Project Inshore

Stage 3 - Strategic Sustainability Review

A National Overview

SEAFISH
the authority on seafood

Shellfish Association of Great Britain

CERTIFIED SUSTAINABLE SEAFOOD MSC
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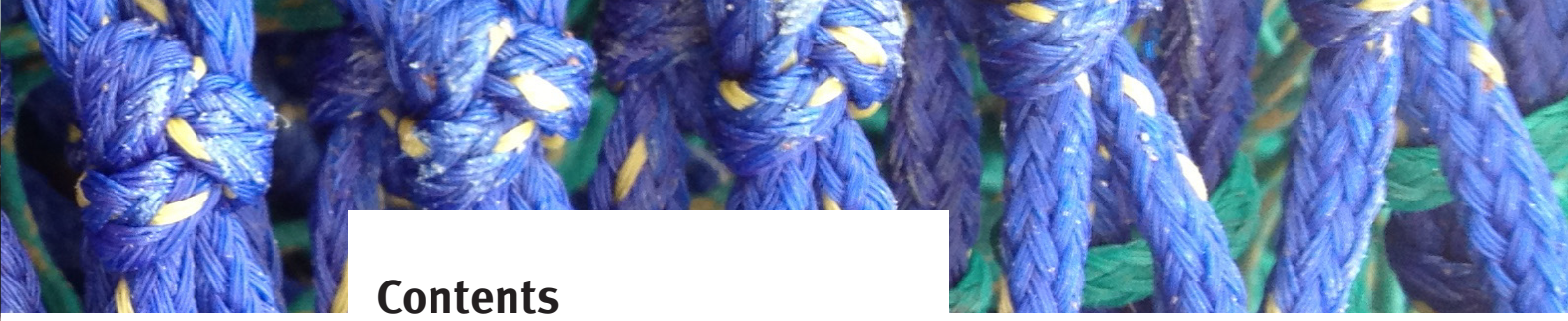

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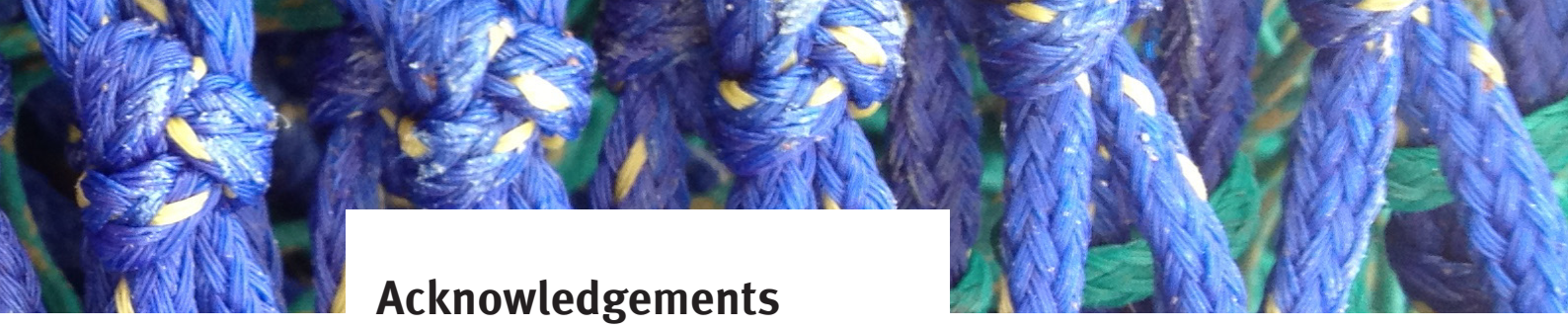

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Glossary

ACOM	Advisory Committee (ICES)
ASCOBANS	Agreement on the Conservation of Small Cetaceans of the Baltic, North East Atlantic, Irish and North Seas
CAB	Conformity Assessment Body
CEFAS	Centre for Environment, Fisheries and Aquaculture Science
CFCA	Community Fisheries Control Agency
CFP	Common Fisheries Policy
CITES	Convention on Trade in Endangered Species of Wild Flora and Fauna
COM	Common Organisation of the Markets
Defra	Department for Environment, Food and Rural Affairs
EC	European Commission
EEZ	Exclusive Economic Zone
EFF	European Fisheries Fund
EMS	European Marine Site
ETP	Endangered, Threatened and Protected Species
EU	European Union
FCI	Food Certification International
HCR	Harvest Control Rule
ICES	International Council for the Exploration of the Sea
IFCA	Inshore Fisheries and Conservation Authorities
IUCN	International Union for Conservation of Nature
IUU	Illegal, unreported and unregulated
JNCC	Joint Nature Conservation Committee
OSPAR	Oslo and Paris Conventions
MCS	Monitoring, Control & Surveillance
MCZ	Marine Conservation Zone
MMO	Marine Management Organisation
MoU	Memorandum of Understanding
MPA	Marine Protected Area
MSC	Marine Stewardship Council
NEAFC	North East Atlantic Fisheries Commission
NFFO	National Federation of Fishermen's Organisations
NGO	Non-governmental Organisation
NUTFA	New Under Ten's Fishermen's Association
Nm	Nautical mile
PI	Performance Indicator (see appendix 4 for further explanation)
PO	Producer Organisation
PSA	Productivity Susceptibility Analysis
RAC	Regional Advisory Council
RBF	Risk based Framework

SAC	Special Areas of Conservation
SAGB	Shellfish Association of Great Britain
SG	Scoring Guidepost (see appendix 4 for further explanation)
SI	Scoring Issue (see appendix 4 for further explanation)
SICA	Scale Intensity Consequence Analysis
SPA	Special Protection Areas
STECF	Scientific, Technical and Economic Committee for Fisheries
TAC	Total Allowable Catch
UoC	Unit of Certification
VMS	Vessel Monitoring System
WGNEW	Working Group on New MoU Species

Executive Summary

1. Project Inshore is an ambitious initiative led by Seafish, Marine Stewardship Council (MSC) and Shellfish Association of Great Britain (SAGB) launched in June 2012 which seeks to work towards an environmentally sustainable future for English inshore fisheries.
2. This report provides a national strategic overview of the findings and recommendations provided in the 9 IFCA specific Strategic Sustainability Reviews which were the primary focus of Stage 3 of Project Inshore. In addition, the national overview report provides the opportunity to highlight those stocks which straddle the inshore boundary (6nm) and have therefore not been the focus of the IFCA specific reports.
3. Project Inshore uses the Marine Stewardship Council (MSC) standard as a framework by which to review the performance of fisheries around the English coast. For some fisheries there may be market or other motivations for seeking MSC certification, however for other fisheries – perhaps particularly lower value, smaller fisheries – it may be less cost effective to pursue certification. Regardless of whether product certification is seen as an objective for the fishery, comparing the fishery against the MSC framework is a useful exercise in reviewing the current status and management within a fishery.
4. The results of the Project Inshore MSC pre-assessment process for English inshore fisheries indicates that some stocks fished in the English Inshore are already 'well managed' and likely to meet the Good Environmental Status Requirements, such as Maximum Sustainable Yield (shown in table 1 of this report). These fisheries are identified as being in a position to proceed with full MSC assessment, should there be the demand to do so (at least when fished by certain gears).
5. If there is a decision to proceed to full MSC assessment for these fisheries, the report outlines the steps needed and the benefits of increasing the size of the client group and Unit of Certification (UoC) (typically up to the spatial range of the stock) for any full assessment.
6. Most of these stocks which could proceed to full MSC assessment are managed by means of EU quotas, set by means of a Long Term Management Plan, with regular and routine scientific advice provided by ICES (of which CEFAS scientists are actively involved in). The only other fisheries in this group are spatially restricted inshore bivalve fisheries where management responsibility is clearly devolved to a local grantee, such as an IFCA.
7. All other stocks are identified as having "gaps" meaning that some aspect of their status, management or information is currently below the best practice thresholds identified by the MSC standard. As such, even where there is a desire and a demand to do so, these fisheries are not currently recommended to proceed to full MSC assessment, until these gaps can be adequately addressed. Typically this would also mean that they do not meet, or cannot be demonstrated to meet "Good Environmental Status", for example, as defined in the EU Marine Framework Strategy Directive (Directive 2008/56/EC targets).
8. Before seeking to advise on how to address those gaps, Stage 3 of Project Inshore first considers the critical question of where responsibility lies for addressing those gaps, highlighting that in many cases the exact responsibility for management is poorly defined and open to differing interpretation.
9. In some cases responsibility is likely to remain with the EU / ICES, in particular for those stocks which are already defined, already subject to regular ICES working group scrutiny and already managed by means of EU quotas (these are highlighted in table 2 of the report).
10. Where these indicators of an EU management lead are absent (i.e. full ICES advice and EU quota) there is an important task to identify and clarify who should lead on addressing management gaps. In some cases this may necessitate a bilateral or European lead, in some cases this may require the lead of a single member state (i.e. DEFRA) and in some cases it may be possible to develop meaningful adaptive management at a more local scale (i.e. IFCA).
11. In order to inform this question, Project Inshore has worked with IFCAs in order to identify those fisheries in their region which are locally important, where there are management gaps,

where management is not being addressed at a higher jurisdiction (i.e. DEFRA / EU) and finally, but importantly where fishery patterns or life history characteristics support a rationale to justify inshore management.

12. The stocks which IFCAs are best placed to lead on management are typically shellfish, although not all shellfish (some are already subject to national or EU level management such as scallops and Nephrops).

13. The key gap to address in most of these fisheries relates to the need for fisheries specific management, featuring understanding of stock status to enable the development of adaptive stock management defined by management rules. From an MSC point of view this bridges the requirements of both Principle 1 and Principle 3.

14. In many of these fisheries that have received less management focus, stock definition is an important pre-requisite of management action. Definitive proof of stock discreteness would require studies such as tagging and genetic analysis. However the results may still prove inconclusive and the cost of the research on an individual fishery may not be justified. For this reason proof of genetic discreetness is not a requirement for MSC assessment – or good management. If guided by international law and the adoption of the precautionary approach in a data-poor situation, then the lack of definitive stock definition should not be a barrier to the adoption of precautionary management actions. Better therefore to recognise that fish stock definition is an imprecise science, and make use of the best available data to establish reasonable working hypotheses for stock assessment purposes and to guide management actions. Regular review and evaluation of the management of the fishery would be expected to examine the working hypothesis of stock definition as part of its remit.

15. Project Inshore provides IFCAs with guidance in the development of this type of adaptive stock management for those stocks or species which the IFCAs maybe best placed to lead on stock management.

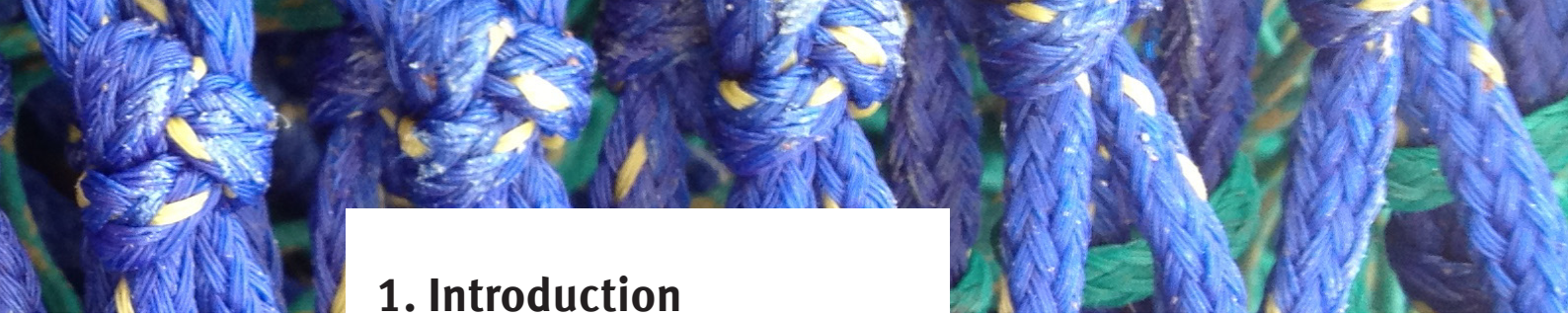
16. For all other stocks the IFCAs still play an important role as key stakeholder and a partner in management. The IFCA remains responsible for enforcement of relevant legislation on these fisheries within their jurisdiction. Additionally, the IFCA have the power to act to further safeguard the resource, should they wish, such as through the introduction of technical measures. However, though this may contribute to responsible stewardship of the resource, it should be recognised that the overall success of stock management – namely whether or not the stock is overexploited – is beyond the IFCAs control.

17. There remain a significant number of species / stocks for which little or no fishery specific management measures are being taken at an EU / multinational level, and which are not suited to local (inshore) adaptive stock management. For these stocks it is critical to identify and explicitly define where management responsibility should lie as an essential pre-requisite of any management action. Although these stocks may be typically lower value, or underutilised species, they are none the less “commercial” species, and as such there remains a requirement to demonstrate that they too are at “Good Environmental Status”.

18. If stocks are unlikely to (in the short term) be the focus of regular and coordinated ICES assessment, or fishery specific EU management or regulation. And if, they are also not suited to inshore management, then it is likely that any initiatives to develop adaptive stock management will need to be conducted nationally or possibly bilaterally (although this would still require to be consulted upon at a RAC / EU Level). The new Common Fisheries Policy gives explicit consideration to the potential for member states to undertake management on resources within their jurisdiction where “the Union has not adopted measures addressing conservation and management specifically for that area or specifically addressing the problem identified by the Member State concerned”. This paves the way for member states to lead on stock management for those resources not yet managed at an EU level.

19. Much of the guidance provided to IFCAs contained in the Stage 3 reports on the development of adaptive stock management are equally as applicable at higher jurisdictional levels and so

remain relevant to the development of management at a national level where this is shown to be necessary.



1. Introduction

1.1. Project Inshore background

Project Inshore is an ambitious initiative led by Seafish, in partnership with Marine Stewardship Council (MSC) and Shellfish Association of Great Britain (SAGB) launched in June 2012 which seeks to work towards an environmentally sustainable future for English inshore fisheries. The then UK Fisheries Minister, Richard Benyon noted at the time that Project Inshore "…should help to ensure that our inshore fleet can continue to flourish, that fish stocks are managed sustainably and our marine environment is given the protection it needs". This project has carried out MSC pre-assessments for an extensive range of fisheries around the English coast and used the results of these pre-assessments to form the basis for Strategic Sustainability Reviews for English Inshore fisheries to provide a road map to guide future management decisions.

The funding for the project comes from a diverse range of sources notably the European Fisheries Fund (EFF), the Sustainable Fisheries Fund and industry (Seafish, UK retailers and processors). Other partners in the project include the Marine Stewardship Council, Shellfish Association of Great Britain and Seaweb's Seafood Choices.

The Sussex Inshore Fisheries and Conservation Authority (IFCA) (previously the Sussex Sea Fisheries Committee) piloted a multi species fishery methodology in 2010 with its 'Navigating the Future' Inshore Fisheries Sustainability Pilot (Dapling et al., 2010). 'Navigating the Future' utilised the MSC pre-assessment criteria to evaluate the performance of 26 local inshore fisheries. Project Inshore carries this model forward on a nationwide scale for key commercial fisheries operating within the remaining IFCA districts.

Food Certification International Ltd (FCI) undertook Stages 1 & 2 of Project Inshore, which concluded with the publication of MSC pre-assessment findings. For the advisory work required for Stage 3 of Project Inshore, Acoura Ltd has assembled a team comprised of many of the team members from Stages 1 & 2. The Stage 3 project team comprises of independent experts from Marine Institute (Ireland), PAH Medley, Nautilus Consultants, Poseidon Aquatic Resource Management Ltd and TD Southall.

1.2. Project Inshore Stages

Project Inshore has been designed as a four stage process to progress from initial review and oversight through to strategic targeted action for English Inshore Fisheries as follows:

- Stage 1: Macro analysis and profiling of English inshore fisheries including:
    - · Data collection/ information gathering phase.
    - · Broad scale analysis of English fisheries.
    - · Development of list of fisheries (species/gear combination) to progress to:
- Stage 2: Pre-assessment of English fisheries based on an aggregated/matrix approach for assessing each selected fishery (species / gear combination) in relation to the Marine Stewardship Council (MSC) standard. The key output of Stage 2 is a report and supporting on-line database which provides a preliminary determination of how closely each performance indicator of each fishery meets the MSC standard.
- Stage 3: Development of bespoke Strategic Sustainability Reviews for each English Inshore Fisheries and Conservation Authority (IFCA) to facilitate English inshore fisheries moving towards a level judged sustainable by the MSC standard.
- Stage 4: This will involve outreach by Project Inshore partners and the Project Inshore Advisory Group with managers and industry to seek to progress some of the conclusions from the initial 3 stages.

The output of Stage 1 was delivered in October 2012. The output of Stage 2 was delivered in June 2013. Both Stage 1 & 2 outputs are now publically available on-line from the Seafish website.

1.3. Report Aims & Objectives

The reporting outputs of Stage 1 and Stage 2 of Project Inshore provided national overview documents for English Inshore Fisheries. By contrast, the emphasis for Stage 3 of Project Inshore has been to provide a more local focus by producing separate bespoke Strategic Sustainability Reviews for each of the 9 IFCAs covered by the project. These have been the main reporting outputs of Stage 3 of Project Inshore. However, given this local focus, it was concluded there would also be merit in producing an additional report as part of Stage 3 to provide a national overview and national strategic context, intended to compliment the IFCA specific reports.

This report therefore seeks to provide that national overview and summarise the guidance provided to the IFCAs, highlighting which stocks IFCAs are likely to prioritise for management and the reasons for those choices. The national overview also therefore highlights those stocks which IFCAs are less well placed to lead on management. For these potentially numerous and in many cases commercially important stocks the stock management lead will have to be taken at a larger jurisdictional scale than the IFCAs, suggesting the need for a far greater involvement for national management authorities (i.e. DEFRA) or further engagement with other Member States to deliver management objectives.

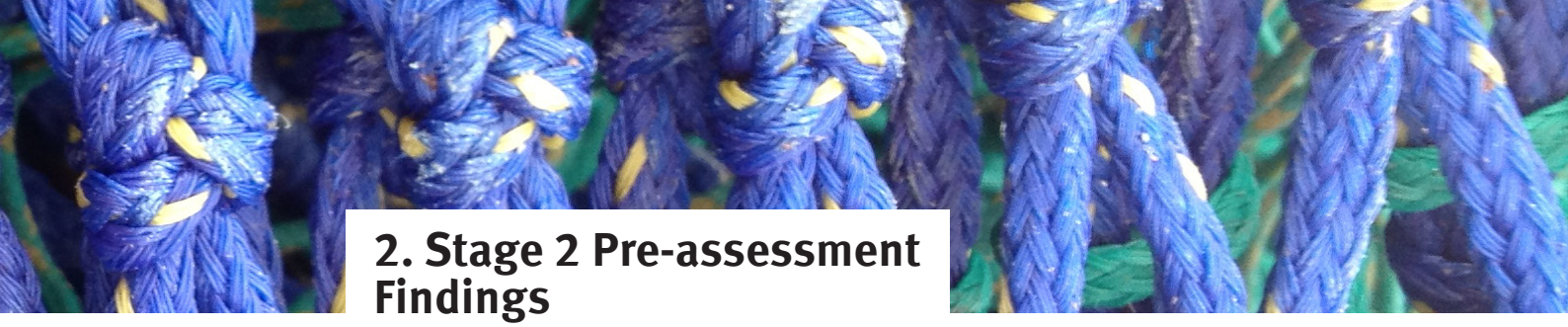
Overall, this report seeks to:

- Recap the main findings of the MSC pre-assessment process that was carried out in stage 2 of Project Inshore.
- Highlight the process and next steps required for those fisheries identified as ready for full MSC assessment (this is a requirement of the MSC pre-assessment process).
- Provide a strategic structure to guide future management actions enabling fisheries to move towards a level deemed sustainable by the MSC standard.
- Highlight those fisheries where stock management initiatives need to be taken at a greater scale of management jurisdiction.

This report is advisory only and is intended to provide a blueprint for developing adaptive stock management initiatives and action where this is deemed appropriate to do so.

[1] http://www.seafish.org/projectinshore

[2] Similar work was undertaken for the Sussex district as part of the 'Navigating the Future' project and is therefore not covered by Project Inshore.



2. Stage 2 Pre-assessment Findings

Each of the IFCA reports provides a summary of the pre-assessment results for the fisheries in their local district. In addition, the results for the fisheries in a particular IFCA district can be queried using the Project Inshore results database. This includes the results of all fisheries in their district, whether or not it is exclusive to their district, primarily managed by the IFCA, or what size of boat fishes the resource. In short, all landings reported in national landing statistics for the district are included. For this national overview report it is perhaps also worth recapping some of the key findings from stage 2 of Project Inshore, although the Stage 2 reporting output – which is itself a national overview – is the best resource for these results.

2.1. Strategic Summary of Stage 2 Findings

A significant issue for English Inshore fisheries is the lack of accurate fisheries information – both of effort and landings and this has complicated the process of both defining fisheries and subsequently scoring fisheries, and in some cases this has led to reduced scores. In particular this undermines scoring of the information performance indicators, but it will likely prove to be of even greater critical importance when seeking to address the management weaknesses identified for English Inshore fisheries. In some instances (informing P2 and P3) this could be rectified relatively quickly. Other aspects such as stock information may require time-series data and therefore require a long-term plan to develop an information base before the fishery is at a point where the MSC standard can be met.

There is no centralised data management for inshore fisheries, accessible to all relevant agencies, which undermines effort at management.

2.1.1. Principle 1

Many inshore resources targeted by fishermen have poorly defined stock boundaries. This undermines attempts to implement good management and leads to uncertainty over the most appropriate management jurisdiction. Where stocks are poorly defined, the management authority needs to adopt a working solution, which is both practical and precautionary. This is part of the decision-making process more than a scientific process in most instances. Careful consideration is required to determine how the functional stock management boundaries of those English Inshore stocks where stock boundaries have not already been defined, will be defined.

For EU pressure stocks, subject to full annual ICES working group scrutiny with a **long term management plan** in place and functioning as intended, there are likely to be relatively few obstacles to certification (under P1). The only exception to this is where stock status is below the limit reference point.

For stocks where it is not possible to determine status relative to reference points from the available information it is necessary to use the MSC risk based framework in order to determine a score in the MSC pre-assessment process. Many resources targeted in English Inshore fisheries fall into this category, simply as a result of the fact that stock boundaries have not been defined and stock assessments are not carried out at the scale of the stock. However, most stocks which are commercially exploited but where stock status is uncertain are likely to score at high risk under the risk based framework. This does not mean that those stocks are overexploited or depleted, but merely that the risk of over-exploitation is such that good management can only be assured if based on more fishery specific information. How to incorporate improved levels of information into more empirical local stock assessment models will be explored later in this report.

Even for highly productive species (typically bivalve) where it can be demonstrated that a risk from even of a targeted fishery is low, it can still be difficult to demonstrate that the risk to future productivity of the stock will always remain low without management safeguards. Bivalve stocks can be extirpated completely in unmanaged situations, so some understanding of stock status (standing stock) should be known to inform (and limit) exploitation.

2.1.2. Principle 2

It is important to highlight that much of the work currently being undertaken by IFCAs to assess

the impact of fisheries on local designations should, once completed, reflect positively on scoring for Principle 2 – at least within their jurisdiction. Where management (either local or national) has identified main vulnerable species and habitats and has demonstrated that the impact of fishing of those has been evaluated and appropriate management action taken, then much of the management scores in P2 will be improved. This is an example of how proactive management steps to address ecosystem impacts are likely to improve P2 scores. Once this process is completed it is likely that pre-assessment scores (or scores at the time of any full MSC assessment) will improve.

Principle 2 requires that the status of the particular fishery under assessment is scored against five different criteria. This is only possible with good fishery specific information on the fisheries and associated habitat and ecosystem.

In the absence of fishery specific data, expert judgment, qualitative information and analogous information can be drawn upon, but only at a lower level of scoring. To achieve scores of 80 or over for many Principle 2 performance indicators quantitative fishery specific data is required. It is therefore routine for pre-assessments to recommend that a fishery wishing to proceed to full assessment should undertake some independent and scientifically robust quantitative assessment of the fisheries ecosystem impacts. Fisheries which have supporting information based upon observer work which is able to detail catch profiles – including discard and ETP profiles - are therefore likely to score higher.

More detailed information on catch profiles will also help determine what are considered 'main' retained and bycatch species. If a fishery is able to quantitatively demonstrate that is does not have any 'main' retained or bycatch species, then scores of 80 are automatically achieved for these performance indicators.

The mixed nature of many English inshore fisheries means that many fisheries have the potential to retain a number of other species. In the scoring exercise the status of all the other species likely to be retained by the same gear in the same area are used to inform the status of retained species for a given fishery. This highlights that there are a relatively small number of stocks which would lead to detrimental scoring (<60) when retained by a particular gear.

By addressing all commercial species as potentially retained, only non-commercial bycatch species are treated as discards. The scoring indicates that no single non-commercial discard species is likely to cause a fishery to score at less than SG60 but that there are some species which could be vulnerable to certain gears and where there is a clear need for more information (in particular in relation to catch profiles) to support scoring at full assessment. The same applies in the case of Endangered, threatened and protected (ETP) species. It should also be noted however that the requirements for management are greater for ETP species than for other P2 criteria (requiring a 'strategy' rather than a 'partial strategy' at SG80) therefore any fishery wishing to move forward with MSC certification would benefit by developing a fishery specific management policy for ETP species – this is something that could be coordinated at either a national or an IFCA level.

For habitats and ecosystem, scores are generally lower for mobile demersal gears, such as trawl, beam trawl and dredges. There are scale issues which have a significant bearing on some of the gears under Principle 2. The scoring is generally based on the impact of the full range of the gear, this often means that local inshore management measures are only credited where it can be shown that the fishery is spatially restricted (such as the case of the spatially restricted Thames cockle dredge fishery).

There is at least the potential for all fishing gears operating in English Inshore fisheries to pass MSC certification and in most cases examples of certified gear already exists somewhere. However for more impacting gears, the level of information and precautionary management required is likely to be considerably greater in order to demonstrate that management can ensure that impacts are not serious or irreversible. For these more impacting gears, such as dredges and demersal towed gear the low scores presented in the stage 2 pre-assessment results do not necessarily present a definitive barrier to certification but they do indicate that further work appears to be required before they can confidently enter the full assessment process.

2.1.3. **Principle 3**

At the national and international level, there is a comprehensive governance and legal framework meaning that overall scores in these areas (the first four P3 performance indicators), for all fisheries, are generally good. Although the commentary in relation to these applies to the EU and UK institutions and legislation, it is as applicable to the local IFCA context.

Where management is carried out at an international level through ICES / EU channels, and where there is full annual ICES working group scrutiny and a **long term management plan** is in place, then a fishery is likely to pass P3 (the only exception being where the international agreement has broken down, such as the current case with mackerel).

Where fisheries are effectively managed locally by local managers with the tools to limit exploitation, the information on which to base that decision, and the necessary fishery specific structures of management are in place (such as consultation, transparent decision making, research and review) then fisheries also have the strong potential to pass P3. The most obvious examples of local fisheries with the requisite tools, information and management structures are those fisheries managed by **Regulating Orders**. In these cases it has been possible to score well under the fishery specific elements of Principle 3 (in particular those PIs relating to fishery specific objectives, decision making and monitoring & evaluation) because there is clear evidence of active and holistic management focused on the performance of a specific fishery under the clear remit of a single primary management authority.

Although the Marine & Coastal Access Act (2009) now provides IFCAs with more effective tools to actively and adaptively manage inshore fisheries (compared with the previous legislation governing Sea Fisheries Committees), the ability to make informed use of these is often undermined by lack of information (and in some cases the lack of available resources or management priority) to actively manage fisheries. For many inshore fisheries there is a lack of clarity about the precise division of roles and responsibilities, both between the EU and the UK, but perhaps more significantly between the MMO and IFCAs. This lack of clarity about roles is mirrored in the division of responsibility for providing management with scientific advice and information.

There are many finfish stocks which do not receive annual ICES advice and which do not have an EU TAC. For these stocks it is not always clear who will take a lead on management. There is a disincentive for local fishery management (IFCAs) to take management action on these stocks which also pass well beyond their jurisdiction meaning any impact of more restrictive management measures would only be felt by local inshore vessels for an uncertain stock benefit. A key determining factor of management success or failure is the ‘reliability’ of the stock response. Although local management steps, such as the protection of nursery or spawning areas is an important contribution to good management, trying to manage overall stock fluctuations of a stock which may be mainly outside of the management area is futile and undermines the relationship between managers and local industry, who feel they are being unfairly restricted. For these cross jurisdictional stocks (such as bass, seabream gurnards, mullets) a clearer understanding of management responsibility and stronger (institutional) links between IFCAs and with MMO is required to determine an appropriate path for management.

For stocks (in particular shellfish) which do not receive annual ICES advice and which do not have an EU TAC, but which are more geographically restricted there is likely to be a greater overlap between the stock boundaries and the IFCA boundaries. In these cases management by IFCAs can be based on sound local information, is more likely to receive the support of local industry and critically, is more likely to bring about the intended response, however it is important to consider how best to incentivise fishing activities within this area. Any system of licencing, or permits or even allocations (either of quota or effort) do go some way toward ensuring that the fleet with access to the resource are likely to derive a future benefit from any management measures. By contrast, where a fishery is perceived as ‘open access’, without the tools to limit access (other than to vessels on the national fleet register), support for local management measures may be less and therefore less likely to succeed.

3. Stage II Pre-assessment Findings

One outcome of the Project Inshore MSC pre-assessment exercise has been to identify those fisheries which appear to be in a position to proceed with a full MSC assessment, should there be a desire and a demand to do so. These are fisheries which have scored relatively highly in the pre-assessment scoring exercise and no significant gaps or obvious barriers to certification have been identified.

According to the pre-assessment findings in stage 2 of Project Inshore – noting the, in some cases, data limited and therefore precautionary nature of a pre-assessment - there are some 16 stocks, or management units fished within English waters which offer the prospect of almost immediate entry into the MSC full assessment (at least when fished with certain gears). These are:

Table 1:

Stocks of Identified as being in a position to proceed to full MSC Assessment (for P1 & 3)

Species	Stock / Management Unit
Cockle	Thames Estuary
	Wash
Cod	Celtic Sea (VII e-k)
Haddock	Western and Channel (VII b-k)
	North Sea (IV IIIa)
Hake	Northern Stock (IIIa IV VI VII VIII a/b/d)
Herring	Irish Sea (VIIaN)
	North Sea Autumn Spawners
Plaice	Irish Sea (VIIa)
	Western Channel (VIIe)
	North Sea (IV)
Saithe	North Sea and West of Scotland (IV IIIa VI)
Sole	Celtic Sea (VII f/g)
	Western Channel (VIIe)
	North Sea (IV)
Whiting	Western (VIIe–k)

Almost all of these are EU pressure stocks managed by primary means of quota, in most cases with a Long Term Management Plan in place. The only exceptions are a small number of bivalve fisheries managed under a Regulating Order. The pre-assessment exercise indicates that fisheries on these stocks are likely to meet both MSC Principle 1 (stock status and stock exploitation rules) and MSC Principle 3 (management structures and processes). How fisheries fare in relation to Principle 2 (impact of fisheries on the wider ecosystem) will depend on the gears that are included in the MSC assessment.

The pre-assessment scoring exercise indicates that demersal fisheries for stocks of species such as plaice and sole using static gears are likely to score best – in particular drift and trammel nets – indicating a likely pass at MSC full assessment. The indication from the pre-assessment is that gill net fisheries would score more poorly, but this result is mainly due to a lack of information, in particular in relation to catch profiles of other species. It is possible that an exercise to quantify the catch profiles of static gear nets could lead to increased scores.

For trawl and beam trawl the level of supporting information to provide evidence that the gear does not pose a risk of serious or irreversible harm to both habitats and bycatch species is likely to be greater – but may still be possible to demonstrate in the longer term and it is worth noting that a number of demersal trawl fisheries are already certified, including in the North Sea. All of these stocks (with the exception of the 2 cockle fisheries) are far more widely distributed than any single IFCA or the overall 6nm boundary around the coast. **In these instances an IFCA is not the primary management authority for these species, however this in no way precludes inshore fishermen from pursing MSC certification of these fisheries on these stocks. Due to the widely distributed nature of the stocks, there is the potential for a large scale Unit of Certification – for example, including all English Inshore static gear vessels fishing demersal stocks shown to be in a position to pass P1 & P3[3].**

3.1. Preparations for full assessment

It should initially be highlighted that the decision to proceed with MSC certification, for those fisheries in a position to do so, is entirely voluntary. For some sectors of the industry this may be an attractive commercial decision, for others the benefits may be less clear. It is the task of an MSC pre-assessment (as has been the function of Project Inshore) to identify the steps to take in preparation for full assessment and this may be helpful for those fisheries wishing to proceed with full MSC assessment. The following section therefore details these steps, but this should not imply that these actions are imperative; in particular should there be no interest in pursuing certification.

For any stocks, fisheries or Units of Certification being considered for full assessment, it will be important to review the conclusions of the Project Inshore Stage 2 pre-assessment – both the report and the scoring database. These contain a lot of useful information and insight into the scoring process. Clearly it will be important to address any 'gaps' identified to seek to further increase scores and so increase assurance of a successful assessment process, but equally it can often be useful to seek to increase scoring in some areas with no gaps – perhaps targeting scores of 100, in order to increase the overall average scores at the principle level.

3.1.1. EU Quota stocks ready for full assessment

Proposed UoCs[4] & Overlapping IFCAs

The Project Inshore Stage 2 pre-assessment exercise reveals that a number of EU managed stocks landed in English ports are ready for full assessment. Some of these may already be certified with some fleets, but others may yet to be certified by any fishery.

For fisheries on the stocks identified in table 1, the Unit of Certification has the potential to be increased in size to encompass a larger number of fishers. The overwhelming advantage of increasing the size of the Unit of Certification is that the cost of assessment, surveillance and re-assessment is shared, effectively bringing individual costs down. A bigger Unit of Certification may also be able to exert greater leverage in order to achieve any conditions placed upon the fishery at the time of full assessment. The MSC now refer to Smarter Units of Certification which aim to make certification more economically viable in the long term. And coupled with the MSC's current work on the Fishery Standard Review and the Scale and Cost Review there is potential for it to provide further benefits to inshore fisheries.

For example, it would be possible for all English registered inshore fishermen targeting those species in the North Sea to come together under a single assessment. As these stocks are not managed at an IFCA level and are also fished outside of 6nm there is no particular advantage to restricting the UoC to a single IFCA. The only exception to this would be if it was felt that there were particular advantages to scoring of P2 issues, such as reduced local habitat impacts or improved gear performance due to local byelaws, however for the static gear fisheries discussed here this sort of local improvement in scores is less likely.

So a single assessment could be used for all English Inshore Fishermen catching the 3 North Sea demersal stocks, using static gears. This single assessment would contain multiple Units of Certification (1 UoC for each combination of stock and gear). By combining many units of certification under a single assessment, the costs are also reduced. This could bring together inshore fishermen along the coast.

[3] A pre-assessment is a snapshot in time (in this case early 2013) and it is beyond the scope of the project to continually revisit and update scores to reflect ever changing policy decisions and / or scientific advice. However, in the context of considering the potential for a future inshore multi-species static gear assessment, it would be worthwhile reflecting on the potential to include North Sea cod in the assessment. The latest ICES advice (June 2013) reflected on an increased stock status and this is projected to have increased further by the time of the next advice (expected June 2014), which, may pave the way for its inclusion in any future full assessment.

[4] The MSC Guidelines to Certifiers specify that the unit of certification is "The fishery or fish stock (biologically distinct unit) combined with the fishing method / gear and practice (= vessel(s) and / or individuals pursuing the fish of that stock) and management framework".

With a larger assessment, or Unit of Certification such as this, it is important to consider who the client would be of any future assessment and what is the 'glue' that binds the individuals within the client group. This is particularly important in order to demonstrate that any commitments made (such as codes of Practice) are effectively complied with and any conditions resulting from the full assessment are enacted across the certified fleet. As such it is likely that some form of fishermen's association may be best placed to take a lead on first ascertaining the level of interest for any such assessment, and second on pulling together the funding and requirements to enable the full assessment process to begin.

At least for the static gear finfish fisheries discussed here, it is not anticipated that the IFCA would necessarily have any particular role to play, other than highlighting the potential opportunity to fishers targeting those resources within the district, and possibly in assisting with preparation for full assessment.

Stakeholders to consult with in full assessment

The following is a preliminary listing of those bodies and interested parties that will need to be contacted during the consultation phases of assessment on fisheries managed at an EU level:

- Owners and management of member vessels - provision of operational data and other data collected by the client;
- Skippers and mates of member vessels - provision of operational data;
- Fisheries managers – (MMO).
- Various fishery research institutes involved with regional fisheries and regional marine management - (CEFAS)
- Details of at-sea and port inspections, checks on recent fishing infringements, information on fishing practices and discards - coastguard and national inspection authorities;
- Fishermen's / producer organisations - details of licensing, quota management and uptake, log book records, fishing practices;
- Other environmental organisations and special interest groups. For static gear fisheries this could include RSPB. It is our experience that it is best to include all possible NGOs with an interest in the stakeholder list, so they are aware of the assessment processes and have the opportunity to comment if interested.

Collection of supporting evidence

Supporting evidence is a crucial aspect of a successful MSC assessment process. The onus is on the client fishery to demonstrate their sustainability. Any supporting evidence provided to the assessment team is likely to increase the likelihood of a successful outcome and speed up the assessment process (an important consideration as the MSC timeline conditions have been tightened, so at worst a delay could lead to failure to complete the assessment in the requisite timeline).

For both Principle 1 and Principle 3 for stocks managed at an EU level with advice from ICES much of the requisite information is readily publically available. For P2 there is often more of a shortage of information which can lead to significantly reduced scores. It is therefore important to demonstrate:

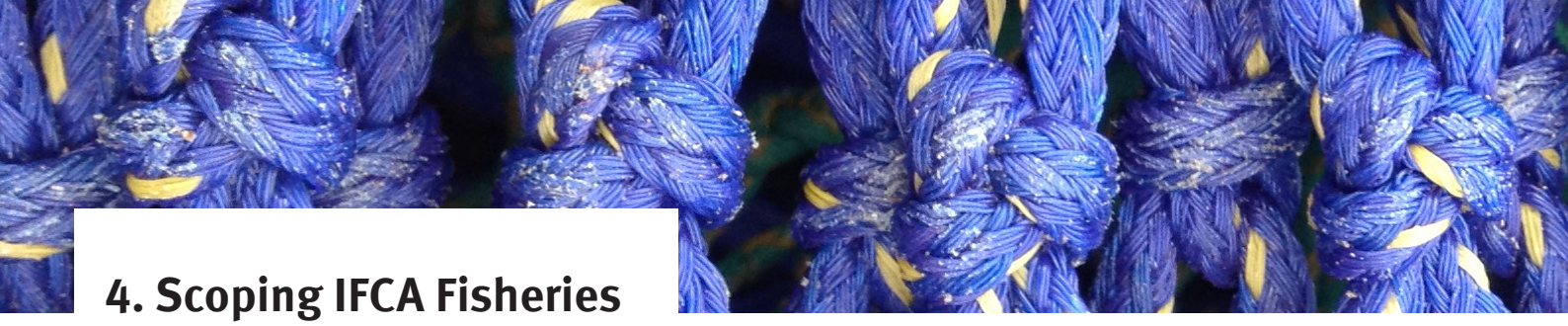
- The catch profile of the gears under assessment, including the discard and ETP profile. This may require some primary research carried.
- The area of the fishery (ideally VMS or Succorfish – or informed estimates if these are not available for inshore vessels) compared to the habitat types.
- Any fleet level management initiatives – such as gear modifications to reduce impact, Codes of conduct designed to minims impact, reporting requirements to demonstrate reduced impact, reports from observers, membership of responsible fishing schemes etc.

- Any appropriate assessments of gear impacts in European marine sites, or any management plans for those sites indicating that the impacts of the gears under assessment are acceptable.

3.1.2. Locally managed fisheries ready for full assessment

Proposed UoCs & Overlapping IFCAs

The two cockle fisheries which have been concluded to be in a position to proceed with full assessment are both geographically restricted and locally managed by means of a Regulating Order. In this instance there is little opportunity for the UoC to be extended, nor any need for national coordination. As such the relevant IFCA reports as part of Project Inshore Stage 3 provide guidance on taking these forward which need not be repeated in this national context report.



4. Scoping IFCA Fisheries

Aside from the stocks referred to above (table 1) which have been identified at the pre-assessment stage of having the required status and management to proceed with full MSC assessment, all other stocks and fisheries targeting them have been identified as not currently meeting the requite MSC unconditional pass park and are likely to therefore require further work in order to demonstrate an assurance of sustainable management – in particular should any fishery wish to proceed to MSC certification.

It is evident from the results that short comings in stock management often result in poorer scores for both Principles 1 and 3, due to the strong linkages between these. Essentially, Principle 1 is an indicator of how management is succeeding (in terms of stock status), by what measures and based on what information, whilst Principle 3 asks how decisions are taken, according to what objectives and by who. There is therefore often – but not always - a strong link between Principle 1 and Principle 3 pre-assessment findings and therefore a linkage in thinking how to address any gaps identified.

4.1. EU quota species

There are a number of species governed by EU quota, where science is coordinated at an international level (via ICES) and it could be argued primary responsibility rests firmly with the EU, and within England, DEFRA and the MMO for application of management decisions. A number of these do not currently meet the P1 requirements. In some cases these may also have some associated weaknesses in P3 – in particular in relation to objectives and decision making processes, where a long term management plan is missing. These include the most commercially important of the remaining stocks, including a large number of demersal finfish, the main remaining pelagic stocks and only a single shellfish (see table 2):

Table 2:

Stocks of EU managed quota species, with gaps identified in either P1 or P3 (or both).

	Species	Stock
Demersal	Blonde ray	Irish and Celtic Sea (VII a/f/g)
		North Sea and Channel (IVa VII d/e)
	Brill	North Sea and Channel (IV+IIIa VIId/e)
	Cod	Irish Sea (VIIa)
		North Sea and Eastern Channel (IV IIIa VIId)
	Cuckoo ray	Irish and Celtic Sea (VII a/f/g)
		North Sea and Channel (IVa IIIa VIId)
	Dab	North Sea (IV+IIIa)
	Flounder	North Sea (IV+IIIa)
	Haddock	Irish Sea (VIIa)
	Lemon sole	North Sea and Eastern Channel (IV IIIa VIId)
	Ling	Southern (IIIa IVa VI VII VIII IX XII XIV)
	Megrim	Celtic Sea and West of Scotland (VIIb–k and VIIIa,b,d)
	Monkfish / Angler	North Sea (IV IIIa VI)
		Western and Channel (VII b-k, VIII a/b/d)
	Plaice	Celtic Sea (VII f/g)
		Eastern Channel (VIId)
	Pollack	Celtic Sea and West of Scotland (VI VII a-c, e-k)
	Small-eyed ray	Celtic Sea (VII f/g)
		Channel (VII d/e)
	Sole	Eastern Channel (VIId)
		Irish Sea (VIIa)
	Spotted ray	Irish and Celtic Sea (VII a/f/g)
		North Sea and Eastern Channel (IV VIId)
	Thornback ray	Irish and Celtic Sea (VII a/f/g)
		North Sea and Channel (IVa IIIa VII d/e)
	Turbot	North Sea (IV+IIIa)
	Whiting	Irish Sea (VIIa)
		North Sea and Eastern Channel (IV VIId)
	Witch	North Sea (IV IIIa VIId)
Pelagic	Horse mackerel	North Sea
		Western Stock
	Mackerel	NEA Mackerel
	Sprat	North Sea (IV)
		Channel (VIId,e)
Shellfish	Nephrops	North Sea
		Celtic Sea / West of Scotland

Addressing the gaps highlighted in the pre-assessment for these fisheries is likely to involve international coordination at an EU level and though local management measures may contribute to international efforts, in particular through enforcement and good stewardship, these alone are unlikely to safeguard the stocks. **There is therefore little sense in an IFCA seeking to take a lead in any stock management initiatives on these stocks.**

In addition to those stocks highlighted above there are a few others that may reasonably be included in this group on the basis that there is already considerable EU level engagement or that their migratory life history makes some form of international engagement vital, these include other pelagic stocks, such as Pilchard and anchovy (even though these are not currently subject to EU quota), other widely distributed species, such as Smoothhound and potentially also scallops, on the basis that there is already an EU effort regime in place for this fishery.

For these stocks the development of long-term management, in the form of EU multi-annual management plans is likely to be required in order to demonstrate that stock management is effective in controlling outcome status. In so doing though would move these fisheries a long way

to meeting the requirements of Principles 1 and 3. This would include the setting of objectives and the development of a harvest control rule including appropriate reference points.

This process is likely to follow much the same process as the development of management plans for those EU quota species which already have multi-annual management plans in place, such as those listed in table 1. As such much of the work to develop management plans is likely to be at a multilateral level, such as through ICES, with implementation at an EU level. The UK administration and scientists are likely to play an active part in this process and in particular it is likely that for those stocks which are fished mostly within the UK jurisdiction, or where quota is held largely by the UK, a proactive push for the development of management is likely to be required from the UK, or UK industry at the level of the Regional Advisory Council (RAC) if management plans are to be developed in the short to medium term.

4.2. Non-EU quota species

In considering the fisheries that are not in a position to proceed to MSC assessment and that fall into the non-EU quota species category it is an important task of this stage 3 project to consider where management responsibility lies (or should lie). This is a topic that this report returns to in later sections, although it should be noted that though this project can give consideration and make informed and practically minding suggestions about where management responsibility lies, ultimately this would be expected to be clarified through management processes.

In the section above, in relation to the EU quota species, the presence of internationally coordinated scientific advice and an EU quota provides an indication that a stock is primarily managed at an EU level. Where these indicators are absent the precise definition of management responsibility is less clear. This lack of clarity results in a lower score for Principle 3 in the MSC pre-assessment as it typically associated with only implicit management objectives and unclear decision making processes (the act of stating fishery specific management objectives, often clarifies where management responsibility lies).

The stock boundaries for species falling into this category may also be more poorly defined (or undefined) and whilst this still includes a number of demersal finfish, these tend to be the less commercially important or less heavily exploited (at least in the past). There are some species included in this category which are also included in the previous category of EU quota species, for example Dab, Flounder and Lemon sole. This is because these are species for which management controls such as quota or ICES advice is provided for some stocks, but not for others. Those included in this category lack that advice or quota control. Interestingly there are no pelagic fish in this category (although pilchard and anchovy lack quota control these were included in the previous category due to their migratory life history which is likely to necessitate international coordination), but by contrast there are a large number of shellfish. Most of these shellfish have an undefined stock distribution. Although Stage 2 of Project Inshore did make some attempt at stock boundary definition, it was highlighted that this was really only for the purpose of the scoring exercise and that ultimately it would be the responsibility of managers to determine appropriate stock boundaries. For the purpose of this reporting exercise these stock boundaries have therefore been once again amalgamated:

Table 3:

Stocks of non-quota species, with gaps identified in P1 and P3[5].

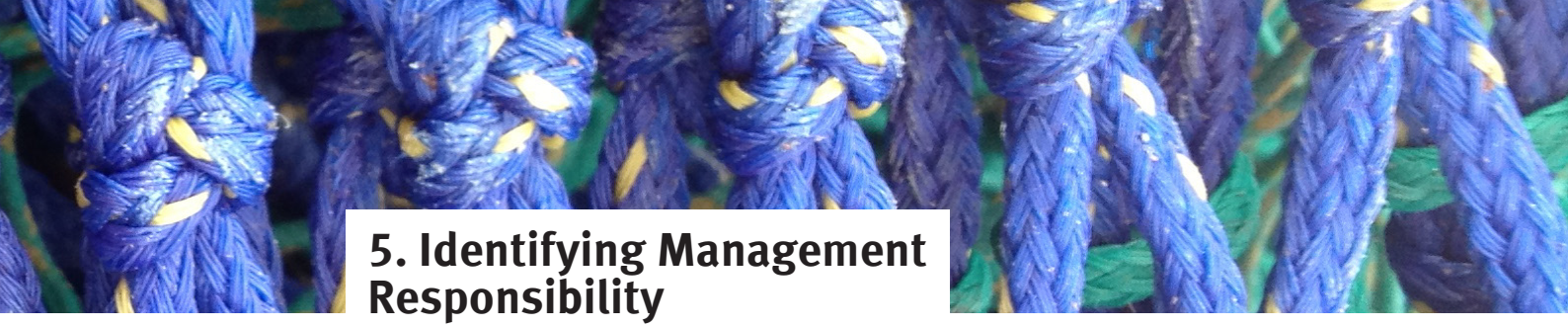
	Species	Stock
Demersal	Bass	NE Atlantic
	Black Seabream	North Sea and Channel (IV VII d/e)
	Dab	Channel (VII d)
		Western (II, V, VI, VII (excl. d), VIII, IX, X, XII, XIV)
	Flounder	Channel (VII d/e)
		Irish Sea (VII a/f)
	Grey Gurnard	Celtic Sea and West of Scotland (VI VII a-c, e-k)
		North Sea and Eastern Channel (IV IIIa VIId)
	Grey mullet	Channel and North Sea (IV VII d-f)
	Halibut	North Atlantic
	John dory	Western Approaches (VIIe-j VIII a,b)
	Lemon sole	Western and Channel (VII a/f/e)
	Other Gurnards	NE Atlantic
	Pollack	North Sea (IV IIIa)
	Pouting	Undefined
	Red Gurnard	Western (VIId–k)
	Red mullet	Celtic Sea and Western Channel (VII e-g)
		North Sea and Eastern Channel (IV IIIa VIId)
	Turbot	Channel (VII d/e)
		Irish Sea (VIIa)
	Witch	Irish Sea
		Western approaches (VII f/e)
Shellfish	Brown crab	Various
	Brown shrimp	Bristol Channel
		Northwest
		Wash
	Carpet shell clam	Poole Harbour
	Cockle	Various / undefined
	Crawfish	Various / undefined
	Cuttlefish	Various / undefined
	Lobster	Various / undefined
	Manila clam	Poole Harbour
	Mussel	Various / undefined
	Native oyster	Various / undefined
	Pacific oyster	Various / undefined
	Periwinkle	Various / undefined
	Razorshell	Various / undefined
	Spider crab	Various / undefined
	Squid	Various / undefined
	Velvet crab	Various / undefined
	Whelk	Various / undefined

Addressing the gaps highlighted in the pre-assessment for these fisheries may still involve some international coordination, for example at an EU level, or it may involve national coordination (i.e. beyond the boundary of a single IFCA) or it may be possible to achieve stock level management (so addressing gaps in Principle 1 & 3) at a local IFCA level. It is the task of stage 3 reports to further divide this list to focus IFCA management effort on the stocks which can, and arguably therefore should, be managed at an IFCA level (see later sections 5.1.2 and 5.2), but also highlight from a national perspective those which cannot be reasonably managed by IFCAs.

For those that cannot reasonably be managed at an IFCA level, because of life history or fishery

[6] Smoothhound, anchovy, pilchard and scallop listed under the previous category although technically these are also non-quota.

patterns which mean that a wider jurisdiction of management is required, decisions over the approach to management is likely to be determined by DEFRA, using the approach outlined in section 7 of this report.



5. Identifying Management Responsibility

5.1. Scoping IFCA Priorities

In moving from the simple results phase of the England-wide MSC pre-assessment exercise that occurred in Stage 2 of Project Inshore toward an IFCA focused strategic management review that is the focus of Stage 3 of Project Inshore, it was useful to pass through a scoping stage where the fisheries in the IFCA districts were prioritised and categorised to consider both their local importance and local management influence in order to help strategically plan IFCA management action.

There are a number of different approaches to doing this and some IFCAs have already undertaken exercises to seek to identify their key fisheries. As part of the Project Inshore Stage 3, the team has undertaken a further simple scoping exercise of the fisheries that occur in the different IFCA districts, seeking to rate fisheries according to parameters which may help to determine future management priorities. These do not at this point refer to the results of the MSC pre-assessment process (i.e. readiness for MSC is not one of the parameters used to determine management priority – although this will be introduced later in the planning process). The parameters used in the Management Scoping exercise were:

Table 4:

Scoping Parameter and scoring key for IFCA management prioritisation exercise

Scoping Parameter	1 – lesser local management priority	2	3 – higher local management priority
Value of Landings	Graduated scale 1 = low value; 3 = high value		
Degree of EU Management Engagement	EU lead, ICES science with defined quotas	Some EU / ICES engagement but no quotas	no fishery specific EU involvement
Stock boundary	Defined – widely distributed or migratory	Undefined & highly mobile	Undefined & sedentary
Local cultural & socio-economic importance	Occasional bycatch, no recreational catch	Commercial bycatch and occasional recreational catch	IFCA Priority Species (i.e. important commercial or recreational catch).

It is important to highlight what this management prioritisation exercise is and is not intended to do. This is focused solely on fish (both finfish and shellfish), and more specifically stocks, to help prioritise local stock management measures. It does not consider any site conservation or any gear impacts (at this point) and clearly the IFCA has many other important (and statutory) priorities which are outside of the remit of this scoping exercise. This exercise is simply to help focus in on the stocks which are locally important and which are best placed to warrant local stock management measures, led at an IFCA level.

The results of this scoping exercise for each IFCA are contained in each bespoke IFCA Project Inshore stage 3 report. The overall pattern of the results from this scoping exercise is discussed in the following sections below.

5.1.1. EU Quota species – National or International Responsibility?

Using the local management ranking exercise described above to scope the fisheries of each IFCA results in relatively low ranking scores for stocks which are already spatially defined by management, already subject to EU quota management and where science is already coordinated at an ICES level (i.e. those EU Pressure Stocks featuring in table 1 & table 2). This is not to say that these stocks do not necessarily warrant management attention – merely that it is unlikely to be the IFCA (or even a single member state) that is best placed to lead on that management. This is a logical conclusion as more widely distributed and commercially important stocks require a high level of both science and management, coordinated at an appropriate spatial scale of the resource; i.e. international.

Most commercially important finfish pressure stocks fall into this category. This means that though these species are locally important (often forming a vital income stream for inshore fishermen), overall responsibility for stock management is rightly at a higher jurisdictional level. For these stocks IFCAs still clearly play an important role both as key stakeholder and a partner in

management. The IFCA also remains responsible for enforcement of relevant legislation on these fisheries within their jurisdiction. In some cases there will be management measures, applied at a higher level, where the IFCA may even have primary responsibility for – such as protection of inshore nursery grounds. Additionally the IFCA have the power to act to further safeguard the resource, should they wish, such as through the introduction of technical measures (gear restrictions, minimum landing sizes, spatial or seasonal restrictions), however, though this is clearly good and responsible stewardship of the resource, it should be recognised that the overall success of stock management – namely whether or not the stock is overexploited – is beyond the IFCAs control. Local measures which apply disproportionately to local inshore vessels, which do not result in overall stock benefits, are likely to be unpopular and may even be counter-productive, in particular in reducing support for management measures on other stocks where the IFCA is best placed to lead on stock level management.

5.1.2. Species suited to local stock management – IFCA Responsibility?

By contrast there are other stocks fished within the 6nm IFCA jurisdiction which are more suited to being managed at a smaller spatial scale such as an IFCA and which scored comparatively highly in the scoping exercise. Typically these will not already feature in any EU management, or any ICES science, other than in very general terms, such as general fleet technical measures, or general ecosystem science. As such the management is not dependent on the EU, so there is no barrier to IFCAs from engaging in stock management.

Of those stocks which are not the focus of any fisheries specific management at an EU level, there are some which are suited to an IFCA stock management more than others and which therefore score more highly in the scoping / ranking exercise. In short, the more sedentary the species, the more suited they are to local stock management measures. Of course there are other factors that are also important in justifying the spatial scale of stock management, such as life history characteristics (migratory etc.), length of planktonic larval phases, fishing patterns or even local bathymetry, and these will be discussed in more detail later, but as a simple proxy for scoping fisheries, it is the sedentary nature of the stocks which most lend themselves to local management.

More shellfish species fall into this category such as those mentioned in table 3 including species such as **bivalves such as native oyster, mussels, clams and cockles, gastropods such as whelk and crustaceans such as lobster or spider or velvet crab**. These are stocks which are of local economic importance and which are not the subject to any fisheries specific either national or international stock management. It is interesting to note that brown crab and scallop are less likely to fall into this category. In the case of crab they are more likely to migrate over longer distances, there is a significant fishery beyond 6nm and there is already some degree of international scientific cooperation, so they are less immediately obvious candidates for inshore adaptive stock management. In the case of scallop, again there is an important offshore fishery, with coordinated scientific effort but in addition there is more fisheries specific management already in place – both at a national level (led by DEFRA) and an international level (such as the EU effort regime).

5.1.3. Stocks where primary management responsibility is unclear

For a large number of species it can be concluded that current management action is less obviously being led by either EU or national processes, or that the species or fishery characteristics mean that they are less obvious candidates for inshore stock management. In short there are a large number of species which have received less management attention at either a local or EU level and which fall between these two management jurisdictions. These are more likely to be lower value finfish species such as the demersal stocks that feature in table 3 such as **smoothhound, John Dory, Black Seabream, gurnard, Pollack, tope, flounder, mullet and bass, plus the previously discussed crab and scallop**. Future effective adaptive stock management of these stocks will only occur if it is first determined at which jurisdiction they should be managed. **Discussions and guidance over most appropriate stock management measures for these species cannot be conducted at a purely local or inshore level (i.e. IFCA level) and a national or possibly international dimension is therefore required if the gaps identified are to be addressed and these**

stocks are to be managed effectively.

5.2. IFCA Stock Management Priorities

Although responsibility maybe shared in meeting the commitments of sustainable fisheries management, it is vital the division of responsibility is explicitly addressed on a species by species and a stock by stock basis if the commitments for Maximum Sustainable Yield and Good Environmental Status are to be met for all commercial species (see section 6.2). The Project Inshore Stage 3 reports (and the scoping exercise described above) help the IFCAs to identify those that they are best placed to manage and that they are therefore perhaps most responsible for managing. The table below details the local inshore stocks that the IFCAs have concluded are locally important and which they are best placed to lead on stock level management[6].

Table 5:

Species[7] identified by IFCAs as both locally important and local stock management priorities

Species	IFCA								
	SO	DV	CO	SC	NW	NO	NE	EA	K&E
Lobster	x	x	x	x		x	x	x	x
Whelk	x	x					x		x
Cockle					x			x	x
Oyster			x					x	x
Spider Crab			x	x					
Cuttlefish	x	x							
Mussel					x				x
Clam	x								
Crawfish				x					
Shrimp								x	

These species are all of a substantial local value, both in terms of first sale value, but also in creating both upstream and downstream economic benefits. They are also of cultural importance with many of the species having a local reputation and market and are an important element of the inshore fisheries regional livelihood. These species are not currently subject to any international coordinated science (through ICES) and little coordinated national level science. Additionally these species are not subject to any fishery specific national or EU controls, other than more general gear specification and licencing and landing regulations, other than perhaps a stipulated minimum landing size. In short stock level management is not likely to be driven by an EU led approach, nor would such an approach be necessarily appropriate or necessary. If stock level management is to be applied it is most likely to be applied at a local level. As such these species are prime candidates for IFCA stock management.

By contrast for the remaining stocks (those non-quota stocks listed in table 3, which have not been identified as suitable for an IFCA led approach to adaptive stock management in table 5), the strategic decision over where responsibility lies for meeting the commitments described above must be addressed and clarified at a national level. These are set out overleaf:

[6] In addition to these species which are more suited to local inshore management there are many others which IFCAs recognise as locally important, and recognise have management gaps which need addressing, but where the IFCA is not in a position to lead on that management. These include many inshore resources important for both commercial and recreational fishing such as (finfish) bass, mullet, tope, (shellfish) brown crab and scallop.

[7] Note that stock boundaries are still to be defined.

	Species	Stock?	Appropriate management jurisdiction?
Demersal	Bass	NE Atlantic	National, bilateral or EU.
	Black Seabream	North Sea and Channel (IV VII d/e)	National, bilateral or EU.
	Dab	Channel (VII d)	National, bilateral or EU.
		Western (II, V, VI, VII (excl. d), VIII, IX, X, XII, XIV)	National, bilateral or EU.
	Flounder	Channel (VII d/e)	National, bilateral or EU.
		Irish Sea (VII a/f)	National, bilateral or EU.
	Grey Gurnard	Celtic Sea and West of Scotland (VI VII a-c, e-k)	National, bilateral or EU.
		North Sea and Eastern Channel (IV IIIa VIId)	National, bilateral or EU.
	Grey mullet	Channel and North Sea (IV VII d-f)	National, bilateral or EU.
	Halibut	North Atlantic	National, bilateral or EU.
	John dory	Western Approaches (VIIe-j VIII a,b)	National, bilateral or EU.
	Lemon sole	Western and Channel (VII a/f/e)	National, bilateral or EU.
	Other Gurnards	NE Atlantic	National, bilateral or EU.
	Pollack	North Sea (IV IIIa)	National, bilateral or EU.
	Pouting	Undefined	National, bilateral or EU.
	Red Gurnard	Western (VIId–k)	National, bilateral or EU.
	Red mullet	Celtic Sea and Western Channel (VII e-g)	National, bilateral or EU.
		North Sea and Eastern Channel (IV IIIa VIId)	National, bilateral or EU.
	Turbot	Channel (VII d/e)	National, bilateral or EU.
		Irish Sea (VIIa)	National, bilateral or EU.
	Witch	Irish Sea	National, bilateral or EU.
		Western approaches (VII f/e)	National, bilateral or EU.
Shellfish	Brown crab	Various	National, bilateral or EU.
	Brown shrimp	Bristol Channel	Potential for inshore management
		Northwest	Potential for inshore management
		Wash	Potential for inshore management
	Carpet shell clam	Poole Harbour	Potential for inshore management
	Cockle	Various / undefined	Potential for inshore management
	Crawfish	Various / undefined	Potential for inshore management
	Cuttlefish	Various / undefined	Potential for inshore management
	Lobster	Various / undefined	Potential for inshore management
	Manila clam	Poole Harbour	Potential for inshore management
	Mussel	Various / undefined	Potential for inshore management
	Native oyster	Various / undefined	Potential for inshore management
	Pacific oyster	Various / undefined	Potential for inshore management
	Periwinkle	Various / undefined	Not identified as IFCA priority
	Razorshell	Various / undefined	Not identified as IFCA priority
	Spider crab	Various / undefined	Potential for inshore management
	Squid	Various / undefined	National, bilateral or EU.
	Velvet crab	Various / undefined	National, bilateral or EU?
	Whelk	Various / undefined	Potential for inshore management

Table 6:

Non-quota stocks or species which have not been identified by IFCAs as local stock management priorities, where management jurisdiction requires clarification

In some areas an IFCA may have identified a species as being suitable to inshore management, whilst another IFCA has concluded that it is not. This reflects either differences in the fishery or differences in IFCA priorities. For example, in some areas whelk is a largely inshore fishery, so is more suited to IFCA led management, whilst in other areas the characteristics of the fishing grounds may mean that there is considerable effort beyond 6nm therefore more national engagement in stock management is likely to be required.

6. The potential to develop local sustainably managed fisheries

6.1. Regionalisation

Article 18 of the new Common Fisheries Policy (REGULATION (EU) No 1380/2013) details new policies in relation to regionalisation. This goes further and is more explicit that that contained in the old, now repealed Common Fisheries Policy (COUNCIL REGULATION (EC) No 2371/2002). This provides greater clarity on what Member States are able to do with management of stocks within their jurisdiction. This indicates that:

- Member States having a direct management interest in a fishery in a defined geographical area may also make joint recommendations to the Commission on measures to be proposed or adopted by the Commission.
- Member States shall only adopt their respective national measures if an agreement on the content of those measures has been reached by all the Member States concerned. Where the Commission considers that a Member State's measure does not comply with the conditions set out in the relevant conservation measure, it may, subject to providing relevant reasons, request that the Member State concerned amend or repeal that measure.

Article 20 addresses the degree to which any measures may be applied within a Member States jurisdiction and the extent to which they apply to all vessels. This states:

- Member State may take non-discriminatory measures for the conservation and management of fish stocks and the maintenance or improvement of the conservation status of marine ecosystems within 12 nautical miles of its baselines provided that the Union has not adopted measures addressing conservation and management specifically for that area or specifically addressing the problem identified by the Member State concerned. The Member State measures shall be compatible with the objectives set out in Article 2 and shall be at least as stringent as measures under Union law.
- Where conservation and management measures to be adopted by a Member State are liable to affect fishing vessels of other Member States, such measures shall be adopted only after consulting the Commission, the relevant Member States and the relevant Advisory Councils on a draft of the measures, which shall be accompanied by an explanatory memorandum that demonstrates, inter alia, that those measures are non-discriminatory.

In short, this appears to give Member States greater scope for introducing management measures within 12nm, where it is demonstrated that there is a need and where the Union has not already adopted management measures. Any such measures would apply to UK vessels but could also apply to vessels of other member states if these are fully consulted upon and approved by the Commission and RAC.

For the species identified as being currently subject to relatively little stock assessment, stock definition or fishery specific management measures it will be important to decide if the requisite management measures will be applied at an EU level or by the Member State through the regionalisation approach detailed above.

The new CFP certainly seems to pave the way for member states to take a proactive approach to managing those species and stocks whose management is yet to be clearly addressed at an EU level (i.e. those in table 3). The question for member states then, is to what extent they wish to take a management lead on those species, and within the member state where will responsibility lie for making the case for, developing and implementing adaptive stock management.

6.2. The MSY Commitment

There is now a clear and unambiguous legal commitment for Member states to demonstrate that fish stocks within their jurisdiction are well managed and sustainably exploited.

The headline target[8] in relation to stock management contained in the new Common Fisheries

[8] There are many other targets relating to fisheries, such as limiting ecosystem impacts, however this particular target is highlighted here as it is most relevant to the Project Inshore discussions.

Policy (REGULATION (EU) No 1380/2013) is that MSY is achieved, by 2015 where possible, and at the latest by 2020 for all stocks and that where scientific information is insufficient to determine those levels, proxies may be used. This enshrines the commitments first made at The Convention on Biological Diversity signed in June 1992 in Rio de Janeiro and adopted by the EU council decision 93/626/EEC.

Other EU marine policy decisions are in line with this commitment. The EU Marine Strategy Framework Directive was adopted in June 2008 and aims to more effectively protect the marine environment across Europe and to achieve "good environmental status" of the EU's marine waters by 2020, and in so doing to protect the resources upon which marine socio-economic activities depend. The directive requires that Member States develop strategies for their marine waters, detailing the state of the environment, and targets and monitoring programmes to achieve "good environmental status". Annex 1 of the Marine Strategy Directive Framework states that 'Populations of all commercially exploited fish and shellfish are within safe biological limits, exhibiting a population age and size distribution that is indicative of a healthy stock'.

6.3. Progress toward commitments

For many commercial fish stocks, good progress is being made toward meeting the MSY commitments. These obviously include those already highlighted in this report as being in a position to proceed with MSC assessment, such as the various stocks of various species of demersal whitefish (haddock, whiting, sole, plaice etc) and pelagic species (herring etc) (featured in table 1). It may also be that some small scale inshore shellfish stocks may meet the obligations (for example some cockle beds under a Regulating Order).

For many other species there are a number of outstanding questions which must be addressed on the road to determining "Good Environmental Status". These include:

Stock Definition

For many commercially exploited species, stocks or management units have not been defined. For some species this comes under the consideration of ICES working groups such as WGNEW[9], however in some cases assessment of stock status and management measures (i.e. quota) only applies for certain stocks and in other areas conclusions have yet to be reached about stock definition. Many other species have not yet received consideration at an ICES level. Overall there are a number of species that fall either partly of fully into this category, including a number of species that are commercially important to the English inshore fleet, such as Dab, flounder, bass, halibut, lemon sole, John Dory, turbot, witch, Seabream, pouting, cuttlefish, squid, velvet and spider crab.

It is important to clarify where responsibility lies for stock definition. Must this be an ICES led approach at an EU level? The Project Inshore Stage 3 IFCA reports encourage IFCAs to consider which species can reasonably be managed within their jurisdiction and present a practical rationale to support the establishment of stock management units for those species.

In moving stock management of English inshore fisheries resources forward, it may be helpful to undertake a strategic national exercise to consider all species commercially exploited in English waters and determine the extent to which stocks boundaries have already been defined and the extent to which further stock definition is required. Such an exercise should go on to identify the lead management authority on both the process of stock definition and the appropriate jurisdiction for future stock management initiatives. **This exercise would provide an important stepping stone toward demonstrating that all English inshore commercial fisheries have a clearly defined management responsibility and where necessary demonstrate that those stocks are**

[9] The ICES Working Group on Assessment of New MoU Species (WGNEW) reviews available information (such as total international landings, research vessel survey data) to determine abundance trends of species which are yet to be subject of full ICES assessment and EU level management controls. Once sufficient information is made available, the stock is passed on to ICES regional stock assessment groups. Each year, a different set of species is dealt with.

sustainably exploited and meeting the commitments for Good Environmental Status.

Management Responsibility

Once stocks are defined (see section 7.2 and appendix 2 for further detail) then it becomes clearer who is best placed to lead on management, based on the extent to which stock boundaries overlap with management jurisdiction. In fact this process may need to combine with the process of definition of management units described above. In some instances it may be both practical and reasonable to make the stock management unit the same as the management jurisdiction. This may be preferable to defining stock boundaries that lead to subsequent confusion over which jurisdiction is best placed to lead on stock management. It is preferable that decisions are taken on stock definition and stock management responsibility based on reasonable and practical rationale, which enables management to proceed, rather than await scientific certainty of divisions between genetically discreet populations that may take considerable time and money and ultimately simply delay the adoption of good precautionary management.

There is a need for all species commercially fished in English waters to have stock management boundaries determined and then to clearly identify who is responsible for management of those stocks. There are many species which do not have EU quota, and therefore receive little MMO consideration, but which the IFCAs cannot reasonably be expected to lead on management of either because stocks are extensively fished outside of their jurisdiction or because life history parameters mean that the fish are highly mobile.

Monitoring and scientific responsibility

As well as defining the management unit (i.e. 'stock') and the appropriate management jurisdiction, it is also vitally important, in terms of meeting the MSY commitments to clearly define who is responsible for providing the scientific monitoring, analysis and assessment (both initial and on-going) needed to demonstrate where the stocks are in relation to the 'Good Environmental Status' targets. This is likely to be closely connected to decisions over appropriate management jurisdiction. For those stocks where a more national approach to management is required, CEFAS are likely to be the lead scientific authority. It is also important that it is clearly understood which stocks CEFAS is not likely to be the lead scientific authority. This will help to ensure that IFCAs have clear understanding of which stocks they can expect scientific advice for and which they cannot and plan and budget their own research and monitoring accordingly.

7. Developing management for priority fisheries

7.1. Characteristics of successful management (The Theory)

Having identified that there are some species, for which stocks or more accurately management units have yet to be defined and where there is a need to develop adaptive stock level management, either at an IFCA or national level, there is considerable scope to design a management system – albeit within the confines of existing legislation. In the following section, the report discusses some of the characteristics of successful management. Many of these characteristics are directly linked to MSC performance criteria, and for simplicity they are set out in the order of the MSC Principles, but some others are less explicitly stated in the MSC model. These characteristics are equally applicable for an IFCA led approach to adaptive management or a national approach.

7.1.1. Principle 1

Principle 1 introduces the idea that successful adaptive stock management should seek to understand and manage all fishing mortality upon that stock, or management unit. This includes all catches from all fleets, any mortality of discard species, or any unreported landings. The following characteristics are of key importance:

Clear management units

It is essential for management to clearly identify what it is managing. Where are the boundaries to the stock or management unit that is being managed and what is the rationale or assumptions on which this management unit has been defined? For many of the species fished around the English coast, this is an important pre-requisite of management action. By clearly stating the assumptions, these are not only openly acknowledged but they can also be tested over time with thorough review and evaluation.

Collection of appropriate information

Information is essential for adaptive stock management. This information should be tailored to the needs of any stock assessment or management analysis. Where fishers are involved in this collection of information, the reasons for the data collection should be explained and it should be demonstrated how this information is used. Data should be collected at an appropriate spatial scale – to correspond to the management jurisdiction and the conduit for information should be via the managers.

Understanding of stock status

Although understanding stock status may seem an obvious characteristic of good management, there remain many examples of fisheries management (not least in the English Inshore) seeking to take measures without fully understanding either the need for those measures or the response of the stock to those measures. Small fortunes can be spent on getting a more a more precise understanding of stock status and this is entirely justified in large high value, commercially important fisheries. But for smaller scale, lower value fisheries it is also possible to make precautionary, informed and adaptive management based on simpler and less data hungry and expensive assessment models. Of course any loss of precision needs to be acknowledged and uncertainties identified and where necessary an increased level of precaution needs to be built into the management decision making process.

A pre-defined adaptive management response

In simple terms, a harvest control rule (HCR) simply states what stock level the fishery is targeting, what measures will be used to reach there, and what management actions will be taken and at what points (reference points) to ensure that management response to a declining stock status is appropriate and timely to prevent impairing the ability of the stock to recruit future generations. The MSC standard does provide more description and requirements about the exact characteristics of these rules, but the key principle is that they are both transparent and pre-determined. This means that negotiations over management response do not have to occur at times of reduced catches, as these decisions are effectively taken and evaluated before a need arises.

Engaging stakeholders in the process of determining the harvest control rules greatly enhances the likelihood that these rules will be adhered to and eases the process of their application. In some cases this may also allow economic considerations to be included in the decision making process – provided this is not seen to be anti-competitive and it can be demonstrated that management actions are taken before there is a biologic risk to the stock. Working with stakeholders to agree on decision rules also means those stakeholders, in particular fishers, have a better understanding for the reasons for management action.

Review & Evaluation

Periodically it is important that the performance of the management system is reviewed holistically; is the stock responding to management actions as expected; are the underlying assumptions appropriate; are the tools used to set the exploitation rate appropriate; is the stock assessment model appropriate or should others be tested. This can be done as an internal exercise but having an external review often provides the benefit of fresh perspective and consideration of alternative approaches. This is part of the ongoing process of management refinement and improvement.

7.1.2. Principle 2

Principle 2 considers the impacts of fishing gears on the ecosystem. In an MSC assessment this would be the particular gear that is under assessment (and defined in the UoC) however for a wider fishery management remit, as might be included in a fisheries management plan it may be more appropriate to consider the impact of all gears targeting the resource in the management area.

Key considerations for Principle 2 would be to identify vulnerable species and habitats, assess the status of those on an on-going basis, and implement appropriate management to ensure that impacts are either minimised or mitigate. Much of this has already taken place and continues to take place. Recent work to identify sites for protection and undertake impact assessments of activities on those sites and ensure that high impacts are avoided counts toward being able to demonstrate good Principle 2 management. In addition, the following actions should be considered.

Data – discards, ETP interactions and ecosystem impacts

As with Principle 1, data is a critical element of good management. Appropriate data provides managers with a quantitative understanding the impacts of a fishery on an ecosystem. From an MSC assessment point of view, a lack of data on impact of fisheries or an over reliance of qualitative data will lead to more precautionary (lower) scores. In preparation for a full assessment, provision of appropriate data of gear impact (ideally independently verified, or in some cases based on risk assessment) will assist in the scoring process. Data enables managers to make changes where warranted, but equally it may provide support for managers not taking precautionary management action, where it can be demonstrated that it is not necessary.

Information of ecosystem characteristics / distribution

Information about the ecosystem in which the fishery takes place is also important and this can provide an understanding of changes over time. In many cases this information will already exist (for example through national habitat mapping projects), in which case it would not be necessary for managers to require any local primary research.

Understanding of spatial distribution of fleet (appropriate to scale of potential impact)

It is important for managers to understand where fishing takes place so that the relationship with the underlying ecology can be considered. However this understanding only need be appropriate to the scale and intensity of the fishery. Before requiring all vessels to have VMS or Succorfish, managers should be clear on what the reasons for that are. In collecting data for Principle 1, capturing a spatial element can be useful for understanding catch per unit effort patterns. This can also help identify changes in fleet patterns over time. Inshore fishers are themselves increasingly keen for their spatial patterns to be understood and recorded, both so they can demonstrate that

certain vulnerable habitats may already be avoided or for highlighting commercially important fishing grounds in time of increasing competition for space with other marine industries.

Review mechanism to allow for management action in event of ecosystem impacts or risk caused by fishing (supported by decision rules where appropriate)

As with Principle 1, some form of review is an important pillar of management. This enables managers to review available information and be assured that the management in place is appropriate. If not management can propose an action either spatial, temporal or technical, as appropriate, and subsequently review the response to that management action.

Codes of Conduct – industry led

In a number of MSC certified fisheries some form of Code of Conduct has proved valuable. In some cases this simply sets out what is existing good practice, but it can be an opportunity to highlight that good practice. In other cases it is an opportunity for the fleet to think about actions in event of certain ecosystem impacts, and the appropriate response or mitigation to any such impact. In many cases these can include incident reporting forms. This information can be used by managers to demonstrate either that existing management is appropriate or that management response can be tightly tailored to address an identified issue of concern. Both data (referred to above) and meaningful codes of conduct can contribute to considerably increased Principle 2 scores in a full MSC assessment, but are also good practice in a well managed fishery regardless of any aspirations for certification.

A Code of Conduct provides a valuable opportunity for the fleet to set out how they ensure that both impacts and perceived impacts are indeed minimized. Where a Code of Conduct calls for action by the fleet, consideration should be given to how it can be verified that the fleet is indeed undertaking that action.

7.1.3. Principle 3

There is considerable cross over between Principle 1 and Principle 3. Principle 3 seeks to capture the apparatus and processes of management. There are some important characteristics of good management that are not contained in the MSC Principle 3, but which should none the less be part of the management consideration. In particular notions of capacity and profitability are not explicitly mentioned. Fisheries with excess capacity or fisheries that are not profitable are less likely to succeed and less likely to engender a sense of stewardship. The notion of profitability is not inviting excess, and is not limitless, but should rather be about ensuring that whilst seeking to maximise the number of fishers sustainably engaged in the fishery, this is not to the detriment of all. Other characteristics of successful management in Principle 3 are:

Appropriate jurisdiction to stock management scale

This mirrors Principle 1. Simply put, it is about ensuring that management decisions are likely to produce the expected stock level response, by selecting an appropriate scale of management prior to commencing management action. This is why some stocks need coastal states engagement, some can be managed within the EU and some can be managed locally as an inshore resource. Seeking to manage cockles through international agreement would be futile and would fail to safeguard local populations, whilst seeking to manage mackerel within a single inshore jurisdiction would fail to address the majority of fishing mortality that occurs on the stock when it is not in the local area and would therefore also be similarly futile.

Limited entry / ring fencing / community ownership / stewardship of resource

The relationship between a common resource and private ownership is sometimes somewhat grey in fisheries management and has and will likely again be tested in the courts. Any new approach to management which seeks to limit access to the resource must be fair, non-discriminatory and equitable. Ideally this should also set out possible routes for new entrants to join the fishery. Should access to fisheries not be intended to be an ownership right, then this should be set out in management. Some form of limited access is likely to greatly increase the sense of stewardship in

the resource which in turn may lead to increased support for sometimes unpalatable management actions, if it is known that those fishers taking the pain will also be the beneficiaries of any gain. The increased sense of stewardship can increase the role that informal approaches such as peer pressure can play in enforcement, stimulating good compliance and at best, reducing costs of enforcement. A key test here is what would happen to exploitation patterns (and how much control would managers have over that) if the price were to double. If it is concluded that many other boats not previously in the fishery would come and exploit the resource and the management system allows this, then the management is unlikely to succeed in meeting its objectives.

Stakeholder engagement in management process

For inshore fisheries, perhaps more so than offshore or cross jurisdiction fisheries (i.e. those managed at an EU level) there is an increased potential in engage fishers in the management process. This is not only about seeking to obtain appropriate and accurate data of fisheries performance but also in engaging them in the development of decision rules and critically in providing feedback of management performance. There are many examples where **annual fishery meetings** play an important role in engaging fishers in the process of management. This can be an opportunity to provide update on stock status, outline any changes to management rules and the reasons for any such changes and highlight any enforcement priorities. Of course it is also an opportunity for managers to listen to the concerns, ideas and information from the fleet. This addresses many of the MSC criteria relating to consultation, provision of explanations for how information is used, understanding of management processes etc. Above all this has the potential to give a real sense of stewardship in "our" fishery. Of course sometimes such engagement may be initially challenging, but should in time lead to a more inclusive and supported approach to management.

Define fishery specific objectives and decision-making processes

Stakeholder engagement in the management process can also be fruitful when it comes to setting out both the fishery specific management decision making processes and the objectives which will guide those management decision making process. The act of explicitly setting out how management decisions will be taken is critically important to determining the overall success of management. Part of this will be about setting the Principle 1 harvest decision rules into a wider management context; how will the rules be applied, by whom, how often and when? However there may be many other management decisions which Principle 1 alone cannot address; how many permits should be issued; what gears should be permitted; what area or seasonal closures (if any) should apply; what technical conservation measures should be in place; what will the enforcement regime be; what are the sanctions for any infringements; what is the consultation and appeals process? These, and many more besides, are all important management questions so in describing the management framework in a **Fisheries Management Plan**, the process for reaching these decisions should be set out. Typically decisions are taken in the context of pre-stated objectives and the success of management decisions should be judged against how well those decisions deliver against objectives. So as well as setting out the decision making process, the management plan should clearly highlight what the objectives are and include within these the ecosystem objectives demonstrating how the wide ecosystem impacts of undertaking the fishery are taken into account by management.

Research and information collection tailored to the needs of management

It is important that a relationship exists between science and managers, to ensure that the needs of management can be best addressed by research, and so that the results of research can be best presented to management to enable a management response. In international fisheries this close relationship can sometimes be difficult to achieve however in smaller locally managed fisheries the relationship can and should be both clear and mutually beneficial.

Management & enforcement appropriate to the scale (and risk) of the fishery

Enforcement need only be appropriate to the scale of the fishery, but management will need to determine what that is. The MSC standard introduces the notion of informal approaches to

enforcement, where the design of the management system engenders a collective sense of stewardship of the resource and incentivizes positive compliance with the management regime. Notions such as restricted access, along with open and transparent decision making processes and explanation of how fisheries information is used (all described above) all help engender that sense of stewardship. Of course such self policing stewardship is an aspiration, which may be difficult to achieve, especially initially. It is therefore important for the fisheries management plan to set out what the formal approaches to enforcement will be and what physical checks will be required to ensure compliance.

Review and Evaluation

Finally, as with both Principle 1 and Principle 2 there is a requirement for periodic review and evaluation of the performance of both the parts of the management system (for example, control & enforcement or data collection) and a holistic evaluation of how the constituent parts of the management system are working together to deliver the management objectives. Which of the objectives are being met, which are not and what are the reasons for the observed patterns in meeting those objectives.

7.2. Strategic Approach to developing stock management

The following strategic approach to developing local adaptive stock management has been included in the IFCA stage 3 Project Inshore reports to guide the IFCA in the process, for those stocks that they are best placed, and wish to take a lead in adaptive stock management. However, in the context of this national overview document these strategic steps may also prove informative for national approaches at a higher jurisdictional level and could provide an outline structure for Fisheries Improvement Projects (FIPs) on those fisheries identified with gaps as part of the Project Inshore pre-assessment exercise.

These steps are ordered in a more chronological order, illustrative of the management process, as opposed the arrangement by MSC Principle in the previous section. This does not really discuss Principle 2. This is because Principle 2 is less critical to developing successful stock management (by definition P2 is about the impact on other things), so these considerations can be included elsewhere in the management process.

For those stocks that are not yet the subject of EU management and which have not been identified as suitable for IFCA led adaptive stock level management, it should be considered whether a Fishery Management Plan can be produced at a larger management scale, such as covering many IFCA districts or extending beyond 6nm. It is likely that DEFRA will be best placed to lead on this process. The approach set out below should be used in the development of the Fishery Management Plan for these species.

7.2.1. Management unit

For English fisheries which are not considered suitable candidates for inshore management (led by the IFCAs), yet which are not yet subject to and EU fishery specific controls, there is an immediate question to be asked at a national level to define the extent of the stock, or more accurately determining the working hypothesis to underpin the determination of the stock. Management will initially be faced with uncertainty about the range, distribution, life cycle and population dynamics of stock and may also be confronted by the fact that the perceived stock range does not exactly overlap with existing management jurisdictions.

Spatial genetic discreetness is unlikely to coincide with jurisdictional boundaries, so at some point managers must make pragmatic decisions to enable management to proceed. Seeking definite evidence based solutions from science will (and has) lead to delay and may result in scientifically accurate, but practically unmanageable conclusions, which are most likely to result in a lack of management action. By clearly identifying the working hypothesis about stock structure, or ‘management units’, the approach to management is open and transparent and clearly highlights uncertainties, enabling these to be periodically reviewed by management evaluations. Should these assumptions be shown by evaluation to be false, then the scale of the management

unit can be adjusted. The types of consideration that could be used in justifications are:

- Local water flow and recirculation characteristics means there are ecosystem characteristics which may support the rational for managing certain species as an inshore management unit.
- Migratory patterns.
- The species are all of significant importance to the inshore fishery yet the level of fishing beyond the IFCA boundary is significant.

The above examples of rationale should be examined more thoroughly as an initial step in a stock specific fishery management plan.

An interesting example of an already certified nearby lobster fishery comes from Normandy and Jersey, which was certified in 2011. The assessment report[10] presents the rationale by which the stock is managed as a geographically respected management unit:

> *The population structure of Homarus gammarus is not well known, since in common with most invertebrate fisheries, not much research has been done into larval connectivity or genetics. There are, however several lines of evidence to suggest that the ..... stock might be a defined (sub)-population, albeit probably linked to others via larval transport:*
>
> - *Evidence from studies elsewhere;*
> - *Tidal gyres centred (in the area of the fishery) are likely to (cause larval retention);*
> - *The spatial isolation of the fishery and tidal patterns*
>
> *Thus, although the geographic and genetic delineation of the stock is far from clear, the best information available suggests that (area) is a rational management unit from the biological point of view.*

In addition to the underlying rationale for a stock management unit, it should also be demonstrated how and why this management unit is precautionary. If the assumption is incorrect, management would respond to a declining stock status, but would fail to halt the overall decline, but critically this would still mean that management was taking the correct response in their jurisdiction. Bigger management units at multi jurisdictional levels are not in immediate prospect for lower value or more sedentary inshore resources.

For fisheries that are a continuing resource along the coastline (as opposed to spatially restricted to beds), whilst it may be pragmatic to make the case for management units which mirror management jurisdictions, it remains important for engagement with neighbouring jurisdictions. This also enables the sharing of best practice, a testing of underlying assumptions and awareness of any issues arising in neighbouring management units.

7.2.2. Information

Firstly, map what data is already available for use. What is the most recent landings data and is this appropriate to the scale of the chosen management unit? Does it capture inshore fishers' landings accurately and does it capture effort? What other useful information is available? Processors will often hold useful data, such as volumes landed, proportions of different size grades over time, length–weight ratios etc. Project Inshore has highlighted significant weaknesses in the fisheries data for English Inshore fisheries which would need to be addressed as part of any management initiatives.

Secondly, management will need to tailor on-going data collection to the needs of management and use in HCR calculation (landings / effort / size) and / or other proxies. This should ensure that data is collected at the scale of the fishery management unit (jurisdiction) and that other fisheries mortality (recreational / discards) is either collected or estimated. For example, there is already good collection of landings data but this may need to be enhanced to ensure a better

[10] http://www.msc.org/track-a-fishery/fisheries-in-the-program/certified/north-east-atlantic/normandy-and-jersey-lobster/assessment-downloads-1/Public_Certification_Report.pdf

understanding of inshore (smaller vessel landings) and other data may also be required to inform the objective of developing adaptive management. Ideally data would be collected in computerised form, and, as will be seen later, any data that includes historic time series is also likely to be useful in informing assessments.

7.2.3. Develop Draft HCR

Appendix 2 of this report provides a detailed explanation of this step of the management process including case study examples which detail the process of developing an appropriate stock assessment for local inshore resources and using this to inform the selection of appropriate empirically justified reference points which are incorporated into a harvest control rule. This discusses the selection of appropriate indicators of stock status and understanding how these relate to stock size. How to in turn determine reference points for the selected indicator and what should inform this:

- Established fisheries science (yield per recruit, spawners per recruit etc.)
- Empirical method (unexploited reference time or reference area) or;
- Bio-economics of fishery operation or;

This also explores how techniques such as simulation testing may provide increased robustness.

Once the assessment and the reference points are established the next step is to define the management actions that will be taken at each of those points to ensure rate of exploitation is reduced appropriately. These tools or measures could include closed areas, seasons, temporal curfews, pot limits, effort restriction, quota, MLS or technical measures, provided in each case that these can be demonstrated to reduce fishing mortality as intended. In particular it is important to define the level of fishing effort below the limit reference point.

It is important that there is stakeholder review and engagement in the drafting of the HCR. One useful approach is to use simulations to help explanation of scenarios and increase stakeholder understanding by providing clear explanation of proposed management response. By secure stakeholder buy-in, the chances of successful implementation in the future are greatly enhanced.

The final element of the HCR development and testing process should be to define how often, how and by who the HCR should undergo testing and evaluation of performance.

7.2.4. Develop management framework

Once a stock assessment is in process and reference points and harvest control rules are in development or consultation it is important to place these tools into a wider fisheries management and legislative context. In many cases the development of a specific **Fisheries Management Plan** is the ideal vehicle for providing this wide context and setting out the overarching management policy and process, as well as detailing the more specific management measures.

A Fishery Management Plan should begin by stating the overarching (high level) objectives. These are likely to include the High Level Objectives, set out in either the Marine & Coastal Access Act (2009). This should state both short term & long term objectives and state how these will be measured. This could include social and should include ecosystem objectives (MSC Principle 3 requires that management includes ecosystem objectives). It is also worth explicitly stating in the management framework what will be the approach to precaution, in particular where data is lacking.

As well as detailing the reference points and the harvest control rule, the management plan should also detail how the HCR will be applied – by whom. Sensibly, for any nationally managed stocks such as these this would be done within the either MMO or by CEFAS on behalf of DEFRA / MMO.

The fishery management plan should also detail the management decision making process and cycle. Where does ultimate responsibility for decision making lie? What information will decisions be based on? How will decisions be informed by consultations? How will decision making process respond to information presented? One successful approach in a number of more locally managed

fisheries is to develop a **fishery working group**. Even if this body does not have power in terms of decision making it can play a vital advisory capacity and be the recognised conduit for stakeholder engagement in the management process. Another important element of management is communication – how will decisions and the reasons for those decisions be widely communicated to interested parties? Again transparency is a key principle for such local stock management initiatives. Sensibly such a body would be engaged early on in the development of the Fishery Management Plan and perhaps coordinate wider stakeholder engagement in the various stages of HCR and management plan development.

7.2.5. Define management actions

The decision making entity should, through the decision making and consultation process give consideration to the requisite management measures. This is linked very much to the development of the harvest control rules, and the selection of measures which can be used to restrict fishing mortality in event of stock status falling below trigger reference points. However, other management measures may be included which are not directly linked to the harvest control rule. For example, these may be considered simply good and precautionary practice, or may already be successfully adopted bylaws, or may warrant inclusion in order to meet some of the wider fishery management objectives, such as reducing impacts on other ecosystem attributes, or reducing conflict with other users of marine resources.

A likely key consideration is whether there is a need for some form of permitting or limited entry. This is likely to be required for most fisheries, partly as the permitting process is a tool to introduce flexible (adaptive) conditions of entry in the fishery, for example reflecting management response to changes in outcome status. This also plays an important role in engendering the sense of stewardship, which is an important step toward successful inshore management. However, if such an approach is not required, then it should be stated why it is not required, by illustrating that management retains the capacity to appropriately respond to changing stock status (or P2 ecosystem conditions).

When selecting measures and tools to control participation in the fishery (permitted / restricted vessels, gear, seasons, area, technical measures, move on rules etc), best practice is to consider how selection of those measures may positively incentivise responsible fishing. A good management planning process will consider likely behavioural responses to management measures and seek to avoid loopholes or perverse incentives. This is an explicit stage in the management planning process.

7.2.6. Determine Management Oversight

Management can only take an oversight of the success or otherwise of management actions with appropriate information feedback. This information feedback comes in many forms. Crucially, there is a requirement for routine monitoring of fishery performance to inform the on-going and timely calculation of the harvest control rule, so that restrictions can be applied as required. The Fishery Management Plan should define this process and data should be collected at an appropriate scale and in an appropriate form. Consider how best to engage stakeholders in the information collection process

Most fisheries require some form of enforcement of management rules. At best a system may be self policing when management design leads to strong stewardship or incentives reward compliance. However, it is likely that some more formal enforcement will be required. The Fishery management planning process should therefore consider the risk factors for non-compliance and demonstrate how the enforcement strategy is tailored to address these risks. The Management Plan should also set out the penalties, in order to demonstrate effective deterrence, but also stipulate the right of appeal.

7.2.7. Institutional, capacity & funding requirements

The resource implications associated with proposed future management activities maybe significant and have the potential to further stretch the current capacity of national bodies such as MMO or CEFAS. The fisheries management planning process should therefore consider what

will be the costs of management and how will these costs be met? Are there the in house staffing capacities in order to undertake the additional management tasks? Is further training required in-house in order to undertake the tasks?

It may be important to therefore consider what if any external funding opportunities may be available for specific programmes and to what extent the requirements of management can be addressed within exiting budgets. Of course, opportunistic funding though extremely beneficial is no substitute for secure core funding and in house capacity.

Stage 4 of Project Inshore will continue until 2015. During this stage 4 the focus of the follow up available from the MSC English Fisheries Outreach team will be focussed on providing support for those fisheries wishing to move into full MSC assessment. This has the potential to engage with those fisheries in a position to almost immediately enter the assessment process (section 3 of this report) and discussing how best to form client groups, how best to address any remaining issues in preparation for full assessment and importantly to explore possible funding options. In addition the outreach work of Stage 4 might include working with national institutions, such as CEFAS / MMO for those fisheries where there is a need of developing adaptive management but which are not suited to a local IFCA led approach.

7.2.8. Reviewing & Improving Management Performance

As well as routine and on-going monitoring needs, designed to ensure oversight of the fishery, there may be additional research requirements. A research planning process can be an important part of the wider management planning process and is an opportunity to consider gaps in knowledge and the research needs of management. It is vital that in developing fishery specific management plans for those management units which can and will be managed nationally that it is clearly understood at the outset what research capacity and funding is available. In particular it is important that it is clearly stipulated what scientific support is available from CEFAS. Clearly for some stocks, in some areas CEFAS take an active lead, but the management plan should clearly define where responsibility for research lies. This should help to identify any need for local capacity building in research, or budgets to be allocated to research as required, all as part of the management cycle.

Holistic Review and evaluation of management performance is also an important periodic task of any well run fishery. The process, timing and capacity needs for such evaluations should also be set out in the management plan. Valuable exercises in review and evaluation can be done ‘in house’ but valuable lessons can also be learned from inviting external review.

It is also important to engage stakeholders and in particular fishers in this process of management review, so that there is a wider understanding of how management is succeeding, or otherwise. An annual fishery stakeholder meeting has proved successful in many fisheries for this process.

7.2.9. Establish Management in Legislation

Once the above stages have been brought together into a Fishery Management Plan, the next stage of the process is to enshrine key aspects into legislation. Not everything will necessarily be required to be formally codified, but key technical aspects will be. Whether or not the actual fishery management plan would be referred to in legislation will be determined on a case by case basis and in some cases it may be simpler simply to define key aspects in legislation.

The byelaw making powers defined in the Marine & Coastal Access Act (2009) is likely to be the main process of making the management measures contained in the Fishery Management Plan legally binding. In some instances the Sea Fisheries (Shellfish) Act 1967 may be the appropriate vehicle in order to establish either a Regulating or Several Order, although this is a slower process, which may not be necessary if the byelaw making process allows sufficient scope for introducing adaptive permitting, or any other such measures deemed appropriate.

If efforts to introduce adaptive management of national stock management units are to be effective, and if required, that those also meet the Principles and Criteria of the MSC, then it seems likely that the byelaw making powers will need to be taken advantage of.

8. Developing National Management of Straddling Species

8.1. Addressing gaps identified at pre-assessment

Table 6 details those fisheries which are not managed by EU quota or subject to ICES assessment, and which are not suited to inshore management at the IFCA jurisdiction. These fisheries which fall between a European and local level management are candidates for national level management, or at least national strategic consideration of where responsibility lies for management. For these fisheries, it is worth recapping here the pre-assessment scores and against each PI scoring below 80 (i.e. a gap) and highlight the types of research or management action which would address the gap. By highlighting areas where improvements are possible to these fisheries it is intended that DEFRA / MMO may use the Project Inshore outcomes as a roadmap towards more sustainable UK fisheries. This seeks to link the theoretical findings of the pre-assessment with practical management actions. This is not intended to dictate a certain management direction, or provide definitive management steps but instead provide industry and regulators with practical steps that could be undertaken to enhance management. In each case, more comprehensive explanation of each of the suggested actions is provided elsewhere in the report.

The following tasks apply equally to those stocks which are not managed at an EU level and which are not suited for IFCA led management. This includes undefined stocks of bass, Seabream, gurnard, pollack, pouting, mullet, turbot, flounder, dab, which, etc (as per table 6). The score in P2 will depend upon which gear is used to fish the resource, but some generic points are highlighted below.

MSC Performance Indicator			Score	Potential remedial work
P1	1.1.1	Stock Status	‹60	Demonstrated to be High Risk during MSC risk based scoring exercise, therefore empirical assessment required to demonstrate stock status. Stock status is highly uncertain as there has been no recent assessment. The stock will not be eligible for MSC certification unless the stock size can be shown to be above its limit reference point.
	1.1.2	Reference Points	›80	Although the pre-assessment scored this PI at ›80, this was due to default scoring triggered by the use of the MSC risk based framework to determine scores. Future management is likely to be based on a more empirical form of stock assessment; therefore this should include appropriate reference points. A successful stock assessment is required to show whether rebuilding is necessary. If the stock is shown to be below the target MSY, as would seem likely, a rebuilding plan will be required.
	1.2.1	Harvest Strategy	‹60	Detail an overarching harvest strategy, including harvest control rule. This is likely to reflect existing measures, along with any additional measures deemed necessary (notably inclusion of an HCR). A fishery management plan (FMP) is required which describes an adaptive management system, which is being implemented. The FMP would define an adaptive management system as a whole, explaining why the system should, subject to explicit assumptions, ensure that fishery is sustainable. The current harvest strategy depends upon technical measures and controls on exploitation levels and does not appear to be sufficient. The harvest strategy will need to be extended with a HCR (PI 1.2.2). The FMP should be a public document and open to consultation and be reviewed.

	1.2.2	HCR	‹60	Develop, define and consult on appropriate harvest control rules, which reflect management targets (reference points). These should be implemented. A harvest control rule (HCR) needs to be established. The HCR directly links controls on exploitation to one or more indicators of stock status. The stock assessment should be used to show that the HCR will work, but the HCR need not directly depend on repeated formal stock assessments. The HCR should include a pre-agreed way to reduce exploitation levels when required as well as define target levels. The HCR will need to be agreed among stakeholders.
	1.2.3	Info & Monitoring	‹60	Collect and collate all relevant time series data including size and sex composition, tagging information (if any), total catch, catch and effort. Data collection has reported to be inconsistent. Therefore a review of data collection protocols might be needed to make sure on-going data collection is consistent, at an appropriate spatial scale, and tailored to needs of assessment with timely receipt and analysis. . Ensure on-going data collection appropriate to needs of assessment, at an appropriate spatial scale and passes to management
	1.2.4	Stock Assessment	›80	Although the pre-assessment scored this PI at ›80, this was due to default scoring triggered by the use of the MSC risk based framework to determine scores. Future management is likely to require the development of an empirical stock assessment. A stock assessment is required to assess stock status, which makes use of all available information. It should aim to provide the best scientific assessment that can be done subject to data limitations, which are severe. The assessment would need to address main uncertainties and undergo formal stakeholder review.
P2	2.1.1	Retained Status	Various	The pre-assessment scores are reduced by a potential bycatch of and species with a status indicated as being below safe limits. This can be addressed either by demonstrating that and depleted resource is not a main retained species (›5% of catch) in the fishery, or by demonstrating that the fishery is not hindering the recovery of that bycatch species. Detailed catch profiling is likely to be necessary to ensure that management is fully informed about any unintended impacts of the fishery and can respond accordingly.
	2.2.1	Bycatch Status	Various	Detail catch profile for the gear in use – before sorting of catch. This will provide an estimate of the incidental bycatch of epifauna and infauna and provides an empirical baseline for future management consideration – plus informs any possible assessment. For any “main” bycatch (i.e. ›5%) demonstrate either that the resource is not depleted or that the fishery is not hindering recovery. Most species are unlikely to be depleted.
	2.3.1	ETP Status	60-80	A fishery wishing to proceed with MSC certification should identify which are the ETP species which potentially interact with the fishery. The status of each should be reviewed in the context of information on the fishery impact. Consider indirect impacts.
	2.3.2	ETP Mgmt	60-80	Develop strategy to manage fishery’s impact on ETP species. Review the ETP species with possible interactions, define if and where management action is required. Link to fleet operations, ensuring that appropriate action is being taken and the efficacy of management is reviewed.
	2.3.3	ETP Info	60-80	Provide quantitative data on the interaction between ETP species and the fishery. Detail how this data will be updated on a periodically appropriate timescale.

	2.4.3	Habitat Info	60-80	A fishery wishing to proceed with MSC certification should provide fleet specific information on spatial and temporal interactions between fishing gear and habitats (in particular vulnerable habitats). Management should also have some information on spatial patterns of the fishery and their change over time (which may provide indications in changes in stock patterns).
P3	3.1.2	Mgmt Roles	60-80	Further definition of Management of stocks needed in MOU between MMO and IFCAs. A management plan should clearly define the limits of the fishery being managed, the underlying assumptions and where responsibility lies for management, science and enforcement.
	3.1.4	Incentives	60-80	Review whether open access (albeit permitted) provides a disincentive to sustainable operation. Consider linking access to resource status. Investigate whether positive incentives can be introduced in the fishery as part of new management proposals.
	3.2.1	Objectives	60-80	A management plan set short and long term objectives, referencing both local priorities and objectives in higher level policy. This should reflect both Principle 1 (target stock status) and Principle 2 (ecosystem) objectives. Where possible these should be well defined and measurable.
	3.2.2	Decision Making Process	60-80	Fully define management and processes in a management plan including consultative processes. How will key decisions be taken? What information will be used to inform these? How will stakeholders participate in the decision-making process?
	3.2.3	Compliance & Enforcement	60-80	Current practise may already meet the requisite SG80 level, however, a fishery specific management plan should review and demonstrate that enforcement is appropriate and effective and focused on risks of non-compliance. Consider potential to incentivise self-regulation in the fishery and system of cross-checks.
	3.2.4	Research Plan	60-80	The Management plan should define areas requiring further research to support management. Responsibility for research should be clearly defined (in particular with CEFAS).
	3.2.5	Monitoring & Evaluation	<60	The Management plan should specify a programme of monitoring and evaluation – both routine internal evaluation and periodic external evaluation.

8.2. Potential timeline of development of management

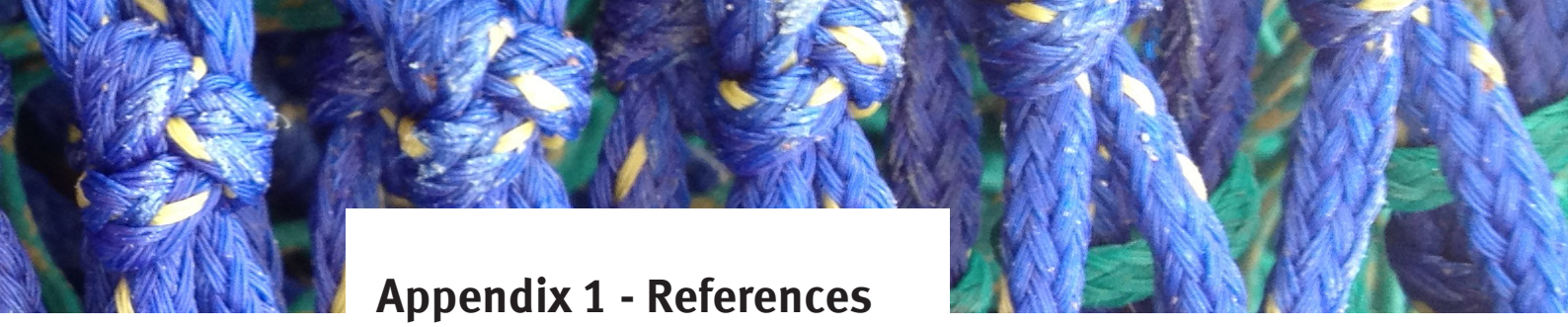
It is difficult, and perhaps inappropriate, for an external project such as this to make recommendations about possible project timelines. Below we instead set out a chronology of the steps taken toward implementing adaptive stock management. This is set in a single fishery example so would need to be adapted where multiple fisheries are moving through the process at the same time. This length of this process will depend on available capacity, however the process should not be unduly rushed and time should be allowed for proper consultation, testing and establishing in law.

Stage	1	2	3	4	5	6	7	8
Identify stocks to be locally managed & develop supporting rationale for local stock management unit	X							
Identify stakeholders and establish initial fishery 'Working Group'	X							
Collate and review available stock & time series data	X							
Define fishery objectives, decision-making processes, consultation mechanisms and communication methods.	X							
Undertake initial empirical assessments of available data and if possible make initial HCR and reference point proposals.	X	X						
Define the on-going stock monitoring data requirements and determine how management will meet these.		X						
Define management measures and restrictions – review existing byelaws and identify where additional measures required (in particular to allow adaptive exploitation rates)		X						
Define capacity and funding requirements		X						
Determine on-going scientific costs and capacity needs and how these will be met.		X						
Where required draw up additional MoUs with other fisheries sector bodies to clarify roles & responsibilities		X	X					
Draft Fisheries Management Plan. And comment process of ensuring binding requirements codified as byelaws.		X	X					
Consult of proposed stock management process and seek stakeholder 'buy-in' for management decisions.		X	X					
Commence operation of fishery under the terms of the Management Plan, with exploitation levels determined by reference to harvest control rule.			X					
Undertake on-going monitoring of stock status and application of HCR.			X	X	X	X	X	X
Undertake periodic evaluation & testing of stock assessment and harvest control rules				X				X
Undertake holistic evaluation of overall performance of the fishery management system.								X
Begin MSC assessment process (if required)			X	X				

Stage 1-3	Proposed FIP Stage
Stage 3-4	Potential MSC Assessment Stage
Stage 3-8	Routine Evaluation of Fishery

Table 7:

Potential process for development of adaptive stock management.



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Appendix 2 - Further notes on Stock Assessment

Stock assessment involves modelling of empirical data to examine the status of fish stocks and to provide advice on future catches; essentially how many fish are there, how many were there and how many are likely to remain if certain catches are taken. This is a specialist task which can involve significant data and highly technical mathematical modelling. Resources are unlikely to be available for regular stock assessments of small scale fisheries, but a stock assessment can be a useful tool for designing and simulation testing a harvest control rule.

Stock assessment of shellfish stocks is generally poorly developed in Europe. There are few standardised approaches and data supports are weak in many cases. The majority of species are not included in the EU Data Collection Framework (DCF).

The approach to stocks assessment should take account of the fishery, species biology, life history and data that are available. The stock assessment model will attempt to explain the data based on what is known of the fishery and biology of the stock. Where data are limited, several competing models may provide equally good explanations for observations. However, as long as the harvest control rule can be shown to achieve desirable results regardless of which model may be right, it can be shown to be robust to uncertainty and suitable for the fishery.

Some examples of off-the-shelf assessment models are provided in Table 4. Their complexity and data requirements vary. All software is freely available on the NOAA web site. In many cases, however, bespoke models may be more appropriate, making better use of the available data. In any case, careful interpretation of assessment results will be required and models will need to be tested to ensure that the fit is valid.

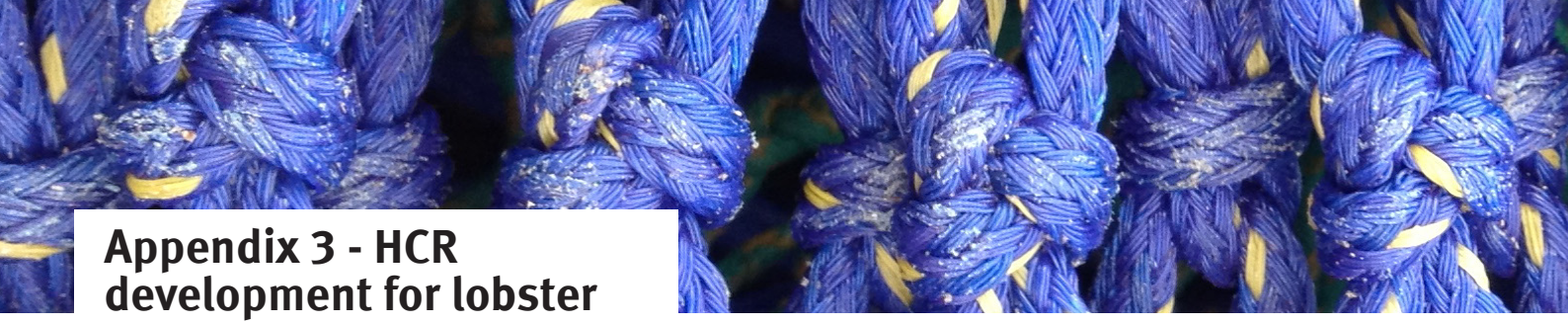
Table 4:

Examples of stock assessment models their relative complexity and data requirements

Source: http://nft.nefsc.noaa.gov/

Models can be downloaded from the NOAA web site. The models are all implemented in the NMFS stock assessment tool box.

Feature	**Model**											
Model Complexity	1	1	1	1	1	2	2	3	3	3	3	4
Data / Observation Error	DCAC	SEINE	AIM	ASPICE	CSA	SCALE	VPA	VPA2BOX	AMAK	STATCAM	ASAP	SS3
Total catch (landings+discards)	X		X	X	X	X		X	X	X	X	X
Catch at age (CAA)							X	X	X	X	X	X
Catch at length (CAL)						X						X
Address variation in CAA or CAL		X							X	X	X	X
Age specific indices of abundance for tuning							X	X	X	X	X	X
Age-aggregated tuning indices			X	X	X	X	X	X	X	X	X	X
Tag-recapture								X				X
Process / Model Specification	DCAC	SEINE	AIM	ASPICE	CSA	SCALE	VPA	VPA2BOX	AMAK	STATCAM	ASAP	SS3
Stcok recruitment function									X		X	X
Sexual dimorphism in growth rates						X		X				X
Spatial heterogeneity								X				X
Incorporate long term historical landings	X			X		X			X	X	X	X
Handle gaps in age or length information		X				X			X	X	X	X
Multiple fleets									X	X	X	X
Handle differences between sexes						X		X				X
Automatic retrospective analyses			X	X			X			X	X	
Independently est. temporal changes in catchability for surveys									X		X	X
Address variations in bioligical sampling intensity over time									X	X	X	X
Consider measurement error for individual time series observations									X		X	X
Uncertainty / Forecasting / BRPs	DCAC	SEINE	AIM	ASPICE	CSA	SCALE	VPA	VPA2BOX	AMAK	STATCAM	ASAP	SS3
MCMC									X	X	X	X
Bootstrap			X	X	X		X	X				X
Estimation of BRP for F			X	X					X	X	X	X
Estimation of BRP for SSB				X					X	X	X	X
Linkage to external/internal forecasting program			X	X			X				X	X



Appendix 3 - HCR development for lobster

The MSC is dedicated to promoting “well-managed” and “sustainable” fisheries, and the MSC initiative focuses on identifying such fisheries through means of independent third-party assessments and certification. Once certified, fisheries are awarded the opportunity to utilise an MSC promoted eco-label and may gain advantages in the marketplace. Through certification and eco-labelling the MSC works to promote and encourage better management of world fisheries, many of which have been suggested to suffer from poor management.

There is no fixed prescription for meeting the MSC standard. It is up to the client to put together argument and evidence to demonstrate that stock condition, fisheries management and fisheries practices meet the appropriate standard. The essence of the standard is that the stock is harvested sustainably with low impact on the ecosystem, using a good management system that is likely to detect and respond to changing circumstances and problems as they occur. The client should achieve this through the presentation to the assessment team of objective and verifiable information, corroborated by independent means wherever possible.

The MSC certification process can be undertaken for any fishery with the exception of a fishery under controversial unilateral exemption to an international agreement or a fishery using poisons or explosives.

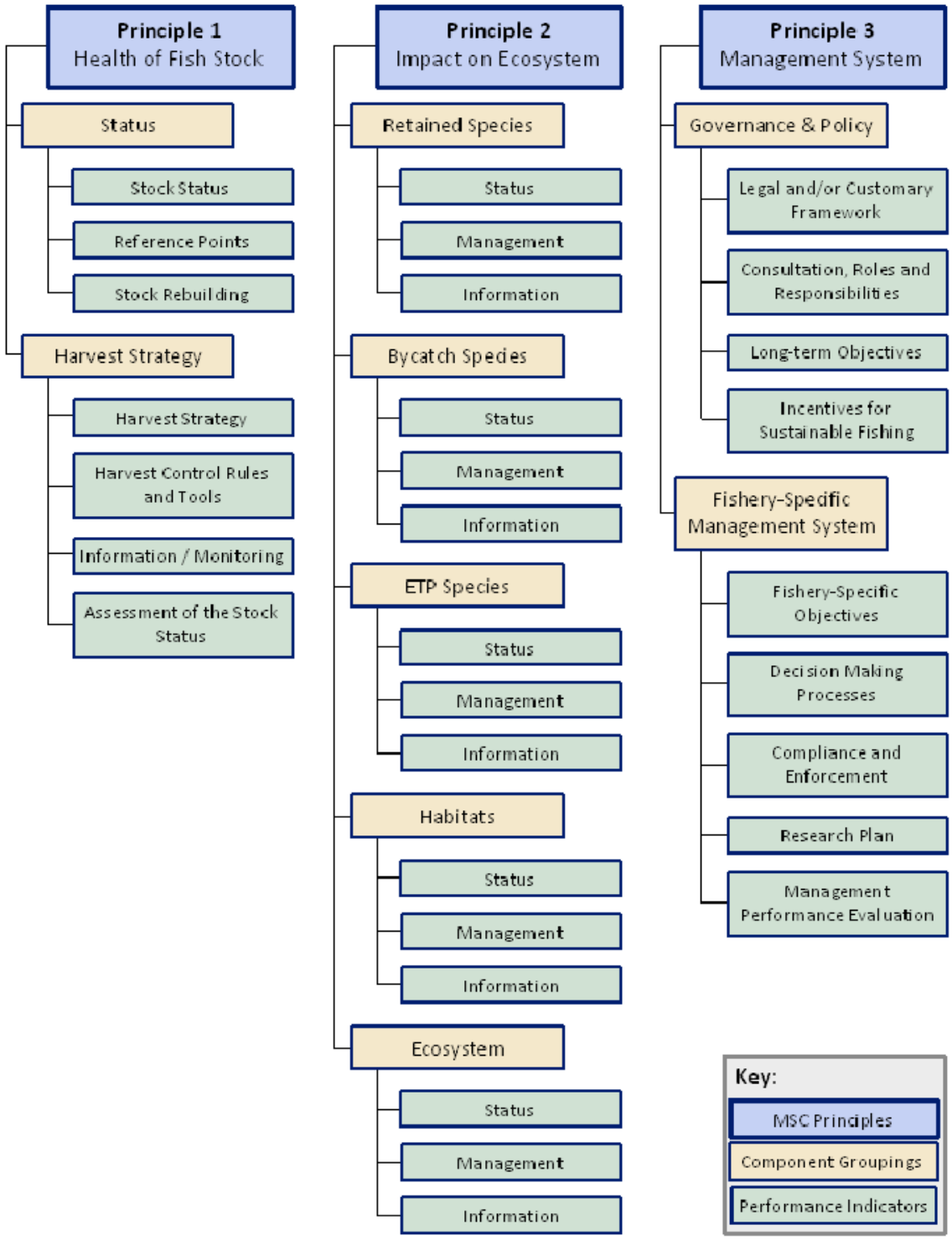
The MSC Standard & Scoring

The MSC standard is divided into three Principles which cover (i) the status and management of the target stock, (ii) the wider impacts of the fishery on the ecosystem and (iii) the overall management governance system. Details of the Principles are provided in the following section.

Under each Principle are a series of components, and under each component are a series of Performance Indicators (PI). Within each PI a set of scoring issues (SI) are defined and the assessment team must decide and justify where scoring issues are met by the fishery under assessment, against a scoring guidepost (SG). Each performance indicator must score › 60 to achieve the minimum pass mark. Any performance indicator failing to meet the SG60 guidepost will result in automatic failure of the fishery. For any indicator scoring from › 60 to ‹ 80, the fishery client must agree to meet conditions to achieve specified outcomes over a defined period of time. To pass overall the fishery must achieve an average score for each Principle of 80.

The default assessment tree is presented below and outlines the components and PIs for each Principle. The scoring issues can be found in MSC certification requirements available for download from the MSC website at:

http://www.msc.org/documents/scheme-documents/msc-scheme-requirements


Principle 1
Health of Fish Stock
Status
Stock Status
Reference Points
Stock Rebuilding
Harvest Strategy
Harvest Strategy
Harvest Control Rules and Tools
Information / Monitoring
Assessment of the Stock Status
Principle 2
Impact on Ecosystem
Retained Species
Status
Management
Information
Bycatch Species
Status
Management
Information
ETP Species
Status
Management
Information
Habitats
Status
Management
Information
Ecosystem
Status
Management
Information
Principle 3
Management System
Governance & Policy
Legal and/or Customary Framework
Consultation, Roles and Responsibilities
Long-term Objectives
Incentives for Sustainable Fishing
Fishery-Specific Management System
Fishery-Specific Objectives
Decision Making Processes
Compliance and Enforcement
Research Plan
Management Performance Evaluation
Key:
MSC Principles
Component Groupings
Performance Indicators

Principle 1

A fishery must be conducted in a manner that does not lead to over-fishing or depletion of the exploited populations and, for those populations that are depleted, the fishery must be conducted in a manner that demonstrably leads to their recovery.

Intent:

The intent of this Principle is to ensure that the productive capacities of resources are maintained at high levels and are not sacrificed in favour of short-term interests. Thus, exploited populations would be maintained at high levels of abundance designed to retain their productivity, provide margins of safety for error and uncertainty, and restore and retain their capacities for yields over the long term. Below is a very simplified summary of some of the key points. For further detail refer to the link provided in the introduction to this appendix.

- The stock is at a level that maintains high productivity and has a low probability of recruitment overfishing.
- Limit and target reference points are appropriate for the stock (or some measure or surrogate with similar intent or outcome).
- Where the stock is depleted, there is evidence of stock rebuilding and rebuilding strategies are in place with reasonable expectation that they will succeed.
- Harvest strategy / management
- There is a robust and precautionary harvest strategy in place, which is responsive to the state of the stock and is designed to achieve stock management objectives.
- There are well defined and effective harvest control rules in place that endeavour to maintain stocks at target levels.
- Sufficient relevant information related to stock structure, stock productivity, fleet composition and other data is available to support the harvest strategy.
- The stock assessment is appropriate for the stock and for the harvest control rule, takes into account uncertainty, and is evaluating stock status relative to reference points.

Principle 2

Fishing operations should allow for the maintenance of the structure, productivity, function and diversity of the ecosystem (including habitat and associated dependent and ecologically related species) on which the fishery depends

Intent:

The intent of this Principle is to encourage the management of fisheries from an ecosystem perspective under a system designed to assess and restrain the impacts of the fishery on the ecosystem. Below is a very simplified summary of some of the key points. For further detail refer to the link provided in the introduction to this appendix.

- Main species (either retained, discarded bycatch or ETP) are within biologically based limits or if outside the limits there is a full strategy of demonstrably effective management measures.
- There is a strategy in place for managing these species that is designed to ensure the fishery does not pose a risk of serious or irreversible harm to retained species.
- Information is sufficient to quantitatively estimate outcome status and support a full strategy to manage main retained / bycatch and ETP species.
- The fishery does not cause serious or irreversible harm to habitat or ecosystem structure and function, considered on a regional or bioregional basis.
- There is a strategy and measures in place that is designed to ensure the fishery does not pose a risk of serious or irreversible harm to habitat types.

- The nature, distribution and vulnerability of all main habitat types and ecosystem functions in the fishery area are known at a level of detail relevant to the scale and intensity of the fishery and there is reliable information on the spatial extent, timing and location of use of the fishing gear.

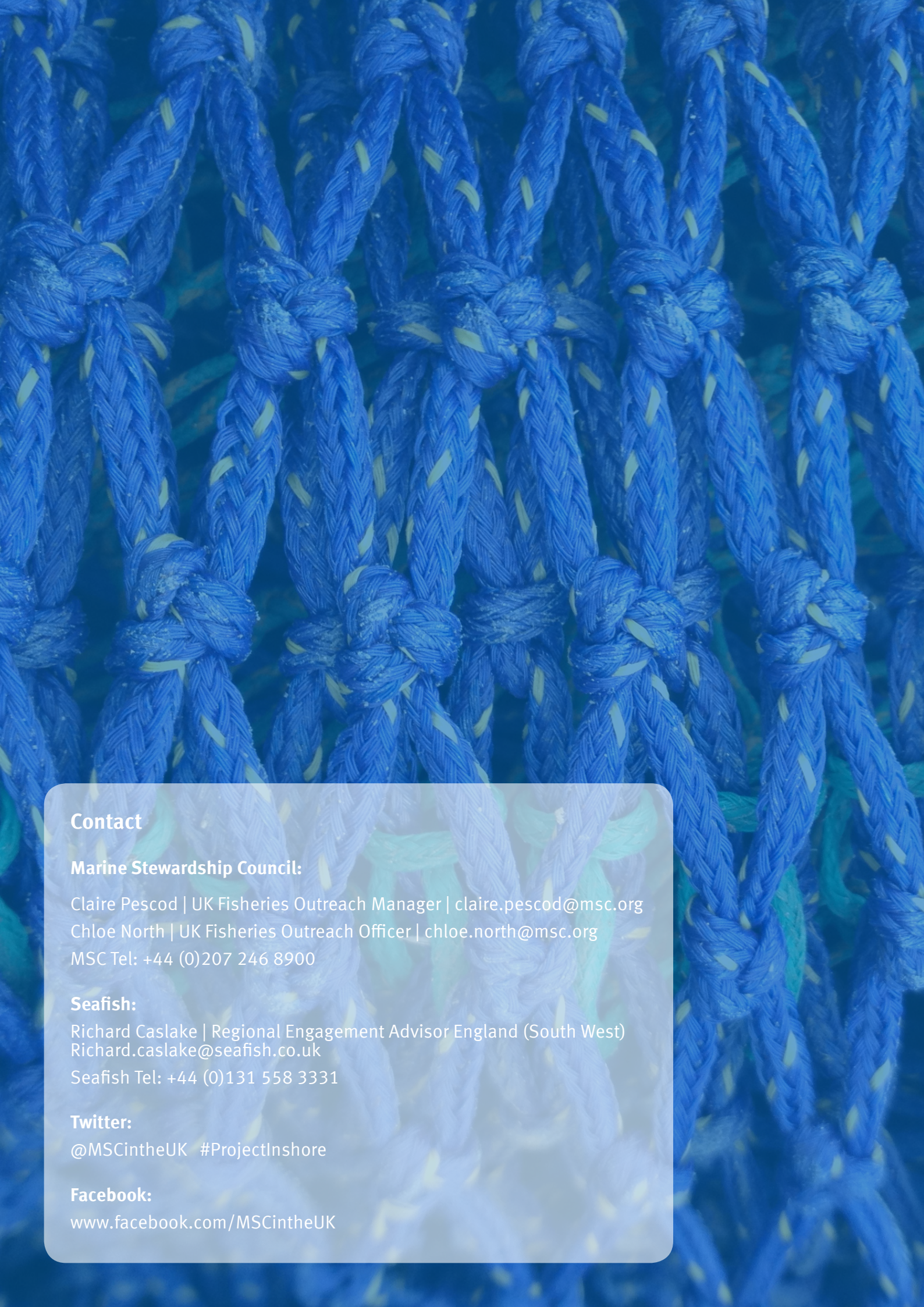
Principle 3

The fishery is subject to an effective management system that respects local, national and international laws and standards and incorporates institutional and operational frameworks that require use of the resource to be responsible and sustainable.

Intent:

The intent of this Principle is to ensure that there is an institutional and operational framework for implementing Principles 1 and 2, appropriate to the size and scale of the fishery. Below is a very simplified summary of some of the key points. For further detail refer to the link provided in the introduction to this appendix.

- The management system exists within an appropriate and effective legal and/or customary framework that is capable of delivering sustainable fisheries and observes the legal & customary rights of people and incorporates an appropriate dispute resolution framework.
- Functions, roles and responsibilities of organisations and individuals involved in the management process are explicitly defined and well understood. The management system includes consultation processes.
- The management policy has clear long-term objectives, incorporates the precautionary approach and does not operate with subsidies that contribute to unsustainable fishing.
- Short and long term objectives are explicit within the fishery's management system.
- Decision-making processes respond to relevant research, monitoring, evaluation and consultation, in a transparent, timely and adaptive manner.
- A monitoring, control and surveillance system has been implemented. Sanctions to deal with non-compliance exist and there is no evidence of systematic non- compliance.
- The performance of the management system is regularly subject to review and evaluation.



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