Annual Research Plan 2012-2013

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1. Introduction

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. The southern part of the district extends six nautical 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.

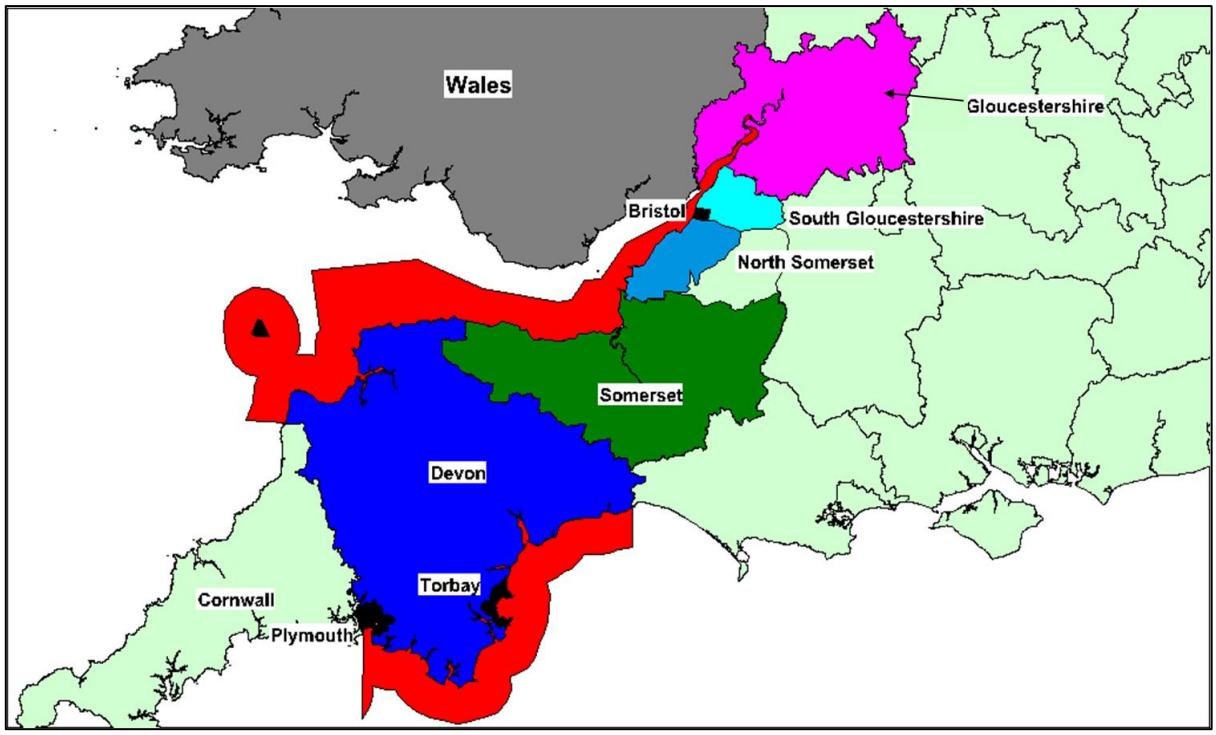

Figure 1 Devon & Severn IFCA District

The Authority's district contains 163,649 Ha of both EU and UK Marine Protected Areas, including Sites of Special Scientific Interest (SSSIs), Special Protected Areas (SPAs), Special Area of Conservation (SACs), Ramsar sites, National Nature Reserves as well as the first Marine Conservation Zone (MCZ) and No Take Zone (NTZ) in England. Finding Sanctuary, the regional project tasked with designing a network of Marine Conservation Zones (MCZ) in the Southwest of England has recommended a further thirteen MCZs in the D&S IFCA district and four reference areas. D&S IFCA will need to develop management measures for these sites.

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'.

IFCA Duties

The main duties of IFCAs are set out under Part 6 Chapter 1, of the Marine and Coastal Access Act 2009[1], and place a greater emphasis seeking to on a balance between 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

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

IFCA Success Criteria

Defra[2] 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 2012 -2013[3]. 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. IFCAs 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. IFCAs 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 IFCAs 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. IFCAs 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

HLO: Demonstrate the adoption of minimum standards and a precautionary

and measuring performance, DEFRA, London, pp. 25.

[3] Devon and Severn IFCA Annual Plan 2012-2013 Appendix 2 pp.31-37 www.devonandsevernifca.gov.uk

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

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 Countryside Council for Wales (CCW), 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 and West of England 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, NE, 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. D&S IFCA currently chair the group (2011-201~) which meets bi-annually and is currently planning a science conference in the Autumn 2012 to highlight the scientific work undertaking by IFCAs and progress of national research projects led by TAG.

IFCA Responsibilities

IFCAs have a responsibility under the Conservation of Habitats and Species Regulations (2010), as a relevant authority[4], 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

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

Habitats Directive requires to be undertaken for 'plans and projects' having a significant effect on the European site.

The advice is contained within the European Marine Site Risk Review[5] and also within detailed advice packages, known as "Regulation 33" packages for each site. The Devon & Severn IFCA therefore has a responsibility to fulfil the Regulation 33 advice for all EMSs in the district and address the concerns in the risk review through research and appropriate management strategies. There are several candidate SACs (e.g. Lyme Bay and Torbay cSAC)[6] in the district and the draft conservation objectives and advice on operations are available for each site to help in the development of management schemes and plans.

Under MaCAA previously unmanaged fisheries such as bait collection can now be subject to fisheries legislation and managed. The IFCAs are also tasked to ensure that the different needs of persons exploiting sea fisheries are taken into account for example, recreational sea angling.

This Annual Research Plan sets out the research projects and work priorities for D&S IFCA between April 2012 and April 2013. The research will be based on the priorities outlined in the D&S IFCA Annual Plan 2012-2013[7]. There were three main areas of focus detailed in the annual plan and these are:

- The development of Marine Protected Area management plans;
- The long term sustainability and management of shellfisheries within the district
- The assessment and development of recreational sea angling (RSA) within the district.

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.

[5] Natural England (2010) European Marine Site Risk Review, Natural England Research Report NERR038, pp.40
[6] http://www.naturalengland.org.uk/Images/LBT-consobj_tcm6-21646.pdf
[7] Devon & Severn Annual Plan 2012-2012

2. Research Resources and Capabilities

Devon and Severn IFCA Environment Team

Devon and Severn IFCA has 9 members of staff including a Chief Officer, a Deputy Chief Officer, and Principal Environment Officer, a Senior Inshore Fisheries and Conservation officers (IFCO), two IFCOs, a Senior Environment Officer, an Environment Officer and an Officer Manager. Devon and Severn IFCA organisational structure is shown in Annex1.

The members of the Environment team are:

Principal Environment Officer –
Sarah Clark s.clark@devonandsevernifca.gov.uk

Senior Environment Officer -
Tamsyn Noble t.noble@devonandsevernifca.gov.uk

Environment Officer –
Katherine Grey k.gray@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 underwater video 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 EMSs, coastal fora, national committees and IFCA technical advisory group. All IFCOs both in the enforcement team and environment team 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.

Devon and Severn IFCA Research Equipment

Devon and Severn IFCA have 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 2.

3. Devon and Severn Research Priorities for 2012 – 2013

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.

	Priority 1 **Development of MPA management plans**	***Priority 2*** **Sustainable Management of Shellfisheries**	***Priority 3*** **Development of Recreational Sea Angling**
Activity 1	Habitat mapping and ground truthing of sensitive features/habitats present in MPAs in the district	Whelk Fisheries Sustainability project – Size at sexual maturity	Assessment of distribution and extent of bait collection in the district
Activity 2	Mapping of Eel grass beds in MPAs within the district	Assessment of mussel resources both intertidal and sub-tidal	Assessment of Recreational Sea Angling to include distribution and intensity of activity
Activity 3	Analysis of benefits of MPAs to surrounding fisheries	Stock assessments of cockle & clam resources in the district.	Data gathering to inform socio-economic value of RSA within the district

Activity 4	Assessment of the impacts of fishing activity within MPAs	Stock assessment of Scallops in Salcombe Estuary	Assessment of RSA Landings – species, numbers, seasonality
Activity 5	Scientific literature review and data collection to inform impact assessment for byelaw reviews	Crustacea stock assessments and analysis of landings	Scientific literature review and data collection to inform impact assessment for byelaw reviews
Activity 6		Scientific literature review and data collection to inform impact assessment for byelaw reviews	

Table 3 D&S IFCA Work Priorities and Research Activities

4. Delivery of Priorities

Overview of Plan Structure

The following section details the activities that the Devon and Severn IFCA intend to carry out between April 2012-2013 to deliver the priorities outlined in table 3. Each activity 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. There are several other projects which will fit into all the D&S IFCA priorities and as such do not fit into the table 3. These will be outlined below. The plan allows some flexibility as not all research activities can be identified at the start of the year and some additional activities may arise through on-going enforcement, research and management priorities. D&SIFCA work closely with the shellfish industry and encourage the development of mariculture. This too might initiate some small-scale projects to trial certain methodologies or innovative techniques to encourage development of this important industry

D&S IFCA Annual Plan 2012-2013 (Annex 3)[8] outlines the risk assessment matrix which considers all the activities conducted by D&S IFCA and highlights the associated risks

[8] Devon & Severn Annual Plan 2012-2012Annex 3 pp. 38-45

identified as a result of the failure of those activities for financial years 2012-2013 and the mitigation measures that can be put in place to avoid this occurring.

5. Devon & Severn IFCA Research Projects for 2012-2013

Priority 1 Development of MPA Management Plans

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

<table>
<tr><th colspan="6">Project 1.1.1 Habitat mapping and ground truthing of sensitive features in MPAs – A Five Year Project</th></tr>
<tr><th>Description</th><th colspan="5">Resources Needed</th></tr>
<tr><td>This project is a continuation of research started in 2011-2012 and is a long term five-year activity. Within D&S IFCA district there are currently more than 163000 Ha of designated conservation area including SPAs, SACs and SSSIs. This area does not include the MCZ recommended by the Finding Sanctuary Project. It is important to know the extent and condition of the designated features at these sites so that a better understanding of the potential impacts of different fishing activities can be assessed and how management measures and plans can be developed to ensure that sustainable fisheries can be maintained whilst protecting the marine environment. The extent and condition of these features and habitats will be assessed and greater confidence gained though ground truthing of bathymetric data and other forms of data.

This evidence together with modern technology such as VMS can be used to inform the 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.</td><td colspan="5">• Underwater video camera and recording system
• Camera sledge
• Underwater torches
• Vessel & time
• GIS software
• Underwater survey equipment e.g. grab, sieves
• JNCC guidelines and Eunis classification system for habitat interpretation/ identification</td></tr>
<tr><th rowspan="2">Outputs</th><th colspan="4">Quarter</th></tr>
<tr><th>Q1</th><th>Q2</th><th>Q3</th><th>Q4</th></tr>
</table>

• Analysis of film footage to determine the extent of features with EMS	✓	✓	✓	✓
• Ground truthing of bathymetric 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	✓	✓	✓	✓
• Report				✓

Justification:	**Opportunities for Joint Working:**
• IFCAs 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. • Success Criteria (SC) 4: IFCAs work in partnership and engages with stakeholders. • SC 5: IFCAs make best use of evidence to deliver objectives • SC 6: IFCAs support and promote the sustainable management of the marine environment	• 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 monitoring programme for 2012-2013 includes monitoring and mapping of the extent of biogenic reefs in Lyme Bay and Torbay SAC, monitoring of intertidal mud and sand communities and subtidal sandbanks in the Severn SAC, and mapping the extent of reefs in the Prawle Point to Plymouth SAC. These are good opportunities for joint working with NE. • 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.

Priority 1 Development of MPA management plans

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

1.1.2 Project Title: Mapping of Intertidal & Sub-tidal *Sabellaria* reefs

Description	Resources Needed
Sabellaria spp are also called reef building worms, ross worms or honey comb worms and are Biodiversity Action Plan (BAP) species as well as designated features of EMSs. *Sabellaria alveolata* reefs are a named feature of the Severn SAC and are a Priority Habitat on the English List (s41 of the NERC Act). They are found both intertidally and sub-tidally in the SAC. It is important for D&S IFCA have evidence on the location of the reefs in our district. Joint working took place in 2011 with EA and NE for conditional assessment purposes and the awareness and profile of these beds was raised and on-going assessment by Natural England in likely to take place in 2012-2013 and 2013-2014. D&S IFCA will gather information on the location of these beds and any data on their extent and condition and it is anticipated that D&S IFCA will have an active role in future partnerships monitoring some of these sites which may involve grab surveys to verify these locations and identify new areas. This data will be important to assess the impact of fishing activities on this feature of the EMS and help inform the byelaw review process. *Sabellaria alveolata* is the intertidal reef building worm and is found at various locations in the D&S IFCA district. Some of these areas have previously been mapped by NE and Devon Biodiversity Records Centre. D&S IFCA will be gathering data on these locations and updating and mapping the location and extent of these and new sites.	• GPS • GIS • Underwater survey equipment e.g. grabs, sieves • Vessel time

Outputs	Quarter			
	Q1	Q2	Q3	Q4
• Data collection of location and extent of *Sabellaria* reefs	✓	✓	✓	
• Surveys of the locations and identification of new sites	✓	✓	✓	
• Data analysis		✓	✓	✓
• Production of GIS maps of the location of *Sabellaria* reefs in the D&S IFCA district		✓	✓	✓
• Produce report				✓

Justification:	Opportunities for Joint Working:
• IFCAs have a legal obligation to ensure that they exercise their conservation functions and comply with the requirements of the Habitats Directive and Natural Environment and Rural Communities Act 2006. • 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. • SC 2: Evidence based, appropriate and timely byelaws are used to manage the sustainable exploitation of sea fisheries resources within the district. • SC 4: IFCAs work in partnership and are engaged with their stakeholders • SC 5: IFCAs make best use of evidence to deliver their objectives • SC 6: IFCAs support and promote the sustainable management of the marine environment.	• Work will be undertaken in collaboration with Natural England to gather data on locations and to undertake future surveys. • EA / Cefas who undertake survey work and provide vessel for NE conditional assessments.

Priority 1 Development of MPA Management plans

Activity 2: Mapping of Eel Grass beds throughout the district

<table>
<tr><th colspan="6">Project 1.2.1 Mapping the extent, density and condition of the intertidal and sub tidal eel grass in MPAs in the District</th></tr>
<tr><th colspan="3">Description</th><th colspan="3">Resources Needed</th></tr>
<tr><td colspan="3">There are two species of eelgrass known to be found in D&S IFCA district. Dwarf eelgrass Zostera noltii is found intertidally. This type of eel grass beds is one of Habitat features of the Conservation objectives for the Exe Estuary SSSI, SPA and Ramsar site. Seagrass Zostera marina is found predominantly in the sublittoral zone. There are several locations in the district where Zostera marina has been identified as a designated feature including Plymouth Sound and Estuaries SAC, Severn Estuary SAC, Salcombe Estuary SSSI and rMCZ at Torbay.
This project 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. Underwater video surveys will be conducted of sub tidal beds in the Torbay rMCZ which have been identified as a habitat of conservation importance. Footage at other subtidal sites will also be undertaken.</td><td colspan="3">• D&S IFCA vessel & time
• Underwater video camera
• GIS software
• Handheld GPS
• Camera
• quadrat</td></tr>
<tr><th rowspan="2">Outputs</th><th colspan="4">Quarter</th></tr>
<tr><th>Q1</th><th>Q2</th><th>Q3</th><th>Q4</th></tr>
<tr><td>• A greater understanding of the distribution, spatial extent and condition of seagrass beds throughout the District, in particular within designated sites.</td><td>✓</td><td>✓</td><td>✓</td><td>✓</td></tr>
<tr><td>• GIS mapping on the extent and locations and production of charts showing the areas</td><td>✓</td><td>✓</td><td>✓</td><td>✓</td></tr>
<tr><td>• Information on the condition and density of the beds</td><td></td><td>✓</td><td>✓</td><td>✓</td></tr>
<tr><td>• Development of management plans to ensure that the designated beds within MPAs are fully protected from the possible impacts of towed fishing gear</td><td></td><td></td><td>✓</td><td>✓</td></tr>
<tr><th colspan="3">Justification:</th><th colspan="3">Opportunities for Joint Working:</th></tr>
</table>

• 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. • Finding Sanctuary Project recommended eel grass within the Torbay rMCZ as a designated feature and will require assessment and protection from certain fishing activities (mobile bottomed towed gear). • Intertidal eel grass beds in Exe Estuary requires annual mapping to ensure that extraction of cockles form 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. • SC 2: IFCAs use evidence based, appropriate and timely management for the sustainable exploitation of sea fisheries resources. • SC 4: IFCAs work in partnership and engages with stakeholders. • SC 5: IFCAs make best use of evidence to deliver objectives • SC 6: IFCAs support and promote the sustainable management of the marine environment	It is envisaged D&S IFCA will work with: • 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. • Harbour Authorities to discuss buoyage of eel grass beds • fishing representatives, • DWT • Plymouth University who have undertaken research into eel grass beds in the Authority's district and expert knowledge that can aid survey design

Priority 1 Development of MPA management plans

Activity 3 Analysis of the Benefits of MPAs to the surrounding fisheries

Project 1.3.1: Lobster Tagging Programme– Lundy Island and North Devon	
Description	**Resources Needed**
Lundy Island off the north Coast of Devon has designated in its surrounding waters the first No Take Zone (NTZ) and Marine Conservation Zone in the country. This project sees the continuation of the lobster tagging programme around Lundy Island that commenced in 2008. Lobsters from within the NTZ and MCZ are tagged and recapture information is gathered to assess the net emigration and immigration of lobster out of the no fished area into the surrounding fishery. In this way any 'spillover' effect can be assessed and the net benefit to the surrounding fishery can be measured. Strings of pots are placed at six sites around Lundy Island, two in the NTZ and two at two separate control sites. All lobsters caught in these pots (escape gaps closed off) are measured, sexed, and tagged using streamer tags and released. Their subsequent recapture by fishermen (and during survey work) allows the collation of data on distance moved, growth increments and condition. This survey is repeated at further reference sites in the North Devon area at Hartland to compare with data collected at the Lundy Island sites. 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.	• Chartering of fishing vessel • Streamer tags • Vernier callipers • GPS • GIS software

Outputs	Quarter			
	Q1	Q2	Q3	Q4
• Two surveys to facilitate the collection of data on the lobster populations around Lundy Island and allow tagging of all lobsters caught	✓	✓	✓	
• Two surveys at the reference point at Hartland North Devon	✓	✓	✓	
• Collation of data from recorded recaptures	✓	✓	✓	✓
• Mapping of the movement of lobsters	✓	✓	✓	✓
• Mapping of changes in fishing effort around Lundy Island	✓	✓	✓	✓
• Analysis of data	✓	✓	✓	✓
• Production of reports				

			✓	✓

Justification:	**Opportunities for Joint Working:**
• 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 • 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 (SC) 2: IFCAs use evidence based, appropriate and timely management for the sustainable exploitation of sea fisheries resources. • SC 4: IFCAs work in partnership and engages with stakeholders. • SC 5: IFCAs make best use of evidence to deliver objectives • SC 6: IFCAs support and promote the sustainable management of the marine environment	• Joint working with stakeholders in particular the fishing industry in North Devon • Collaborative working with Lundy Island Wardens and NE in relation to the designation of the site and working within the NTZ. • Liaison with other IFCA who are currently undertaking similar work. • Possible collaborative working with Swansea University to continue assessment of the health of Crustacea within the MCZ.

Priority 1 Development of MPA management plans

Activity 3 Analysis of the Benefits of MPAs to the surrounding fisheries

Project 1.3.2: Lobster Larval Recruitment – Identifying the benefits of a protected brood stock in Lundy NTZ	
Description	**Resources Needed**
During the lobster tagging surveys around Lundy Island in 2010 and 2011 larval light traps were deployed in the NTZ at Lundy Island. This was to collect lobster larval and to demonstrate the recruitment potential from the large brood stock of lobsters in the NTZ assessed during previous D&S IFCA surveys. This will help to identifying the additional benefits of closing an area to fishing. Larval light traps have been successfully developed and deployed in Sweden (Øresland, 2007) and after correspondence with Vidar Øresland similar traps were produced and have been trialled in Lundy NTZ. Lobster larvae were trapped and identified in 2011. Other species of crustacean larval, such as edible crab larvae, were also caught. This work will be continued in 2012 and other modified light traps might be trialled in working in conjunction with Cefas who are currently proposing a programme of larval collection at sites around the country. Some small meshed traps might also be trialled within the MCZ to collect and evaluate juvenile lobster abundance (these usually escape through the mesh of traditional parlour pots). To investigate locations outside the NTZ where settlement of lobster larvae is likely to occur, D&S IFCA will work with Cefas and potentially use an epibenthic dredge to survey these sites.	• Light traps • Underwater torches • Microscope • Identification books • Boat charter

Outputs	Quarter			
	Q1	Q2	Q3	Q4
• Trial light traps at sites within the NTZ		✓	✓	
• Trial small mesh pots to sample juvenile lobsters		✓	✓	
• Trial collection of post settlement larvae		✓	✓	
• Mapping of locations where larvae/juveniles found		✓	✓	✓
• Analyse data collected			✓	✓
• Produce report				✓

Justification:	Opportunities for Joint Working:

• S153 MaCAA 2009 states that the IFCA can 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 • 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) 2: IFCAs use evidence based, appropriate and timely management for the sustainable exploitation of sea fisheries resources. • SC 4: IFCAs work in partnership and engages with stakeholders. • SC 5: IFCAs make best use of evidence to deliver objectives • SC 6: IFCAs support and promote the sustainable management of the marine environment	• Joint working with fishermen • Collaborative work with Cefas • Collaborative working with Lundy Island Wardens and NE in relation to the designation of the site and working within the NTZ

Priority 1 Development of MPA management plans

Activity 4 Assessment of the impacts of fishing activity within MPAs

Project 1.4.1: Assessment of the impacts of fishing activity within MPAs

Description	Resources Needed
This project will oversee various aspects of the work D&S IFCA currently undertakes. In order to assess the impact of fishing activities within MPAs evidence is needed on the current activity and understanding of how this can impact designated features of the MPA. Mapping fishing effort using sightings data and GIS will help inform this process and highlight areas of greatest vulnerability. It is important to know the extent of the features designated for protection, data on which will be gathered under Project 1.1.1, so that D&S IFCA can assess how fishing activity interacts with these features. Supporting the development of technologies such as Vessel Monitoring Systems (VMS) can help the IFCA ensure that a sustainable fishery can be maintained whilst protecting the marine environment. Any fishing activity 'plan or project' that may significantly impact a EMS may need an appropriate assessment or Test of Likely Significant Effect and it is likely that D&S IFCA will be involved in undertaking or assisting in the development of these within the district. Data collected will inform the byelaw review process.	• Underwater camera • Vessel time • GPS • Surveying equipment such as quadrats, sieves, grabs • Digital scales • Measuring equipment e.g. callipers • Camera • VMS • GIS

Outputs	Quarter			
	Q1	Q2	Q3	Q4
• Gather data on sightings of fishing activity	✓	✓	✓	✓
• Undertake survey work to inform any assessment of the impacts of fishing activity		✓	✓	✓
• Map sites of activity and designated features		✓	✓	✓
• Produce assessments		✓	✓	✓
• Produce report				✓

Justification:	Opportunities for Joint Working:

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. • IFCAs 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. • Success Criteria (SC) 4: IFCAs work in partnership and engages with stakeholders. • SC 5: IFCAs make best use of evidence to deliver objectives • SC 6: IFCAs support and promote the sustainable management of the marine environment.	• Natural England – who provide conservation advice for EMS and through the Appropriate Assessment process. • Plymouth University – who provide opportunities for MSc and BSc to undertake project work to input into assessment as part of course dissertation requirements • Fishing industry • MMO

Priority 2 Sustainable Management of Shellfisheries

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

Project 2.1.1: Whelk Fishery Sustainability Project – Size at Sexual Maturity	
Description	**Resources Needed**
In more recent years there has been a marked increase in the fishing effort on edible whelk stocks (*Buccinum undatum*) in the D&S IFCA district. The fishery is still on the increase 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 are more pressurised due to spatial limitation of the fishery and intense effort. In 2009 a research project was undertaken funded by Fisheries Science Partnership (FSP) programme and involved collaborative working between Sussex SFC, Cefas and fishermen. Monthly sampling was undertaken for a full year to ascertain size at sexual maturity, seasonality of the reproductive cycle and growth rates. The EU minimum size (MS) for whelk is 45mm shell length. The project found that at 57.3mm 50% of whelks had reached sexual maturity within one of the sampling sites; hence the EU MLS may be inappropriately applied to these fisheries, and exploitation may not currently be sustainable. Cefas is currently undertaking a more extensive study under the FSP for April 2011 - March 2013 which will determine the size of sexual maturity 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 Size legislation. D&S IFCA have helped Cefas with the provision of samples in February from one boat based in Ilfracombe and one from Exmouth. 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 MLS, whether there should be a closed season for the fishery and input into the byelaw review process this survey will be continued in-house. Operculum sample will also be collected from samples for Cefas to determine the age through analysis	• Weighing equipment • Dissections kits including tweezers, blades, • Freezer for storage of samples • Magnifying light • Envelopes for whelk operculum samples • Small vice • Sacks

of growth rings on the operculum. A survey will also be undertaken to determine the extent of the fishery, numbers of boats and level of fishing effort, and areas worked within the district.	

Outputs	Quarter			
	Q1	Q2	Q3	Q4
• 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		✓	✓	✓
• Determine if there are differences in these factors in differ areas of the district e.g. north and south differences		✓	✓	✓

Justification:	Opportunities for Joint Working:
• 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: IFCAs use evidence based, appropriate and timely byelaws to manage the sustainable exploitation of sea fisheries resources. • SC 3: IFCAs implement a fair, effective and proportionate enforcement regime. • SC 4: IFCAs work in partnership and engages with stakeholders. • SC 5: IFCAs make best use of evidence to deliver objectives. • SC 6: IFCAs support and promote the sustainable management of the marine environment.	• Collaborative working with Cefas who is currently coordinating a national project. Provision of whelk samples to Cefas to support this project. This will involve working with fishermen in the districts and coordination of the collection of samples. • Further joint working with Cefas to provide advice on methodology and analysis of data collected as on-going in-house analysis of whelk sample progresses. • Joint working with other IFCAs taking part in the project as well as Welsh Government who are undertaking a similar project • Joint working with whelk fishermen to involve them in the project, gain support and help input into the future management of the fishery.

Priority 2 Sustainable Management of Shellfisheries

Activity 2 Assessment of mussel resources both intertidal and sub littoral

2.2.1 Project Title: Assessment of Sub-Littoral Mussel Resources	
Description	**Resources Needed**
Sublittoral mussel beds within the Authority's district can provide a valuable resource. In particular subtidal seed mussel can be 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 will be removed and relayed or commercially fished to determine the impacts of the fishing method for the removal of mussels.	• D&S IFCA vessel & time • Underwater video camera • GIS software • Underwater survey equipment e.g. grab, sieves

Outputs	**Quarter**			
	Q1	**Q2**	**Q3**	**Q4**
.				
• 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:
• 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. • SC 5: All management must be evidence based appropriate and timely and IFCAs must make best use of evidence to deliver their objectives • SC 6: IFCAs support and promote the sustainable management of the marine environment	• Natural England – who provide conservation advice on MPAs and through the Appropriate Assessment process. • 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**				
Intertidal mussel beds that are not managed through regulating orders or held under private lease are a public resource that needs to be management sustainably. There are several beds in the district that are public beds (under the Magna Carta Public right to fish). It is important that mussel stocks on these beds are assessed to determine the level of harvesting that would be 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 Dutch[9] and has been used successfully by EIFCA on the mussel beds of The Wash for many years. Other intertidal mussel beds will be surveyed e.g. Teign Salty Bed/Polly steps area and Exe Bull Hill beds. Intertidal seed mussel resources will also be assessed as required especially those established in EMS in the district and the removal and relaying of which is requested by shellfishermen working in the area e.g. Exe Estuary SPA.	• Dutch method surveying tool • 0.1m^2 quadrat • Callipers • Digital scales • Sieves • GPS • GIS				
Outputs	**Quarter**				
	Q1	**Q2**	**Q3**	**Q4**	
• An annual survey of the Taw Torridge Mussel beds to inform management decisions for the shellfishery.			✓		
• Annual surveys of other intertidal beds		✓	✓		
• 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.		✓	✓	✓	

[9] Method developed by MarinX, Dutch Marine Consultants, ESFC Research Report 2006.

• 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:**
• 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). • SC 5: All management must be evidence based appropriate and timely and IFCAs must make best use of evidence to deliver their objectives • SC 6: IFCAs support and promote the sustainable management of the marine environment	• 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 • Work with fisherman to help identify sub-littoral resources and determine the sustainable use of these resources

Priority 2 Sustainable Management of Shellfisheries

Activity 3: Stock Assessments of cockle and clam resources in the district

2.3.1 Project Title: Monitoring and Assessment of Cockle & Clam Resources in the District.	
Description	**Resources Needed**
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 keep this up to date. The main cockle bed is a classified shellfish harvesting area on the Exe. Over the last three years an appropriate assessment has been undertaken working with NE, students from the Universities of Plymouth and West of England and the commercial fisherman to assess the impact of an elevator harvester on the Cockle Sands at Exmouth. From the assessment it was determine 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. In order to allow the fishery to continue further monitoring of any impacts of the fishery is being undertaken. D&S IFCA are monitoring the cockle stocks across the bed on a biannual basis and mapping the distribution, coverage and abundance of cockles present. This will continue throughout 2012-2013. Other cockle beds will be assessed in particular those on the Teign Estuary and Avon Estuary as cockles are regularly gathered at these sites by members of the public under the public right to fish. These beds are not classified as shellfish harvesting areas and therefore cannot be fished commercially. Other sub-littoral clam stocks are located within the district including razor fish beds and surf clam, *Spisula solida,* beds and these will also be surveyed.	• 0.1m^2 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

Outputs	Quarter			
	Q1	Q2	Q3	Q4
• Survey sampling		✓	✓	✓
• Mapping of beds		✓	✓	✓
• Data analysis			✓	✓
• Stock assessments			✓	✓
• Prepare report			✓	✓

Justification:	Opportunities for Joint Working:
• 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. D&S IFCA have facilitate students to help with the macrofaunal identification and particle analysis and have undergone bi-annual stock assessment on the Cockle Sands at Exmouth to assess the density, distribution and abundance of cockles which could support the overwintering bird populations and a sustainable cockle fishery.	• Natural England – who provide conservation advice 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

• Success Criteria (SC) 4: IFCAs work in partnership and are engaged with their stakeholders • SC 5: IFCAs make best use of evidence to deliver their objectives. • SC 6: IFCAs support and promote sustainable management of the marine environment	

Priority 2 Sustainable Management of Shellfisheries

Activity 3: Stock Assessments of cockle and clam resources in the district

2.3.2 Project Title: Monitoring and Assessment of cockle mortalities					
Description	**Resources Needed**				
In 2011 cockles in the Exe Estuary suffered atypical mortalities. Testing of gaping and healthy-looking cockle by Cefas identified the presence of several parasites including haplosporidian parasites. In 2012 it is planned that D&S IFCA will conduct a study to monitor moribund cockles on the cockle bed at Exmouth and to assess any mortality if identified on other beds within the district.	• 0.1m^2 Quadrat • Callipers • Sieves • Digital scales • GPS				
Outputs	**Quarter**				
	Q1	**Q2**	**Q3**	**Q4**	
• Identification of mortalities on beds • Survey sampling • Data analysis • Prepare report		✓ ✓	✓ ✓ ✓	✓ ✓ ✓ ✓	
Justification:	**Opportunities for Joint Working:**				

• 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) • 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. • D&S IFCA have facilitated students to help with the macrofaunal identification and particle analysis and have undergone bi-annual stock assessment on the Cockle Sands at Exmouth to assess the density, distribution and abundance of cockles which could support the overwintering bird populations and a sustainable cockle fishery. • Success Criteria (SC) 4: IFCAs work in partnership and are engaged with their stakeholders • SC 5: IFCAs make best use of evidence to deliver their objectives. • SC 6: IFCAs support and promote sustainable management of the marine environment	• Cefas- who analyse sample to assess the cause of cockle mortalities and keep the IFCA inform of any changes in the notifiable disease status of identifiable diseases. • Natural England – who provide conservation advice 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

Priority 2 Sustainable Management of Shellfisheries

Activity 4: Stock Assessments of scallops in Salcombe Estuary

<table>
<tr><th colspan="6">2.4.1 Project Title: Stock Assessment of the King Scallop in Salcombe Estuary</th></tr>
<tr><th colspan="3">Description</th><th colspan="3">Resources Needed</th></tr>
<tr><td colspan="3">Since 1998 D&S IFCA (formerly as Devon Seas Fisheries Committee) has permitted a highly restricted king scallop (Pecten maximus) 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 MLS) 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. This will determine if further development of the resource or stock management needs to be undertaken.</td><td colspan="3">• Fishing boat charter to include dredge equipment
• Callipers
• GPS
• GIS</td></tr>
<tr><th colspan="3" rowspan="2">Outputs</th><th colspan="3">Quarter</th></tr>
<tr><th>Q1</th><th>Q2</th><th>Q3</th><th>Q4</th></tr>
<tr><td colspan="3">• Survey sampling
• Data analysis
• Prepare report</td><td></td><td></td><td>✓

</td><td>✓
✓
✓</td></tr>
<tr><th colspan="3">Justification:</th><th colspan="3">Opportunities for Joint Working:</th></tr>
</table>

• 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) • Success Criteria (SC) 4: IFCAs work in partnership and are engaged with their stakeholders • SC 5: IFCAs make best use of evidence to deliver their objectives. • SC 6: IFCAs support and promote sustainable management of the marine environment	• Fishing industry

Priority 2 Sustainable Management of Shellfisheries

Activity 5: Assessments of Crustacea Landings at Ports within the D&S IFCA District.

2.5.1 Project Title: Assessment of Crustacea landings at ports within the district.					
Description	**Resources Needed**				
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 landing of lobsters and crabs in the country. The first byelaw that is being drafted under the byelaw review process is a potting permitting byelaw which will require an impact assessment and this data gathering exercise will help inform this review and provide best evidence. Data collected will not only be used to assess quantities landed and landing sizes (maximum and minimum) but also provide species specific information e.g. landings of Crawfish *Palinurus elephas* from rMCZ areas.	• Callipers • GPS • GIS				
Outputs	**Quarter**				
	Q1	**Q2**	**Q3**	**Q4**	

• Survey sampling of port landings • Data gathering (effort, gear used, areas worked) from fishermen • Data analysis • Prepare report		✓ ✓	✓ ✓ ✓ ✓	✓ ✓ ✓ ✓

Justification:	**Opportunities for Joint Working:**
• The Authority must manage the exploitation of sea fisheries resources in their district (MaCAA, 2009). • Success Criteria (SC 2): IFCAs use evidence based, appropriate and timely byelaws to manage the sustainable exploitation of sea fisheries resources. • SC 3: IFCAs implement a fair, effective and proportionate enforcement regime. • SC 4: IFCAs work in partnership and are engaged with their stakeholders • SC 5: IFCAs make best use of evidence to deliver their objectives. • SC 6: IFCAs support and promote sustainable management of the marine environment	• Fishing industry • MMO/EA

Priority 3 Development of Recreational Sea Angling

Activity 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**
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 2008 was 26,488. It is important to assess the distribution and extent of bait collection not only to evaluate the impact of this activity but the socio-economic benefit of this activity to the district and	• GPS • GIS software • 0.1m2 quadrat • Sieves • Camera

it communities. Sea angling is a priority activity under D&S IFCA Action Plan 2012-2013 and a full audit of this sector will be undertaken during the year to make decisions over possible future development for the sea angling sector in the whole district, in particular in the Severn Estuary area. The Recreational Sea Angling Priority Project will highlight areas of bait collection to feed into this project.	

Outputs	**Quarter**			
	Q1	**Q2**	**Q3**	**Q4**
• 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 surveys in the D&S IFCA district estuaries	✓	✓	✓	✓
• Evaluation of the impacts of bait collection in EMS			✓	✓
• Mapping 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			✓	✓

Justification:	**Opportunities for Joint Working:**
• 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	• 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 to help undertake surveys • Collaborative working with AONB units, estuary partnerships and North Devon Biosphere officer. • Anglers and bait collectors

• 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 • 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 IFCAs must make best use of evidence to deliver their objectives • SC 6: IFCAs must promote sustainable management of the marine environment.	

Priority 3 Development of Recreational Sea Angling

Activity 2 Assessment of Recreational Sea Angling to include distribution and intensity of Activity

3.2.1 Project Title: Assessment of Recreational Sea angling including distribution and intensity of activity	
Description	**Resources Needed**
In January 2012 D&S IFCA officers put together a database of sea angling activity sites in the district from meetings and discussions with D&S IFC Authority members, Sea Angling groups and Environment Agency staff. The sites were mapped using GIS and were categorised in terms of high and low activity. These sites made the basis of the D&S IFCA Recreational Sea Angling survey which commenced in February and follows survey design, standard operating procedures and	• GIS software • GPS • Binoculars

methodologies developed in USA[10] and which has been used in countries such as New Zealand, Australia and European countries (ICES 2009, 2010, 2011[11]). The onsite design adapted by Cefas for their national Sea Angling 2012 project has been documented for the Delaware River by Vølstad (2006). Since the start of the survey some of the site assessments and locations have required updating and this evaluation needs to continue throughout the year as the seasonality of the sea angling activity becomes more apparent and the level of intensity changes. New charts of sites and categories will be produced quarterly and the survey adapted accordingly.	

Outputs	Quarter			
	Q1	Q2	Q3	Q4
• Production of charts of angling sites in both the Devon and Severn areas of the district	✓	✓	✓	✓
• Evaluation of the intensity of activity and adaption of charts and survey design	✓	✓	✓	✓
• Update intensity and location of sea angling in the district with seasonal changes		✓	✓	✓
• Evaluate the number of anglers at sites both using shore sites and private boat anglers		✓	✓	✓

[10] Link to US (NOAA) web site on their angling surveys:

http://www.countmyfish.noaa.gov/index.html

[11] Link to ICES Planning Group on Recreational Fisheries:

http://www.ices.dk/workinggroups/ViewWorkingGroup.aspx?ID=445

Justification:	Opportunities for Joint Working:
• D&S IFCA Annual Plan 2012-2013[12] 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 IFCAs must seek to balance the different needs of persons engaged in the exploitation of sea fisheries resources in the district. • SC 4: IFCAs work in partnership and engages with stakeholders • SC 5: All management must be evidence based appropriate and timely and IFCAs must make best use of evidence to deliver their objectives • SC 6: IFCAs must promote sustainable management of the marine environment.	Joint working with • EA • NE • Sea angling clubs • Angling trust members • IFC MMO appointees on D&S IFCA • Anglers

Priority 3 Development of Recreational Sea Angling

Activity 3 Data gathering to inform socio-economic value of RSA within the district

3.3.1 Project title: Data gathering to inform socio-economic value of RSA	
Description	**Resources Needed**

[12] pp6-7 Outline of Challenges for 2012-2013 D&S IFCA Annual Plan 2012-2013

As a priority work stream in the D&S IFCA Annual Plan Recreation Sea Angling is also a priority under the research plan for 2012-2103. Several different aspects of this activity are being evaluated and data collected. One of these activities relates to the socio-economic value and benefit of RSA in the Devon and Severn areas of the district. Alongside the development of the methodology for the assessment of the extent and intensity of sea angling (project 3.2.1) procedures have been developed to evaluate the socio economics of this activity (as developed in the USA and adapted by Cefas for the Sea Angling 2012 project). Additional aspects developed by D&S IFCA have been incorporated into this SOP and this should provide invaluable information. It is envisaged that D&S IFCA will work alongside researchers from Plymouth University and Cefas to interpret these data	• Survey forms • Staff time • GPS • GIS

Outputs	**Quarter**			
	Q1	**Q2**	**Q3**	**Q4**
• Collation of socio –economic data during shore site and private angling boat surveys	✓	✓	✓	✓
• Analysis and interpretation of the data			✓	✓
• Production of report				✓

Justification:	**Opportunities for Joint Working:**
• S153 of MaCAA (2009) states that IFCAs must seek to balance the different needs of persons engaged in the exploitation of sea fisheries resources in the district. • S153 of MaCAA (2009) states that IFCAs must 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 4: IFCAs work in partnership and engages with stakeholders • SC 5: All management must be evidence based appropriate and timely and IFCAs must make best use of evidence to deliver their objectives • SC 6: IFCAs must promote sustainable management of the marine environment.	• Anglers • Plymouth university • D&S IFCA Authority members

Priority 3 Development of Recreational Sea Angling

Activity 4 Assessment of Recreational Sea Angling Landings

3.4.1 Project Title: Assessment of RSA landings	
Description	**Resources Needed**

Recreation Sea Angling is a priority under this research plan for 2012-2103. Several different aspects of this activity are being evaluated and data collected. One of these activities relates to the landings of fish caught by anglers in the Devon and Severn areas of the district. A previously mentioned in Projects 3.2.1 and 3.3.1 above the methodology for surveying Recreational Sea Angling has been widely used in other countries and has been adapted by Cefas for the Sea Angling 2012 project. Additional aspects developed by D&S IFCA have been incorporated into this SOP and this should provide invaluable information. Data will be collected on all species of fish caught and retained and caught and released at angling sites identified under Project 3.2.1. Fish will be weighed and measured and other information on bait used and time spent fishing will be collated. Data will also be collected from private angling boats whilst out fishing or on their return to shore. These data will provide an insight into the species and numbers caught and seasonality of the fisheries.	• Vessel and time • Digital Scales • Fish measures • GPS • Binoculars

Outputs	**Quarter**			
	Q1	**Q2**	**Q3**	**Q4**
• Survey anglers at activity sites identified	✓	✓	✓	✓
• Survey anglers aboard private angling boats	✓	✓	✓	✓
• Gather data on fish caught	✓	✓	✓	✓
• Analyse data		✓	✓	✓
• Produce report				

Justification:	**Opportunities for Joint Working:**

• S153 of MaCAA (2009) states that IFCAs must seek to balance the different needs of persons engaged in the exploitation of sea fisheries resources in the district. • SC 4: IFCAs work in partnership and engages with stakeholders. • SC 5: All management must be evidence based appropriate and timely and IFCAs must make best use of evidence to deliver their objectives • SC 6: IFCAs must promote sustainable management of the marine environment.	• Working with Anglers during surveys and when disseminating information • Potential joint working with EA to help gather data

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
Scientific literary review will be carried out as part of the Byelaw review process to inform impact assessments that must accompany any new byelaw. 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. Where gaps in information are evident further research can be undertaken to provide the evidence need to inform the byelaw reviews.	• 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
• Evidence to inform byelaw reviews	✓	✓	✓	✓
• Successful byelaw implementation	✓	✓	✓	✓
• Gaps in data and evidence filled		✓	✓	✓

Justification:	Opportunities for Joint Working:
• IFCAs 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. IFCAs work in partnership and are engaged with their stakeholders • SC 5. IFCAs make the best use of evidence to deliver their objectives.	• Other IFCAs through information exchange • Universities

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

Description	Resources Needed
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 can be 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 will offer baseline data against which the future of the health and extent of the fisheries and their impacts can be assessed. 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.	•

Outputs	Quarter			
	Q1	Q2	Q3	Q4
• A better understanding by D&S IFCA of the fisheries within the District.	✓	✓	✓	✓
• Collation of effort data to produce thematic effort maps using GIS.	✓	✓	✓	✓
• A formal baseline document to inform future management decisions.	✓	✓	✓	✓
• Evidence based, appropriate and timely byelaws are used to manage the sustainable exploitation of sea fisheries resources	✓	✓	✓	✓

Justification:	Opportunities for Joint Working:
• SC 2 All management must be evidence based, appropriate and timely • SC 5 IFCAs 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)	• Possible national project co-ordinated by SAGB

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

Description	Resources Needed
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 of all data previously and currently stored by the IFCA to aid its management and make it easily accessible. A Marine Environment Data and Information Network (MEDIN) training workshop has been undertaken by IFCA Officers and IFCA metadatabase will be created to be MEDIN compliant. This will facilitate data sharing between IFCAs and other partner organisations such as DEFRA and CEFAS (with consideration to 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.	• Raw data sets • Access to the internet

Outputs	Quarter			
	Q1	Q2	Q3	Q4
• Creation of a metadatabase of past and present data sets • Feed in data to wider MEDIN database	✓	✓ ✓	✓ ✓	✓ ✓

Justification:	Opportunities for Joint Working:
• 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 • SC 4 IFCAs work in partnership • SC 5 IFCAs must make best use of evidence to deliver their objectives	• 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 Wildlife Trust, CEFAS and the EA

Annex 1: Devon & Severn IFCA Vessels

- FPV 'Drumbeat of Devon' 21.9 m steel hulled vessel with an aluminium wheelhouse. The draft of the vessel is 1.7m. A HIAB sea crane is fitted to the vessel as well as Pull Master PL5 winch with 100m of cable. On board the vessel is an Avon 5.4m coded RIB that is launched with the crane.

- Tornado 'Enforcer' 6m coded RIB (small ships code of practice) used for boarding fishing vessels and research work (seen here deploying an underwater camera)

Figure 3 Deployment of underwater camera from Enforcer RIB

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

Figure 4 Flat bottomed aluminium boat on the Dart Estuary

Annex 2: Devon & Severn IFCA Research Equipment

- Olex on board FPV Drumbeat of Devon
- Echo Sounder with Dual beam transducer (50 + 200Hz)? On board FPV Drumbeat of Devon
- Transas Multifunctional Electronic Chart Display on board FPV Drumbeat of Devon
- Large aluminium Sled and underwater camera to be deployed using the crane from FPV Drumbeat of Devon. This is used attached to a towed sled and used to undertake habitat mapping and ground truthing of acoustic data and the assessment of the condition of MPA designated features and habitats. Can be used in depths up to 50m. Footage is live fed to screens on board the patrol vessels and saved using CCTV storage system
- 2 small underwater cameras which can be mounted to a small aluminium sled or 'flown' independently through shallow habitats. Can be used in waters up to 25m depth and deployed from the FPV Drumbeat or from the D&SIFCA RIBS. These are used for habitat mapping, extent and coverage assessments, ground truthing of acoustic data and the assessment of the condition of MPA designated features and habitats
- Underwater HD Stills camera which can be mounted to the large or small aluminium sleds
- Three ruggedized Panasonic tough book laptop with 5Hz GPS overlay w/PS/2 interface and external antenna which can be used to receive live feed from the small underwater cameras or independently in the field
- Handheld GPSs
- Quad bike for access to estuarine shellfisheries
- 1m Oyster dredge which can be used 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
- Larval light traps for assessment of crustacean larval recruitment
- Underwater LED torches
- Stock assessment apparatus such as box corers, Dutch mussel density corer
- Fish scales and digital scales
- Digital Vernier callipers
- Variety of sieves
- Small plankton nets
- Variety of software for evaluating and analysing data including MapInfo 10.5 and vertical Mapper GIS software
- Grab & table
- Sieving table

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Glossary of Terms

AA	Appropriate Assessment
CEFAS	Centre for Environment, Fisheries and Aquaculture Science
D&S IFCA	Devon and Severn Inshore fisheries and Conservation Authority
DASSH	Data Archive for Seabed Species
DEFRA	Department for Environment, Food and Rural Affairs
EA	Environment Agency
EMS	European Marine Site
FPV	Fisheries Protection Vessel
GIS	Geographic Information System
GPS	Geographical Positioning System
HLOs	Higher Level Objectives
IFCA	Inshore Fisheries and Conservation Authority
MaCAA (2009)	Marine and Coastal Access Act (2009)
MCZ	Marine Conservation Zone
MMO	Marine Management Organisation
MPA	Marine Protected Area
NE	Natural England
NTZ	No Take Zone
PI	Performance Indicator
RIB	Rigid Inflatable Boat
RSA	Recreational Sea Angling
SAC	Special Area of Conservation
SAGB	Shellfish Association of Great Britain
SC	Success Criteria
SFC	Sea Fisheries Committee
SOP	Standard Operating Procedure
SPA	Special Protection Area
SSSI	Site of Special Scientific Interest
TLS	Test of Likely Significant Effect
VMS	Vessel Monitoring System
WT	Wildlife Trust