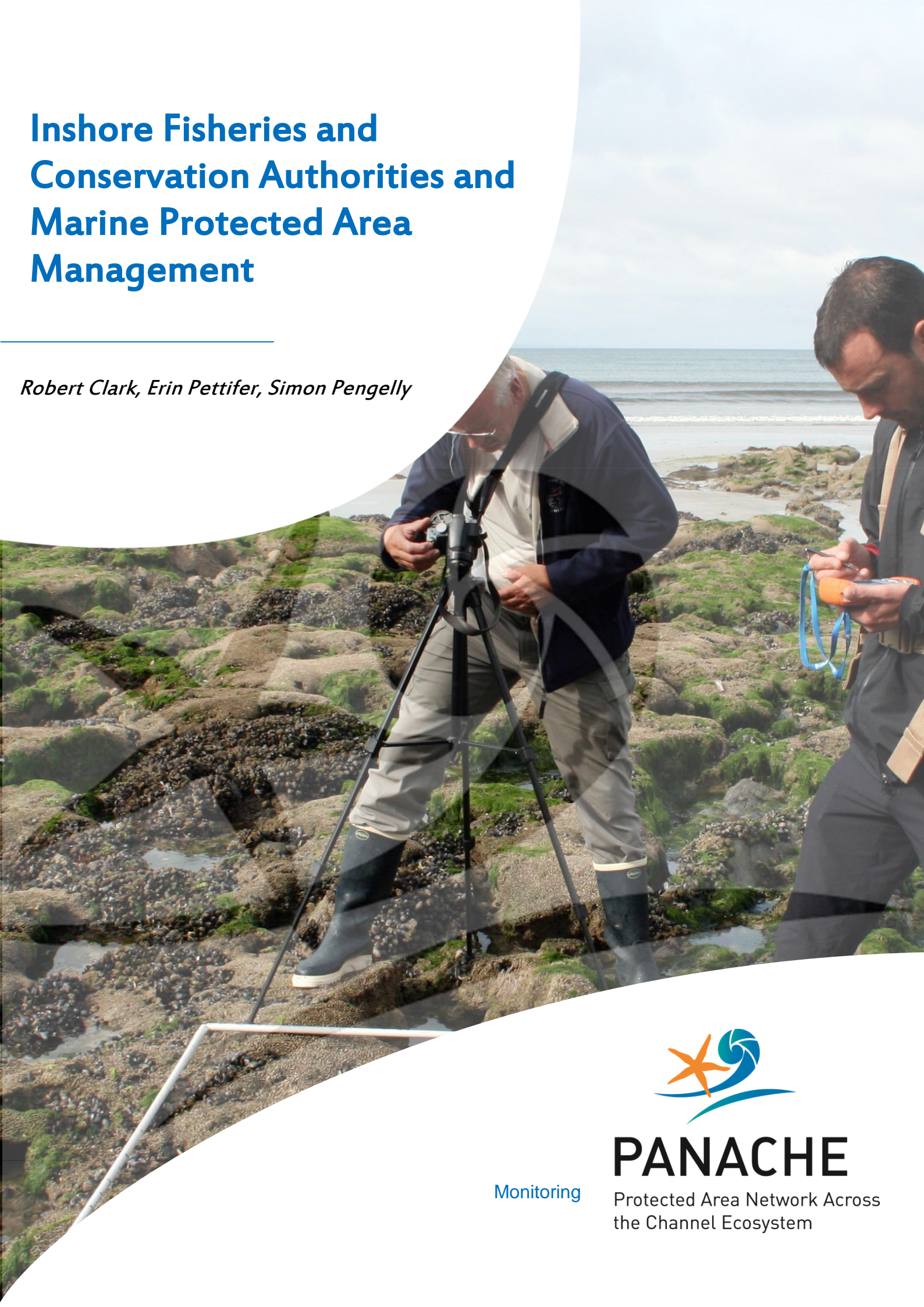


Inshore Fisheries and Conservation Authorities and Marine Protected Area Management

Robert Clark, Erin Pettifer, Simon Pengelly



PANACHE

Monitoring

Protected Area Network Across
the Channel Ecosystem

Inshore Fisheries and Conservation Authorities and Marine Protected Area Management Monitoring

Prepared on behalf of / Etabli par



by / par

Author(s) / Auteur(s) : Robert Clark, Erin Pettifer, Simon Pengelly

Contact : Sussex Inshore Fisheries and Conservation
Authority. 12a Riverside Business Centre.
Shoreham-by-Sea, West Sussex, BN43 6RE

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Inshore Fisheries and Conservation Authorities and Marine Protected Area Management

L'Inshore and Conservation Authorities et la gestion d'aire marine protégée

ABSTRACT

IFCAs are either committees or joint committees of the local authorities that fall within an IFC district which role are to sustainably manage sea fisheries resources and to protect marine ecosystems from the impact of fishing

With regard to Marine Protected Areas, IFCAs have duties which are specifically relevant to marine conservation and must exercise any functions which are relevant to marine conservation so as to secure compliance with the requirements of the Habitats Directives and further the conservation objectives of Marine Conservation Zones. They must proactively manage inshore sea fisheries resources to ensure that activities support the conservation objectives of marine protected areas.

The collection of evidence to inform decisions is integral to effective management. As such, IFCAs also have an integral role in monitoring work within MPAs, from the collection of fishing activity data to habitat surveys to verify and monitor the location of features for which MPAs are designated.

KEYWORDS: Inshore fisheries; IFCA; Conservation; evidence based; marine protected area; assesment

RÉSUMÉ

Les IFCA sont soit des comités, soit des comités mixtes d'autorités locales relevant d'un district dont le rôle est d'assurer une gestion durable des ressources halieutiques et pour protéger les écosystèmes marins contre l'impact de la pêche.

S'agissant des Aires Marines Protégées, les IFCA ont des devoirs spécifiques pour la conservation marine et doivent exercer toutes les fonctions pertinentes pour la conservation marine afin d'assurer la conformité aux exigences des Directives Habitats et approfondir les objectifs de conservation des Zones de conservation marine. Ils doivent gérer de manière proactive les ressources halieutiques marines côtières pour s'assurer que les activités soutiennent les objectifs de conservation des Aires Marines Protégées.

La collecte de preuves en vue de la prise de décisions informées est un élément essentiel de la gestion efficace. Ainsi, les IFCA jouent également un rôle majeur dans les travaux de surveillance au sein des AMP, de la collecte de données sur les activités de pêche aux études des habitats afin de vérifier et de surveiller l'emplacement des caractéristiques pour lesquelles les AMP sont désignées.

MOTS-CLÉS : Inshore fisheries; IFCA; Conservation; preuve ; aire marine protégée; évaluation



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I. Introduction

1.1 What are IFCA's?

The Marine and Coastal Access Act 2009 has modernised the way that inshore sea fisheries resources are managed in England by replacing Sea Fisheries Committees with Inshore Fisheries and Conservation Authorities (IFCAs) from April 2011.

1.1.1. IFC membership

IFCAs are either committees or joint committees of the local authorities that fall within an IFC district. They are tasked with the sustainable management of inshore sea fisheries resources in their local area. They are made up of representatives from the constituent local authorities (who provide funding for the IFCA) along with people from across the different sectors that use or are knowledgeable about the inshore marine area, such as commercial and recreational fishermen, environmental groups and marine researchers, who offer their time voluntarily.

The Marine Management Organisation, Environment Agency and Natural England also each have a statutory seat on the IFCA. Through their local management and funding structures, IFCA's help put local authorities, local communities, local businesses and individual citizens in the driving seat, allowing them to play a bigger part in the protection and enhancement of their inshore marine environment.

1.1.2. IFCA vision

IFCA's aim to *“lead, champion and manage a sustainable marine environment and inshore fisheries, by successfully securing the right balance between social, environmental and economic benefits to ensure healthy seas, sustainable fisheries and a viable industry”*.

1.1.3. IFC districts

Each IFCA manages a district that covers part of the English coast that goes out to six nautical miles and its inland boundaries align with those of its constituent local authorities. IFCA's also manage sea fisheries resources in estuaries that fall within their districts.



There are ten IFCA districts, with their corresponding IFCAs, in England (see Figure 1):

- North Western IFCA and district
- Northumberland IFCA and district
- North Eastern IFCA and district
- Eastern IFCA and district
- Kent and Essex IFCA and district
- Sussex IFCA and district
- Southern IFCA and district
- Devon and Severn IFCA and district
- Cornwall IFCA and district
- Isles of Scilly IFCA and district

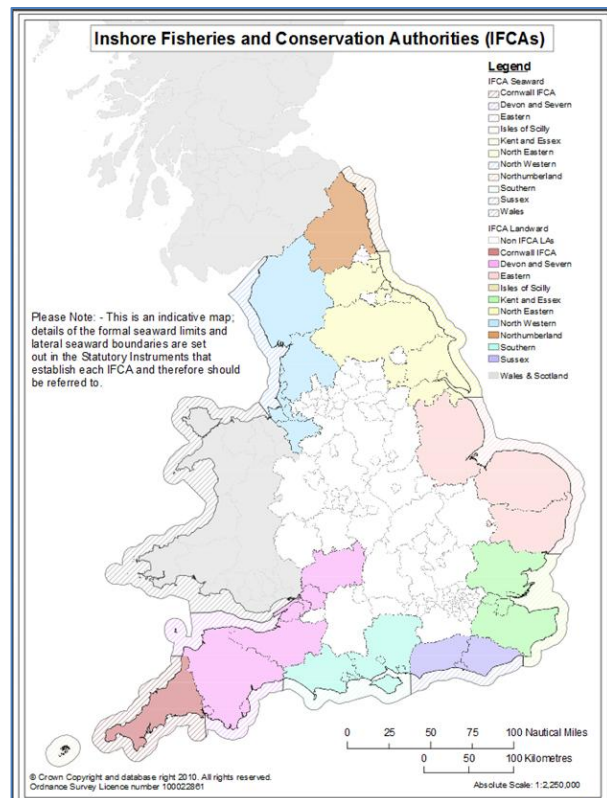


Figure 1. IFCA Districts

1.2 IFCA guidance

Defra has produced the following best-practice guidance for IFCAs which provides further details on the function of IFCAs:

- [Guidance on the byelaw making powers and general offence under Part 6, Chapter 1, Sections 155 to 164 of the Marine and Coastal Access Act](#) (PDF 490KB)
- [IFCAs' contribution to sustainable development](#) (PDF 450KB)
- [Annual planning and reporting](#) (PDF 250KB)
- [Evidence-based marine management](#) (PDF 340KB)
- [A framework for monitoring and evaluation, and measuring performance](#) (PDF 700KB)
- [A framework for risk-based enforcement](#) (PDF 230KB)

1.3 Roles and Responsibilities

IFCAs were established to sustainably manage sea fisheries resources and to protect marine ecosystems from the impact of fishing. They are required to contribute to effective management of marine habitats in the inshore area. This includes commercial fishing and activities such as recreational sea angling and bait digging.

In order to sustainably manage sea fisheries resources, IFCAs will need to gather evidence, evaluate options, propose management solutions and, where necessary, develop and agree byelaws. IFCAs will also need to evaluate outcomes and review the effectiveness of any action taken.

Inshore fisheries and conservation management involves working with the community and multiple partnerships. As well as local fisheries management, there are national and international regulations. As such, the IFCAs must consider where local management is the most appropriate or where other options are better suited to achieve the IFCAs vision.

1.4 IFCA Powers

IFCAs will be responsible for producing byelaws within their districts which includes such part of the English inshore region lying 6 nautical miles (nm) from baselines. The MMO and the Environment Agency may also make fisheries byelaws in England within the 6 nm limit to protect the marine environment (MCZs) from fishing activities or to protect migratory fish. Natural England (NE) has byelaw making powers in intertidal SSSI and National Nature Reserves (NNR) where they overlap with IFCAs.

Byelaws must be compatible with existing Community law and the Common fisheries Policy (CFP) and cannot, therefore, be less stringent or inconsistent with national or Community legislation. However, Council Regulation (EC) No 2371/2002, which embodies the CFP, does recognise the UK's exclusive right to fish within 6nm of baselines. Accordingly, IFCA byelaws, which apply only within 6nm, will only affect UK registered vessels. Foreign vessels fishing within the 6 nautical mile limit would be contravening EC legislation.

Provisions that may be made by a byelaw include

- prohibiting or restricting the exploitation of sea fisheries:
 - in specified areas or during specified periods;
 - limiting the amount of sea fisheries resources a person or vessel may take in a specified period.



The provisions cover:

- permits (including conditions for the issue, cost and use of permits)
- vessels
- methods and gear, (including the possession, use, retention on board,
- storage or transportation of specified items)
- protection of fisheries for shellfish, including monitoring by:
 - requiring vessels to be fitted with specified equipment;
 - requiring vessels to carry on board specified persons for the purpose of observing activities carried out on those vessels;
- marking of gear
- identification of items
- information that those involved in the exploitation of sea fisheries resources in an IFCA district must submit to the IFCA.

More specifically, byelaws may:

- Prohibit or restrict the exploitation of sea fisheries resources in specified areas or periods or limiting the amount of resources that may be exploited or the amount of time a person or vessel may spend exploiting fisheries resources in a specified period.
- Prohibit or restrict the exploitation of sea fisheries resources in an IFC district without a permit. IFCAs will be able to recover the costs of administering and enforcing a permit scheme, attach conditions to permits and limit the number of permits they issue under a particular scheme.
- Prohibit or restrict the use of vessels of specified descriptions and any method of exploiting sea fisheries resources. The possession, use and transportation of specified items or types of items used in the exploitation of sea fisheries resources may also be prohibited or restricted. This would enable an IFCA to require the use of a particular method of sea fishing or an item used in sea fishing (for example to reduce by-catch) by means of a prohibition on the use of other methods and items.
- Protect and regulate shellfisheries including, but not limited to, requirements for shellfish to be re-deposited in specified places and for the protection of shellfish laid down for breeding purposes and cultch, which is the substrate/material on which the spat or young of shellfish may attach and grow.
- Establish a district of oyster cultivation, allowing an IFCA to prohibit the sale of oysters between certain dates, and allows IFCA authorities to disapply the defence concerning the taking and sale of certain crabs and lobsters as set out in section 17(2) of the Sea Fisheries (Shellfish) Act 1967.



- Make provision for monitoring the exploitation of sea fisheries resources. This includes requirements as to the fitting of particular equipment, the carriage of on board observers and the marking or tagging of items used in the exploitation of sea fisheries resources.
- Require people involved in the exploitation of sea fisheries resources in their district to provide them with specified information so that it is an offence if certain information is not provided.

1.5 IFCA Success Criteria

There are seven IFCA success criteria; the following success criteria are particularly relevant to MPA management;

- Evidence based, appropriate and timely byelaws are used to manage the sustainable exploitation of sea fisheries resources within the district
- IFCAs work in partnership and are engaged with their stakeholders
- IFCAs make the best use of evidence to deliver their objectives
 - IFCAs support and promote the sustainable management of the marine environment

1.5.1 IFCA High Level Objectives

The IFCA High Level Objectives are the tangible embodiment of the Success Criteria. High Level Objectives have been established for 2011-2015, the following key objectives are of particular relevance to the IFCA MPA management:

- Identify and evaluate key issues that are likely to impact on the sustainable management of the marine environment
- The impacts of different courses of action are thoroughly evaluated, are proportionate and are continuously monitored
- Partnership working and the sharing of mutually beneficial information to improve efficiency and the delivery of beneficial outcomes
- Stakeholder engagement and communication
- Best available evidence must be used
- Demonstrate in-house capability to collect analyse and interpret evidence to inform management policy decisions
- The adoption of the principles of best practice in sustainable management of the marine environment
- Demonstrate minimum standards and a precautionary approach has been adopted for the management and protection of designated marine protection areas.

The High Level Objectives of the IFCA are further translated on working level objectives and staff objectives as summarised in Plate 2:





Figure 2. IFCA High Level, Working Level and Staff Objectives

II. Marine protected area in the English Channel in inshore waters

2.1 Definition of an MPA

The IUCN define a Marine Protected Area (MPA) as: *“Any area of intertidal or sub tidal terrain, together with its overlying water and associated flora, fauna, historical and cultural features, which has been reserved by law or other effective means to protect part or all of the enclosed environment”* (Kelleher and Kenchington, 1992)

Natural England, a Government adviser on nature conservation in England, defines MPAs more simply for the public as: *“Zones of the sea and coasts where wildlife is protected from damage and disturbance”* (<http://www.naturalengland.org.uk/ourwork/marine/mpa/default.aspx>)

2.2 Marine Protected Area Designations in English Channel inshore waters

The government has committed to creating an ecologically coherent network of MPAs in the UK which will encompass both existing statutory MPAs and those newly created. In the English Channel the role of IFCA in the management of Marine Protected areas is focussed upon the following designations:

1. Special Areas of Conservation (SACs). This category of MPAs falls within the broader category of “European Marine Sites”, and was originally set up in article 3 of the Habitats Directive. According to this, SACs “hosting the natural habitat types listed in Annex I and habitats of the species listed in Annex II, shall enable the natural habitat types and the species' habitats concerned to be maintained or, where appropriate, restored at a favourable conservation status in their natural range” (EU, 1992).
2. Special Protection Areas (SPAs). This category is also included within the broader category of “European Marine Sites”, and was originally established in the Birds Directive (EU, 1979). SPAs should be made up of the most suitable territories in number and size for the conservation of the bird species mentioned in the Annex I in the geographical sea and land area covered by the Directive in order to ensure their survival and reproduction in their area of distribution.



3. Sites of Special Scientific Interest (SSSIs). SSSIs are designated for the protection of the most significant sites for the conservation of wildlife (species & habitats) and/or geology (NE, 2013). They are established under the Wildlife and Countryside Act 1981 to protect habitats, species and geology of national importance. Marine components may cover intertidal areas or estuaries.
4. Marine Conservation Zones (MCZs). MCZs can be established for conserving: marine fauna, flora, habitats, geological or geomorphological features, according to the Marine and Coastal Access Act (2009). No MCZ has yet been designated in the Channel area, although 31 of them have been proposed to be designated in 2013 across the whole of the UK (DEFRA, 2013), 13 of which are in the Channel area.

OSPAR and RAMSAR sites are also types of MPA designations which exist within the English Channel, but for the purposes of the role of IFCAs, the objectives of these types of MPAs are achieved through the implementation of IFCAs duties in EMSs, SSSIs and MCZs.

In addition to the statutory designated sites IFCAs also have a role in the management of voluntarily protected areas, these include:

- Marine Sites of Nature Conservation Importance (mSNCI). In Sussex, Local Authorities and agencies have identified marine Sites of Nature Conservation Importance (SNCIs) to protect their habitats and their wildlife, and to encourage sensitive management. SNCIs are voluntary designations and their success depends on the responsible actions and co-operation of all concerned.
- Voluntary Marine Conservation Area (VMCA). VMCA is a designation in the United Kingdom for areas of coastline which are of particular wildlife and scientific value that enjoy a level of voluntary protection. VMCAs are run by a range of organisations and steering groups and are often supported by community or volunteer groups. VMCA's often aim to promote the Seashore Code as a means for the public to treat the coastline with care. The first VMCA to be set up was Purbeck, in Dorset in 1978.

2.3 IFCAs duty in Managing Marine Protected Areas.

The Marine and Coastal Access Act, 2009 is where the IFCAs key duties, powers and responsibilities may be found. In summary, IFCAs must:

- seek to ensure that the exploitation of sea fisheries resources is carried out in a sustainable way,
- seek to balance the social and economic benefits of exploiting sea fisheries resources of the district with the need to protect the marine environment from, or promote its recovery from, the effects of such exploitation,



- take any other steps which, in the IFCA's opinion are necessary or expedient for the purpose of making a contribution to the achievement of sustainable development,
- seek to balance the different needs of persons engaged in the exploitation of sea fisheries resources in the district.

With regard to Marine Protected Areas, IFCAs have duties which are specifically relevant to marine conservation and must exercise any functions which are relevant to marine conservation so as to secure compliance with the requirements of the Habitats Directives and further the conservation objectives of Marine Conservation Zones (see Annex I). IFCAs must proactively manage inshore sea fisheries resources to ensure that activities support the conservation objectives of marine protected areas, such as European Marine Sites, Marine Conservation Zones, Sites of Special Scientific Interest and Ramsar sites.

As Local Authorities, IFCAs, which are responsive to the needs of the local community by virtue of their membership, can play an active role in the implementation of local and voluntary Marine Protected Areas. For example in Sussex, the district's IFCA is part of the designation committee for marine sites of nature conservation importance, a local designation which is discussed further in s.2.2 of this report.

2.4 IFCAs role in implementing Marine Protected Areas

2.4.1 European Marine Sites (EMSs)

IFCA's are relevant and competent authorities in relation to EMSs. Under the Conservation of Habitats and Species Regulations 2010 there is a legal duty to manage fisheries within EMSs to protect the site and features from damage and, in some cases, to develop plans that will allow recovery of the site or features. Under Article 6.2 of the Habitats Directive IFCAs have a duty to 'take appropriate conservation measures to avoid damaging activities in EMSs'.

Until recently, IFCA undertook these duties with regards to the Habitats Regulations through engagement with the EMS Management Groups (where they are in place). Where IFCAs did not permit fisheries (and there are instances where they do, however generally fishing is undertaken without permission by IFCAs but under a general license) they managed fishing as an 'activity' for the purposes of the Directive and not as a plan or project. Therefore in general IFCAs did not apply the Appropriate Assessment process which is required to determine the implications for the site whereby the competent authorities can only agree to the plan or project after having ascertained that it will not adversely affect the integrity of the site concerned (Article 6.3). This is because the IFCAs were not permitting the activity.

More recently however, in England, Ministers have agreed to revise the approach to management of commercial fishing activity in EMSs. Under this revised approach, all commercial fishing activities that can legally be carried out in EMSs under a general fishing licence will require an assessment to ensure that they are compatible with our obligations to protect sites under the European Union (EU)



Directives. As the lead Authority in inshore fisheries management IFCAs will undertake this process within the 0-6nm part of the English Channel, within British Waters.

IFCAs and partners intend to proceed on the basis of assessments through a matrix type approach which shows, at a high generic level, gear types and their effect on relevant features, for which EMSs have been designated or classified under EU Habitats and Wild Birds Directives, achieving their conservation objectives.

This generic matrix (“The Matrix”) should provide IFCAs and other regulators with an indicator as to whether the activity requires management measures to be introduced to protect that feature without further site level assessment or whether a further assessment is necessary.

The first stage of this work has been to agree on and finalise the generic matrix based on existing information to highlight the vulnerability of EMSs features to different gear types, to be grouped into “red”, “amber” and “green” categories, as described in Table 1.



Table 1. Risk matrix classifications

Risk	Definition	Action by IFCAs
Red	Habitat features which are the most vulnerable to the impact of certain fishing gear types. Activities are deemed incompatible with the conservation objectives for the site features (or sub-features) for which a EMS was designated	Under Article 6.2 of the Habitats Directive, IFCA is required to implement management measures to protect red risk features by the end of 2013
Amber	There is doubt as to whether certain fishing activities are likely to have a significant effect on achieving the conservation objectives for a site feature (or sub-feature)	<p>Under Article 6.3 of the Habitats Directive, IFCAs (from 0-6nm) or MMO (6-200nm) are required to conduct further detailed site-based assessment on the effect of such activities on vulnerable features - an Appropriate Assessment.</p> <p>Based on that assessment, appropriate management action should be taken if needed by end of 2016, or sooner where activities pose a high risk to the site</p> <p>Management will not always lead to closures; mitigation measures may be introduced instead</p>
Green	It is clear the achievement of conservation objectives for a site feature is highly unlikely to be affected by a type of fishing activity	No management action should be necessary, unless there is the potential for in-combination effects. Under Article 6.3 an Appropriate Assessment needs to be conducted to assess this potential and management introduced by the end of 2016 if needed
Blue	No feasible interaction between gear types and habitat features	No further assessment or management is needed



A case study is presented as to how Sussex IFCA will approach the management of risks to a EMS features and sub feature using this approach is included in the appendix and an example of where Southern IFCA has undertaken an Appropriate Assessment of an EMS (in this case where the IFCA is providing a permit).

2.4.2 Marine Conservation Zones (MCZs)

In 2009 the Joint Nature Conservation Committee (JNCC) and Natural England set up a project to give sea-users and interest groups (stakeholders), from local fishermen to international corporations, the opportunity to recommend possible MCZs to UK Government through the establishment of four regional MCZ projects. IFCA's took an active part as stakeholders in this process and in some areas recommended zones for designation.

IFCA's were consulted on the economic impact of the designations and they provided additional data on the extent and location of the 'Broadscale Habitats' and Features of Conservation Interest (FOCI) within their Districts.

In September 2011, these regional MCZ projects recommended 127 MCZs including 65 reference areas to JNCC and Natural England. The recommended MCZs cover approximately 15% of the DEFRA marine area (English territorial waters and UK offshore waters adjacent to England, Wales and Northern Ireland).

Natural England and the JNCC, as the Government's advisers on the natural environment, reviewed these recommendations and in December 2012, the Minister announced the launch of the MCZ consultation and the first report to Parliament on meeting the requirements of the Marine and Coastal Access Act with regard to marine protected areas. It is proposed that 31 MCZs shall be designated in 2013, subject to the findings of the consultation.

Upon designation IFCA's shall have a duty to 'further the conservation objectives' of marine conservation zones. A conservation objective is a statement describing the desired ecological/geological state (the quality) of a feature for which a Marine Conservation Zone (MCZ) is designated. The conservation objective establishes whether the feature meets the desired state and should be maintained, or falls below it and should be recovered to favourable condition.

Therefore 'favourable condition' is the overall aim and whether the feature requires 'recovery to' or to be 'maintained in', action is needed to achieve the objective. Protected sites in the UK use the term "Favourable Condition" to represent the desired state of their features.

A 'feature' is one of the habitats, species or geo-diversity interests that MCZs are intended to conserve.



2.4.3 Sites of Special Scientific Interest (SSSIs)

The Countryside and Rights of Way Act 2000 provides for the protection of SSSIs in England and Wales and the public right of access. Under this Act IFCA's are classed as '28G' authorities with powers to grant permissions to other parties to carry out proposed operations. Where such operations are likely to damage an SSSI, the legislation places a duty on IFCA's to consult and take advice from the Nature Conservancy Council (Natural England) within specified timelines.

Under the Natural Environment and Rural Communities Act 2006, public authorities have an obligation to have regard for the conservation of biodiversity. This Act amended Section 28 of the Countryside and Rights of Way Act 2000, making IFCA's liable to prosecution and a potential fine of up to £20,000 if convicted, where they permit operations which cause damage to the features of an SSSI.

III. The IFCA role in the ecological and socio-economic monitoring of MPAs

3.1 Evidence Based Decision Making

As outlined previously IFCA's have clear duties with regard to managing MPAs. Integral to effective management is the collection of evidence to inform decisions.

If IFCA's are required to restrict management of fishing within areas it follows that they are involved, where able, in the collection of evidence to support management decisions. This evidence collection will often be in conjunction with relevant partners, including Natural England, Environment Agency and local Non-Governmental Organisations (NGOs) such as Wildlife Trusts & etc.

Evidence may be in the form of ecological data, to verify and monitor the location of features for which MPAs are designated, or socio-economic information, for example the location of each fishing activity type.

IFCA's also need to have a consistent approach to their decision making and be able to articulate clearly to stakeholders why they have chosen a certain approach.

The evidence-based marine management cycle outlined in Figure 3 provides a common framework for decision making by IFCA's. It is a common sense, best practice approach and is similar to the policy cycles that are widely, and successfully, used across central Government. The cycle below focuses on decision making within marine management.



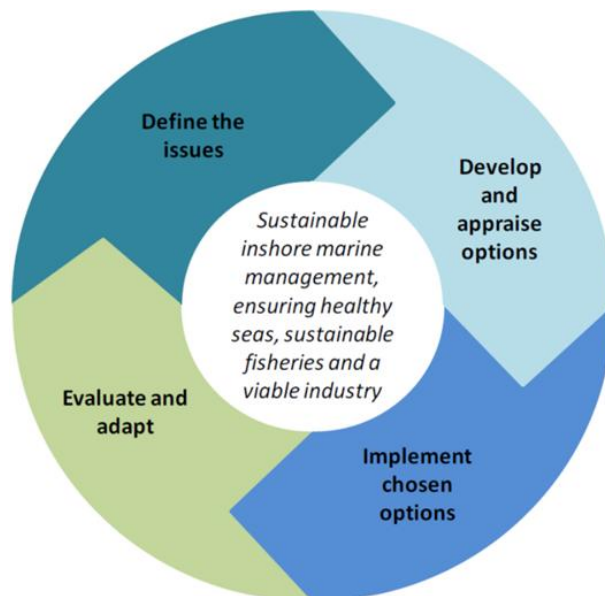


Figure 3. Decision making within marine management

3.2 Appropriate Assessments

The new requirement for IFCAs to conduct Appropriate Assessments (AA) of certain fisheries within EMSs to ensure compliance with our legal requirements under Article 6 of the Habitats Directive will require evidence. These are a form of environmental impact assessment and consider whether a particular fishing gear type may adversely affect features for which the EMS is designated.

The AA requires much work to be undertaken to gather enough evidence to allow an assessment of the impact of an activity on the features of a site. While there will be guidance from SNCBs, much of the burden for evidence collection will fall to each district's IFCA, so that a thorough assessment can be made of the impacts on local EMSs of local fishing methods. For example, if it is suspected that a gear type used locally has a detrimental impact on a protected feature, the relevant districts IFCA will be required to collect evidence of damage if this is not widely supported in existing literature.

IFCA byelaws are likely to play a key part in achieving the required management as it is considered that byelaws can best reflect local needs and issues.

3.4 High Level Objectives

IFCAs have High Level Objectives as they relate to evidence and decision making. Table 2 below summarises these objectives, their intended outcome and the performance indicators.

Table 2. High level objectives, outcomes and performance indicators

High Level Objective	Outcome(s)	Performance indicator(s)
By April 2012, put procedures, plans and appropriate records systems in place that demonstrate that the best available, quality-assured evidence, whether acquired in-house or externally, is used appropriately in decision-making at all levels. These procedures, plans and records systems must meet minimum standards as set out in government guidance and EU legislation.	IFCAs are provided with accurate and timely evidence-based information upon which to base their management decisions and the reasons for decisions are clear, transparent and communicated effectively.	By April 2012, Authority to sign off strategic research plan, which has undergone consultation, covering the period until April 2015. Research plan is published each year. Previous year's research report published each year. IFCA annual report to demonstrate how evidence has been used in decision making processes.
By April 2013, demonstrate that there is the in-house capability to collect, analyse and interpret evidence to inform management policy decisions and meet the minimum requirements laid out in government guidance on evaluation and monitoring.	IFCAs have the technical capability to collect, analyse, interpret and manage evidence. IFCAs have personnel within the organisation with appropriate skills to ensure that management decisions make the best use of available evidence.	IFCA annual plan and report demonstrate use of evidence, resources and capability as per strategic research plan. Seek appropriate peer review of research reports [prior to publication]. IFCA annual plans and reports, including research plans and reports, are published online on the IFCA and Technical Advisory Group websites.

3.5 Impact Assessments

Having decided to implement a byelaw and having evidenced the need for this regulatory intervention IFCA's have a role in the ecological and socio-economic monitoring of MPAs through their development of an Impact Assessment (IA) which must accompany any byelaw that they make. An IA should be prepared by the IFCA in accordance with the best practice guidance published by the Better Regulation Executive. This can be viewed at the following link: <http://www.bis.gov.uk/ia>

The IA should set out the anticipated costs and benefits of the proposed measure, including the identified fisheries, nature conservation, sustainable development, environmental, social, and economic implications. The IA should be consulted on at the same time as the byelaw is formally consulted on.

IV. Conclusions

IFCA's were established to sustainably manage sea fisheries resources and protect marine ecosystems from the impact of fishing, and have clear duties with regards to managing Marine Protected Areas (MPAs). Under Article 6.2 of the Habitats Directive, IFCA's must take appropriate conservation measures to avoid damaging activities in EMSs, and under Section 154 of the Marine and Coastal Access Act (MCAA) 2009, they have a duty to further the conservation objectives of EMSs and MCZs.

The collection of evidence to inform decisions is integral to effective management. As such, IFCA's also have an integral role in monitoring work within MPAs, from the collection of fishing activity data to habitat surveys to verify and monitor the location of features for which MPAs are designated. They also need to evaluate outcomes and review the effectiveness of any action taken.

With the pending MCZ designations and government's revised approach to managing fisheries within EMSs, MPA management and monitoring work will form a core part of IFCA's work around the country and they will be vital in achieving a well-managed MPA network.



V. Case studies

5.1 Mapping inshore fishing activity and effort

Accurate maps showing clustering of different types of fishing activity are an important tool for the implementation of marine policies, developing marine spatial plans and to reduce conflict in the marine environment. Information on fishing effort is particularly useful as it provides an insight into where pressures and impacts to the marine environment are most intense. It is also important from a socio-economic perspective to know how implementing spatial management measures on the fishery might affect the industry. The knowledge can also be used to inform spatial planning within the area in an attempt to reduce conflict between stakeholders.

Mapping inshore fishing effort is, however, particularly difficult as tools such as the Vessel Monitoring System (VMS) cannot currently be used to track vessels below 15m in length, which tend to utilise inshore waters most often. EU regulations do require the introduction of the VMS system for vessels under 12m from the 1st January 2012 but this has been delayed in the UK. The changeable nature of fisheries, with significant variation in spatial and temporal intensity, is also a significant obstacle in its mapping in the marine environment.

Sussex IFCA, working with CEFAS has developed a simple, robust and repeatable methodology, using existing data to help tackle this issue and enable the mapping of inshore fishing effort. Using existing data means that results can be achieved more quickly and cheaply than if new data was collected. More recently this work has also supported the development of a national inshore fishing data layer.

Since 2001 the Sussex Sea Fisheries Committee (SFC) and its replacement the Sussex IFCA has, while undertaking fisheries patrols, collected data on all the fishing activities that they have observed. The SFC commenced initiatives to map fishing activity upon the establishment of European Marine Sites within the old SFC district, and has since developed a simple methodology using this patrol sightings data to estimate and map inshore fishing effort.

To ascertain the relative importance of areas of the seabed to certain fishing types (i.e. trawling, potting etc) the sightings data was simplified and grouped onto a grid. This gives each grid rectangle (cell) a value which corresponds to the number of sightings of fishing, by type, that have been observed in that cell. Each cell is 1/400th of an ICES subrectangle (ca.3nm²). These were deliberately related to ICES rectangles in order to allow linking effort to landings (species, value etc) data.

The density of fishing vessel sightings was normalised by the number of patrols undertaken through each cell, or 'surveillance effort'. Dividing the number of sightings of each fishing method by the number of patrols through each cell provides a measure of relative fishing effort. The resultant maps are indicative of where fishing activity occurs and is clustered:

Sightings per unit of effort (SPUE) = number of sightings / surveillance effort

See Figure 4 on the below for an example of the process of capturing sightings data and creating a fishing activity map.



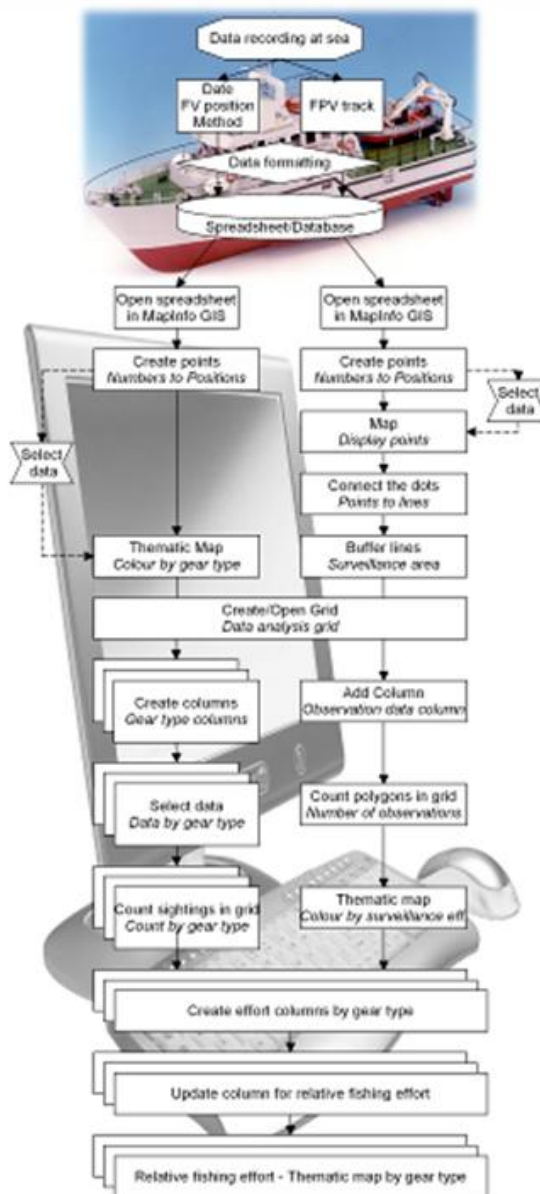


Figure 4. Capturing sightings data process (from Vanstaen, 2010)

Specifically with regard to MPAs, map analysis may prove useful in developing a risk based approach to the management of the UK MPA network, encompassing both existing sites such as SACs and SPAs and the MCZs currently under consideration. Within these protected areas varying degrees of regulation on human activities will apply. In order for the UK to implement its policy on achieving an MPA network, up to date, accurate and appropriate data about the area and intensity of human activity is essential.

Utilising these fisheries activity maps IFCAs will be able to initially target management and focus resources on sites most at risk, in terms of feature sensitivity and the type and intensity of fishing activity occurring within each MPA.

See Figure 5 below for an example of a resultant inshore fisheries effort map.

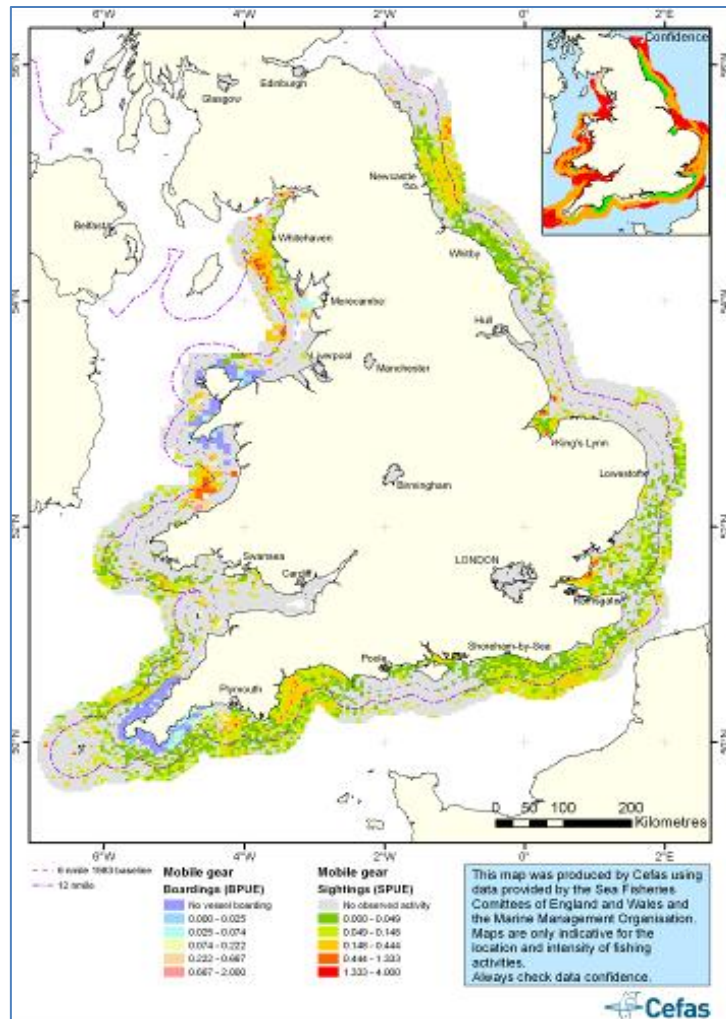


Figure 5. Inshore fisheries effort map

Further work is also continuing to utilise these maps as part of its joint work with the Environment Agency and Sussex Wildlife Trust on a Water Framework Directive initiative (Sussex Coastal Habitats Inshore Pilot project). Using data collected from fisheries patrol vessels and aircraft nationally between 2007 and 2009, this work has also culminated in and supported the development of an integrated fishing activity later for English and Welsh waters, as well as the development of a GIS tool box for future inshore fishing activity data analysis. This includes a series of maps showing inshore fishing patterns for a range of gear types, vessel lengths and registered engine powers that have been produced.

5.2 Studland to Portland candidate Special Area of Conservation (cSAC) Appropriate Assessment Mussel Seed Fishery 2013

This is a record of the appropriate assessment, required by Regulation 48 of the Conservation (Natural Habitats & c.) Regulations 1994, undertaken by Southern Inshore Fisheries and Conservation Authority (SIFCA) in respect of a mussel fishery within the Studland to Portland cSAC, in accordance with the Habitats Directive (Council Directive 92/43/EEC). Having considered that the plan or project may have a significant effect on the Studland to Portland candidate Special Area of Conservation (cSAC) and that the plan or project is not directly connected with or necessary to the management of the site, an Appropriate Assessment was undertaken by the IFCA into the potential impacts of the proposed fishery in view of the cSAC integrity and conservation (Table 3).

Table 3. Studland to Portland candidate Special Area of Conservation (cSAC).
Appropriate Assessment Mussel Seed Fishery 2013

Title	Portland Mussel (<i>Mytilus edulis</i>) Seed Fishery
Location	West and South of the Shambles, Portland
Nature/description of the plan or project	<p>Purpose</p> <p>The purpose of the existing activity is to remove commercial quantities of seed mussel (<i>Mytilus edulis</i>) from the fishery with minimal and non-significant impact to the designated site.</p> <p>Description</p> <p>Seed mussels (<i>Mytilus edulis</i>) are removed from the fishery by the use of steel framed dredges with a mesh collection bag, operated from a vessel, as defined in Southern IFCA 'Fishing for oysters, mussels and clams' byelaw. Fishing for seed mussel within the Southern IFCA district may only take place with the Chief Officer's consent as detailed in the Southern IFCA 'Mussels' byelaw.</p>
Date recorded	30 th November 2012

Studland to Portland cSAC is designated because:

The site comprises a mosaic of two areas containing Annex I reef habitat. The areas are described as Studland Bay to Ringstead Bay reefs and Portland reefs.

Identifying significant effects of the Proposal:

The likely significant effects by the proposal on the international nature conservation interests for which the site was designated are:



- a. Physical loss of biogenic mussel (*Mytilus edulis*) reef communities through direct removal or smothering. Many communities that use the reef habitats are interdependent on the ecological functioning of others. The biogenic reefs are moderately sensitive to physical loss due to removal as the re-establishment of the reef may take considerable time. Overall the vulnerability of biogenic reef sub-features within the Studland to Portland cSAC due to physical loss is considered to be nil to moderate.
- b. Physical damage to biogenic mussel (*Mytilus edulis*) reef communities through abrasion as the re-establishment of the reef may take considerable time.
- c. Biological disturbance to biogenic mussel (*Mytilus edulis*) reef communities through the introduction of pathogens or non-native species as well as selective extraction of species from the ecosystem. Overall the vulnerability of reef sub-features to biological disturbance within the cSAC is considered to be moderate to high for selective extraction and low for other forms of biological disturbance.

Portland Mussel Beds

Southern IFCA has undertaken a study of the Portland mussel beds in order to better inform this appropriate assessment process. Dr Ken Collins from the National Oceanography Centre, Southampton and IFCA officers carried out the survey work on board of IFCA vessels and the fishing vessel 'Nicola L'.

Fishing surveys were carried out with the regularly used dredges on board the Nicola L. The tracks of the vessel's mussel dredge were recorded and the mass of the mussels collected estimated so that size distribution of each haul and associated species could be recorded. Fishing took place within and outside of the regularly fished area. A specially designed HD video system was also mounted to the mussel dredge to show images of the seabed immediately before harvesting and to demonstrate how the dredge operates.

A specially developed towed video sledge (Collins et.al, 2010) was deployed from the Nicola L, both within and outside of the fished area. The camera was towed for approximately 30 minutes at a speed of around 1 knot. The video data were analysed to determine mussel density, size and associated macrofauna. Southern IFCA used the fisheries patrol vessel Southern Trident to survey the wider extent and condition of the mussel beds by deploying a towed video sledge for short -approximately 10 minute- tows with an aim of maximum area coverage. Data was analysed by Dr Collins, a Southampton University MSc student and SIFCA staff and used to map the coverage and density of Portland's biogenic mussel (*Mytilus edulis*) reef communities.

The size distribution of mussels was found to be variable across the area. There was a significant difference ($P < 0.001$) between the size of mussels found within and outside of the harvested area, with an average length of 2.5cm for mussels growing within the area compared to 5cm for mussels growing outside of the harvested area. The fishing vessel Nicola L targets mussels around 2cm in length to relay in Poole Harbour. HD video and stills footage was analysed to calculate the average

mussel coverage. Within the harvested area the average mussel coverage was found to be 61-62% compared to 45-50% outside the harvested area. This suggests that the existing fishing operation is sustainable and there is no likely significant effect of the activity upon the overall biomass of the biogenic mussel reef communities.

The dredge used by the fishing vessel 'Nicola L' was found to be far from 100% efficient and a video camera mounted to the dredge mouth showed clear spillage of the catch. Nicola L typically tows two 1 tonne dredges with a combined width of 3 metres for approximately 100 metres. Video footage of the area fished since 1993 (Smith, Davies pers. comms.), taken on 15th April at the start of the 2011 fishing season and then on 1st and 15th July 2011, rarely showed any marks that could be associated with previous dredge tracks. This suggests that either the dredge doesn't remove all mussels from an area of seabed or that fished tracks recover quickly, within 3 months of fishing. Video footage taken within the fished area instead showed almost continuous areas of very dense mussel bed with the occasional small bare patch of rock, invariably populated by dog whelks (*Nucella lapillus*).

The study confirms that the area of biogenic mussel reef was greater than that reported by Axelson et al. (2010). Southern IFCA views the mapping of the Portland mussel beds as an ongoing, annual study. With this in mind the full extent of the mussel beds has not yet been determined; however the study suggests that the area of seabed with coverage of more than 10% mussels is 48.67 km², based on a 1km interpolation. It has been estimated that based on a 1km interpolation and at an overall coverage of 25%, the currently known area of Portland mussel beds holds an approximate biomass of 190,000- 438,000 tonnes, depending on the size of the mussels. If the overall mussel coverage of this area was 50% the estimated biomass of mussels would be 380,000- 876,000 tonnes. These calculations are based on density, size and weight calculations carried out as part of this study. Based on a 500 metre interpolation of data the average estimate of the standing mussel biomass is in the region of 280,000 tonnes (Collins, 2011).

In order to investigate the impacts of dredging and the recoverability of the biogenic mussel reef this study intended to match bare ground with previous dredge tracks through video surveying fished areas and comparing before and after footage. It was evident, however, that the dredge was far from 100% efficient, not capturing mussels over uneven bedrock and losing a fraction of the displaced mussels. Thus there were rarely any bands 3m wide seen in the towed video record which could be associated with previous dredge tracks (Collins, 2011).

The harvested area has remained very constant over the past 20 years, suggesting that the mussel dredging impact is sustainable, if there was no new settlement in this area then the harvesting area would have to be constantly changed (Collins, 2011). The removal of mussels creates bare patches of rocky seabed for new settlement and it appears there is sufficient mussel spat in the area to repopulate these sites, particularly as fishing generally takes place when mussels are spating. Furthermore the Royal Haskoning SAC selection Assessment document (2008) concludes that "it does not appear that (the mussel dredging activity) significantly impacts on the features and therefore there is no reason to assume that the reefs' structure and functions will alter in the future."

Mussel fishing track data for the Nicola L since approximately 2002 can be seen in Figures 6, 7 and 8. This clearly demonstrates that mussel seed extraction is an existing activity in this area, prior to the

designation of the Studland to Portland cSAC. Based on these historical tracks an outline has been drawn around the 2009-2011 fished area, shown in figure 6. Two designated fishing areas have then been drawn to best fit two of the most heavily fished areas within the cSAC boundary. When defining these areas Southern IFCA has followed best practice techniques and used straight lines with minimal node points, to fit around the fishing areas.

None of the sensitive species listed in the conservation objectives document were found within the fished area during surveys for the Southern IFCA study.

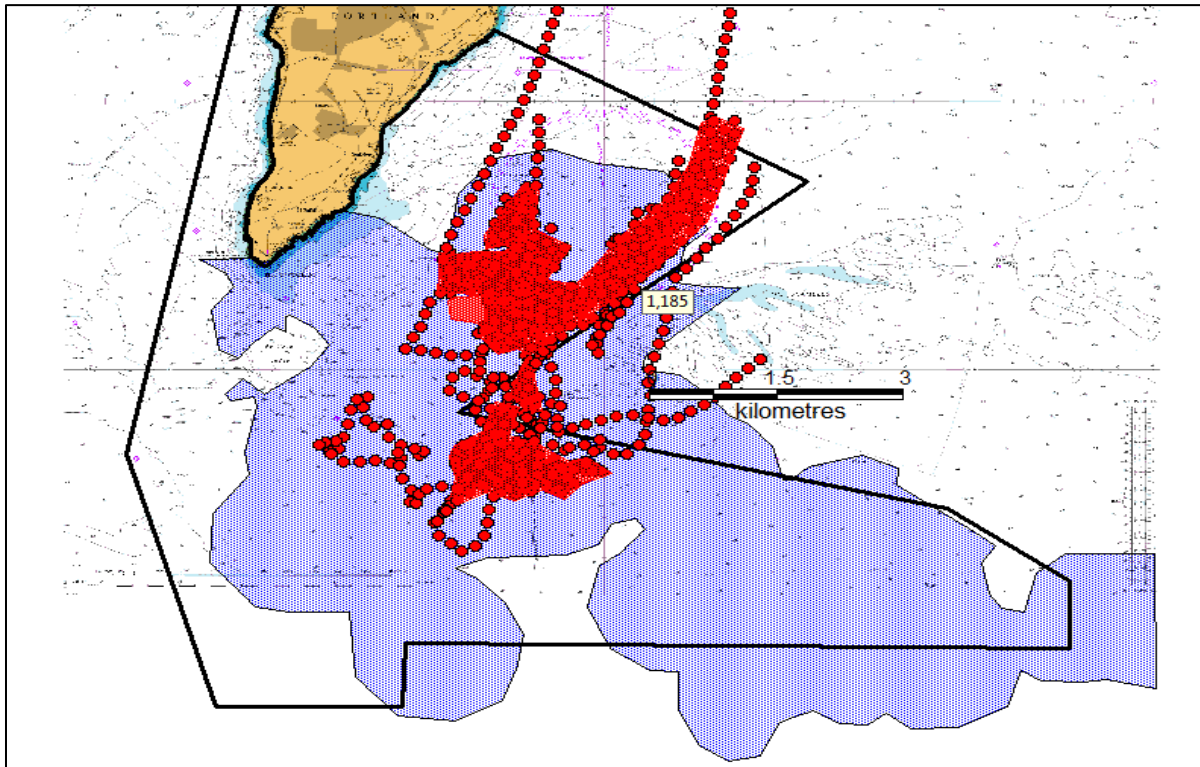


Figure 6. Main tracks of mussel fishing activity since approximately 2002 (in relation to the area of mussel coverage and the cSAC area). Repeated tracks are not recorded. Red dots represent the guide tracks for mussel fishing and the red shaded areas indicate 2009/2010 fishing areas.

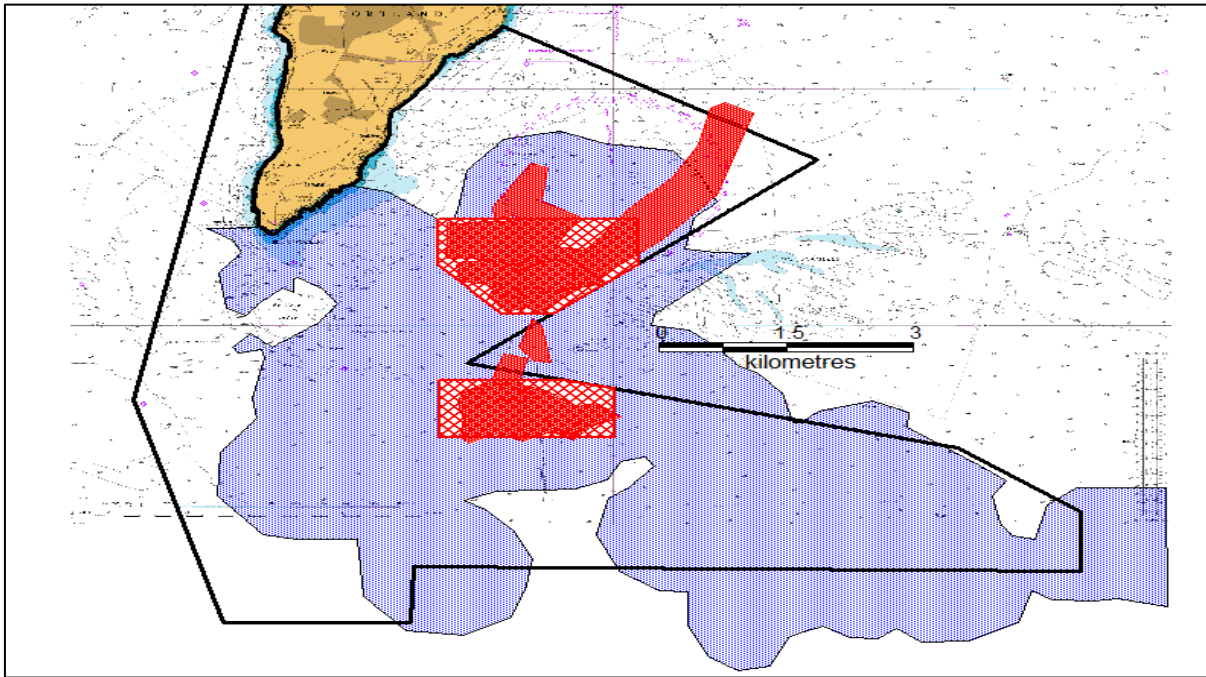


Figure 7. Outline shading made by Southern IFCA of historical mussel fishing tracks (red shaded areas) in relation to fishing tracks, mussel bed coverage and the cSAC area.

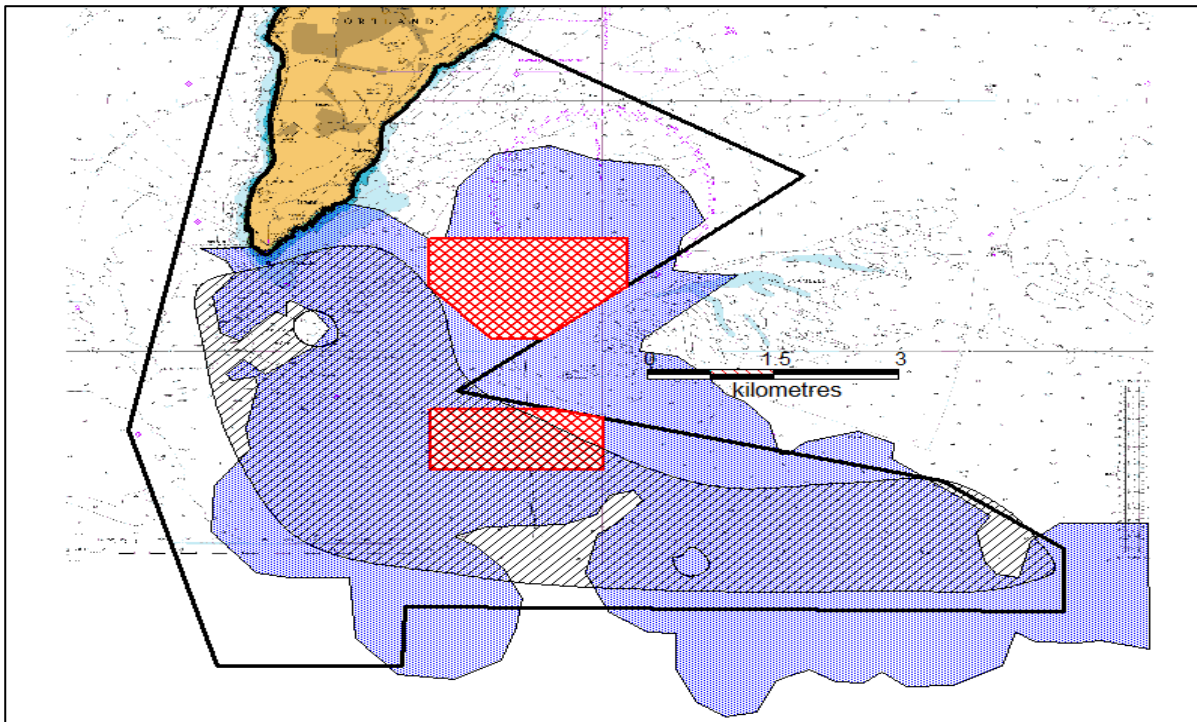


Figure 8. Southern IFCA proposed designated mussel fishing areas (red hatched boxes) in relation to historical fishing tracks, mussel bed coverage and the cSAC area.

Summary of mitigation measures:

There exists a Southern Sea Fisheries District Committee legacy byelaw that prohibits the removal of seed mussel from within the IFCA district except for the intended purpose of relaying within the district. In order to remove mussels for relaying the consent of the Chief Fishery Officer must be obtained in writing. There also exists a Southern IFCA byelaw defining the methods allowed for the fishing of mussels. These byelaws will be fully reviewed and amended as IFCA byelaws by April 2015 in accordance with DEFRA guidance for legacy byelaws.

Southern IFCA aims to mitigate potential impacts that may have an adverse effect on the features of the Studland to Portland cSAC as a direct result of the proposal. This Appropriate Assessment will aim to maintain mussel fishing effort at the sustainable level experienced over the past ten years.

The Authority has laid down the following mitigation measures for the proposal:

a. The Chief Executive Officer (CEO) (formerly Chief Fisheries Officer) will issue permission to remove seed mussels on an annual basis as an outcome of Appropriate Assessments and annual monitoring.

b. A condition of the annual permission will be that all mussel seed fishing within the Studland to Portland cSAC will take place within a designated area where fishing has historically taken place. The designated area has been surveyed using underwater camera and dredge samples and was found to mostly contain the *Mytilus edulis* beds with hydroids and ascidians on tideswept rock biotope.

Before fishing and after fishing video tracks as part of this study have demonstrated that biogenic mussel beds within the fished area have recovered from direct fishing removal. It is not currently known whether this recovery is through freshly settled spat or by small mussels being washed onto fishing tracks. The inefficiency of the fishing dredge may also assist recovery by enabling part of the biogenic mussel reef to remain.

As there has historically been no requirement for vessels to fish within certain areas and due to the death of a former skipper there are little track data available before 2001. Anecdotal evidence (Smith, Davies pers. comms.) suggests that fishing has taken place throughout the designated area since 1991. Due to the strong tidal influence and exposed site two relatively small (approximately 60ha and 8ha) sites have been traditionally fished each year. Fishing activity has been intense over these small areas and there is normally a great deal of overlap between areas fished from year to year, also demonstrating the sustainability of the practice.

Data shows how Southern IFCA has used 2009-2011 mussel fishing track data to define a designated mussel fishing area. The total area of the northern designated area is 2.83 km² and the southern designated area covers 1.808 km², producing a combined area of 4.638 km². The total known area of the Southern IFCA mapped biogenic mussel reef (>10% coverage) is 48.67 km². It is believed that there is a greater area of mussel bed coverage than this figure as, due to the presence of static fishing gear in an area south of the West Shambles buoy, an area remains un-surveyed. The Dorset

Integrated Seabed Study (DORIS) project mapped this area as biogenic mussel reef habitat and there remains other areas of overlap where Southern IFCA have been unable to survey as of yet.

c. As a condition of the annual permission the vessel currently fishing for mussel seed within the Studland to Portland cSAC will voluntarily fit an inshore vessel monitoring system (iVMS). This will enable Southern IFCA to monitor and enforce area restrictions imposed. The iVMS technology will provide the fishers and managers with 30 second position updates.

d. Vessels with annual permission will trial gear sensors with their iVMS in an attempt to establish an accurate method of determining exactly when and where the vessel is fishing.

e. A total allowable catch of 2,000 tonnes per year will be applied to the fishery to ensure that landings do not exceed levels experienced within the past ten years. Southern IFCA will monitor mussel landings from within the cSAC.

Based on the estimate that one 100 metre tow will collect 2 tonnes of mussels, if the fishing vessel was to not re-fish two same sites in a year and collect the maximum tonnage of 2000 tonnes, the total maximum annual dredge coverage would be 0.3 km². Currently the Nicola L regularly revisits recently fished sites on estimates that the vessel fishes an area of 0.03 km² each year. Based on the worst case scenario that no ground is re-fished in a single year and the dredges are 25% less efficient than usual, the total area fished in any one year would not exceed 0.45 km², 0.92% of the total Southern IFCA mapped area of biogenic mussel reef (also believed to be an underestimate). Based on the worst case scenario estimate of a total mussel tonnage of 190,000, the 2,000 tonne annual total allowable catch will equate to less than 1.05% of the total mussel biomass.

f. Southern IFCA will annually monitor the designated fishing area to determine the effect of mussel seed fishing on the features of the cSAC. Video data of the seabed within the fished area will be collected and analysed to compare with previous years' data to establish variation in species composition, mussel size and density and the overall condition of the site, including distribution and extent of key biotopes. This monitoring work will, where possible, take place following the conclusion of fishing activity. This will most likely be during the late summer and early autumn period although water clarity, tidal and weather conditions will be the determining factors in timing the survey work. A control site outside of the designated fishing areas, but within the cSAC area will be selected and monitored annually. Southern IFCA also intends to continue work to map the full extent of the mussel beds in the area through video analysis. Data will be collected over a 3 year period to aid this process.

g. Any proposed change in gear type will either instigate a review of the Appropriate Assessment, or be postponed until any likely effect on the Studland to Portland candidate Special

Area of Conservation (cSAC) can be determined through the annual review of the Appropriate Assessment.

h. Southern IFCA shall submit the rolling Appropriate Assessment annually, by the end of each calendar year. This will include annual monitoring data and landings reports.

Summary of the Fishery 1991-2011

Approximately 95% of mussel fishing activity within the Studland to Portland cSAC since 1991 is believed to have taken place within the Southern IFCA designated mussel fishing area (Smith and Davies, Pers. Comms., 2011). The vessel Nicola L, from the port of Weymouth, has been the sole vessel fishing for seed mussel within the cSAC area over the past two years. Prior to this the vessel 'Lady Helen', also from Weymouth, was known to fish the site at a low intensity.

Mussels fished in the area are fished for relaying and on-growing to a good commercial size, either in Poole Harbour where they are laid on the sea bed in Southern IFCA leased several beds, or in Portland Harbour where they are suspended from ropes. Mussels are fished using rigid framed dredges with a mesh collection bag as defined in the Southern IFCA fishing for oysters, mussels and clams byelaw. The dredges are not fitted with teeth and are not designed to dig into the seabed.

Between 2001 and 2010 a total of 19,426.8 tonnes of mussels were fished from the Portland mussel beds and landed in the local port of Weymouth. Due to weather restrictions 1,100 tonnes of mussels were fished from the site in 2011. Mussels are generally fished for in the area between April and July each year, depending on weather conditions. In the past 10 years annual mussel landings from the cSAC site brought an approximate average first sale value of £167,713.10. When fishing for mussels the Nicola L provides an income for 4 crew and a skipper, one lorry driver and 4 fishermen in Poole. Once re-laid in Poole or Portland the mussels require ongoing attention until they are re-sold. There are also a series of ancillary industries associated with maintaining the vessels and vehicles involved and dealing with the catch when it is re-sold. It is therefore very difficult to estimate the true value of the Portland Shambles mussel fishery to the South Dorset economy.

Summary of the fishery in 2012

The Nicola L fished for seed mussel between 14th March and 10th July during 2012. During this period fishing activity took place exclusively within the Southern designated fishing area, within the Studland to Portland cSAC. Although the site had not been designated as a cSAC at this time, the Nicola L adopted best practice by fishing within the previously agreed designated fishing area and limiting total landings to the agreed TAC of 2,000 tonnes. During 2012 to date (November 2012) the Nicola L has fished a total of 1,400 tonnes of mussels from within the Studland to Portland cSAC. The vessel has no plans to fish for further mussel seed in 2012. Fishing during 2012 was disrupted due to the Olympics held at Weymouth and Portland, vessel re-fit and gearbox failure. As a result, the total landings of seed mussel were lower than hoped. During 2012 the Nicola L exclusively targeted seed mussel of approximately 2-3cm in length, all of which was re-laid on several ground in Poole Harbour.

The Southern IFCA carried out benthic towed video surveys of the designated fishing areas using a specially modified camera and sledge on 22nd and 23rd October 2012. A series of approximately 30 minute tows were made through both of the designated fishing areas. Video datasets were then analysed to determine mussel density, size, associated species and ground type. The footage was also assessed for any evidence of potential dredge scars. A control site was not surveyed during 2012, despite the SIFCA plans to include a control site in 2013 surveys.

Findings of the 2012 video survey indicate that the biogenic mussel reef within the designated fishing areas are in good health and there was no evidence of dredge scars or damage to beds as a result of fishing. Figures 9 and 10 show the relative mussel densities found during the 2012 video survey.

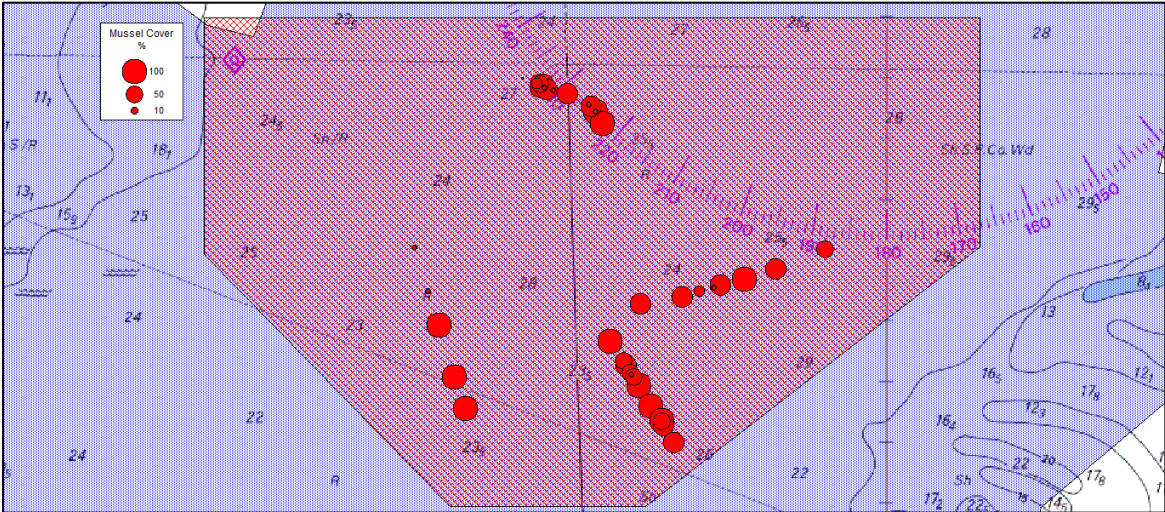


Figure 9. Mussel densities found within the Northern designated fishing site during the 2012 seabed video survey.

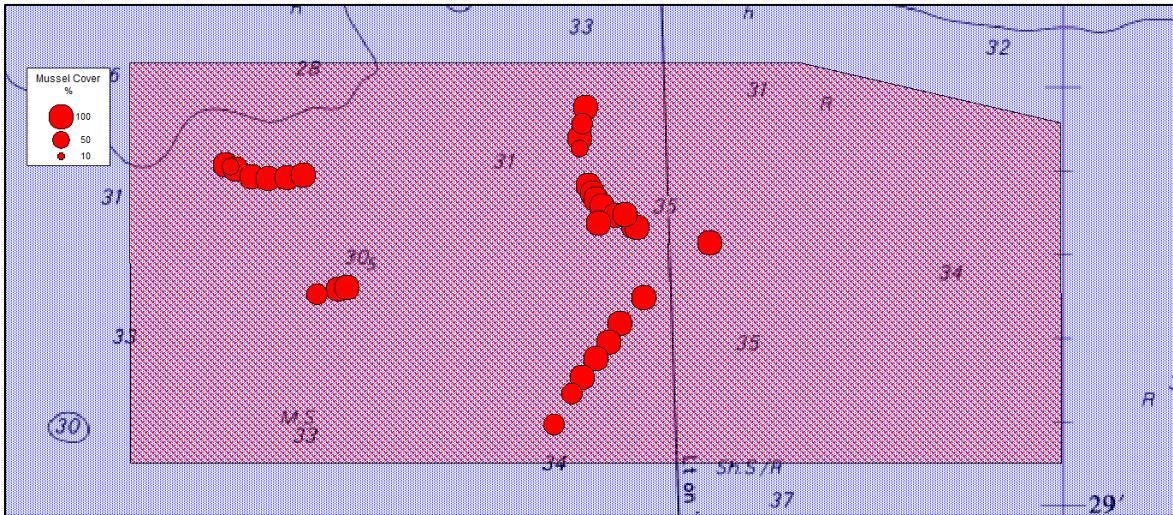


Figure 10. Mussel densities found within the Southern designated fishing site during the 2012 seabed video survey.

The Southern designated fishing area was found to hold almost continuous patches of 100% mussel density, consisting of exclusively small (2-3cm) mussels. At the Northern site there appeared to be a greater variation in mussel densities found, possibly due to varying seabed types. The smaller (2-3cm) mussels appeared to find settlement on mobile cobbles and sand difficult. Larger (4-8cm) mussels were found in small densities (10-25%) within the Northern site. Despite the variation in densities, there were substantial patches of >50% mussel coverage, particularly in the southern half of the site.

Conclusion

Taking into account all the information provided in the Appropriate Assessment, it is the opinion of the Authority that the Portland seed mussel fishery is an existing activity and the permitting of FV Nicola L to fish for seed mussel in 2013, following the above mentioned measures, will have no likely significant adverse effect on the features of the Studland to Portland cSAC.

Decision

That the Southern IFCA CEO issues annual permission to fish for mussel seed to FV Nicola L (WY37) in accordance with the SIFCA 'MUSSELS' byelaw and the conditions detailed in this document for 2013.

5.3 Kingmere recommended Marine Conservation Zone and the Management of Black Bream (*Spondyliosoma cantharus* (L.))

In spring each year black bream migrate from the wider English Channel to the shallow coastal waters of West Sussex and the Sussex Inshore Fisheries District. Once inshore the bream form spawning congregations whereby the larger male bream seek specific seabed sediment types to 'build' or excavate individual 'nests' (depressions on the seabed surface). Once a female bream has selected a suitable nest she will lay her eggs in a thin layer. After fertilisation the fish will guard the eggs until they hatch; this philopatry make the adults susceptible to fisheries exploitation.

Black bream are not subject to ICES stock assessment; they are not classed as a pressure stock for EU fisheries management purposes and no Total Allowable Catch is prescribed. The fish is targeted across its range in net and trawl fisheries, notably in the Sussex IFCA District by pair trawlers. Without a limit on the exploitable biomass there is a risk to the stock of recruitment overfishing, furthermore there is currently no minimum legal landing size prescribed under EU law; however as protogynous hermaphrodites black bream are not necessarily protected from growth overfishing through the application of this technique.

The vulnerability of the stock within the IFCA District and the limited extent of the available and known spawning habitat (as well as its susceptibility to modification) means that bream are suitable candidates for protection through spatial management measures.

This case study describes how the Sussex IFCA, working with the fishing and angling communities and a range of other stakeholders has, through the framework of the Marine and Coastal Access Act (2009) and as part of the Marine Conservation Zone process, recommended for protection a 50 km²

area around Kingmere Reef. The case also considers the role of inshore fisheries managers in stock management, the value of collaboration and the role of evidence in decision making.

The ecology and Geology of Kingmere rMCZs

Kingmere Rocks (also known as Kingmere Reef) is a sandstone bolder reef which is approximately 3nm. SSE of Littlehampton Harbour entrance and extends SE to a position approximately 7nm. SW of Worthing Pier. The reef moderate energy infralittoral rock reef (EUNIS class A3.2) is ~ 0.5 square nm. and is composed of large sandstone boulders which form a conspicuous feature which extends 2-3 m off the seabed and ranges in depth from 6 to 14 m BCD.

The sandstone boulders which form the reef are regularly 1-2 m in length and 0.2 – 0.5 thick. The upward facing surfaces of sandstone bedrock and boulders are covered by marine life, the tops of the shallower ones < 8m depth BCD having a covering of foliose red algae, whilst those slightly deeper are dominated by a dense animal turf; particularly the bryozoans *Bugula spp.* and *Flustra foliacea*.

Irving (1999) records extensive patches of encrusting coralline algae as being present on the sides of the boulders, together with various sponges (*Esperiopsisfucorum*, *Dysidiafragilis*, *Tethyaaurantium*, *Suberitesficus* and *Polymastia mammilaris*), dead man's fingers (*Alcyonium digitatum*), sea squirts (especially *Clavelina lepadiformis*, *Aplidium punctum* and *Morchellium argus*), and occasional starfish *Asterios rubens*. The mud tubes of fan worms (particularly *Bispira volutacornis*) protrude from the cracks between boulders, and edible crabs (*Cancer pagurus*) are frequently encountered sheltering under overhangs.

Worthing Lumps consists of two separate northerly facing chalk exposures, ranging in height from 2-3m. Worthing Lumps in the SE corner of the Kingmere rMCZ box.

The submerged landscape of the Paleo Arun transects North to South the Kingmere rMCZ in the Western part of the site. This feature is associated with deep coarse sediment; these include river terrace deposits and channel infill.

Chalk outcrops occur within the rMCZ. Linear chalk outcrops are exposed to the south of Kingmere Reef, (within the rMCZ) and extend > 1km (EMU 2011, 2009), forming, what appears to be preferential bream nesting habitat.

Surrounding the principal reef exposures and the infilled paleochannels the bedrock of the Tertiary Bracklesham Group (and associated lignite), and chalk is covered with a veneer of coarse sediment. Smaller areas of coarse sand are associated with depositional areas near to the exposed reefs.

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Worthing Lumps along with Kingmere itself have been designated by West Sussex a marine site of nature conservation importance, a non-statutory designation which recognises the local significance of the features.



Aspects of the ecology and biology of black bream (*Spondyllosoma cantharus*)

In spring each year black bream migrate from the wider English Channel, to the shallow coastal waters within the Sussex Inshore area, once inshore the fish form spawning aggregations. The larger male fish seek specific types of seabed sediment where they “build” or excavate individual “nests” or depressions on the seabed surface to attract a mate. In the process of building their “nests” male black bream use their tail to remove surface layer sediment layers to expose the bedrock or compacted gravel beneath and in so doing male black bream may use their nests in intraspecific competition to attract a female.

Sea bed substrates and features which have been identified as being associated with bream nest sites include sands and gravels and thin veneer’s and gravels on bedrock and adjacent to reefs and wreck. The bedrock they have been noted on includes Chalk, lignite and the Tertiary Bracklesham Group. Bream nest sizes are typically between 1–2 m wide and 5–30 cm in depth, they create a distinctive group of pitted sea bed features which may be discernible if surveyed with side scan sonar. Data shows that the sizes of bream nests can vary considerably within the area off West Sussex ranging from 0.14m² to 2.10m² whereby “smaller nests coincided with chalk areas and the larger nests with the sandstone reef areas” (EMU 2009).

Black bream are protogynous hermaphrodites; at sexual maturity they develop female sexual organs then later, as they grow, they become male. When the bream become sexually mature (as females) they recruit into the adult stock and range into the wider English Channel and South West Approaches to feed. It is expected that the bream exhibit site fidelity; returning to the same sites to spawn annually. Once a female black bream has selected a suitable nest she will lay her eggs in a thin layer within the nest; bream eggs are sticky they become strongly attached to the substrate. After the female has laid her eggs the male fish will fertilise them, the male fish will then guard the eggs until they hatch to protect them from predators such as crustacean and to ensure siltation of the nest does not occur. This philopatry makes the adult fish susceptible to fisheries overexploitation through extraction and the eggs vulnerable to abrasion from fishing activity.

Unmolested juvenile bream will remain in the vicinity of the nest sites until they are 7–8 cm in length; they then disperse but remain in the inshore areas for 2–3 years (approximately 20 cm in length). Adapted from James et al (2010)

The regional significance

The Kingmere Reef and the surrounding area are the best known and most studied examples of a bream nesting site in England. Hanson Marine Aggregates Ltd and United Marine Dredging Ltd have completed repeat monitoring of the region to comply with the conditions of the Government View for aggregate license areas 435 and 396 (South of the rMCZ). These studies investigate the densities and status of black bream nest sites [see Southern Science Ltd. (1995), EMU (2003), EMU (2009a) EMU (2009b) EMU (2011)]



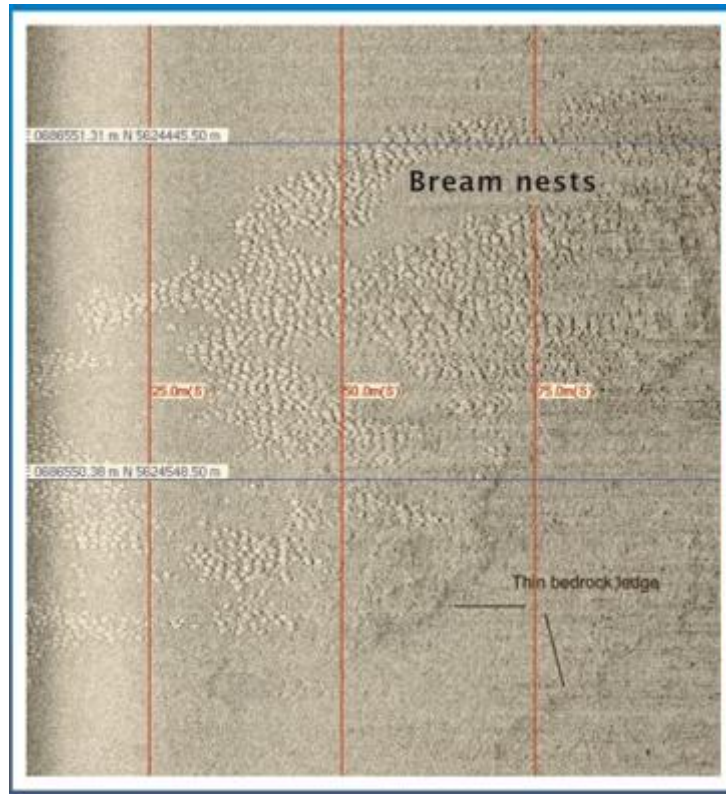


Figure 11. Sonar Image of Bream nests (James et al 2010 © Crown Copyright all rights reserved)

As part of the conditions regular surveys are undertaken to monitor the nesting activity of black bream in a series of sample sites, both within an outside the rMCZ and these surveys demonstrate that there are areas of dense nests (100 nests per 400 m²) consistently found within the rMCZ (particularly to the south of the Kingmere Reef) and nests have been consistently observed in high densities within the rMCZ since 1995 and “although some changes were noted within the black bream nest areas, the majority of nesting areas appear to be populated to the levels found previously” and “Distribution and densities of Black Bream nests fluctuate year to year and as such some variability is to be expected” (EMU, 2011).

Bream are known to nest elsewhere off West Sussex in the vicinity of Kingmere, such as Shelley Rocks and Southwest Rocks (Williams and Clark 2010, James et al. 2010, James et al. 2011) but James (2010 *ibid.*), demonstrates the regional significance of the Kingmere area. Nationally and internationally there are other known black bream nesting areas, such as Poole Bay and Cardigan Bay, but the Kingmere area is thought to be the most extensive. This is supported by the internationally significant landings of bream from this area and the infrequent occurrences of what appears to be preferred nesting habitats (shallow sediment overlying bedrock).

Timing of Spawning

Analysis of the monthly landing figures of bream in ICES rectangle 30E9 indicates a period of activity extending from March to July with a peak in May coinciding with the spawning period of Black Bream (EMU, 2011 and *pers. obs.*)

Fisheries Management

The status of the black bream stock in the Eastern English Channel is unknown and the fish is not subject to stock assessment; they are not classed as a pressure stock for EU fisheries management purposes and no Total Allowable Catch is prescribed. As a non-quota species the fish is fished inshore and offshore in net and trawl fisheries, notably in the Balanced Seas area by pair trawlers and recreational sea anglers. There is currently no minimum legal landing size for black bream under European Union technical regulations (as protogynous hermaphrodites such measures can have a counterproductive effect). The Sussex inshore fishing fleet is subject to numerous technical measures designed to reduce the incidence of capture of juvenile fish, including minimum mesh sizes but the vulnerability of the nesting sites means that they are suitable candidates for protection through spatial management measures.

The Fishery in Kingmere

Recreationally black bream fishery is very significant at Kingmere. The area is extremely popular with private boat anglers and charter boat operators. In the spring, given suitable weather, dozens of small vessels can be seen enjoying their sport on the site.

The commercial black bream fishery off West Sussex, in terms of landings, is dominated by pair trawling. More recently some high profile prosecutions have stopped the reported incidence of illegal incursion of vessels greater than 14m fishing inshore off Sussex and today (2011) the fishery is pursued by 4 of 5 pairs of trawlers using modified single boat trawls with >95mm cod-end trawls. Sussex pair trawlers use clumps of chain instead of trawl doors to maintain the contact of the trawl footrope with the seabed and rock hopper discs are used to avoid damage to the footrope and to minimise the footrope digging into the seabed. The fishery is associated with low levels of discards due to the relatively large mesh sizes. In 2010 MMO recorded landings from the trawl fishery, from area 30E9, of £138,231. This ICES is the highest value

Fixed nets are also used to target bream, but the fishery is currently relatively limited in its economic extent due to a number of factors, including coincidence with other fisheries, landing more product and market factors associated with supply and etc.

Support for the management of Kingmere

Despite of (or indeed because of) the extensive fishery for bream off Sussex there is good support for the rMCZ in the commercial and recreational sectors. The Sussex IFCA (and SFC before it) has engaged in community consultation and education which has been supported by the availability of good information on the site. In 2012 The Minister announced his intention to designate Kingmere rMCZ as part of the first tranche of designations for this new type of Marine Protected Area.



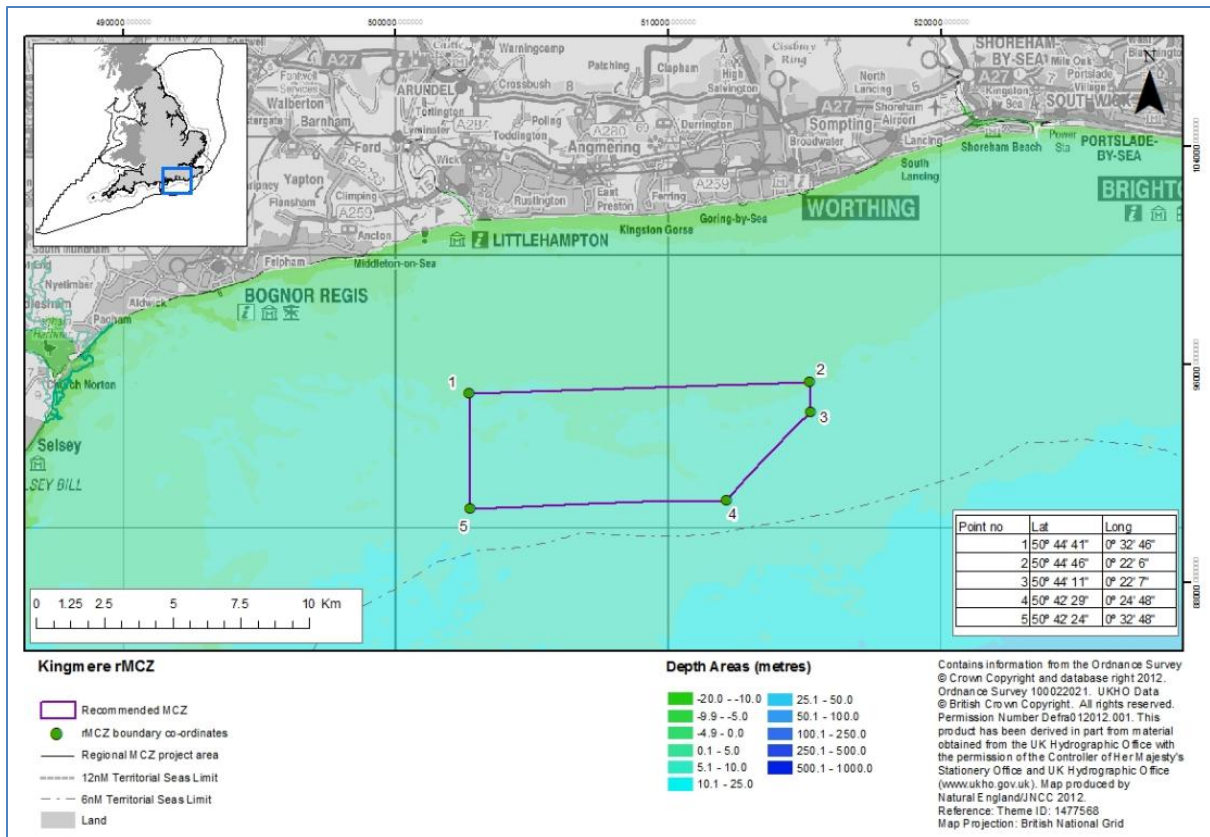


Figure 12. Kingmere rMCZ

Table 4. Features recommended for designation in Kingmere rMCZ in 2013

Subtidal chalk
Black Bream (<i>Spondyliosoma cantharus</i>)
Moderate energy infralittoral rock and thin mixed sediment
Native oyster (<i>Ostrea edulis</i>)

Table 5. General Information on Kingmere site

Regional Project: Balanced Seas	Site surface area: 48 km ²	Biogeographic Region: Eastern English Channel	
Site Location: ETRS89 N50 43' 39.980" W0 27'54.772" N50 43.666' W0 27.913'			
Inshore/Offshore: inshore			
Broad Scale Habitat	Feature type	26 km ²	Recover
Habitat FOCI	Broad Scale Habitat	0.02 km ²	Recover
Habitat FOCI	Moderate	2 records	Maintain
Non ENG feature	energy infralittoral rock and	4 records	Recover

More information on classifications used is contained in the Balanced Seas final recommendations report

The site is seen as the most important Black bream (*Spondyliosoma cantharus*) breeding site and the best studied in the UK. The site also contains excellent examples of Rocky habitats and Subtidal chalk outcropping reef systems. These chalk reef systems are also present beyond the boundary. The Sussex seabed also contains very small (3%) quantities of Sublittoral rocky reefs and the site also contains Kingmere Rocks. The Subtidal sediment in the site is a very important nursery ground for other commerce ally important fish species. SNCBs have recommended that the inner boundary of this site is moved landward to capture the additional benefits of Subtidal chalk.

The SNCBs have also identified the presence of the Undulate ray within the site, although it is not a feature proposed for designation.

Socio-Economics

Kingmere recommended MCZ had strong support from all stakeholders during the Regional Project process, evidenced by draft management proposals being developed by Sussex IFCA. There is however, an annual best estimate cost to industry of £20,000 as a result of the rMCZ designation.

Data Certainty

Kingmere recommended MCZ has acceptable data certainty for its features; of these features the Native Oyster (*Ostrea edulis*) and Subtidal chalk have been identified as being at higher risk.

Conclusion

As the advantages for this site justify the socio-economic costs, and the SNCBs have highlighted this site as at higher risk, this site has been proposed for designation in 2013 for the features as demonstrated in Table 4.



5.4 The revised approach to fisheries in European Marine Sites: The process for identifying Chichester Harbour red risks

Introduction

In August 2012 DEFRA announced its decision to revise the approach to the management of commercial fisheries within European Marine Sites (EMSs). This is to ensure that EMSs receive the requisite level of protection, and enhance compliance with our legal obligations under Article 6 of the Habitats Directive.

The revised approach places new management duties on the IFCAs, who now have a legal obligation to ensure that fishing activities which could affect EMSs are managed in a manner that secures compliance with Article 6. Under this revised approach fisheries are now treated in the same way as any other activity at sea and are classed as 'permitted activities' and treated as a 'plan or project'.

All existing and potential commercial fishing activities that can be carried out in EMSs are now subject to an assessment of their impact on the conservation objectives of the site features for which they were designated. This is assessed through a matrix type approach which shows, at a high generic level, gear types and their effect on relevant features for which EMSs were designated.

A risk-prioritised, phased approach is taken, assessing the level of risk that fishing activities present to the protected species and habitats in EMSs and focusing first on high-risk sites and fishing activities.

This case study outlines the application of this risk based decision making process by Sussex IFCA, for identifying priorities for action within Chichester Harbour.

Generic risk matrix

An initial generic matrix ("The Matrix") was produced by DEFRA and partners, broadly identifying EMS feature sensitivity to all the different types of fishing activity, see: http://www.marinemangement.org.uk/protecting/conservation/ems_fisheries.htm. This provides IFCAs and other regulators with an indicator as to whether an activity requires management measures to be introduced to protect a feature without further site level assessment or whether a further assessment is necessary.

Final agreement on the generic matrix was the first stage of the process. Utilising existing information, the vulnerability of EMS features to different gear types were grouped into "red", "amber", "green" or "blue" categories according to their sensitivity, as described in Table 1, in section 2.4.1.



Site specific risk matrix

Utilising the generic risk matrix a site specific risk matrix has been produced for Chichester Harbour. Working in partnership with Natural England all the features, sub-features and attributes for which the EMSs within Chichester Harbour were designated, were plotted in a matrix against all fishing activities included in the generic matrix. The associated risk ratings (red, amber, green and blue) from the generic matrix were directly transferred to this site-specific matrix - see Annex II.

Chichester Harbour falls within two EMSs – Langstone and Chichester Harbours Special Protection Area (SPA) and Solent Maritime Special Area of Conservation (SAC). Table 6 below summarises the features for which both of these sites were designated.

Table 6. Designation features and sub-features for EMSs falling within Chichester Harbour

Chichester and Langstone Harbours SPA	Solent Maritime SAC
<p>Internationally important population of regularly occurring Annex 1 species:</p> <ul style="list-style-type: none"> • Sandwich tern • Common Tern • Little Tern 	<p>Estuaries – subfeatures include</p> <ul style="list-style-type: none"> • Intertidal mudflats and sandflats communities • Intertidal mixed sediment communities • Subtidal sediment communities
<p>Intentionally important population of regulary occurring migratory species</p> <ul style="list-style-type: none"> • Grey Plover • Sanderling • Dunlin • Redshank • Dark-bellied Brent Goose • Shelduck • Teal 	<p>Atlantic salt meadows – subfeatures include</p> <ul style="list-style-type: none"> • Low marsh communities • Mid-Marsh communities • Upper Marsh communities • Transitional high marsh communities
<p>Internationally important assemblage of more 20,000 waterfowl European important of regulary occurring migratory species including – Bar- tailed Godwit</p>	<p>Annual vegetation of drift lines</p>
<p>Sand and shingle/ Mixed sediment shores</p>	<p>Salicornia and other annual colonising mud and sand</p>



Chichester and Langstone Harbours SPA	Solent Maritime SAC
	<ul style="list-style-type: none"> • Annual Salicornia saltmarsh communities • Suaeda maritima saltmarsh communities
Shallow coastal waters	Cordgrass Swards <ul style="list-style-type: none"> • Small cordgrass (<i>Spartina maritima</i>) communities • Smooth cordgrass (<i>Spartina alterniflora</i>) communities • Townsend's cordgrass (<i>Spartina x townsendii</i>) communities
Saltmarsh	Mudflats and Sandflats not covered by seawater at low tide <ul style="list-style-type: none"> • Intertidal mud communities • Intertidal muddy sand communities – (attribute: intertidal <i>Zostera marina</i> beds) • Intertidal sand communities • Intertidal mixed sediment
Intertidal mudflats and Sandflats	Sandbanks slightly covered by seawater all the time <ul style="list-style-type: none"> • Subtidal gravelly sand and sand • Subtidal muddy sand • Subtidal eelgrass <i>Zostera marina</i> beds
Sheltered muddy shores (including estuarine mud)	

Based on the associated risk ratings transferred from the generic matrix, only eelgrass (*Zostera marina*) beds in the SAC were identified as red risk from the above list of features and therefore of high priority for action. The specific activities identified as incompatible with the conservation objectives for eelgrass were: Towed (demersal) gear; dredges; intertidal handwork and bait collection.

Eel grass beds within the SPA were not categorised as red risk as they are not a key feature for which the site is designated, with this designation instead focusing on bird species. Instead they were

classified as amber with an associated requirement to conduct an appropriate assessment. This is a form of environmental impact assessment which will examine the potential effects of different fishing activities on this feature and consider whether they may adversely affect the EMSs integrity.

As part of this evidence based process a review of the fishing activities taking place within Chichester Harbour was conducted with all those known not to occur highlighted within the site specific matrix. Maps of known eel grass beds extents and fishing activity in the harbour were also constructed – see Annexes III and IV. These could be overlaid to understand where there was overlap between a known damaging activity and the feature.

A detailed Site Action Plan was subsequently constructed by IFCA for eelgrass and all fishing activities present within Chichester Harbour.

Site Action Plan

The Site Action Plan (SAP) constructed for eel grass beds within Chichester Harbour acts as an audit tool for MMO and DEFRA and ensures the evidence trail underpinning all management decisions is accurately and thoroughly recorded.

The plan considers available evidence (for activity levels, impacts and feature mapping), information gaps, such as on feature extents, and proposed ways to fill these. Current management in place is also noted and whether it fulfills some of the management needs for the feature protection, and where future management is needed to protect specific features. This is conducted for each cell of the site-specific matrix i.e. each gear combination with subtidal and intertidal eel grass beds. Those activities known not to occur were not assessed within the SAP.

These SAPs will be working documents that can be used to inform future tasks such as appropriate assessments and activity mapping, and can be updated as new evidence is gathered or interpreted. The initial SAP currently conducted for eel grass within Chichester Harbour provides an evidence gap analysis to help inform future evidence gathering priorities. The need for further surveying of eel grass extents within the harbour was identified, particularly to confirm the absence of subtidal eel grass beds. For those activities identified as red risk for eel grass no additional evidence on habitat impacts needs to be obtained before byelaws are implemented.

Generic Red Action Plan Summary table

A summary table was then conducted for eel grass, as the high risk feature identified within Chichester Harbour. This will enable Sussex IFCA to project, record progress on and detail tasks for implementation of management by the end of 2013.

The action plan summary table will thereby act as a reporting tool as required. These tables will then

be collated on a tranche-based approach for the remaining gear-type/habitat combinations (ambers and greens), which require actions to be completed and implemented by 2016.

Next steps

The outcomes of these assessments provide information to underpin Sussex IFCA's management decisions within EMSs and the plans provide a robust recording mechanism.

Through the above risk-based process, underpinned by evidence on impacts, Sussex IFCA will now assess the appropriate management to be introduced for eel grass within Chichester Harbour. Under the powers IFCA have under Section 155 of the Marine and Coastal Access Act 2009, they are able to enforce their duties under Section 154 to further the conservation objectives of EMSs. Potential options include the creation of a local byelaw which prohibits fishing activities known to damage eel grass over the mapped areas of this habitat or a permit system regulating what activities can occur where this feature is present.

Any management within Chichester Harbour will need to be developed in close partnership within Southern IFCA given the division of the harbour between the two IFCA districts.

Existing knowledge gaps identified in the SAP, regarding the extent of the eel grass feature, will be addressed by survey programs developed with partners, such as Natural England, the Environment Agency and the Wildlife Trusts. These will be conducted over summer 2013 to meet the end of the year deadline for red risks. In this way, IFCA can ensure their management prescriptions are based on sound evidence.



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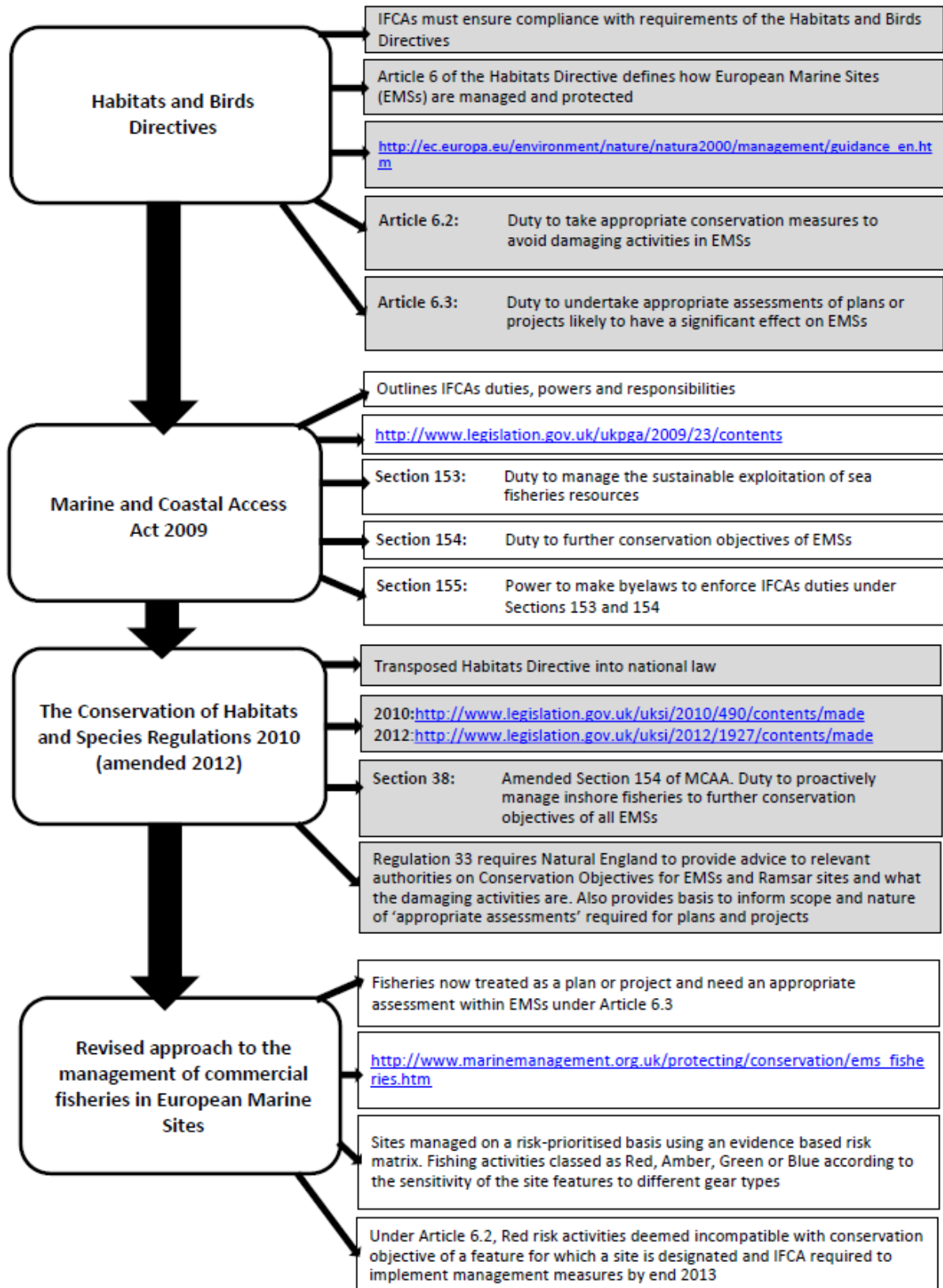


Appendix

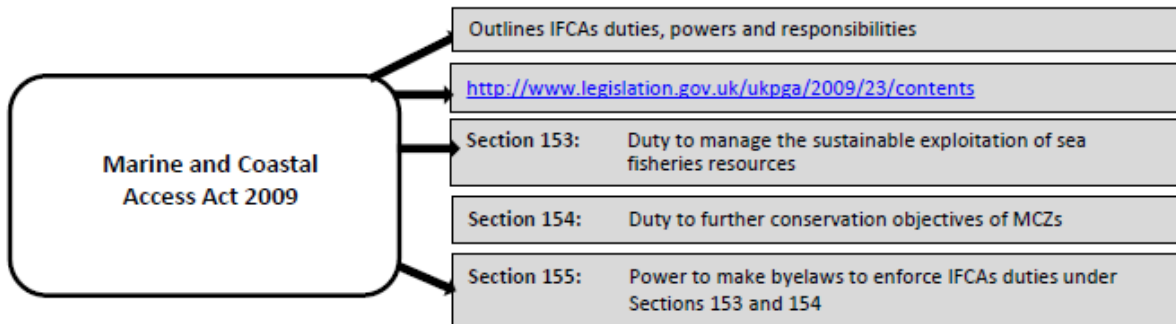
Appendix 1: Summary diagram of IFCAs duties as relates to MPAs



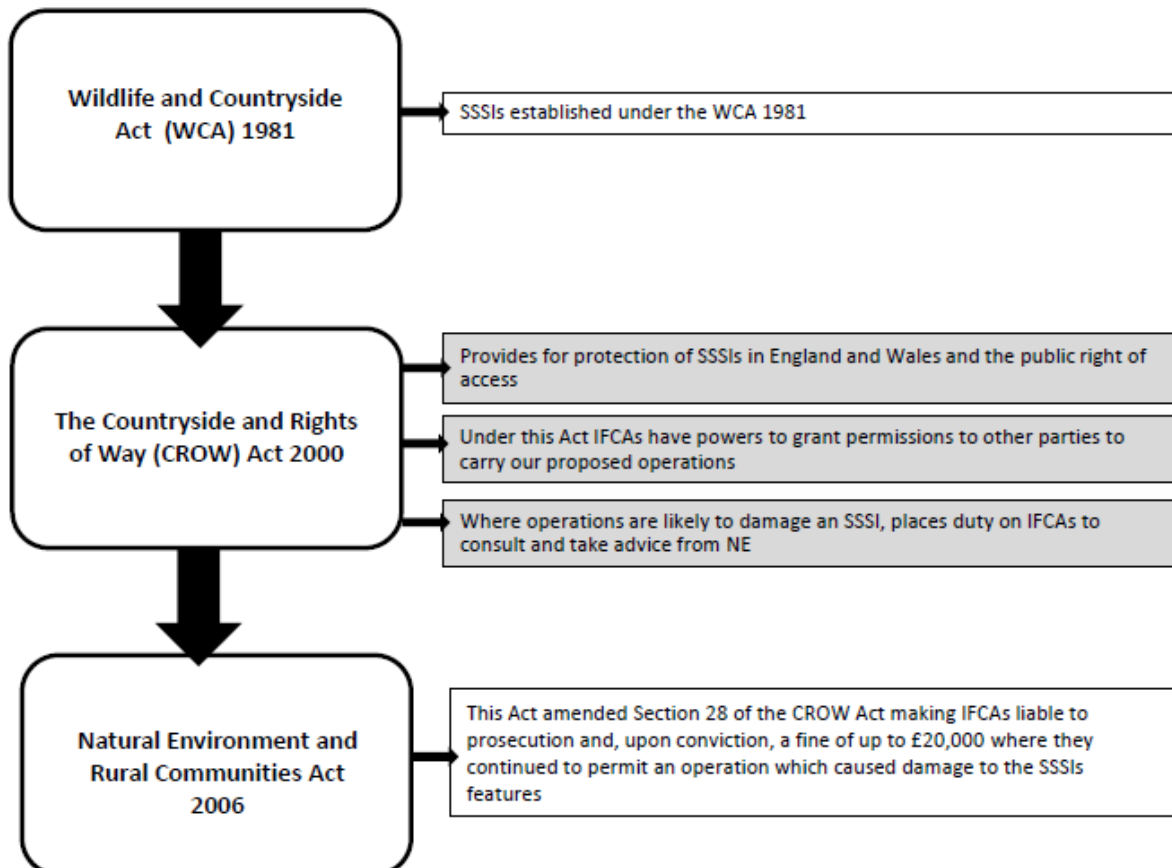
IFCAs duties as relates to European Marine Sites (EMSs)



IFCAs duties as relates to Marine Conservation Zones (MCZs)



IFCAs duties as relates to Sites of Special Scientific Interest (SSSIs)



Appendix 2: Site specific matrix for Chichester Harbour (referred to on P49)

	Site Name	CHICHESTER HARBOUR (Part of Solent Maritime)									
	Designation	SAC									
Fishing gear type	Generic sub-Feature	Subtidal gravel and sand	Subtidal muddy sand	Seagrass (SACs)	Subtidal mud	Intertidal mud	Intertidal mud and sand	Seagrass (SACs)	Intertidal mixed sediments	Saltmarsh spp, Salicornia and Seablite	
	Feature	Subtidal Sandbanks			Estuaries	Mudflats and sandflats not covered by sea at low tide.				Atlantic saltmeadows	Annual vegetation of driftlines
	Related sub-feature (or attribute) in Reg 33	<i>Subtidal gravelly sand and sand</i>	<i>Subtidal muddy sand communities</i>	<i>Subtidal eelgrass Zostera marina beds</i>	<i>Subtidal sediment communities</i>	<i>Intertidal mud communities</i>	<i>Intertidal muddy sand communities</i>	<i>Intertidal zostera beds (structural component of intertidal muddy sand communities)</i>	<i>Intertidal mixed sediment communities</i>	<i>Atlantic salt meadows (Interest Feature), Salicornia and other annuals colonising mud and sand (Interest Feature), Cordgrass swards (Interest</i>	<i>Annual vegetation of driftlines (Interest feature)</i>

										feature)	
Towed (demersal)	Beam trawl (whitefish)										
	Beam trawl (shrimp)										
	Beam trawl (pulse/wing)										
	Heavy otter trawl										
	Multi-rig trawls										
	Light otter trawl										
	Pair trawl										
	Anchor seine										
	Scottish/fly seine										
Towed demersal/pelagic											
Towed (pelagic)	Mid-water trawl (single)										
	Mid-water trawl (pair)										
	Industrial										



	trawls											
Dredges (towed)	Scallops											
	Mussels, clams, oysters											
	Pump scoop (cockles, clams)											
Dredges (other)	Suction (cockles...)											
	Tractor											
Intertidal handwork	Hand working (access from vessel)											
	Hand work (access from land)											
Static pots/traps	Pots/creels (crustacea/g astropods)											
	Cuttle pots											
	Fish traps											



Static - fixed nets	Gill nets		Blue	Blue	Red	Blue	Orange	Orange	Red	Orange	Orange	Orange
	Trammels		Blue	Blue	Red	Blue	Orange	Orange	Red	Orange	Orange	Orange
	Entangling		Blue	Blue	Red	Blue	Orange	Orange	Red	Orange	Orange	Orange
	Drift nets (pelagic)		Blue	Blue	Red	Blue	Orange	Orange	Red	Orange	Orange	Orange
Passive - nets	Drift nets (demersal)		Blue	Blue	Red	Blue	Orange	Orange	Red	Orange	Orange	Orange
	Longlines (demersal)		Blue	Blue	Red	Blue	Orange	Orange	Red	Orange	Orange	Orange
	Longlines (pelagic)		Blue	Blue	Red	Blue	Orange	Orange	Red	Orange	Orange	Orange
Lines	Handlines (rod/gurdy etc)		Blue	Blue	Red	Blue	Orange	Orange	Red	Orange	Orange	Orange
	Jigging/trolling		Blue	Blue	Red	Blue	Orange	Orange	Red	Orange	Orange	Orange
Seine nets and other	Purse seine		Blue	Blue	Red	Blue	Orange	Orange	Red	Orange	Orange	Orange
	Beach seines/ring nets		Blue	Blue	Red	Blue	Orange	Orange	Red	Orange	Orange	Orange



	Shrimp push-nets											
	Fyke and stakenets											
Miscellaneous	Commercial diving											
	Bait dragging											
	Crab tiling											
Bait collection	Digging with forks											

	Site Name	Chichester Harbour											
	Designation	Part of Chichester and Langstone Harbour SPA											
Fishing gear type	Generic sub-Feature	Seagrass (SPAs)	Intertidal mixed sediments	Intertidal mud and sand	Estuarine fish community	Saltmarsh spp, Salicornia and Seablite	Surface feeding birds	Estuarine Birds					
	Feature	Bird species or assemblage							Interest feature	Interest feature			



		<i>Related sub-feature/supporting feature/attribute in Reg 33/35</i>	Seagrass	Mixed sediment shores; Sand & shingle	Intertidal mudflats & sandflats	Shallow coastal waters	Saltmarsh	Sandwich tern, Common tern, Little tern	Grey Plover, Sanderling, Dunlin, Redshank, Dark-bellied brent goose, Shelduck, Teal, Ringed plover, Curlew, Bar-tailed godwit, Turnstone, Wigeon, Pintail, Shoveler, Red-breasted merganser
Towed (demersal)	Beam trawl (whitefish)								
	Beam trawl (shrimp)								
	Beam trawl								

	(pulse/wing)								
	Heavy otter trawl								
	Multi-rig trawls								
	Light otter trawl								
	Pair trawl								
	Anchor seine								
	Scottish/fly seine								
Towed demersal/pelagic									
Towed (pelagic)	Mid-water trawl (single)								
	Mid-water trawl (pair)								
	Industrial trawls								
Dredges (towed)	Scallops								
	Mussels, clams, oysters								
	Pump scoop (cockles, clams)								
Dredges (other)	Suction (cockles...)								
	Tractor								



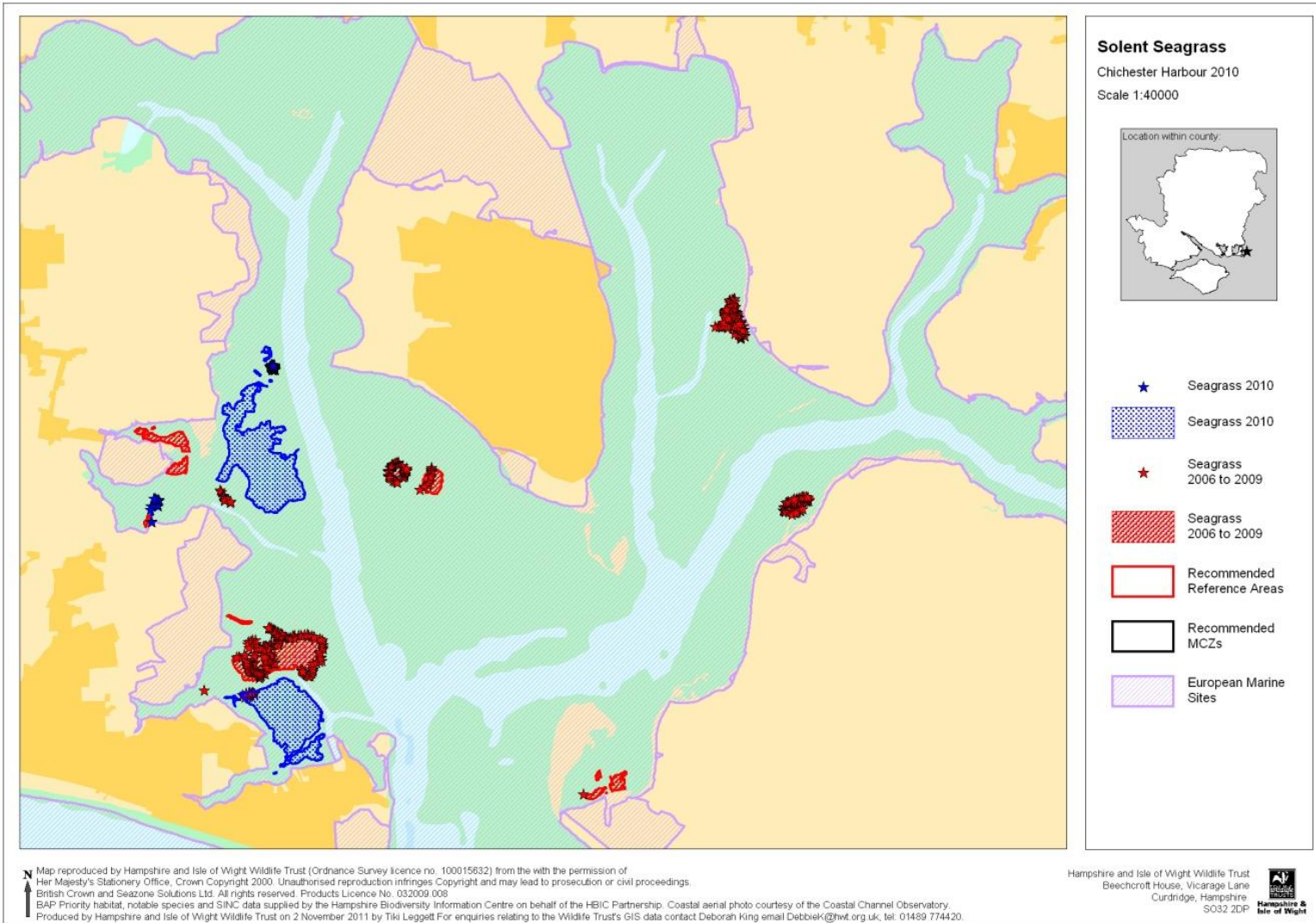
Intertidal handwork	Hand working (access from vessel)		Orange	Orange	Orange	Blue	Orange	Blue	Orange
	Hand work (access from land)		Orange	Orange	Orange	Blue	Orange	Blue	Orange
Static pots/traps	Pots/creels (crustacea/gastropods)		Vertical lines	Vertical lines	Vertical lines	Orange	Blue	Blue	Blue
	Cuttle pots		Vertical lines	Vertical lines	Vertical lines	Vertical lines	Blue	Blue	Blue
	Fish traps		Vertical lines	Vertical lines	Vertical lines	Vertical lines	Blue	Vertical lines	Vertical lines
Static - fixed nets	Gill nets		Vertical lines	Vertical lines	Vertical lines	Vertical lines	Blue	Blue	Vertical lines
	Trammels		Vertical lines	Vertical lines	Vertical lines	Vertical lines	Blue	Green	Vertical lines
	Entangling		Orange	Orange	Orange	Orange	Blue	Green	Orange
	Drift nets (pelagic)		Blue	Blue	Blue	Orange	Blue	Blue	Blue
Passive - nets	Drift nets (demersal)		Orange	Orange	Orange	Orange	Blue	Blue	Blue
	Longlines (demersal)		Orange	Orange	Orange	Orange	Blue	Orange	Blue
	Longlines (pelagic)		Blue	Blue	Blue	Orange	Blue	Orange	Blue
Lines	Handlines (rod/gurdy etc)		Blue	Blue	Blue	Orange	Blue	Blue	Blue
	Jigging/trolling		Blue	Blue	Blue	Orange	Blue	Blue	Blue
Seine nets and other	Purse seine		Blue	Blue	Blue	Orange	Blue	Green	Green
	Beach seines/ring nets		Orange	Orange	Orange	Orange	Blue	Blue	Blue



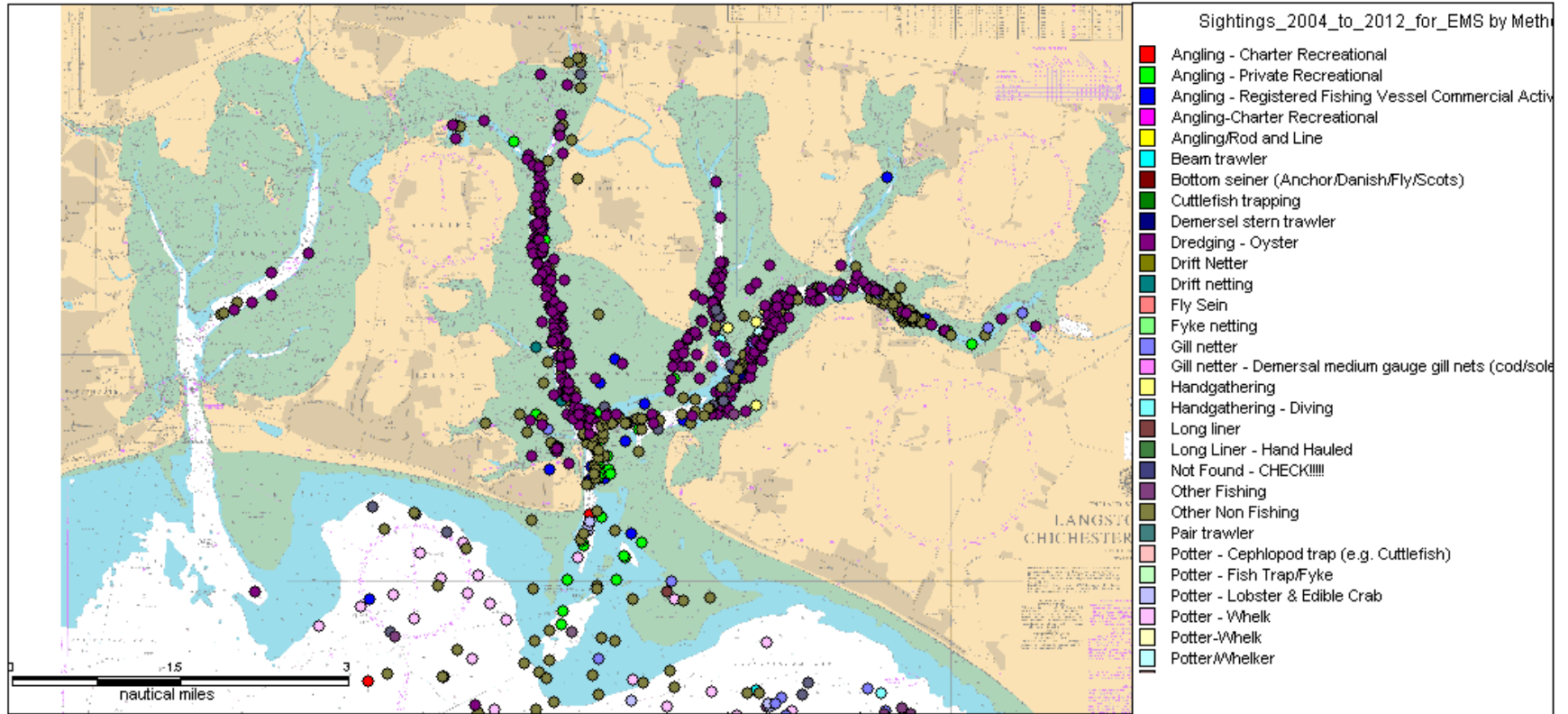
	Shrimp push-nets									
	Fyke and stakenets									
Miscellaneous	Commercial diving									
	Bait dragging									
	Crab tiling									
Bait collection	Digging wth forks									



Appendix 3: Eelgrass beds extent in Chichester Harbour



Appendix 4: Fishing activity in Chichester Harbour





PANACHE

Protected Area Network Across
the Channel Ecosystem

PANACHE is a project in collaboration between France and Britain. It aims at a **better protection** of the Channel marine environment through the **networking** of existing marine protected areas.

The project's five objectives:

- **Assess** the existing marine protected areas network for its ecological coherence.
- **Mutualise** knowledge on monitoring techniques, share positive experiences.
- **Build** greater coherence and foster dialogue for a better management of marine protected areas.
- **Increase** general awareness of marine protected areas: build common ownership and stewardship, through engagement in joint citizen science programmes.
- **Develop** a public GIS database.

France and Great Britain are facing similar challenges to protect the marine biodiversity in their shared marine territory: PANACHE aims at providing a **common, coherent and efficient reaction**.

PANACHE est un projet franco-britannique, visant à une **meilleure protection** de l'environnement marin de la Manche par la **mise en réseau** des aires marines protégées existantes.

Les cinq objectifs du projet :

- **Étudier** la cohérence écologique du réseau des aires marines protégées.
- **Mutualiser** les acquis en matière de suivi de ces espaces, partager les expériences positives.
- **Consolider** la cohérence et encourager la concertation pour une meilleure gestion des aires marines protégées.
- **Accroître** la sensibilisation générale aux aires marines protégées : instaurer un sentiment d'appartenance et des attentes communes en développant des programmes de sciences participatives.
- **Instaurer** une base de données SIG publique.

France et Royaume-Uni sont confrontés à des défis analogues pour protéger la biodiversité marine de l'espace marin qu'ils partagent : PANACHE vise à apporter une **réponse commune, cohérente et efficace**.

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