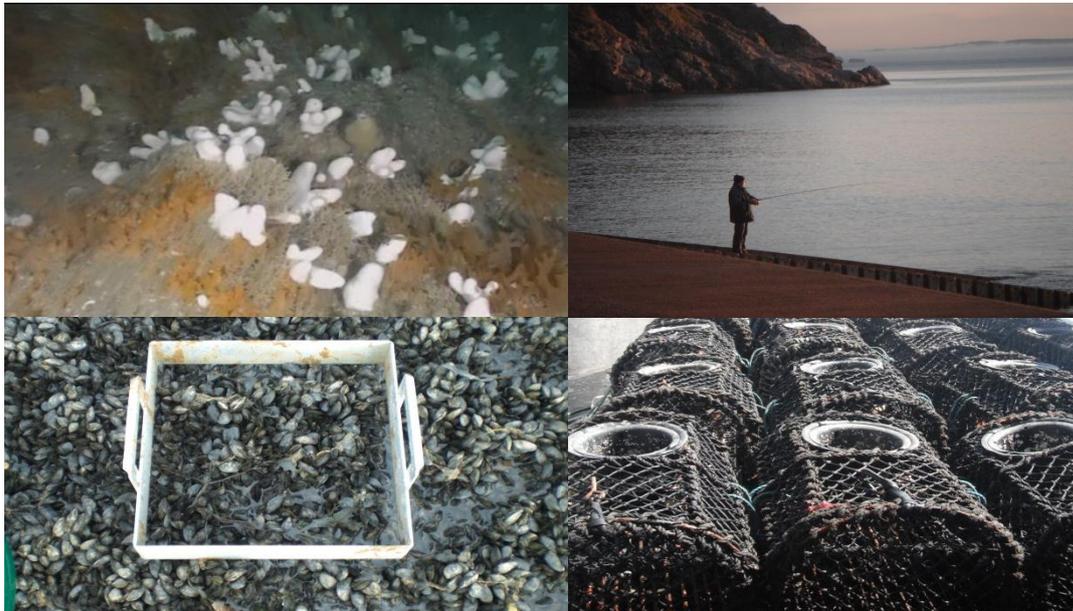




Annual Research Plan 2014-2015



Sarah Clark
Principal Environment Officer

This document has been produced by Devon and Severn Inshore Fisheries and Conservation Authority.

Devon & Severn IFCA
Old Foundry Court
60A Fore Street
Brixham
Devon
TQ5 8DZ

Tel: 01803 854648

Email: office@devonandsevernifca.gov.uk

This document can also be viewed online at www.devonandsevernifca.gov.uk

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1. Introduction

1.1 Overview of District

Devon and Severn Inshore Fisheries and Conservation Authority (D&S IFCA) is one of the ten Inshore Fisheries and Conservation Authorities in England created under Section 150 of the Marine and Coastal Access Act 2009 (MaCAA, 2009) providing inshore fisheries and conservation management. The D&S IFCA was fully vested on 1st April 2011 and its district extends along two coasts including numerous estuaries and covers an area of 4,522 km². The southern part of the district extends six miles seawards from Lyme Regis in the east to the border between Devon and Cornwall in the west. The northern part of the district stretches from Countisbury Cove in Devon at the borders with Cornwall along the coast and Severn Estuary as far as Maisemore Weir in Gloucestershire to Chepstow and extends out to median line with Wales and includes Lundy Island. The D&S IFCA district has two neighbouring IFCAs of Cornwall and Southern, and an extended border with the Welsh Government.

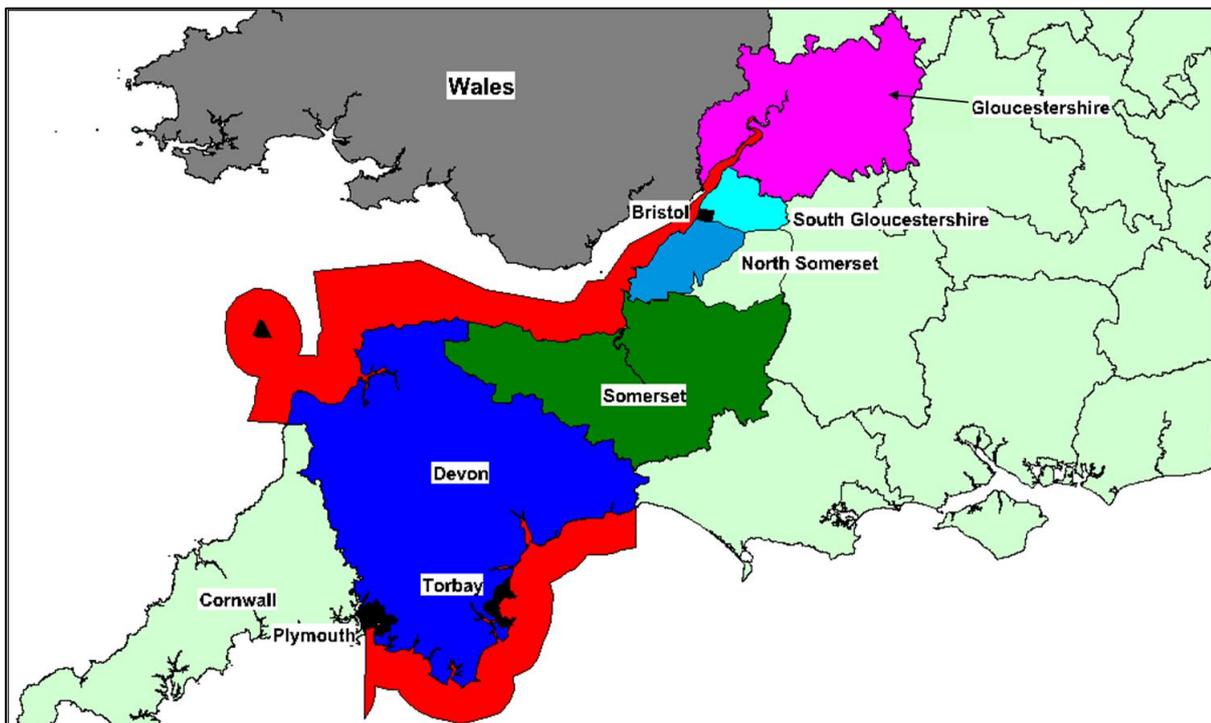


Figure 1 Devon & Severn IFCA District

D&S IFCA district contains 1,110 km² of designated EU and UK Marine Protected Areas (many of which are co-located) including six European Marine Sites consisting of three Special Protected Areas (SPAs) and five Special Area of Conservation (SACs), Ramsar sites, four Conservation Zone (MCZ) under the first Tranche of designations (and a further three more proposed more under the Second tranche) and the first No Take Zone (NTZ) in England. There are numerous Sites of Special Scientific Interest (SSSI) within the district that have marine elements to them.

The IFCA vision is a shared vision for all IFCAs where we

‘will 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’.

1.2 IFCA Duties

The main duties of IFCAs are set out under Part 6 Chapter 1 of the Marine and Coastal Access Act 2009¹, and place a greater emphasis on seeking to balance the socio- economic factors associated with exploiting sea fisheries resources and the protection of the marine environment. These duties are outlined below.

153 Management of inshore fisheries

- 1) The authority for an IFC District must manage the exploitation of sea fisheries resources in that district
- 2) In performing its duty under subsection 1), the authority for an IFC district must –
 - a. Seek to ensure that the exploitation of sea fisheries resources is carried out in a sustainable way
 - b. Seek to balance the social and economic benefits of exploiting the 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,
 - c. Take any other steps which in the authority’s opinion are necessary or expedient for the purpose of making a contribution to the achievement of sustainable development, and
 - d. Seek to balance the different needs of persons engaged in the exploitation of sea fisheries resources in the district
 - e.

154 Protection of marine conservation zones

- 1) The authority for an IFC district must seek to ensure that the conservation objectives of any MCZ in the district are furthered

Table 1: IFCA duties

¹ The Marine and Coastal Access Act (2009), HMSO, London, pp. 347
<http://www.legislation.gov.uk/ukpga/2009/23/contents>

Defra² has established seven Success Criteria for the IFCAs to achieve. Each success criteria has associated high level objectives which are listed in D&S IFCA Annual Plan 2014 -2015³. The table below show those success criteria which are particularly relevant to the research work to be undertaken by D&S IFCA. In order to achieve the high level objectives a number of performance indicators must be met. The legislation and guidance outlined here shows the need for strategic research plans to be developed, as well as the production of annual research plans and reports.

SC2. Evidence based, appropriate and timely byelaws are used to manage the sustainable exploitation of sea fisheries resources within the district.

HLO: Identify and evaluate key issues that are likely to impact on the sustainable management of the marine environment using the best available evidence

HLO: The impacts of different courses of action might have in managing the marine environment are thoroughly evaluated, proportionate and continuously monitored

SC4. IFCA work in partnership and are engaged with their stakeholders

HLO: Development of efficient and effective partnership working between all relevant parties and the IFCA

SC5. IFCA make the best use of evidence to deliver their objectives.

HLO: to ensure that “the best available, quality-assured evidence...is used appropriately in decision-making at all levels”

HLO: Mutual beneficial information will be shared between IFCA and key delivery partners to improve efficiency and the delivery of beneficial outcomes

HLO: Demonstrate an in-house capability to collect, analyse and interpret evidence to inform management policy decisions

SC6. IFCA support and promote the sustainable management of the marine environment.

HLO: the adoption of the principles of best practice in sustainable management of marine environment in the D&S IFCA district

Table 2 IFCA Success Criteria and High Level Objectives relevant of Research activities of Devon & Severn IFCA

² DEFRA (2011a) Guidance to Inshore Fisheries and Conservation Authorities on monitoring and evaluation, and measuring performance, DEFRA, London, pp. 25.

³ Devon and Severn IFCA Annual Plan 2014-2015 Appendix 2 pp.34-40 www.devonandsevernifca.gov.uk

Success Criteria 4 outlines the importance of working in partnership with key partners, organisations and stakeholders. Working together and sharing resources has been developed through the Sea Fisheries Committees and this joint working continues and is being developed providing significant benefits for all involved. The benefits include improvements in the quality of research; sharing expertise; quality assurance of worked undertaken and interpretation of data; improvement in communication and understanding of the research outcomes, better value for money, shared use of equipment and skilled technical staff..

Devon and Severn IFCA has very good working relationships with many statutory organisations including Natural England (NE), Environment Agency (EA), Marine Management Organisation (MMO), Centre for Environment Fisheries and Aquaculture Science (CEFAS) and Natural Resources Wales, Local Authorities and other IFCAs. Other organisations include non-government organisation (NGOs) such as local Wildlife Trusts, Torbay Coast and Countryside Trust, Worldwide Fund for Nature (WWF), Marine Conservation Society (MCS), Estuary Partnerships and Coastal Fora, Shellfish Association of Great Britain (SAGB), Universities of Plymouth, Exeter, West of England Bangor and Swansea and national and local fishermen's associations and angling groups and federations.

The IFCA Technical Advisory Group (TAG) was established to promote collaboration of statutory authorities whom have an interest in fisheries management. Members of TAG include IFCAs, Welsh Government, Defra, MMO, Cefas and NE. The aims of the group are to improve the quality and extent of fisheries management information through better co-ordination and dissemination of fisheries related scientific research and to define and apply best practice relating to the scientific and technical functions and responsibilities of IFCAs.

2. D&S IFCA Priorities for 2014-2015

This Annual Research Plan 2014-2015 sets out the research projects and work priorities for D&S IFCA between May 2014 and April 2015. The D&S IFCA Annual Plan 2014-2015 lays out three main areas of focus for activities and actions to be undertaken in 2014-2015 and these are:

- To lead on the protection of the Marine Protected Areas network within the district
- Sustainable potting and shellfishery management within the district
- Recreational sea angling (RSA) development

These three areas are linked to the mission statement for the D&SIFCA and help to deliver adaptive co-management of the sea fish resources for the district

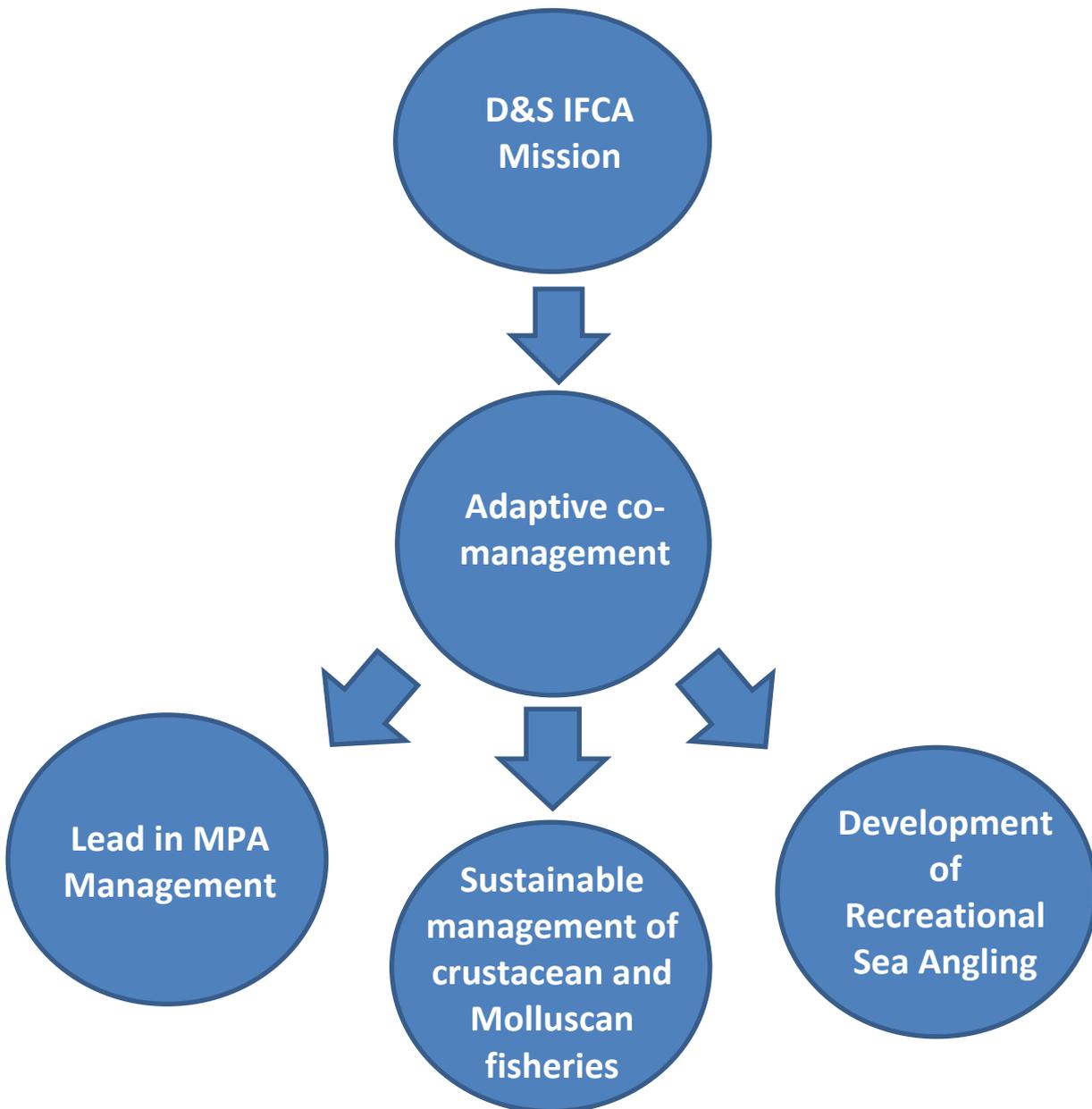


Figure 2 D&S IFCA Core Work Priorities 2014-2015

This research plan has been produced to outline the research activities needed to be undertaken to collect data to inform these work priorities and to provide a sound evidence base to aid the Authority in its decision making process both in terms of achieving successful and sustainable management and a protected marine environment.

2.1 Lead on MPA Management

IFCAs have a responsibility under the Conservation of Habitats and Species Regulations (2010), as a relevant authority⁴, to further the conservation objectives of European Marine Sites under the advice of Natural England (the appropriate nature conservation body). The IFCA receives advice on any operations which may cause deterioration of natural habitats or the habitats of species, or disturbance of species for which the sites have been designated. This information will be a key component of any management scheme that may be developed for this site and it will also define the scope and nature of 'appropriate assessment' which the Habitats Directive requires to be undertaken for 'plans and projects' having a significant effect on the European site.

In October 2012 Defra revised its approach to commercial fishing activities occurring within EMS to ensure that EMS receive the requisite level of protection and ensure compliance with the EU Habitats and Bird Directives. This approach ensures that all commercial fisheries which may impact EMS are being suitable and effectively managed and have undertaken an appropriate assessment of the impact on the designated features of the EMS. Following this revised approach and the subsequent letter outlining the expectation from Defra for the management of the red risk fisheries within EMS by January 2014, the D&SIFCA have implemented the Mobile Fishing Permit Byelaw. This byelaw fulfils the expectation from Defra to protect all EMS within the district from the interaction of towed gear fishing on sensitive interest features but also sets up management to protect the entire district through flexible and adaptive byelaws. This year's work will revolve around projects which will provide evidence to support management measures required to protect the EMS features from the Amber risk fisheries activity that have to be completed by December 2016. This will involve assessing all the fisheries interactions identified in the national matrix as amber and fitting them into an individual site assessment plan. The high risk ambers have been identified and prioritised in terms of the requirement for management in order to reduce the risk of damage to the features of the site. As part of the process each amber will require a Test of Likely Significant Effect to help establish the risk, if the activity is high risk then an Appropriate Assessment will be required which may necessitate further research in order to assess the full impact of an activity and the required management action.

D&S IFCA has six European Marine Sites (EMS) within the district all of which have fishing activities which are considered to be amber risk within the national matrix. Four of the EMS have shared boundaries with another IFCA or in the case of the Severn EMS a boundary with the Welsh Government. One site has two IFCAs and the MMO as the managers for the fishing activity. The drawing up of management measures to protect the sites from fishing activities by

⁴ The Conservation of Habitats and Species Regulations (2010), Statutory Instruments No. 490, Wildlife and Countryside; Part 1, Section 6(i), HMSO, London

the end of 2016 will require a great deal of joint working to produce coherent protection for the sites. In total there are 1,110km² of EMS within the D&SIFCA district or part of joint management sites for the IFCA.

The first tranche of Marine Conservation Zones (MCZ) were designated by the Minister on 21st November 2013. The MCZ were enacted through the Marine and Coastal Access Act 2009 (MACAA), the same Act that formed the new Inshore Fisheries and Conservation Authorities (IFCA). The IFCAs were set up to manage the new MCZ and were given specific powers and requirements to undertake the role. With the designation of the four sites in the D&SIFCA district work has started on producing management schemes to further the conservation objectives of the sites. All four of the sites are co-located with EMS in the district but will still require management measures in tandem with the EMS to protect and in some cases aid the recovery of the named feature.

In March 2014 the second tranche of 37 MCZs were listed, there will be three new sites within the D&SIFCA district, all within the Bristol Channel. Formal consultation on the sites will begin in January 2015, but, in the meantime there is an expectation from Defra that the IFCAs will be working on management plans for the new sites and features.

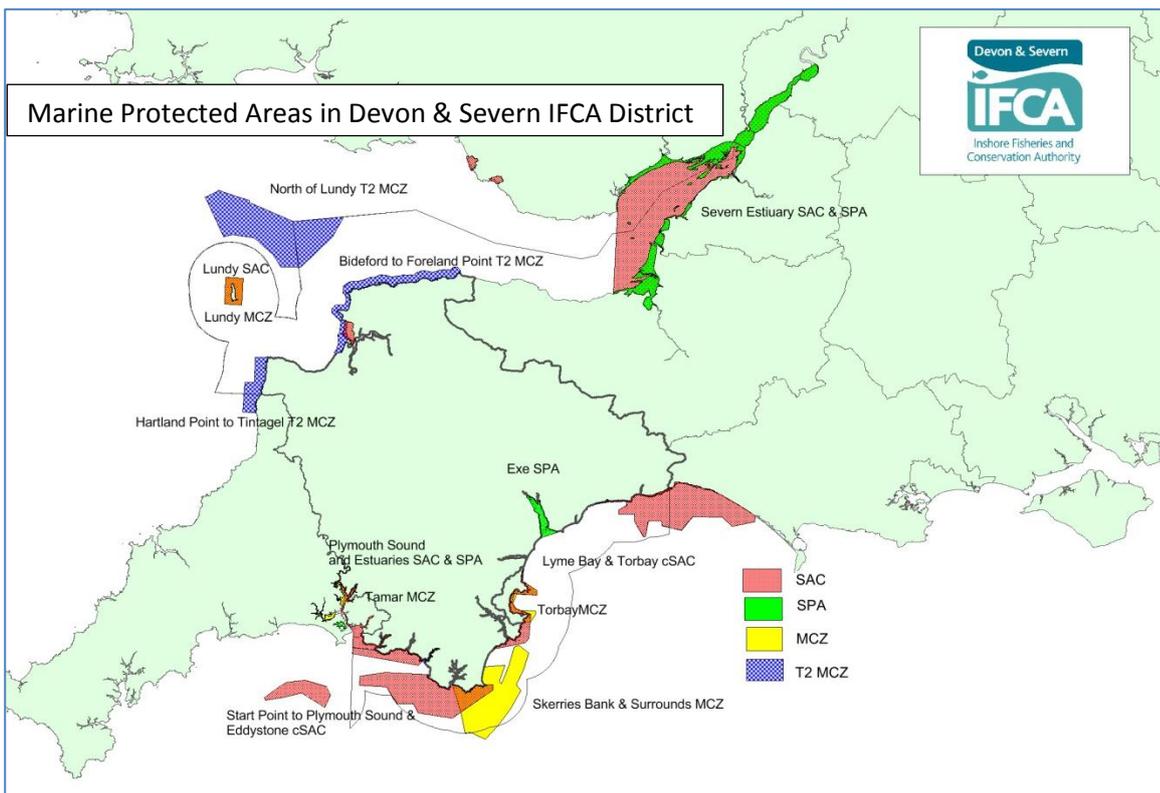


Figure 3 Marine Protected areas within D&S IFCA district

The research work required for the management of the EMS is accurate mapping of the features of the EMS that require protection. Whilst feature maps has been provided by NE this will need to be built upon in order for the IFCA permitting byelaw approach to work correctly. Therefore ground truthing of feature location and extent is imperative.. The second part of the

research work will require data to be collected on the interaction of fishing activities labelled as amber within the matrix to assess the possible management measures required to provide protection to the features of the EMS by 2016. Some studies have already commenced but other fishing interactions will need research this year and then to be built upon in subsequent years. There will be a requirement for local as well as national research to be conducted in this area. Ground truthing of MCZ habitats and features is needed to ensure that management of fishing activities within the four MCZ sites is developed in parallel with EMS work. The D&SIFCA has some protection of MCZ features already in place through our mobile fishing permit byelaw and further protection will be encompassed in the potting byelaw

2.2 Sustainable Development of Crustacean and Molluscan Fisheries

As shellfish stocks are within the management control of the IFCA survey work will need to be undertaken to assess the levels of Molluscan shellfish stocks within certain estuaries and management measures will need to be assessed working with other delivery partners to ensure that the shellfish stocks are protected whilst enabling a viable commercial fishery to operate. Crustacean fisheries will be a focus of research work in terms of gathering evidence of catch composition and population structure and how this can inform management of these fisheries

An area of focussed research that will be completed this year is the project looking at the appropriate landing size for whelks in the D&S IFCA district. Previous studies have questioned the current EU minimum size and have suggested that in many areas around the country 45mm is too small for 50% of the stock to reach sexual maturity. Results of the D&S IFCA research so far reinforces this and further and final analysis of the data will provide vital evidence. The whelk fishery in the district is very important and the stocks may need further protection by raising the minimum landing size to reflect the results of the study and allow for the on-going recruitment of into the fishery so providing for its long term future.

2.3 Development of Recreational Sea Angling

Under MaCAA previously unmanaged fisheries such as bait collection may now be subject to fisheries legislation and managed. The IFCA's are also tasked with ensuring that the different needs of persons exploiting sea fisheries are taken into account for example, recreational sea angling. Work undertaken previously by D&S IFCA has identified important areas to the RSA sector and there may be a need for management in these areas as well as addressing concerns over illegal fishing and fish minimum landing sizes. Greater engagement with the RSA sector will be promoted during the year. A full audit will be undertaken to allow the IFCA to make decisions over possible future development for the angling sector building on the national Angling 2012 programme and the work undertaken by the IFCA in 2013. Research in 2014-2015 will focus around bait collection, netting activity and charter and private boat angling.

3. Research Resources and Capabilities

3.1 Devon and Severn IFCA Environment Team

Devon and Severn IFCA has 11 members of staff including a Chief Officer, a Deputy Chief Officer, a Principal Environment Officer, two Senior Inshore Fisheries and Conservation officers (IFCO), two IFCOs, a Senior Environment Officer, an Environment Officer, a Research Assistant and an Officer Manager.

The members of the Environment team are:

Principal Environment Officer :

Sarah Clark s.clark@devonandsevernifca.gov.uk

Senior Environment Officer :

Libby Ross e.ross@devonandsevernifca.gov.uk

Environment Officer:

Katherine Gray k.gray@devonandsevernifca.gov.uk

Research Assistant:

Lauren Parkhouse l.parkhouse@devonandsevernifca.gov.uk

Each member of the environment team brings a variety of qualifications, specific skills, expertise and experience in conducting research and have the capability to collect analyse and interpret a wide range of scientific and research data. All have a background in marine biology and bring wide ranging expertise from habitat mapping to statistical analysis; management of shellfisheries to developing MPA management plans, stock assessment to appropriate assessments. Officers sit on a variety of focus and working groups in particular relating to estuary partnerships in EMS, coastal fora, national committees and institutes and the IFCA Technical Advisory Group. All members of the environment team and other IFCOs will work together to ensure that research priorities outlined in this plan will be delivered. Strong working relationships have been developed with academic institutions in the district which have proved to be very beneficial and researchers, students and interns work with the D&S IFCA officers to help deliver certain aspects of the research work undertaken.

3.2 Devon and Severn IFCA Research Equipment

Devon and Severn IFCA has a variety of equipment which may be utilised to undertake research to fulfil the work priorities outline in this plan. Officers are skilled in a range of survey methodologies and analytical and reporting skills. Details of the equipment including vessels available to undertake research can be found in Annex 1.

4. Devon and Severn Research Priorities for 2014 – 2015

The table below shows the three work priorities detailed in the D&S IFCA Annual Plan and the research activities that will be undertaken in 2012-2013 to gather data to inform these priorities.

	<i>Action 1</i> Lead in MPA Management	<i>Action 2</i> Sustainable management of Crustacean and Molluscan fisheries	<i>Action 3</i> Development of Recreational Sea Angling
<i>Priority 1</i>	Habitat mapping and ground truthing of sensitive features/habitats present in EMS and MCZs in the district	Whelk Fisheries Sustainability project – Size at sexual maturity	Assessment of distribution and extent of bait collection in the district
<i>Priority 2</i>	Assessment of the impacts of fishing activity within EMS – High risk ambers	Assessment of mussel resources both intertidal and sub-tidal to inform stock management, HRA and the development of hand gathering permit byelaw	Mapping of fishing effort in the Severn Estuary
<i>Priority 3</i>	Re-evaluate Red Risk Management in EMS – further evidence gathering to inform	Stock assessments of scallop, cockle & clam resources in the district to inform stock management,, HRA and the development of hand gathering permit byelaw	Survey of Netting activity in the district to inform Angling strategy development and HRA
<i>Priority 4</i>	Assessment of impact of fishing activities in MCZ to inform management	Survey of Potting activity throughout the district to provide effort and extent data and inform potting permit byelaw	Survey of angling effort from charter and private boats within the Severn Estuary
<i>Priority 5</i>	Eel grass mapping- extent, density and conditional assessment throughout the district	Analysis of crustacea landings including berried lobster scrubbing testing to inform future management	Scientific literature review to inform impact assessment for byelaw reviews
<i>Priority 6</i>	Scientific literature review to inform IA & HRA	Scientific literature review to inform IA & HRA	

Table 3 D&S IFCA Work Priorities and Research Activities

5. Overview of Plan Structure

The following section details the activities that the Devon and Severn IFCA intends to carry out from April 2014 to March 2015 to deliver the actions outlined in table 3. Each priority has research projects associated with it.

Each project is outlined in the form of a table including a brief description of research work to be undertaken and desired outputs as well as the time scale of the project and justification for the work. Equipment and resources needed to undertake the work and opportunities for collaborative working with other organisations are also detailed in each table. As listed in table 2 Defra has established success criteria for the IFCAs to achieve and there are several that are particularly relevant to the research work being undertaken by D&S IFCA. Each project table identifies those success criteria that the research fulfils. D&S IFCA Annual Plan 2014-2015 outlines the risk assessment matrix which considers all the activities conducted by D&S IFCA and highlights the associated risks identified as a result of the failure of those activities for financial years 2014-2015 and the mitigation measures that can be put in place to avoid this occurring.

6. Devon & Severn IFCA Research Projects for 2014-2015

Acton 1 Lead in MPA Management

Priority 1: Habitat mapping and ground truthing of sensitive features and habitats present in MPAs in the District.

Project 1.1.1 Habitat mapping and ground truthing of sensitive features in MPAs	
Description	Resources Needed
<p>Within D&S IFCA district there are currently more than 1,110 km² of designated conservation areas including SPA, SAC and MCZ. Many of these EMS and MCZ are co-located. High confidence in the extent and condition of the designated features at these sites is needed to understand and assess the potential impacts of different fishing activities and how management measures and plans can be developed to ensure that sustainable fisheries can be maintained whilst protecting the marine environment. The following priority sites and features will be assessed:</p> <ul style="list-style-type: none"> • Start Point to Plymouth Sound and Eddystone cSAC – reef / sand banks • Torbay MCZ – subtidal mud • Skerries Banks MCZ – circalittoral rock; subtidal mud, sand & coarse sediments • Lyme Bay & Torbay cSAC – Reef / interstitial areas • Lundy Island SAC – sandbanks; kelp <p>This evidence together with modern technology such as iVMS can be used to inform the location, level and type of fishing activity that can be sustained at these sites. It will be important to work with other agencies to collate as much previous data to highlight the areas that need further evidence gathering. Underwater filming will be undertaken in the sensitive areas and grab sampling may be required outside of the sensitive area to ground truth the sediment type present there. Side scan sonar will be used to identify the extent and location of different subtidal habitats. <i>Sabellaria reef</i> in the Severn SAC may be surveyed through collaboration with NE as this is included in their monitoring plan for 2014.</p>	<ul style="list-style-type: none"> • Underwater video camera, lights and recording system • Camera sled • Underwater torches & lasers • SeaKing Side scan Sonar • D&S IFCA vessel & time • GIS software • Underwater survey equipment e.g. grab, sieves • JNCC guidelines, MESH guidelines and EUNIS classification system for habitat interpretation/ identification • D&S IFCA SOPs and Risk Assessment for deployment of survey equipment

Outputs		Quarter			
		Q1	Q2	Q3	Q4
<ul style="list-style-type: none"> • Undertaking underwater filming / side scan sonar / grabbing • Analysis of film footage/ data gathered to determine the extent of features with EMS • Ground truthing of bathymetric data and other habitat data • Quality assurance of the analysis of these data with NE, Cefas , Plymouth University • Mapping the extent of the features and sensitive areas • Desk based data gathering of information on habitats types from studies carried out previously 		✓	✓	✓	✓
<ul style="list-style-type: none"> • have a responsibility under the Conservation of Habitats and Species Regulations (2010), as a relevant authority to further the conservation objectives of European Marine Sites • IFCAs have a legal obligation to ensure that they exercise their functions which are relevant to marine conservation to comply with the requirements of the Habitats Directive. • IFCAs have a legal obligation to ‘further the conservation objectives’ of MCZs. • Defra revised approach requires the IFCAs to assess the impact of commercial fishing gears on the features of EMS and good evidence of the extent and location of the features is need to make these assessments • D&S IFCA will use this activity to fill gaps in the evidence supplied by NE. • D&S IFCA will use this evidence to adapt its management of fishing activities in MPA through its permitting byelaws • Success criteria 4: IFCAs work in partnership and engages with stakeholders. • Success Criteria 5: IFCAs make best use of evidence to deliver objectives • Success Criteria 6: IFCAs support and promote the sustainable management of the marine environment. 		Opportunities for Joint Working: <ul style="list-style-type: none"> • Previous habitat mapping has developed collaborative working with NE and Cefas to quality assure data and share expertise. This will continue through this project. Data collation from previous surveys undertaken by these organisations will inform where further detailed surveying is needed and where there is less confidence in the features present • NE is currently collating all the evidence they have on the features of MPAs to source to the IFCAs. The ground truthing will fill gaps in the data held by NE. On-going discussions with NE will highlight where its areas of survey work and research priorities are for the year to prevent duplication of work. The Severn Estuary SAC mapping of <i>Sabellaria</i> will be looked at and opportunities for joint working will be explored. • On-going partnership working with researchers from Plymouth University to share expertise and quality assure the analysis of the footage and determination of habitat types. 			

Acton 1 Lead in MPA Management

Priority 2: Assessment of the impacts of fishing activity within EMS

Project 2.1.1 Assessment of the impacts of fishing activity within EMS – High Risk Ambers	
Description	Resources Needed
<p>Under Defra revised approach to management of commercial fishing activities within the EMS there is a need to assess the impact of different fishing gear types. The survey work and literature review will be used to inform Habitats Regulations Assessment to assess whether the fishing activity and the level of effort impact on the designated features of the EMS within the D&S IFCA district and whether the activity is appropriate to ensure the conservation objectives of the sites are met. Priority activities that will be assessed on a variety of different habitats are potting, netting, bait collection and towed gear and therefore survey work will be focussed on these. D&S IFCA is funding a PhD student from Plymouth University to look at the impacts of different fishing activities within the Start Point to Plymouth Sound and Eddystone SAC. Underwater filming will continue to inform this work. Use of Go-Pros to film the interaction of pots with the seabed is being undertaken by the PhD student working with D&S IFCA Environment Team. The use of Go-pros to film the interaction of nets on sensitive habitats will be investigated. Some grabbing may be necessary to look at the changes in habitat community composition and structure between areas that have demersal fishing activity and those where this activity is prohibited under the mobile fishing byelaw. Gathering fishing effort data is also an important part of the research to inform these assessments. Research on the effort of these activities will be covered under projects for Actions 2 & 3.</p>	<ul style="list-style-type: none"> • Underwater video camera, lights and recording system • Camera sled • Underwater torches & lasers • Go- Pro cameras • D&S IFCA vessel & time • GIS software • Day grab • Sediment sieves • JNCC guidelines, MESH guidelines and EUNIS classification system for habitat interpretation/ identification • D&S IFCA SOPs and Risk Assessment for deployment of survey equipment • Literature review of gear impacts – Cefas and NE Matrix

Outputs		Quarter			
		Q1	Q2	Q3	Q4
<ul style="list-style-type: none"> • Undertaking underwater filming /side scan sonar / grabbing • Analysis of film footage/ data gathered • Quality assurance of the analysis of these data with NE, Cefas , Plymouth University • Analysis of effort data to inform Habitats Regulation Assessments • GIS mapping of activities • Analysis of previous studies and literature review 		✓	✓	✓	✓
		✓	✓	✓	✓
		✓	✓	✓	✓
		✓	✓	✓	✓
		✓	✓	✓	✓
		✓	✓	✓	✓
Justification:	Opportunities for Joint Working:				
<ul style="list-style-type: none"> • D&S IFCA has a responsibility under the Conservation of Habitats and Species Regulations (2010), as a relevant authority to further the conservation objectives of European Marine Sites • IFCA's have a legal obligation to ensure that they exercise their functions which are relevant to marine conservation to comply with the requirements of the Habitats Directive. • Defra revised approach requires the IFCA's to assess the impact of commercial fishing gears on the features of EMS and good evidence of the extent and location of the features is need to make these assessments • D&S IFCA will use this evidence to adapt its management of fishing activities in MPA through its permitting byelaws • Success criteria 4: IFCA's work in partnership and engages with stakeholders. • Success Criteria 5: IFCA's make best use of evidence to deliver objectives • Success Criteria 6: IFCA's support and promote the sustainable management of the marine environment 	<ul style="list-style-type: none"> • NE is currently collating all the evidence they have on the features of MPAs to source to the IFCA's. This will held aid the assessment of effort and impact. • On-going partnership working with researchers from Plymouth University to share expertise and quality assure the analysis of the footage and determination of habitat types. • D&S IFCA will work with other IFCA's to share results of studies. The IFCA TAG has dedicated 'champions' who help facilitate the exchange of data relating to different fishing activities and the potential impacts of these activities. 				

Acton 1 Lead in MPA Management

Priority 3: Re-Evaluation of Red Risk Management – Further Evidence Gathering

Project 1.3.1 Further Evidence Gathering- Presence of Reef					
Description		Resources Needed			
<p>From 1st January 2014 D&S IFCA Mobile Fishing Permitting Byelaw came into being. This byelaw includes the restriction of access for demersal fishing gear within EMS in the district whose features include highly sensitive features such as reef. In some of the sites in particular Start Point to Plymouth Sound and Eddystone cSAC and Lyme bay and Torbay cSAC further evidence gathering is needed to verify the presence and absence of reef to ensure that the appropriate management of demersal fishing gear is in place. In these areas there is a lack of confidence in the location of the features and this needs to be validated through further underwater filming to potentially open up areas that have been previously closed and allow managed access to demersal fishing vessels. With the introduction of iVMS on mobile gear fishing vessels under the permitting byelaw this should allow the monitoring of compliance of the vessel to opening up access in EMS.</p>		<ul style="list-style-type: none"> • Underwater video camera, lights and recording system • Camera sled • Underwater torches & lasers • SeaKing Side scan Sonar • D&S IFCA vessel & time • GIS software • JNCC guidelines, MESH guidelines and EUNIS classification system for habitat interpretation/ identification • D&S IFCA SOPs and Risk Assessment for deployment of survey equipment 			
Outputs		Quarter			
		Q1	Q2	Q3	Q4
<ul style="list-style-type: none"> • Undertaking underwater filming /side scan sonar / grabbing • Analysis of film footage/ data gathered to determine the presence /absence of features with EMS • Ground truthing of bathymetric data and other habitat data • Quality assurance of the analysis of these data with NE, Cefas , Plymouth University • Mapping the extent of the features and sensitive areas • Production of amended feature maps to inform permitting byelaw 		✓	✓	✓	✓
		✓	✓	✓	✓
		✓	✓	✓	✓
		✓	✓	✓	✓
		✓	✓	✓	✓
		✓	✓	✓	✓

Justification:	Opportunities for Joint Working:
<ul style="list-style-type: none"> • have a responsibility under the Conservation of Habitats and Species Regulations (2010), as a relevant authority to further the conservation objectives of European Marine Sites • IFCA has a legal obligation to ensure that they exercise their functions which are relevant to marine conservation to comply with the requirements of the Habitats Directive. • Defra revised approach requires the IFCA to assess the impact of commercial fishing gears on the features of EMS and good evidence of the extent and location of the features is needed to make these assessments • D&S IFCA will use this activity to fill gaps in the evidence supplied by NE. • D&S IFCA will use this evidence to adapt its management of fishing activities in MPA through its permitting byelaws • Success criteria 4: IFCA works in partnership and engages with stakeholders. • Success Criteria 5: IFCA makes best use of evidence to deliver objectives • Success Criteria 6: IFCA supports and promotes the sustainable management of the marine environment 	<ul style="list-style-type: none"> • Collaborative work with NE to share results of this research and inform HRAs. • On-going partnership working with researchers from Plymouth University to share expertise and quality assure the analysis of the footage and determination of habitat types.

Action 1 Lead in MPA Management

Priority 4 Assessment of impact of fishing activities in MCZ to inform management

1.4.1 Project Title: Assessment of Impact of fishing Activities in MCZ to inform Management					
Description		Resources Needed			
<p>There are currently four designated MCZ in the district and a further three to be recommended for designation in 2015. Research and survey work will need to be undertaken to assess the different fisheries operating in these area, the level of effort and the impact of the gear types on the feature or habitat of conservation importance (FOCI / HOCl) particularly where there is a conservation objective of recover There will be crossover with the research undertaken on the impacts of gear types on EMS features and this will be used to inform MCZ management. Cefas literature review and forthcoming MCZ conservation advice from Natural England will help this area of work as will the package of advice from JNCC and NE with regard to fisheries impacts on MCZ habitat Features (2011)⁵. In particular the impact of bottom towed gear on the subtidal mud in Torbay and on the subtidal mud, sand and coarse sediments in Skerries Bank and Surrounds MCZ. Some detailed survey work including underwater filming and sediment grabbing may be necessary and this be determined by the results of MCZ survey work commissioned by NE and currently being produced by Cefas and EA. Gathering of evidence on the presence and extent of features for the Tranche 2 sites in North Devon may be required to inform the designation process.</p>		<ul style="list-style-type: none"> • Literature review of gear impact studies • Underwater video camera, lights and recording system • Camera sled • Underwater torches & lasers • Day grab • Sediment sieves • D&S IFCA vessel & time • GIS software • JNCC guidelines, MESH guidelines and EUNIS classification system for habitat interpretation/ identification • D&S IFCA SOPs and Risk Assessment for deployment of survey equipment 			
Outputs		Quarter			
		Q1	Q2	Q3	Q4
<ul style="list-style-type: none"> • Analyse previous survey reports on the impacts of different fishing gear of the FOCI and HOCl on MCZ in the district • Identify evidence gaps • Cross reference with EMS outputs, Cefas literature review and other IFCA evidence shared through TAG 		✓	✓	✓	✓
		✓	✓	✓	✓
		✓	✓	✓	✓

⁵ Advice from the Joint Nature Conservation Committee and Natural England with regard to fisheries impacts on Marine Conservation Zone habitat features.

<ul style="list-style-type: none"> • Design specific surveys to investigate direct impacts of gear and how to monitor recovery • Use evidence to inform permitting byelaws and management 	✓	✓	✓	✓
Justification:	Opportunities for Joint Working:			
<ul style="list-style-type: none"> • IFCA should proactively manage inshore sea fisheries resources to ensure that activities support the conservation objectives of Marine Protected Areas (MPAs), such as European Marine Sites, Marine Conservation Zones, Sites of Special Scientific Interest and Ramsar sites • Under S154 of MaCAA (2009) the authority for an IFC district must seek to ensure that the conservation objectives of any MCZ in the district are furthered • Success criteria 2: IFCA use evidence based, appropriate and timely management for the sustainable exploitation of sea fisheries resources. • Success criteria 4: IFCA work in partnership and engages with stakeholders. • Success Criteria 5: IFCA make best use of evidence to deliver objectives • Success Criteria 6: IFCA support and promote the sustainable management of the marine environment 	<ul style="list-style-type: none"> • Joint working with stakeholders in particular the fishing industry, Fishermen association, Sea Torbay and all other stakeholder involved in the MCZ • Liaison with other IFCA who are currently undertaking similar work. • Through the IFCA TAG share methodologies, survey designs and evidence • Work with NE and EA on survey work undertaken and utilise data and results from these surveys. 			

1.4.2 Project Title: Lundy Island Lobster Tagging Programme– Data Analysis

Description	Resources Needed			
<p>Lundy Island has designated in its surrounding waters the first No Take Zone (NTZ), first Marine Conservation Zone in the country and is designated as a SAC. This project will see the analysis of data collected over the last six years through the lobster tagging programme around Lundy Island that commenced in 2008. Lobsters from within the NTZ and MCZ have been tagged and recapture information is gathered to assess the net emigration and immigration of lobster out of the NTZ into the surrounding fishery. In this way any 'spillover' effect can be assessed and the net benefit to the surrounding fishery can be measured. The recapture by fishermen (and during survey work) of tagged lobsters allows the collation of data on distance moved, growth increments, condition and natural and fishing mortality. In addition to the data gathered through the tagging programme, fishermen diaries are also being analysed to look at changes in the landings per unit effort from 2002 (prior to designation of the NTZ) to date. The project will help inform LPUE and effort around the Island and the analysis will be carried out in a joint project with Cefas.</p>	<ul style="list-style-type: none"> • GIS software • Statistical packages – excel & R 			
Outputs	Quarter			
	Q1	Q2	Q3	Q4
<ul style="list-style-type: none"> • Collation of data from recorded recaptures • Mapping of the movement of lobsters • Mapping of changes in fishing effort around the Island • Analysis of tagging, catches and recapture data • Analysis of fishermen's dairies • Production of report 	✓	✓	✓	✓
	✓	✓	✓	✓
	✓	✓	✓	✓
	✓	✓	✓	✓
	✓	✓	✓	✓
	✓	✓	✓	✓
	✓	✓	✓	✓

Justification:	Opportunities for Joint Working:
<ul style="list-style-type: none"> • IFCA's should proactively manage inshore sea fisheries resources to ensure that activities support the conservation objectives of Marine Protected Areas (MPAs), such as European Marine Sites, Marine Conservation Zones, Sites of Special Scientific Interest and Ramsar sites • Under S154 of MaCAA (2009) the authority for an IFC district must seek to ensure that the conservation objectives of any MCZ in the district are furthered • Success criteria 2: IFCA's use evidence based, appropriate and timely management for the sustainable exploitation of sea fisheries resources. • Success criteria 4: IFCA's work in partnership and engages with stakeholders. • Success Criteria 5: IFCA's make best use of evidence to deliver objectives • Success Criteria 6: IFCA's support and promote the sustainable management of the marine environment 	<ul style="list-style-type: none"> • Joint working with stakeholders in particular the fishing industry in North Devon • Liaison with other IFCA who are currently undertaking similar work. • Collaboration with Cefas on the analysis of the data which will also assist in assessment of population dynamics and stock assessment under Action 2 Priority 5..

Acton 1 Lead in MPA Management

Priority 5: Mapping of Sea Grass beds throughout the district

Project 1.5.1 Mapping the extent, density and condition of the intertidal and sub tidal Seagrass in MPAs in the District	
Description	Resources Needed
<p>There are two species of Seagrass known to be found in D&S IFCA district. Dwarf eelgrass <i>Zostera noltii</i> is found intertidally. This type of sea grass is one of designated features of the Exe Estuary SSSI, SPA and Ramsar site. There is a need to reassess the extent of this species as evidence to inform the impact of bait collection and hand gathering on the features of the SPA. This will be discussed with the Exe Management Partnership Group to see what future surveying with the Environment Agency are planned as part of their WFD evidence gathering.</p> <p>Seagrass <i>Zostera marina</i> is found predominantly in the sublittoral zone. There are several locations in the district where <i>Zostera marina</i> has been identified as a designated feature including Plymouth Sound and Estuaries SAC, Salcombe Estuary SSSI and Torbay MCZ.</p> <p>This project will be a joint project with Devon Wildlife Trust (DWT), part funded by Royal Society of Wildlife Trusts, and will gather information, assimilate existing data and involve surveying the beds within the district to map the location and extent of the seagrass beds and their density and condition. Within the Torbay MCZ the extent and density of the sea grass beds will be assessed to investigate changes over time and inform the mobile fishing byelaw restricted areas to demersal gears. Within Salcombe SSSI the seagrass beds will be surveyed to update the evidence and charts on the extent of the beds to inform the areas closed to the Salcombe scallop fishery and future management. Collaboration will take place with NE and South Hams AONB to ensure that duplication of work does not take place and the data collected are shared.</p>	<ul style="list-style-type: none">• D&S IFCA vessel & time• Underwater video camera• Laptops to record data• GIS software• Handheld GPS• Camera• quadrat

Outputs		Quarter			
		Q1	Q2	Q3	Q4
<ul style="list-style-type: none"> • A greater understanding of the distribution, spatial extent and condition of seagrass beds throughout the District, in particular within designated sites. • GIS mapping on the extent and locations and production of charts showing the areas • Information on the condition and density of the beds • Development of management plans to ensure that the designated beds within MPAs are fully protected from the possible impacts of towed fishing gear and other gear types. 		✓	✓	✓	✓
<p>Justification:</p> <ul style="list-style-type: none"> • IFCAs have a legal obligation to ensure that they exercise their conservation functions and comply with the requirements of the Habitats Directive. • IFCAs should proactively manage inshore sea fisheries resources to ensure that activities support the conservation objectives of Marine Protected Areas (MPAs), such as European Marine Sites, Marine Conservation Zones, Sites of Special Scientific Interest and Ramsar sites. • Intertidal sea grass beds in Exe Estuary requires annual mapping to ensure that extraction of cockles from the bed does not impact the eel grass. This information is necessary to inform the permission given by NE to the fisherman working this bed. • Success criteria 2: IFCAs use evidence based, appropriate and timely management for the sustainable exploitation of sea fisheries resources. • Success criteria 4: IFCAs work in partnership and engages with stakeholders. • Success Criteria 5: IFCAs make best use of evidence to deliver objectives • Success Criteria 6: IFCAs support and promote the sustainable management of the marine environment 		<p>Opportunities for Joint Working:</p> <p>It is envisaged D&S IFCA will work with:</p> <ul style="list-style-type: none"> • Joint funded project with DWT and volunteers • Torbay Coast and Countryside Trust – Sea Torbay is the stakeholder group who help inform and disseminate information regarding habitat and species conservation within the Torbay area. Previous seagrass surveys have been undertaken in conjunction with Sea Torbay and DWT • Natural England – who provide conservation through the Appropriate Assessment process and also will share their survey plans to remove duplication of work. • Fishing industry representatives and groups. • DWT • Exe Estuary Management Partnership and the Environment Agency to ensure the mapping of the sea grass beds on the Exe Estuary is up to date 			

Action 2 Sustainable Management of Crustacean and Molluscan Fisheries

Priority 1: Whelk Fishery Sustainability Project – Size at Sexual Maturity

2.1.1 Project Title: Whelk Fishery Sustainability Project – Size at Sexual Maturity	
Description	Resources Needed
<p>Over the last few years there have been fluctuations in the stock levels and fishing effort on edible whelk stocks (<i>Buccinum undatum</i>) in the D&S IFCA district. The fishery appears to be increasing again in particular in the northern part of the district with lengthening of the season when fishing takes place and increase in number of boats and therefore effort on the whelk stock. In the southern part of the district the fisheries is more pressurised due to spatial limitation of the fishery and intense effort. The EU minimum size (MS) for whelk is 45mm shell length. Cefas undertook a study to determine the size of sexual maturity (SOM) for both sexes of whelks in all the main fisheries around the country including the whelk fisheries in the northern and southern parts of the D&S IFCA district. This work will assist managers in determining appropriate national and regional Minimum Landing Size legislation. D&S IFCA helped Cefas with the provision of samples in February 2013 from one boat based in Ilfracombe and one from Exmouth. The results of this survey indicated that for the sample taken from Ilfracombe the SOM was 75.5mm for both females and males and for the Exmouth sample the SOM was 72.4mm for females and 69.2mm for males. In order to look at the seasonality of the maturation of whelks and gather further data to assess the size at sexual maturity to determine the validity of the current minimum size; assess whether there needs to be a change in the minimum size to inform the Potting permitting byelaw and whether temporal management of the fishery is needed an in-depth survey has taken place throughout 2013 and the first half of 2014. This research has involved taking samples on a monthly basis from the north and south coast and the determination of the size of sexual maturity and seasonality of reproductive</p>	<ul style="list-style-type: none"> • Weighing equipment • Dissections kits including tweezers, blades, • Freezer for storage of samples • Magnifying light • Envelopes for whelk operculum samples • Small vice • Sacks

<p>cycle. A relationship between shell height and width will be determined to inform future management measures. Additional sample have been taken from Start Point areas of the South Coast as a requested from fishermen working in this area. Analysis of the data and report writing will be completed by end of July 2014.</p>				
Outputs	Quarter			
	Q1	Q2	Q3	Q4
<ul style="list-style-type: none"> • To determine the size of sexual maturity of whelks in the district to ascertain whether the current MLS is appropriate to allow for a continued sustainable fishery • To gather data to input into the byelaw review process • Collect and analyse sample to determine the sex, size at sexual maturity of whelk. Analyse samples to determine the seasonality of the reproductive cycle in the D&S IFCA district. • Investigate the relationship between shell height and shell width to inform future management measures • Determine if there are differences in these factors in differ areas of the district e.g. north and south differences 	<p>✓</p>	<p>✓ ✓</p>		
Justification:	Opportunities for Joint Working:			
<ul style="list-style-type: none"> • D&S IFCA must manage the exploitation of sea fisheries resources in their district (MaCAA, 2009), to ensure healthy seas, sustainable fisheries and a viable industry. • SC 2: IFCA's use evidence based, appropriate and timely byelaws to manage the sustainable exploitation of sea fisheries resources. • SC3: IFCA's implement a fair, effective and proportionate enforcement regime. • SC 4: IFCA's work in partnership and engages with stakeholders. • SC 5: IFCA's make best use of evidence to deliver objectives. • SC 6: IFCA's support and promote the sustainable management of the marine environment. 	<ul style="list-style-type: none"> • Collaborative working with Cefas. Provision of whelk operculum samples to Cefas to support their whelk age determination project. • Joint working with whelk fishermen to inform them of the outputs from the project, gain support and help input into the future management of the fishery. 			

Action 2 Sustainable Management of Shellfisheries

Priority 2 Assessment of mussel resources both intertidal and sub littoral

2.2.1 Project Title: Assessment of Sub-littoral Mussel Resources	
Description	Resources Needed
<p>Sublittoral mussel beds within the Authority's district can provide a valuable resource. In particular subtidal seed mussels are an important resource to the shellfisheries in the district and help sustain these fisheries. It is important to map these beds once they are identified to determine their extent and density. Seed mussel beds are quickly predated by starfish and are lost. D&S IFCA will work with fishermen to identify the sites. Once they are identified the extent of the bed will be mapped and a survey will be undertaken to assess the health, coverage and density of the mussels across the beds. If this resource is located within a MPA then the appropriate assessment will need to be undertaken if the resource is to be removed and relayed or commercially fished to determine the impacts of the fishing method on the designated feature. Focus of survey work will be in the Torbay part of the Lyme Bay to Torbay cSAC as one feature for which the site is designated is biogenic reef, mussel beds, and survey work in 2013 involving D&S IFCA, NE and Cefas failed to identify any location of this feature within the site. Verification of the absence (or presence) of this feature is needed to inform any revision of the designation and conservation objectives of the EMS.</p>	<ul style="list-style-type: none">• Underwater video camera, lights and recording system• Camera sled• Underwater torches & lasers• SeaKing Side scan Sonar• D&S IFCA vessel & time• GIS software• JNCC guidelines, MESH guidelines and EUNIS classification system for habitat interpretation/ identification• D&S IFCA SOPs and Risk Assessment for deployment of survey equipment• Other underwater survey equipment e.g. grab, sieves

Outputs		Quarter			
		Q1	Q2	Q3	Q4
<ul style="list-style-type: none"> • Sub-tidal mussel beds in the district will be identified • The extent of the beds will be mapped using GIS • Beds will be surveyed using underwater camera and grabs sample will be taken across the bed to assess the coverage and density, • Analysis of data collected will be undertaken and report produced • D&S IFCA will work with fishermen and undertake the necessary assessments where these beds fall within MPAs 		✓	✓	✓	✓
		✓	✓	✓	✓
		✓	✓	✓	✓
		✓	✓	✓	✓
Justification	Opportunities for Joint Working:				
<ul style="list-style-type: none"> • The Authority must manage the exploitation of sea fisheries resources in their district (MaCAA, 2009). • The Authority must consider the socio-economics of the district and the mussel fisheries therein. • An IFC authority may take such steps as it considers necessary or expedient for or in connection with the development of any fishery for any sea fisheries resources (which includes power to stock or restock a public fishery for any sea fisheries resources) (MaCAA, 2009). • IFCAs have a legal obligation to ensure that they exercise their conservation functions comply with the requirements of the Habitats Directive. • IFCAs should proactively manage inshore sea fisheries resources to ensure that activities support the conservation objectives of Marine Protected Areas (MPAs), such as European Marine Sites, Marine Conservation Zones, Sites of Special Scientific Interest and Ramsar sites. • SC5: All management must be evidence based appropriate and timely and IFCAs must make best use of evidence to deliver their objectives • SC6: IFCAs support and promote the sustainable management of the marine environment 	<ul style="list-style-type: none"> • Natural England – who provide conservation advice on MPAs and through the Appropriate Assessment process. • NE, Cefas and EA to access survey data and reports from previous surveys • With fisherman to help identify sub-littoral resources and determine the sustainable use of these resources 				

Priority 2 Sustainable Management of Shellfisheries

Activity 2 Assessment of mussel resources both intertidal and sub-littoral

2.2.2 Project Title: Assessment of Intertidal Mussel Beds						
Description		Resources Needed				
<p>Intertidal mussel beds that are not managed through regulating orders or held under private lease are a public resource that needs to be managed sustainably. There are several beds in the district that are public beds. It is important that the mussel stocks on these beds are assessed to determine the level of harvesting that is sustainable and whether a shellfishery could be developed. A very good example of such a resource is the mussel beds in the Taw Torridge Estuary in North Devon. 2011 saw the first full survey of the mussel bed in the estuary using a method developed by the Dutch⁶ and has been used successfully by EIFCA on the mussel beds of The Wash for many years. Surveys have been undertaken annually since then. The Taw Torridge Estuary is a SSSI and assessment of the mussel resources is necessary to ensure that there is a sufficient mussel resource as food for the overwintering birds for which the site is designated. Other intertidal mussel beds may be surveyed e.g. Teign Salty Bed/Polly steps area where high levels of hand gathering for personal consumption take place. The intertidal mussel beds on the Exe Estuary SPA are surveyed annually to inform the HRA for the removal of mussels by the elevator harvester as part of Exmouth Mussels shellfish harvesting activity.</p>		<ul style="list-style-type: none"> • Dutch method surveying tool • 0.1m² quadrat • Callipers • Digital scales • Sieves • GPS • GIS 				
Outputs			Quarter			
			Q1	Q2	Q3	Q4
<ul style="list-style-type: none"> • An annual survey of the Taw Torridge Mussel beds to inform management decisions for the shellfishery. • Annual surveys of other intertidal beds 				✓	✓	
				✓	✓	

⁶ Method developed by MarinX, Dutch Marine Consultants, ESFJC Research Report 2006.

<ul style="list-style-type: none"> • Production of charts showing location, extent and coverage across the beds • Analysis of data & production of reports • Production of report/management plan for the Taw Torridge to ensure a sustainable environment and fishery and inform the byelaw review process. • Assessment of mussel sources on the Exe Estuary SPA to inform HRA • Periodic assessment (stock, TLS, AA) of seed resources where settlement occurs and a request for relaying from fishermen is received to include the production of charts and reports 		✓ ✓ ✓ ✓ ✓	✓ ✓ ✓ ✓ ✓	✓ ✓ ✓ ✓ ✓
Justification:	Opportunities for Joint Working:			
<ul style="list-style-type: none"> • The Authority must manage the exploitation of sea fisheries resources in their district (MaCAA, 2009). • The Authority must consider the socio-economics of the district and the mussel fisheries therein. • An IFC authority may take such steps as it considers necessary or expedient for or in connection with the development of any fishery for any sea fisheries resources (which includes power to stock or restock a public fishery for any sea fisheries resources) (MaCAA, 2009). • SC5: All management must be evidence based appropriate and timely and IFCAs must make best use of evidence to deliver their objectives • SC6: IFCAs support and promote the sustainable management of the marine environment 	<ul style="list-style-type: none"> • Working with NE to determine the assess mussel stocks and impacts of fishing activity on the features of the EMS. • Collaborative working with Estuary Officers and North Devon Biosphere Officer • Work with University students and supervisors to provide work experience / volunteer opportunities 			

Action 2 Sustainable Management of Shellfisheries

Priority 3: Stock Assessments of cockle, clam and scallop resources in the district

2.3.1 Project Title: Monitoring and Assessment of Cockle & Clam Resources in the District.	
Description	Resources Needed
<p>Across the D&S IFCA district there are commercial and non-fished cockle and clam beds. These have been previously mapped but it is important to undertake on-going assessments. The main cockle bed in the district is located on the Exe Estuary. Whilst it is currently declassified due to lack of commercial fisheries taking place and annual cockle mortalities that have reduced the harvestable stock, it is a resource that has in the past been exploited and may well be in the future. It is also a food resource for overwintering birds which are features of the SPA. A previous HRA on the impact of an elevator harvester on the Cockle Sands at Exmouth has shown that there is sufficient food resource on this bed to allow small scale harvesting of cockles. From the assessment it was determined that this fishing method did not negatively impact the infauna, sediment type nor cockle abundance and therefore NE permitted the fishery to go ahead under SSSI legislation. D&S IFCA is monitoring the cockle stocks across the bed on an annual basis and mapping the distribution, coverage and abundance of cockles present. Hand gathering of cockles and clams also takes place on the estuaries of Devon and it is therefore important to assess the stocks and the level of effort to inform the development of a hand gathering byelaw. Other cockle beds that may be assessed throughout 2014 are those on the Teign Estuary, Avon Estuary and Taw Torridge Estuary as cockles are gathered at these sites by members of the public under the public right to fish. These beds are not currently classified as shellfish harvesting areas. Other sub-littoral clam stocks are located within the district including razor fish beds and surf clam, <i>Spisula solida</i>, beds and</p>	<ul style="list-style-type: none"> • 0.1m² Quadrat • Callipers • Digital scales • Sieves • Vessel & time (D&S IFCA vessel or chartered fishing vessel) • Underwater video camera • Underwater survey equipment – grabs or dredges • GPS • GIS

<p>these will be identified and surveyed where an assessment is needed to identified the stock available and the potentially impacts of the gear type if occurring within the an MPA.</p>				
<p style="text-align: center;">Outputs</p>	Quarter			
	Q1	Q2	Q3	Q4
<ul style="list-style-type: none"> • Identification of beds • Mapping of beds • Stock assessments • Data analysis • Produce report • Inform management of these resources 	✓	✓	✓	✓
	✓	✓	✓	✓
	✓	✓	✓	✓
		✓	✓	✓
		✓	✓	✓
		✓	✓	✓
		✓	✓	✓
<p>Justification:</p>	<p>Opportunities for Joint Working:</p>			
<ul style="list-style-type: none"> • An IFC authority may take such steps as it considers necessary or expedient for or in connection with the development of any fishery for any sea fisheries resources (which includes power to stock or restock a public fishery for any sea fisheries resources) (MaCAA, 2009). • The Exe cockle beds have under gone an appropriate assessment to assess the impacts of harvesting cockles using an elevator harvester on the infauna, cockle stocks and sediment composition requested by NE to ensure that this method of fishing does not have a negative impact on the food source for birds in this Natura 2000 site. It is important to monitor stock levels to ensure that any future fishery would allow the conservation objectives of the site to be met. • Success Criteria (SC) 4: IFCAs work in partnership and are engaged with their stakeholders • SC5: IFCAs make best use of evidence to deliver their objectives. • SC6: IFCAs support and promote sustainable management of the marine environment 	<ul style="list-style-type: none"> • Natural England – who provide conservation through the Appropriate Assessment process. • Plymouth University – who provide opportunities for MSc and BSc to undertake project as part of course dissertation requirements • Fishing industry 			

Action 2 Sustainable Management of Shellfisheries

Priority 3: Stock Assessments of scallops in Salcombe Estuary

2.3.2 Project Title: Stock Assessment of the King Scallop in Salcombe Estuary	
Description	Resources Needed
<p>Since 1998 D&S IFCA has permitted a highly restricted king scallop (<i>Pecten maximus</i>) dredge fishery in Salcombe Estuary under D&S IFCA Byelaw 23 . The permit requests that annual returns are provided to D&S IFCA which include the number of scallops retained, the number of undersized (less than 100mm MS) and number of days fished. However in order to gather more detailed information to inform the state of the scallop stock in the estuary pre- and post-fishery stock assessment are carried out working with the fishermen and using their fishing gear to collect data. This will determine if further development of the resource or stock management needs to be undertaken.</p> <p>Requests have been received from the Salcombe scallop fishermen to investigate the possibility of opening other areas to the estuary outside the current fishery access areas to have a rotation of the fishery to allow recovery. D&S IFCA permitting byelaw allows for adaptive management and this will be looked into. This will involve filming the estuary bed and making an assessment of stocks from this footage and provide evidence to undertake any necessary assessments.</p>	<ul style="list-style-type: none"> • Fishing boat charter to include dredge equipment • Callipers • GPS • GIS software • Underwater video camera, lights and recording system • Camera sled if applicable • Underwater torches & lasers • D&S IFCA vessel & time • GIS software • JNCC guidelines, MESH guidelines and EUNIS classification system for habitat interpretation/ identification • D&S IFCA SOPs and Risk Assessment for deployment of survey equipment

Outputs		Quarter			
		Q1	Q2	Q3	Q4
<ul style="list-style-type: none"> • Surveying closed areas within the Estuary to inform management • Pre and post- fishery stock assessments • Data analysis • produce report and disseminate result of stakeholders 		✓	✓	✓	✓
<ul style="list-style-type: none"> • An IFC authority may take such steps as it considers necessary or expedient for or in connection with the development of any fishery for any sea fisheries resources (includes power to stock or restock a public fishery for any sea fisheries resources) (MaCAA, 2009) • IFCAs should proactively manage inshore sea fisheries resources to ensure that activities support the conservation objectives of Marine Protected Areas (MPAs), such as European Marine Sites, Marine Conservation Zones, Sites of Special Scientific Interest and Ramsar sites • Success Criteria (SC) 4: IFCAs work in partnership and are engaged with their stakeholders • SC5: IFCAs make best use of evidence to deliver their objectives. • SC6: IFCAs support and promote sustainable management of the marine environment 		Opportunities for Joint Working: <ul style="list-style-type: none"> • Fishing industry • Possible joint working with NE and South Ham AONB 			

Action 2 Sustainable Management of Shellfisheries

Priority 4: Survey of Potting Activity throughout the D&S IFCA District.

2.4.1 Project Title: Survey of Potting Activity to provide effort and extent data to inform Potting Permit Byelaw					
Description		Resources Needed			
<p>Crustacea fisheries within the D&S IFCA district are extremely important locally, nationally and internationally. Fisheries on the north coast and south coast contribute to some of the largest landings of lobsters and crabs in the country. This project will assess the full extent of the potting fishery throughout the district and within MPA, the level of effort of potting for all species and engage with the members of the industry and provide a mechanism for fishers to input into the future management of the fishery. The survey involves mail shots of survey forms and charts to all known potting gear fishermen working within the Authority's district. These data will also be used to inform the amber risk HRA process (see Action 1 Priority 2) for activities occurring within EMS and also the impact and management of these activities with MCZ (Action 1 Priority 4).</p>		<ul style="list-style-type: none"> • Survey form • Charts and grids • GIS software • Postage and envelope • GIS 			
Outputs		Quarter			
		Q1	Q2	Q3	Q4
<ul style="list-style-type: none"> • Distributing survey form and chart to members of the industry • Inputting data and information from returned survey forms • GIS mapping of the areas potted within the district • Collate industry suggestions for future management of the fishery • Inform Permitting byelaw • Disseminate information/ results to industry. • Inform HRA process 		✓	✓	✓	✓
		✓	✓	✓	✓
		✓	✓	✓	✓
		✓	✓	✓	✓
		✓	✓	✓	✓
		✓	✓	✓	✓
		✓	✓	✓	✓

Justification:	Opportunities for Joint Working:
<ul style="list-style-type: none"> • The Authority must manage the exploitation of sea fisheries resources in their district (MaCAA, 2009). • Success Criteria (SC 2): IFCA's use evidence based, appropriate and timely byelaws to manage the sustainable exploitation of sea fisheries resources. • SC3: IFCA's implement a fair, effective and proportionate enforcement regime. • SC4: IFCA's work in partnership and are engaged with their stakeholders • SC5: IFCA's make best use of evidence to deliver their objectives. • SC6: IFCA's support and promote sustainable management of the marine environment 	<ul style="list-style-type: none"> • Fishing industry • NE through the HRA process • Share results through the IFCA TAG

Action 2 Sustainable Management of Shellfisheries

Priority 5: Analysis of Crustacea Landings to Inform Management.

2.5.1 Project Title: Analysis of Crustacea landings including berried lobster scrubbing testing.	
Description	Resources Needed
<p>Crustacea fisheries within the D&S IFCA district are extremely important locally, nationally and internationally. Some landings data have been collected over the past few years and these will be analysed to inform the Potting permitting byelaw. The data collected will investigate the relationship between weight and carapace length to help determine a 'slot size' or maximum size for landing. More data will be collected to feed into this work.</p> <p>Data on the landings of crawfish <i>Palinurus elephas</i> will also be recorded. D&SIFCA has been working with Lundy Island Marine Protected Area Advisory Group on the development of survey forms for divers operating with the Lundy Island MPA to gather data on crawfish sightings. Data collected will include location, abundance, size and sex. <i>Palinurus elephas</i> is the feature for which the MCZ was designated and it has a recover objective and therefore this will provide a baseline to measure recovery against.</p> <p>IFC Officers from both the Environment team and Enforcement team have been tasked with rolling out the lobster scrubbing test district wide. Lobsters landed at ports within the district will be tested to determine whether they have been scrubbed of their eggs. D&SIFCA Byelaw 27 and the new Potting Permit Byelaw prohibit the removal from a fishery of any berried lobster. This test was developed in the USA and has been trialled, tested in court and used successfully in EIFCA to identify those lobsters that have had their eggs removed by scrubbing. The test involves staining the egg bearing hairs or ovigerous setae on the pleopods where</p>	<ul style="list-style-type: none"> • Callipers • scales • GPS • GIS • Lobster scrubbing test kit including vials, tweezers, scissors, etc. • Supplies of chemicals to undertake the test - haematoxylin, IMS, formalin and glycerol.

<p>the eggs are normally attached with a glue like substance with an biological stain called Haemotoxilin. This staining process allows the easy identification of the setae that are damaged by scrubbing as opposed to the condition of those from a lobster that has not been scrubbed. The results will determine enforcement action.</p>						
Outputs			Quarter			
			Q1	Q2	Q3	Q4
<ul style="list-style-type: none"> • sampling of port landings • undertaking testing of lobsters • Data analysis • Sharing survey results from divers in Lundy Island MPA • Prepare report 			✓	✓	✓	✓
Justification:			Opportunities for Joint Working:			
<ul style="list-style-type: none"> • The Authority must manage the exploitation of sea fisheries resources in their district (MaCAA, 2009). • Success Criteria (SC 2): IFCA's use evidence based, appropriate and timely byelaws to manage the sustainable exploitation of sea fisheries resources. • SC3: IFCA's implement a fair, effective and proportionate enforcement regime. • SC4: IFCA's work in partnership and are engaged with their stakeholders • SC5: IFCA's make best use of evidence to deliver their objectives. • SC6: IFCA's support and promote sustainable management of the marine environment 			<ul style="list-style-type: none"> • Fishing industry • Lundy Island MPA Advisory Group • Divers 			

Action 3 Development of Recreational Sea Angling

Priority 1: Assessment of Distribution and Extent of bait collection in the district

3.1.1 Project Title: Assessment of distribution and extent of bait collection in the district	
Description	Resources Needed
<p>Under S153 of MaCAA (2009) bait collection is subject to fisheries legislation as a sea fisheries resource. Bait collection has the potential to have a negative impact on the marine environment, which includes impacts on target and non-target species, the physical characteristics of the sediment and over-wintering bird populations, especially in EMS. In light of this, management measures may be necessary to monitor and effectively manage bait collection at sustainable levels taking account of both environmental impacts and socio-economic factors. Bait collection includes bait digging and crab tiling both of which occur in the estuaries in the D&S IFCA district and are of economically important to local communities and the sea angling sector. For example in the Exe Estuary the number of crab tiles in 2012 was 20,998. It is important to assess the distribution and extent of bait collection not only to evaluate the impact of this activity within MPA but the socio-economic benefit of this activity to the district and its communities. The 2014-2015 will focus on bait digging as crab tiling surveys were completed in 2012-2013 in MPA in the district. However there may need to be some surveying of the crab tiling activity in the Taw Torridge Estuary as there are concerns regarding the high rate of exploitation of <i>Carcinus maenas</i> in this estuary system. Bait digging surveys are being carried out on the Plymouth Sound and Estuaries EMS, Exe SPA, Severn Estuary EMS where this activity is known to occur and will provide spatial and temporal data.. Torbay MCZ will be considered for bait collection survey work this year to feed into the development of management measures in the MCZ. HRAs will need to be undertaken to make an assessment of the impacts of these fishing activities within EMS</p>	<ul style="list-style-type: none"> • GPS • GIS software • Camera • Survey forms and charts

<p>– amber risk (See Action 1 Priority 2). These surveys will gather data on the location, extent of the activity, level of effort, species and quantities removed.</p>				
<p style="text-align: center;">Outputs</p>	<p style="text-align: center;">Quarter</p>			
	<p style="text-align: center;">Q1</p>	<p style="text-align: center;">Q2</p>	<p style="text-align: center;">Q3</p>	<p style="text-align: center;">Q4</p>
<ul style="list-style-type: none"> • Literature review of previous research, management schemes, legal aspects and biology of species • Detailed GIS maps showing the locations and extent of bait collection • Effort survey of bait digging • Crab tile survey in the Taw Torridge estuary • Evaluation of the impacts of bait collection in EMS • HRA on bait collection in MPA in the district • Database of bait shops and outlets • Collection of data on the socio-economics benefits of bait collection • Report production • Development of management plans / voluntary codes of conduct 	<p>✓</p>	<p>✓</p> <p>✓</p> <p>✓</p> <p>✓</p> <p>✓</p> <p>✓</p> <p>✓</p> <p>✓</p> <p>✓</p>	<p>✓</p> <p>✓</p> <p>✓</p> <p>✓</p> <p>✓</p> <p>✓</p> <p>✓</p> <p>✓</p> <p>✓</p>	<p>✓</p> <p>✓</p> <p>✓</p> <p>✓</p> <p>✓</p> <p>✓</p> <p>✓</p> <p>✓</p> <p>✓</p>
<p>Justification:</p>	<p>Opportunities for Joint Working:</p>			
<ul style="list-style-type: none"> • In EMS in the district e.g. Exe Estuary SPA, Severn SAC, Plymouth Sound SAC bait collection has been flagged as a potential high risk – activity and assessment of the extent and impacts needs to be understood, not only possible direct impacts to the sediment and infauna but to disturbance of birds in these sites. • Previous surveys of crab tiling and disturbance studies can feed into this project and further research into these activities can supplement this work • This work will aid the development and input into additional management measures to avoid deterioration and disturbance in line with obligations under Article 6(2) of the Habitats Directive • IFCA's have a legal obligation to ensure that they exercise their 	<ul style="list-style-type: none"> • Advice from NE on conservation objectives of sites and likely risks of bait collection • Joint work with NE to undertake survey work and develop management measures where necessary • Work with university students and volunteers to help undertake surveys • Collaborative working with AONB units, estuary partnerships and North Devon Biosphere officer. • Anglers and bait collectors 			

<p>functions which are relevant to marine conservation to comply with the requirements of the Habitats Directive</p> <ul style="list-style-type: none">• Monitoring of crab tiling activity to ensure that this activity has not increased in the estuaries previously surveyed and to register a baseline of activity at other unsurveyed sites.• Development of management plans and codes of conducts.• SC 5: All management must be evidence based appropriate and timely and IFCA's must make best use of evidence to deliver their objectives• SC 6: IFCA's must promote sustainable management of the marine environment.	

Action 3 Development of Recreational Sea Angling

Priority 2 Mapping of Fishing Effort

3.2.1 Project Title: Mapping of Fishing Effort and Recreational Sea angling in Severn Estuary					
Description		Resources Needed			
<p>D&S IFCA took part in the National Sea Angling 2012 project the results of which have been widely disseminated. The Authority extended the survey of RSA through 2013 which gave a valuable second year of survey data for the Severn Estuary. Data from these surveys are currently being analysed.</p> <p>Whilst a greater understanding of RSA has been achieved there are other fishing activities where less information is known. This project will help to address this gap in evidence by mapping the different fishing activities, location of the activities and the levels of effort. This study includes desk-based research element, field work and surveys and liaising with recreational and commercial fishers and other stakeholders.</p>		<ul style="list-style-type: none"> • GIS software • GPS • Survey forms and grids • Statistical packages e.g. 'R' 			
Outputs		Quarter			
		Q1	Q2	Q3	Q4
<ul style="list-style-type: none"> • Production of amended charts of angling sites in both the Devon and Severn areas of the district • Analysis of data from the national Sea Angling 2013 project and the extended D&SIFCA project including intensity, catches, seasonality, and socio-economic aspects • Gather information on the type, location and effort of other fishing activities in the Severn Estuary • GIS mapping of fishing activities and effort in the Severn Estuary 		✓	✓	✓	✓
		✓	✓	✓	✓
		✓	✓	✓	✓
		✓	✓	✓	✓
Justification:		Opportunities for Joint Working:			

<ul style="list-style-type: none"> • D&S IFCA Annual Plan 2014-2015⁷ outlines the main areas of work that D&S IFCA will led and develop best management practice to provide benefits to those who live and work within the IFCA district. Recreational Sea Angling is one of these work streams to help 'make decisions over possible future development for the angling sector in this important area nationally to RSA. • S153 of MaCAA (2009) states that IFCA's must seek to balance the different needs of persons engaged in the exploitation of sea fisheries resources in the district. • SC 5: All management must be evidence based appropriate and timely and IFCA's must make best use of evidence to deliver their objectives • SC 6: IFCA's must promote sustainable management of the marine environment. 	<p>Joint working with</p> <ul style="list-style-type: none"> • EA • NE • Sea angling clubs • Angling trust members • IFC MMO appointees on D&S IFCA • Anglers • Commercial fishers • Port representatives

⁷ pp6-9 Outline of Challenges for 2014-2015 D&S IFCA Annual Plan 2014-2015

Action 3 Development of Recreational Sea Angling

Priority 3 Survey of Netting Activity in the District

2.4.1 Project Title: 3.3.1 Project Title: Survey of Netting activity in the D&S IFCA district to inform Angling Strategy , HRA and Netting Permit Byelaw

Description	Resources Needed
<p>Netting for sea fish and crustacea takes place across the district both in the inshore areas and in the estuaries. This research will help to understand the full extent of the netting throughout the district and within MPA, the level of effort of netting for all species and engage with the members of the industry and have their input into the future management of the fishery. The survey involves mail shots of survey forms and charts to all known netting fishermen working within the Authority’s district. Survey forms will also be given out at fishermen association meetings and other stakeholder meetings and handed out in the field and to known netters. These data will also be used to inform the amber risk HRA process (see Action 1 Priority 2) for activities occurring within EMS and also the impact and management of these activities with MCZ (Action 1 Priority 4).The results of these surveys will be used to best inform the D&S IFCA Angling strategy and potential areas for development of RSA. The data collected on effort, extent, seasonality of catches and additional information gathered from the fishers relating to any suggestions they have on the management of netting by the IFCA will also feed into the development of a Netting Permit Byelaw.</p>	<ul style="list-style-type: none"> • Survey form • Charts and grids • GIS software • Postage and envelope • GIS • Statistical Packages

Outputs		Quarter			
		Q1	Q2	Q3	Q4
<ul style="list-style-type: none"> • Distributing survey form and chart to members of the industry • Inputting data and information from returned survey forms • GIS mapping of the areas potted within the district • Inform Angling Strategy development of angling areas • Collate industry suggestions for future management of the fishery • Inform Permitting byelaw • Disseminate information/ results to industry. • Inform HRA process 		✓	✓		
		✓	✓	✓	✓
		✓	✓	✓	✓
		✓	✓	✓	✓
		✓	✓	✓	✓
			✓	✓	✓
			✓	✓	✓
			✓	✓	✓
Justification:	Opportunities for Joint Working:				
<ul style="list-style-type: none"> • The Authority must manage the exploitation of sea fisheries resources in their district (MaCAA, 2009). • Success Criteria (SC 2): IFCA's use evidence based, appropriate and timely byelaws to manage the sustainable exploitation of sea fisheries resources. • SC3: IFCA's implement a fair, effective and proportionate enforcement regime. • SC4: IFCA's work in partnership and are engaged with their stakeholders • SC5: IFCA's make best use of evidence to deliver their objectives. • SC6: IFCA's support and promote sustainable management of the marine environment 	<ul style="list-style-type: none"> • Fishing industry • NE through the HRA process • Share results through the IFCA TAG 				

Action 3 Development of Recreational Sea Angling

Priority 4 Survey of Angling Effort from Charter and Private Boats in the Severn Estuary

3.4.1 Project Title: Survey of Angling Effort from Charter and Private Boats in the Severn Estuary						
Description		Resources Needed				
<p>D&S IFCA took part in the National Sea Angling 2012 project the results of which have been widely disseminated. The Authority extended the survey of RSA through 2013 which gave a valuable second year of survey data for the Severn Estuary. Data from these surveys are currently being analysed. It has become apparent that the charter boats and private boats angling in the Severn Estuary were not well represented in the survey. This project will help create a database of the vessels working in the Severn and record the activity, its extent and location and develop a catch recording programme. The data can be used to inform D&S IFCA angling strategy.</p>		<ul style="list-style-type: none"> • GIS software • GPS • Survey forms and grids • Statistical packages e.g. 'R' 				
Outputs			Quarter			
			Q1	Q2	Q3	Q4
<ul style="list-style-type: none"> • Update databases of vessels operating in the Severn Estuary • Production of charts of charter boat and private boat angling sites in the Severn area of the district • Analysis of data from catch recording forms • GIS mapping of fishing effort and extent in the Severn Estuary 			✓	✓	✓	✓
			✓	✓	✓	✓
			✓	✓	✓	✓
			✓	✓	✓	✓
Justification:			Opportunities for Joint Working:			
<ul style="list-style-type: none"> • D&S IFCA Annual Plan 2014-2015⁸ outlines the main areas of work that D&S IFCA will led and develop best management practice to provide benefits to those who live and work within the IFCA district. Recreational Sea Angling is one of these work streams to help make decisions over possible future development for the angling sector in this important area nationally to RSA. 			<p>Joint working with</p> <ul style="list-style-type: none"> • NE • Sea angling clubs • Angling trust members • IFC MMO appointees on D&S IFCA • Anglers 			

⁸ pp6-9 Outline of Challenges for 2014-2015 D&S IFCA Annual Plan 2014-2015

<ul style="list-style-type: none">• S153 of MaCAA (2009) states that IFCA's must seek to balance the different needs of persons engaged in the exploitation of sea fisheries resources in the district.• SC 5: All management must be evidence based appropriate and timely and IFCA's must make best use of evidence to deliver their objectives• SC 6: IFCA's must promote sustainable management of the marine environment.	<ul style="list-style-type: none">• Commercial fishers• Port representatives

7. Other D&S IFCA Projects which link to all Research Priorities

Project A: Scientific Literature Review to inform impact assessment for byelaw reviews to fulfil activities under Priorities 1,2 & 3					
Description		Resources Needed			
<p>Scientific literary review will be carried out as part of the gathering data to inform the revised approach to commercial fishing activity in EMS and the Byelaw Review process to inform impact assessments that must accompany any new byelaw. A fisheries impacts evidence matrix ⁹has been put together as part of a project with NE and Cefas to inform the HRA needed to assess the impact of different gear type on EMS features. This matrix includes primary and secondary evidence and will be added to as new literature and evidence comes to light. Science Direct, scientific journals and other sources of information including academic institutions will be utilised to gather evidence to support the rationale for the making of byelaws for out three priority work streams as listed in table 3. Cefas has also produced a gap analysis to highlight where there is a lack of information on gear feature interaction. IFCA through the TAG are sharing any new evidence that comes to light and any research being undertaken to fill the gaps so that duplication of work is reduced and the research benefits all IFCAs around the country.</p>		<ul style="list-style-type: none"> • Cefas/NE Fisheries Impact Evidence Matrix • Science Direct • Scientific journals • Links with academic institutions and universities • Possible survey work including use of vessels and equipment 			
Outputs		Quarter			
		Q1	Q2	Q3	Q4
<ul style="list-style-type: none"> • Evidence to inform byelaw reviews • Successful byelaw implementation • Gaps in data and evidence filled 		✓	✓	✓	✓
		✓	✓	✓	✓
		✓	✓	✓	✓

⁹ Cefas Marine Biodiversity SLA Report: The effects of fishing activities on EMS sub features

Justification:	Opportunities for Joint Working:
<ul style="list-style-type: none"> • IFCA must, under S153 of MaCAA 2009, seek to ensure that the exploitation of sea fisheries resources is carried out in a sustainable way and seek to balance the social and economic benefits of exploiting the 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, • SC 2. Evidence based, appropriate and timely byelaws are used to manage the sustainable exploitation of sea fisheries resources within the district • SC 4. IFCA work in partnership and are engaged with their stakeholders • SC 5. IFCA make the best use of evidence to deliver their objectives. 	<ul style="list-style-type: none"> • Other IFCA and the TAG through information exchange • NE • Cefas • Academic Institutes/ Universities

Project B: Assessment of Fisheries and Fisheries Data within the District

Description	Resources Needed			
<p>D&S IFCA has a responsibility to sustainably manage the marine environment and the exploitation of sea fisheries resources within the district. It is important that the Authority has the best evidence available to inform management decisions. Whilst a great range and quantity of data already exists, this has been collated and complemented with reliable socio-economic, sightings and fishing effort data gathered by D&S IFCA to build an understanding of individual fisheries within the IFCA district. This baseline data will be continually updated as and when more fisheries information comes to light– in particular effort data from some of the research projects described in this research plan. The future health and sustainability of stocks and effort levels of the fisheries and their impacts can be assessed against this data. A district wide assessment of fisheries will serve as a gap analysis for managers so that research, management measures and enforcement plans can be tailored accordingly.</p>	<ul style="list-style-type: none"> • Excel spreadsheet • Survey forms and charts • Statistical Packages • GIS software 			
Outputs	Quarter			
	Q1	Q2	Q3	Q4
<ul style="list-style-type: none"> • A better understanding by D&S IFCA of the fisheries within the District. • Collation of effort data to produce thematic effort maps using GIS. • Up to date evidence to inform future management decisions. • Evidence based, appropriate and timely byelaws are used to manage the sustainable exploitation of sea fisheries resources 	<ul style="list-style-type: none"> ✓ ✓ ✓ ✓ 	<ul style="list-style-type: none"> ✓ ✓ ✓ ✓ 	<ul style="list-style-type: none"> ✓ ✓ ✓ ✓ 	<ul style="list-style-type: none"> ✓ ✓ ✓ ✓

Justification:	Opportunities for Joint Working:
<ul style="list-style-type: none"> • SC 2 All management must be evidence based, appropriate and timely • SC 5 IFCA's must make the best use of evidence to deliver their objectives. • The Authority must manage the exploitation of sea fisheries resources in their district (MCAA, 2009) 	

Project C : Creation of a D&S IFCA Metadata for Environmental and Research Data

Description	Resources Needed						
<p>To aid compliance with the INSPIRE Directive 2007/2/EC which established an Infrastructure for Spatial Information in the European Community (INSPIRE) and came into force on the 15th May 2007, D&S IFCA is seeking to create metadata for all data previously and currently stored by the IFCA to aid its management and make it easily accessible. Marine Environment Data and Information Network (MEDIN) training has been undertaken by IFCA Officers. Members of the Environment team have been tasked with ensuring that IFCA metadata is produced in a MEDIN compliant format and are inputting survey metadata into the Data Archive for Seabed Species (DASSH). This will facilitate data sharing between IFCAs and other partner organisations such as DEFRA and CEFAS (with consideration of the Data Protection Act). The overall aim is to ensure that by collation of existing and new data the best available evidence will always be used in management decision making.</p>	<ul style="list-style-type: none"> • Raw data sets • Access to the internet 						
Outputs				Quarter			
<ul style="list-style-type: none"> • Creation of a metadata of past and present data sets • Feed in data to wider MEDIN database 				Q1	Q2	Q3	Q4
				✓	✓	✓	✓
Justification:				Opportunities for Joint Working:			
<ul style="list-style-type: none"> • Marine and Coastal Access Act (2009) – “Every IFC authority must provide the Secretary of State with such information as the Secretary of State may reasonably require about — (c) the effect of the exploitation of sea fisheries resources in that district on the marine environment”. • INSPIRE Regulation 2007 				<ul style="list-style-type: none"> • Working with MEDIN to ensure compliance • Collaborative working with IFCA through the IFCA Technical Advisory Group (TAG) to standardise data sets and allow exchange of data • Collation of data from organisations such as NE, the 			

<ul style="list-style-type: none">• SC 4 IFCAAs work in partnership• SC 5 IFCAAs must make best use of evidence to deliver their objectives	Wildlife Trust, CEFAS and the EA

Abbreviations:

AA	Appropriate Assessments
AONB	Area of Outstanding Natural Beauty
Cefas	Centre for Environment Fisheries and Aquaculture Science
cSAC	Candidate Special Area of Conservation
DASSH	Data Archive for Seabed Species
D&S IFCA	Devon and Severn Inshore Fisheries and Conservation Authority
DWT	Devon Wildlife Trust
EA	Environment Agency
EIFCA	Eastern Inshore Fisheries and Conservation Authority
EMS	European Marine Site (s)
EUNIS	European Nature Information System
FOCI	Feature of Conservation Importance
GIS	Geographical Information System
GPS	Geographical Positioning System
HLO	High Level Objective
HOCl	Habitat of Conservation Importance
HRA	Habitats Regulations Assessment
IFCO	Inshore Fisheries and Conservation Officer
iVMS	Inshore Vessel Monitoring System
JNCC	Joint Nature Conservation Committee
MaCAA	Marine and Coastal Access Act 2009
MCS	Marine Conservation Society
MCZ	Marine Conservation Zone
MESH	Mapping European Seabed Habitats
MMO	Marine Management Organisation
MPA	Marine Protected area
MS	Minimum Size
NE	Natural England
NGO	Non-Government Organisation
NTZ	No Take Zone
RSA	Recreational Sea Angling
SAC	Special Area of Conservation
SAGB	Shellfish Association of Great Britain
SC	Success Criteria
SOM	Size of Sexual Maturity
SOP	Standard Operating Procedure
SPA	Special Protection Area
SSSI	Site of Special Scientific Interest
TAG	Technical Advisory Group
WFD	Water Framework Directive
WWF	World Wide Fund

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Annex 1 Inventory of equipment held by the Devon and Severn IFCA 2014

Vessels

- **SV Black Jack** 8m Coded Cougar Catamaran with Gantry A frame and Hydraulic winch used for surveys and spatial enforcement



- **Tornado 'Enforcer'** 6.4m coded RIB (small ships code of practice) used for boarding fishing vessels and research work (seen here deploying an underwater camera)



- **Sea Strike 14 Aluminium boat & road trailer** – flat bottom vessel used predominantly in estuarine environments

Video Survey Equipment

Frames

- 2 x flying arrays
- 1 x pyramid drop frame
- 2 x spare end caps for array

SD Camera kit

- 1 x Bowtech SD umbilical
 - IWO14058, XX-10083. (128287 stamped onto connector ends)
- 1 x Bowtech SD camera
 - S/N 13713/1 (26899 stamped onto connector ends)
- 1 x Bowtech SD recording/monitor unit
 - BPL-DVIS-3-022, S/N 14059/1
- 2 x Bowtech LED lamps (Model: LED-K-3200-DC-1600-RS-15)
 - S/N 13714/2 (126712 QC stamped onto connector end)
 - S/N 13714/1 (126712 QC stamped onto connector end)
- 1 x GeoStamp unit (& leads)
 - IWO14059, WPCONV-005

HD Camera kit

- 1 x Bowtech HD recording/monitor unit
 - S/N 050-HD (Model HDO-1)
- 1 x Bowtech HD umbilical
 - IWO16161 XX-10102
- 1 x Bowtech HD camera- (Model: Surveyor- WAHD-B8)
 - S/N: 14612/1
- 3 x Bowtech LED lamps (Model: LED- K- 3200- DC- 13)
 - S/N: 14613/1
 - S/N: 14613/2
 - S/N: 14613/3

Other Cameras/ camera accessories

- 4 x lasers (Make: Z-Bolt SCUBA-1)
 - S/N ZB02245
 - S/N ZB02206
 - S/N E00586
 - S/N
- 2 x Bowtech umbilical for Divecams
 - IWO14648-2, XX-9929. (131032 stamped onto connector ends)
 - IWO14648-1, XX-9929. (128940 stamped onto connector ends)
- 1 x Bowtech Divecam
 - S/N 14641/1, QC 132863
 - S/N 14641/2

- 2 x Bowtech lamp (for use with Divecam)
 - S/N 14642/2 (141092 stamped onto connector end)
 - S/N 14642/1
- 2 x Bowtech camera control/overlay units (for Divecams)
 - 14644/1
 - 14644/1
- 3 x Panasonic tough books
- 2 x Seapro static camera housing/cages (with lamp inside)
 - No. 29940 on lamp cable (same number on both)
- 2 x Panasonic HDC-SD80 video cameras (with instructions & cables)
 - SD80EB-K, B1HG01640
 - SD80EB-K, D1HG00352
- 2 x Battery charger (ACS-Series)
- 9 x dive torches'
- 3 x red lasers
- 10 x GoPro Hero 3 with back up batteries and memory cards (some currently with SG)

Grab equipment

- 1 x 0.1m² Day Grab & table
- Sieving table – currently being sourced

Side scan equipment

- 1 x SeaKing Sidescan Sonar (& umbilical)
 - S/N 08324.24557

Additional Survey Equipment

- 4 x garden sieves & trowels
- 3 x 01.m² quadrats
- 1 x sling for fish weight
- 1 x plankton net + accessories
- 10 x plastic callipers
- 2 x metal callipers
- 1 x electronic/ digital callipers
- 2 x measuring boards (scallop)
- 8 x weighing scales (fish and digital)
- 5 x Dutch wands
- 2 x Dissecting kits
- 1x magnifier with lamp
- 1 travelling microscope
- Lobster and scallop tags and associated equipment
- Variety of pots and creels for stock assessments
- 1m Oyster dredge to undertake shellfish stock assessments

- Variety of shellfish growing bags & cages including aqua purses, north west trays, lantern nets & pearl nets – for growth trials and trialling various growing methods to encourage development of shellfisheries in the district
- Spat collectors
- 4 x Larval light traps for assessment of crustacean larval recruitment
- Stock assessment apparatus such as box corers, Dutch mussel density corer
- Variety of sieves
- Lobster scrubbing test kit and chemicals