels of effort cannot be distinguished between these fisheries because of the low spatial resolution of data provided in catch returns forms.

Due to the commercial importance of this group (particularly brown crab, European lobster and velvet swimming crab) and the paucity of information regarding effort for fisheries specifically relating to the North Norfolk Coast, Lincolnshire or The Wash, it is recommended that action will need to be taken in the medium term. A greater understanding of effort would also provide a higher level of confidence in assessments of impacts on MPAs and if necessary, the development of regulation to protect MPA habitats.

Suggested actions:

Review the inherited Eastern IFCA byelaws relating to the Crustacean fisheries within the district in line with the Defra work to improve the sustainability of these fisheries. A synergistic approach is required to avoid a confusing situation for the fishers and improve the sustainability of the fishery. Increase effort in data gathering to inform MPA assessments of this fishery. Undertake MPA assessment and continue dialogue with fishers throughout process of assessment and if needed, development of measures.

⁷ Eastern IFCA research report 2015; www.eastern-ifca.gov.uk

⁸ Eastern IFCA research report 2013; www.eastern-ifca.gov.uk

December 2015

Group: Skates & Rays

Relative Risk Rank: 3

Priority: Medium

ICES Advice:

Unfavourable (overall)

Nursery areas within

Unknown (yes for thornback rays)

District:

Spawning areas within

Unknown

District:

Main concerns:

Limited understanding of biology, nursery area (thornbacks) present within the district, limited understanding of effort, trawl type gears potentially damaging.

Current Regulations:

No IFCA byelaws specifically related to skates and rays. No minimum landing sizes in place, quotas set by MMO, landings record of individual species required since 2008 (as opposed to recording landings as 'skates and rays').

Group Biology:

Skates and rays are generally long-lived species, reaching sexual maturity after 5-10 years and are less fecund than most fish species – characteristics making this group particularly vulnerable to overfishing especially given the lack of a minimum landings size. Skates and rays do however show high survivability as a by-catch species.

Gear:

Skates and rays are often targeted by recreational anglers using rod and line and commercial fishers using demersal trawls, longlines and nets; they are often a by-catch species of the commercial demersal fisheries.

Justification:

Landed weight of thornback rays were among the top ten fisheries in Eastern IFCA district (ranked ninth for average over last five years), as was the value (ranked eighth). Generally this group is not considered a key target species however, large amounts of thornback are landed annually. Given Cefas and ICES concerns regarding the mis-reporting of landings in this group (as a result of an inability to distinguish between species – i.e. most species landed from within this group are recorded as thornback rays) there is also potential risk to other species in addition to thornback.

Suggested actions:

Cefas are currently running a project aimed at understanding elasmobranchs better generally including in The Wash. Continued joint working in this area would benefit our understanding of the group.

Unregulated netting is also likely to be having an impact on this group. Work relating to non-commercial netting is required in relation to several fisheries within the district.

Implementing minimum landing sizes may have a beneficial effect and would bring this group in line with most other commercial species. More evidence would be required to justify a minimum landings size at a species level. Any implementation would also require restrictions on the minimum size of detached wings.

December 2015

Group: Demersal	Relative Risk Rank: 4	Priority: Medium
ICES Advice:		Unfavourable (overall, particularly for bass)
Nursery areas within District:		Bass, smelt, grey mullet, likely for other species.
Spawning areas within District:		Unknown (likely for many species)

Main concerns:

Unfavourable ICES advice, limited understanding of stocks, fishing mortality likely to be higher than estimated from commercial data as a result of recreational activity.

Current Regulations:

Most are managed through national or European legislation (minimum conservation reference sizes, catch limitations). Eastern IFCA has inherited trawling restrictions from NESFC which are likely to be having a protective effect on this group but requires review.

Group Biology:

Some species in this group are very vulnerable to overfishing due to slow maturation but this group is often highly valued and as such, fishing mortality can be very high.

Gear:

Gears used vary possibly the most of any group and include fixed and drift nets, trawls and hook and line.

Justification:

This group is highly regulated through national and European legislation making it less of a strategic priority (in contrast to its potentially higher operational priority). Key measures for the protection of bass have been put in place at a European level which is the most at-risk species within this group. Further work is being undertaken by Defra with regards to nursery areas for bass within Eastern IFCA's district.

Several species are likely to have spawning areas within estuaries within the district – the greatest potential risk to these is likely to be use of shrimp fishing gears which can remove and kill large numbers of juvenile fish – given that shrimp fishing is prioritised as high, this should have a positive effect on this risk.

Unregulated netting (Illegal, Unreported and Unregulated fishing) still has the potential to have a serious detrimental effect on this group – particularly on bass however, there is (inherently) limited data available on the scale of the issue despite having run an evidence gathering project for two years now. Eastern IFCA currently has no enforcement powers with regards to this activity.

Suggested actions:

Review byelaws inherited from NESFC (trawl restrictions).

Given that the recreational community targets this group above all others, it would be beneficial to gather more information on recreational activity. IFCA's are ideally placed to engage with recreational anglers.

In addition, the scale of the unregulated netting issue is still largely unknown and is likely to be having a detrimental effect on this group. As such, measures should be considered which would limit or prohibit this activity.

December 2015

Group: Flat fish	Relative Risk Rank: 5	Priority: Medium
ICES Advice: Nursery areas within District:		Favourable overall Unknown (likely for several species according to EA data/Eastern IFCA research)
Spawning areas within District:		Unknown

Main concerns:

High risk associated with the bottom towed gears used; important nursery area identified for sole in Humber Estuary.

Current Regulations:

Most are managed though national or European legislation (minimum conservation reference sizes, catch limitations). Eastern IFCA Inshore trawling restriction prohibits trawling in small parts of the district and sets vessel size restrictions (which also restrict gear size) in other parts of the district. Eastern IFCA has inherited a fixed engines byelaw from NESFC which is likely to be having a protective effect on sole spawning grounds in the Humber Estuary. Eastern IFCA has also inherited trawling restrictions from NESFC which are likely to be having a protective effect on this group but requires review.

Group Biology:

Some are vulnerable to overfishing due to slow maturation but this group is often highly valued and as such, fishing mortality can be very high.

Gear:

Gears used vary possibly the most of any group and include fixed and drift nets, trawls and hook and line.

Justification:

This group is highly regulated through national and European legislation making it less of a strategic priority (in contrast to its potentially higher operational priority).

Several species are likely to have nursery areas within estuaries within the district – the greatest potential risk to these is likely to be use of shrimp fishing gears which can remove and kill large numbers of juvenile fish – given that shrimp fishing is prioritised as high, this should have a positive effect on this risk.

Unregulated netting (Illegal, Unreported and Unregulated fishing) still has the potential to have a serious detrimental effect on this group – particularly on bass however, there is (inherently) limited data available on the scale of the issue despite having run an evidence gathering project for two years now. Eastern IFCA currently has no enforcement powers with regards to this activity.

Suggested actions:

The inherited fixed net byelaw requires review which reflects its protective effect on the sole nursery grounds in the Humber Estuary and requires a joint approach with North Eastern IFCA. Other inherited byelaws (trawl restrictions) also need review to reflect their protective effects on this group.

Given that the recreational community targets this group, it would be beneficial to gather more information on recreational activity. IFCA's are ideally placed to engage with recreational anglers.

In addition, the scale of the unregulated netting issue is still largely unknown and is likely to be having a detrimental effect on this group. As such, measures should be considered which would limit or prohibit this activity.

December 2015**Group: Bivalve molluscs****Relative Risk Rank: 8****Priority:****Medium**

ICES Advice: n/a
Nursery areas within District: n/a
Spawning areas within District: n/a

Main concerns:

High economic value; high risk associated with the bottom towed gears (although rarely used); severe mussel stock die-offs; regulations are in place and but need review in light of 2015 fishery.

Current Regulations:

All species are regulated within The Wash via the Wash Fishery Order (1992), which has a suite of regulations relating to effort, gear type and reporting. Wash Fishery Order policies set out additional restrictions related to the MPA designations for this site. Cockle and mussel fisheries are annually assessed and managed according to EMS requirements. Minimum landings sizes apply for mussels, oysters and scallops (although there is no scallop fishery and oysters are fished only on the north Norfolk coast and Suffolk estuaries. Eastern IFCA byelaws relating to bivalve molluscs include byelaws 3, 4, 7, 8, 9, 11 & 15. Inherited byelaw (Humber Estuary cockle fishery byelaw) requires review.

Group Biology:

Bivalve molluscs are generally well studied and understood. Individuals settle interstitially and live sedentary lives, dispersing through spawning into the plankton – allowing juveniles to settle onto new areas or already established beds. The mussel population in the Wash is affected by an unknown factor causing mortality at 2-3 years, and the majority of mussel beds have declined significantly in size and mussel density in recent years. The cockle population is also affected by an atypical mortality affecting cockles post-spawning, although recent good spatfalls mean this mortality has had less impact on the sustainability of the fishery.

Gear:

Gear includes dredges (suction dredges for cockle, although not used since 2008; Baird or Dutch dredge for mussels), which if unmanaged could cause significant damage to habitats associated with shellfish beds. Scallops are targeted using scallop dredges (on beam trawls) which are similarly damaging to the associated habitats, but there is no history of this gear being used in the Eastern IFCA district. Intertidal beds of shellfish can be fished by hand gathering (and using rakes) which is generally considered low impact and has been the only method used in the Wash Fishery Order cockle fishery since 2008. However, some hand gathering methods include 'prop washing' which, when conducted at high intensities or inappropriately can result in significant damage to habitats.

Justification:

Despite scoring highly for annual landings and value and the association with highly damaging gears, shellfish are not considered a high priority. Shellfish fisheries within the district fall almost exclusively within The Wash, where they are managed via the Wash Fishery Order (1992). Shellfish landed outside of the Wash include small scale shellfisheries on the North Norfolk coast and Suffolk estuaries. Periodically, sublittoral mussel beds occur within the district and form a high value seed mussel resource. Scallops are very rarely found within the District and the last fishery occurred outside of the 6nm limit (Silver Pits). In addition, Eastern IFCA has several byelaws which already cover shellfish fisheries which can be used to close beds, limit landings and regulate gear and vessel size.

However, the current suite of byelaws does have significant gaps – most notably Eastern IFCA does not have the ability to limit the number of vessels engaging in a bivalve fishery outside of The Wash. Damage to habitats associated with the gear types used in these fisheries is thought to be related to intensity and as such, measures which can limit fishing intensity would be required to have a protective effect on associated habitats.

Suggested actions:

Wash Fishery Order regulations require review alongside the review of the associated management policies, in line with updated conservation advice for this EMS. Regulations need to be amended such that they are fit for purpose.

Byelaws associated with bivalves require updating – the suite of associated byelaws should be consolidated into one (or at least fewer) byelaws.

Mortalities in the mussel fishery affecting its sustainability require investigation.

Annex 1. Species fished for within Eastern IFCA's district between 2010-2014 according to MMO landings data.

Group	Species	Rationale
Shrimp/prawns	Brown Shrimps, Common Prawns, Pink Shrimps	Similar fishing methods. Species share very similar biology and habitat geographically and physically similar benthic environments.
Crustaceans	Crabs - Velvet (Swim), Crabs (C.P.Mixed Sexes), Green Crab, Lobsters, Mixed Crabs, Spider Crabs	Fishing methods are similar for all species (i.e. pot fishery) and are often fished for in the same areas.
Skate/Ray	Arctic Skate, Blonde Ray, Skate (Round), Skates and Rays, Small-eyed Ray, Spotted Ray, Thornback Ray	Belonging to group elasmobranchs but distinguished from dogfish/sharks by fisheries management – most notably the quota system for skates and rays. Many are commercial species but are also caught as bycatch but have more of a market than dogfish/sharks which are often used as bait in potting fisheries.
Demersal	Bass, Black Seabream, Bream - Ray's, Cod, Conger Eels, Eels, Greater Weever, Gurnard and Latchet, Gurnards – Grey, Gurnards – Red, Haddock, Hake, John Dory, Ling, Lumpfish, Monks or Anglers, Mullet – Other, Pollack, Pouting (Bib), Red Mullet, Rockling, Roes, Rudderfish, Saithe, Sand Smelt, Sea Breams, Sea Trout, Triggerfish, Tub Gurnard, Whiting, Wrasses	Demersal species, most of which are heavily managed through European quotas. Have lower survivability than other demersal groups (flatfish and elasmobranchs).
Flatfish	Brill, Dabs, Flounder or Flukes, Halibut, Lemon Sole, Long Rough Dabs, Plaice, Sand Sole, Sole, Turbot, Witch	Distinguished from 'demersal' primarily as a result of lower survivability. Several flatfish species are still not recorded separately (Flounder or flukes for example) making them more data deficient.
Dogfish/sharks	Dogfish (Scyliorhinidae), Lesser Spotted Dog, Sharks, Smooth Hammerhead, Smoothhound, Spurdog, Thresher Shark, Tope, Unid DS Squal Sharks & Dogfish, Unidentified Dogfish	Elasmobranchs distinguished from other demersal species by their high survivability and lower market place. Often used as bait.
Cephalopods	Cuttlefish, European Flying Squid, Mixed Squid and Octopi, Octopus, Squid	Mixture of molluscs which do not play an important role in Eastern IFCA fisheries.
Bivalve Mollusc	Cockles, Mussels, Scallops	Harvesting techniques include a combination of dredging and hand-working. Sedentary, bed forming species.
Whelks	Whelks	Most similar in fishing techniques to the group 'crustaceans' but of very different biology. Distinct from 'molluscs' in that the fishery plays an important role in Eastern IFCA's district.
Pelagic	Bigeye Tuna, Garfish, Herring, Horse Mackerel, Mackerel, Pilchards, Shad, Smelt (European), Sprats	Distinct in terms of biology from other groups and in terms of fishing gear.

Glossary

Cefas	Centre for Environment, Fisheries and Aquaculture Science
Defra	Department for the Environment, Food & Rural Affairs
EMS	European Marine Site (a type of marine protected area designated under the EU Habitats Directive or EU Birds Directive)
EU	European Union
FAO	Food & Agriculture Organisation
HRA	Habitats Regulations Assessment
ICES	International Council for the Exploration of the Sea (provides fisheries advice to European Council)
IFCA	Inshore Fisheries & Conservation Authorities
IUU	Illegal, Unregulated and Unreported fishing
MCZ	Marine Conservation Zone (a type of marine protected area for English waters)
MMO	Marine Management Organisation
MPA	Marine Protected Area
MSC	Marine Stewardship Council
MSFD	Marine Strategy Framework Directive
MSY	Maximum Sustainable Yield
NESFC	North Eastern Sea Fisheries Committee
SAC	Special Area of Conservation (a type of marine protected area)
SCI	Site of Community Importance (a type of marine protected area)
SPA	Special Protection Area (a type of marine protected area)
WFO	Wash Fishery Order 1992