MAPPING FISHERMEN'S KNOWLEDGE (IPF_D128)

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Development of the FisherMap methodology to map commercial fishing grounds and fishermen's knowledge

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with contributions from Mike Hughes, the MCZ planners, GIS/data and liaison officers of the four MCZ projects, and from the Thames Estuary Partnership

Final Report

Annexed tables

Summary

The FisherMap protocol has been revised in order to map out commercial fishing grounds, main target species and gear contribution to fishermen's livelihood. The initial version developed by Finding Sanctuary, the Marine Conservation Zone (MCZ) project for the South-west of England, used a questionnaire and mapping survey followed by validation meetings to describe the extent of fishing grounds.

The revised protocol, used by the three new MCZ regional projects, links individual grounds to percentage gross earnings. Using data from the Seafish annual fisheries economic survey data by fleet segment, it will now be possible to convert individual percentage values into a common currency across fisheries, in a way similar to the 100 pennies approach pioneered by Ecotrust in California. The revised protocol also uses a simplified and standardised gear description directly compatible with the codes used by the Marine and Fisheries and other Agencies. This will make it easier to cross-validate data from various sources. However, the coarse time scale (overall average over last 5 years) and precise local spatial definition used in FisherMap provide unique and rich information that are not collected elsewhere.

With the revised FisherMap, the validation group meetings will also have to discuss and finalise the overall economic value of composite maps of local fishing grounds. The same, or subsequent, group meetings presenting the regional conservation priorities will ask fishermen to share their expert local knowledge of essential fish habitats, features and species targeted by the conservation objectives. Local knowledge will be essential to obtain meaningful estimates of both economic and environmental impacts (positive and negative) that the MCZ regional projects need to estimate for their Impact Assessment (IA) of each proposed network and associated management regime.

MCZ regional projects would greatly benefit from using Seafish species guides and information on basic fishing methods, and from collaborative work with Seafish, especially Seafish economists to devise a sampling strategy for fishing vessels along the coast and use the best economics data available to conduct their Impact Assessments.

1   Introduction

In May 2009, Seafish commissioned a peer review of the 'FisherMap' final report published by Finding Sanctuary (des Clers, S., et al 2008). The peer review aimed to identify possible gaps and improvements, before the methodology for participatory mapping of fishing grounds was used by the three other Marine Conservation Zones (MCZ) projects covering the rest of the English coastline.

Results of the peer review and of other mapping initiatives were presented at a workshop facilitated by Seafish and hosted by Defra on 28th July 2009 in London. The review of FisherMap was generally positive and three areas of further work were identified: spatial and temporal arrangements, socio-economic consideration and data validation.

Following the presentation and discussion of the peer review results, Seafish commissioned a short project to develop FisherMap further.

The tasks for the project were defined as follows:

- To prepare and facilitate a workshop to develop a methodology to map fishermen's knowledge.
- Following the workshop, to draft a methodology to map fishermen's knowledge for peer review, and following peer review, to produce a final methodology.

- To run a workshop to train individuals who will use the revised FisherMap.

This report is structured in a further four parts, for each project task and a final discussion section.

2   FisherMap protocol revisions

2.1   *FisherMap revision Workshop - 15 October 2009*

The workshop to develop the FisherMap protocol was hosted by Defra in London in October 2009. The workshop brought together twenty-four participants from Defra, statutory agencies, practitioners and the MCZ projects (see Attendants list in

Table 1).

The day was organised to discuss and finalise a first revision of the FisherMap protocol including features to address the key points made by the referees. Three important points are summarised below:

1.   Regarding the collection of socio-economic information and complement of data on fishing activity data using official statistics, some features developed by Ecotrust (Scholz et al, 2008) could be easily adapted to the UK context. A table from the OceanMap survey is annexed as Table 2. It shows that all economics questions about individual costs and earnings for fishermen and other stakeholders are asked in terms of percentages. Absolute values needed to scale the percentages are derived independently from official statistics for individual vessels landings and from cost and earning surveys by fleet segment.

2.   Consent forms need to be tailored according to the precise remits of MCZ projects and to the level of interviewee data confidentiality. Each new MCZ project needs a presentation document such as the one developed by Finding Sanctuary, to introduce the purpose; the methods used and expected results of FisherMap as well as the team and local Liaison Officers. The custody and future possible uses of the data collected also need to be made clear to the interviewee in the Consent Form.

3.   With regards to data validation, Jo Myers introduced an on-going Defra-funded project, led by Koen Vanstaen at Cefas, designed to collate and cross-validate fishing activity data collected by the Sea Fisheries Committees (using Sussex SFC as an illustration at the workshop), with those from VMS and aerial/navy sightings data collected on behalf of the MFA.

The workshop was split into three groups, and each had to examine three aspects with a discussion facilitator (Mark Gray, Mike Hughes and Sophie des Clers). The groups examined the revised questionnaire in detail and suggested clarification or changes regarding a) Fishing activity and ecological data and b) Social and Economics data and also c) discussed data collection, database and GIS issues.

The presentations and group discussions helped develop a common understanding of the revised FisherMap protocol and identified ways to address referees suggestions about data collection and data validation to develop FisherMap further. However, participants from Defra then argued that the revised protocol should also allow the new MCZ projects to take the opportunity to collect social and economic information needed to undertake a formal impact assessment (IA) of their proposed network (on the fishing industry and other stakeholders).

The workshop concluded that:

• Defra/Cefas needed to identify in more detail the potential for official data that could be used by the revised FisherMap to validate individual and/or fleet activity data;

• Defra and related agencies would provide precisions regarding what information were needed to conduct an Impact Assessment (IA) that could be included in the questionnaire;

• Defra, the nature conservation agencies and Seafish (for fishing-related data) agreed to examine the question of data ownership and custody beyond the life of the MCZ projects.

In the light of the day's discussions the FisherMap questionnaire was discussed between the MCZ projects in more depth, and each provided feedback and suggestions for another questionnaire revision. The data validation and the IA data questions were examined during two further meetings.

2.2   *Data validation meeting - 13 November 2009*

The meeting, hosted by Defra, was organised by Hannah Thomas (MCZ Planner Balanced Seas, see Table 3 for the list of participants). It aimed to share a better understanding of the ongoing Defra-funded Cefas project led by Koen Vanstaen, with respect to sources of official fisheries statistics that could be used for cross-reference and validation purposes.

The Cefas project is a follow up from a number of mapping projects (see for example Eastwood et al. 2006, Mills et al 2007) bringing together fisheries monitoring and surveillance data collected at local (SFC, landings and RBS) and national (VMS) levels. A first report is due in the spring 2010. Fishing activity maps are produced from an extrapolation of SFC surveillance activity and sightings, VMS records, landings and Registered Buyers and Sellers (RBS) statistics.

Key differences in spatial and temporal scales make FisherMap and Cefas/MFA data difficult to compare directly, although there is some degree of spatial overlap that may allow cross validation.

The MFA data is coarse in its spatial resolution (ICES rectangle, 30' latitude and 1° longitude are approximately 30 nautical miles square) but precise in time to the day and comprehensive in terms of vessel coverage. The SFC data, for those with GIS capability like Sussex, has a finer spatial definition (1km^2), but only in the 6nm coastal waters. By contrast, FisherMap is as precisely geo-referenced as the interviewee can indicate of the chart used, but refers to "the past 5 years". Therefore, FisherMap stakeholder data and fisheries managers' statistics mostly complement more than overlap each other.

FisherMap may also help plug some gaps identified by Cefas in the fisheries data, notably for vessels less than 15m LOA operating beyond 6nm, and for vessels operating fixed gear, for which time at sea and sailing speed give little indication of fishing effort. Another gap concerns the fishing grounds of foreign vessels operating between 6 and 200nm in UK waters.

2.3 *FisherMap and Impacts Assessment Scoping Meeting - 17 November 2009*

The meeting was organised and chaired by Natural England (NE) and hosted by Defra (see Table 4 for the list of participants).

Defra's and NE's environmental economists clarified what was expected of the Impact Assessment (IA), and action points were agreed for MCZ to join up forces through an IA forum, and to clarify the roles of the MCZ Stakeholder Group and Advisory Panel, and for the soon-to-be-recruited MCZ project economists in the IA process and delivery.

Simon Maxwell presented a Defra-funded project examining the Social Impact of Fishing[1], under the SAIF (Sustainable Access to Inshore Fisheries) initiative, which will report in 2010. Kirsty Inglis referred to the IA undertaken for transposition of the Marine Strategy Framework Directive (MSFD[2]) for the bare minimum that the MCZs should be aiming for; to the Marine Bill IA[3] with regard to the level of information needed to justify the sites in terms of environmental benefits, and to the ABPmer Ltd. (2009) report on the Development of spatial information layers for commercial fishing and shellfishing in UK waters to support strategic siting of offshore windfarms. Sophie des Clers circulated electronic copies of the latest European Commission Impact Assessment Guidelines (EC, 2009) as well as a recent example of a Seafish Economic Impact Assessment (Seafish, 2009a).

The discussions identified possible social and economic questions that could be answered using MFA data, and other questions that may be included in FisherMap or at Validation Meetings.

Robbie Fisher, NE liaison for the MCZ projects, wrote and circulated minutes with a number of Actions aimed at progressing a common understanding of the IA process at all level and key stages of the MCZ networks identification calendar.

3 Revised FisherMap

3.1 Introduction

The questionnaire was initially revised for this project in response to the FisherMap review led by Seafish at the beginning of 2009. The need for additional data collection to support the IA led to multiple revisions of the questionnaire between October and December 2009, when a final version was sent for another round of peer review.

The reviewers felt that most of the suggestions provided during the initial referee process had been included.

The revision process led to a number of in-depth workshops and discussions with government agencies, and to a large amount of work by the MCZ regional projects working together. The potential for FisherMap to collect information to underpin the MCZ networks Impact Assessment reinforced the need to include social and economic questions that was identified by some referees. However, it was decided to leave out questions linked to the potential impacts of closures and examine these aspects at a later stage in focus group meetings, once potential MCZ areas had been identified. Similarly, the collection of Ecological Knowledge (old Table 6) has been taken out of the questionnaire and is now left to focus groups.

3.2 Questionnaire

The major changes in the revised FisherMap were made as a result of the initial review that led to the inclusion of relative economic value (in % gross earnings) for each polygon describing a specific gear-fishery combination (new Tables 3 and 5).

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[1] http://randd.defra.gov.uk/Default.aspx?Menu=Menu&Module=More&Location=None&Completed=0&ProjectID=16798

[2] http://www.defra.gov.uk/corporate/consult/msfd-legal-framework/impact-assessment.pdf

[3] http://www.ialibrary.berr.gov.uk/ImpactAssessment/?IAID=845ddb4a38ac445f9c9d1592b4d32483

The new questionnaire tables (Annex 2) have all changed to some extent. Some additional information are collected, and questions that Finding Sanctuary had found superfluous (e.g. about Ices rectangles and distances, old Table 4) or overly detailed (e.g. gear description old Table 3) were left out or simplified. The gear-fishery combination in the new Table 4 aims to provide a multi-species image easier to link to landing records, vessel characteristics and fleet segments.

The second round of referees' comments and the Training Workshop also led to minor clarifications of the questionnaire and to a final revision of the gear classification.

3.3 Fishing gear and species

The four MCZ regional projects compiled a common Gear classification (Table 7). The list is much simpler than the detailed description obtained by Finding Sanctuary using the first FisherMap open questions (old Table 3). The final compilation was done by Spike Searle (Finding Sanctuary) and Jules Martin (Balanced Seas) and brings together gear tables used by MFA, Cefas and Sussex SFC and CCW (see Hall et al, 2008), with inputs from the four MCZ regional projects liaison officers.

The list of species (provided on the CD version of the report) with the English name, Latin name and three-letter code is an extract of the FAO species list[4] used by the MFA.

3.4 Interviewing and mapping

The FisherMap protocol relies on individual interviews and mapping of the interviewee's fishing grounds, followed by group validation sessions of summary maps, by area and gear type.

Individual interviews

The individual interview part of the protocol has changed little, and some interview practice was given during the Training Workshop (see below), using paper questionnaires and charts overlaid with acetates.

Balanced Seas is developing a new field protocol to collect both questionnaire and mapping data directly on laptops. The capacity to call up numerous maps and scales should enhance the mapping capacity of fishing grounds for vessels that fish in several MCZ regional project areas, for example, but will undoubtedly also bring new challenges.

Focus group Validation meetings

There was little time to discuss validation meetings during the FisherMap revision process, but their role will become and their format will have to be adapted to discuss questions dealing with

1) Sharing and collecting the fishermen's local expert knowledge of, for example, the location of features targeted by conservation objectives, sensitive species, essential fish habitats and local environmental change, and
2) Aspects linked to the effects (positive and negative) of proposed MCZ network and management regime.

The new format will need careful consideration and planning, and the briefing of local fishermen about:

- The synthesis of individual fishing grounds into group fishing activity and intensity maps,
- The local conservation objectives and description of features in need of protection,
- The choice of MCZ areas and possible networks, and
- The estimation of local positive and negative impacts of each MCZ area.

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[4] http://www.fao.org/fishery/collection/asfis/en

3.5   Data collection, GIS and databases

The first revision Workshop held in October 2009 (see 2.1) provided an opportunity for the MCZ regional projects and other participants to propose further revisions to the questionnaire and its delivery. In the afternoon, Mike Hughes (ENSIS consultant to Seafish) facilitated a session on the interview process, use of maps, and technology for data capture and the post-processing of data collected from the field.

Much of the discussion concerned the work already done by Finding Sanctuary and problems encountered with the methodology (see Annex 3). Alternative methods for data collection were discussed and the potential for using laptops during interviews to save time. However, the use of paper maps over digital versions was generally preferred.

All regional projects are working closely and in a consistent manner to undertake data collection. This includes using the same questionnaire. Apart from the original questionnaire for commercial fishermen, additional questionnaires have been designed for 5 other target groups – diver, angler, chart boat operator, wildlife enthusiast, and watersports.

All groups take measures to ensure confidentiality and anonymity. There are slight differences between groups with regard to the actual interview process and data handling. Generally, data are collected on paper and acetate and entered digitally afterwards. One group (BS) collects data digitally directly at time of interview.

ArcGIS and/or MS Access (Personal Geodatabase) are the software of choice. There is a common database scheme across projects, although only two projects are explicitly using the same methodology (FS and NG), all projects are willing to share code, database schemas etc.

Generally, interviews take 1-2 hrs with another 1-2 hrs post-processing (digitising, data entry). MCZ regional projects have between 3 and 6 liaison officers (carrying out interviews) and between 1 and 3 GIS/Data officers. Prior training for liaison officers has ranged from virtually none (already experienced fishermen and familiar with process) to several days.

The regional projects have a three weekly GIS teleconference on a Monday afternoon. They indicated that they will be happy to share and discuss their methodology with any other UK regional project during one of these or separately (see contact names in Table 6).

The four MCZ regional projects currently involved in the interview process have responded to a brief questionnaire regarding their use of the final methodology. Their responses (as of February 2010) are summarised in Annex 4.

4   Training Workshop – 5 January 2010

At the demand of the MCZ regional projects, the training Workshop was condensed into a single day and organised at the beginning of January when they expected to have finalised their changes to the new questionnaire.

Seventeen participants took part in the workshop (see List in Table 5). Three GIS/Database officers organised a parallel meetings to discuss the coordination of their software development and progress of the laptop-based field data collection led by Greg Vaughan from Balanced Seas. Jill Goddard and Rebekah Rochester, from the Thames Estuary Partnership[5] - a coastal partnership based at UCL - convened and helped facilitate the workshop. Most participants (14/17) came from the MCZ projects (12 Liaison Officers and 2 MPA planners). Sophie Elliott, the newly recruited Liaison officer for JNCC Offshore MCZs and two PhD students from Bangor University also took part.

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[5] www.thamesweb.com

Most participants arrived the previous afternoon when they organised a discussion meeting. They were briefed regarding the Training day's format and given a copy of the final questionnaire to prepare for the following day. All participants and organisers had supper together to break the ice, which greatly helped ensure an early start given the snowy weather and transport disruptions on the day.

4.1   Training activities

The workshop aimed for Liaison Officers from the three MCZ regional projects to fully understand the questionnaire and become familiar with the process used to conduct successful interviews and obtain meaningful questionnaire and map information. Three ex-fishermen, Dave Murphy (FS), Ian Rowe (NG) and Jules Martin (BS) helped those not familiar with fishing activities understand the questions.

Participants were split into three groups for the day, making sure to split Liaison Officers from each regional projects and at least one experienced fisherman into each group. Each group was seated around a table in three separate locations and the three facilitators (Jill Goddard, Rebekah Rochester and Sophie des Clers) changed groups after each session to gain an overview of the participants' needs and questions.

The day was organised as a series of five interview practice sessions, with reporting back before the lunch and in the afternoon. Each session dealt with one or two of the new Tables 2 to 5.

The interview practice was restricted to the Liaison Officers, who had to take the role of the interviewer or that of an interviewed fisherman for six minutes at a time. All those around the table could take notes and ask questions. The next interviewer could start asking a previous question again or move on to the next question in the same Table. Before each 6' practice interview, the fisherman impersonator was handed a card indicating one of four stereotypes (very chatty, in a hurry, irate, helpful and kind) to be used for the interview. The interviewers took note of the answers and difficulties they met, which were discussed and summarised by the group at the end of each session.

The summarised comments, suggestions or problems by all three groups were shared in plenary before lunch and in the afternoon. The facilitators also commented on difficulties linked to specific question or questionnaire feature.

The interview sessions held by the three groups in parallel were run speedily to give Liaison Officers as much interview practice as possible. The lunch break was only 30' to make up for a possible early finish as snow was falling heavily and most participants had long train journeys home. The participants were asked to fill in a feedback form before leaving. The day started at 9 am and finished at 4pm, although some participants stayed on for chats.

4.2   Organisers feedback

Apart from three 'outsiders' (one from JNCC and the two PhD students from Bangor), all participants came from the MCZ regional projects. Most had either worked together or met before. They worked well as a group and were very keen the day.

Unfortunately, the questionnaire was not entirely finalised. Some changes and a valuable explanation of the questions and expected answers put together by the MCZ teams were only available on the day. Thus the Liaison Officers did not have time to prepare for the workshop. In addition to the frantic workload of all three new MCZ regional projects, this problem was also linked to the Workshop date being so soon after the Christmas and New Year holidays.

As a result, time was taken by discussions about the content of the questionnaire and the meaning of the questions in nearly all sessions. The discussions led to useful last minute changes but also wasted training time.

Another problem came for the heterogeneous amount of prior knowledge of commercial fishing among the Liaison Officers. Some had no knowledge at all of fishing gear, fisheries species and the combination of both. The organiser and ex-fishermen present felt this lessened the credibility of the interview process itself.

Overall, the day made it possible to finalise the questionnaire, explain the gear and species list, and demonstrated some of the difficulties linked to interviewing skippers who have to run a business and have limited time. It also made it evident for all present that the questions were highly technical and that they and some of the commonly expected answers needed to be well understood and fully rehearsed in order to conduct successful interviews. From the organisers' points of view, the day delivered awareness and training to the MCZ regional projects.

4.3   *Participants feedback*

Seventeen participants gave feedback and all said that the Seafish FisherMap training day had been useful to them.

The participants liked the role-play sessions, but there was a general feeling that training had been limited due to the fact that more revisions were discussed for the questionnaire.

All participants felt that the balance between information delivery, debate and networking was about right and the role-play useful, although three were questioning whether it reflected the responses of real fishermen. In terms of future training needs, four participants felt they needed more practice with ex-fishermen on gear types and species, and on potential conflict resolution, and most thought they could obtain such training and practice runs from their team with the help of ex-fishermen Liaison Officers.

Generally, the response to the training event was very good.

5   Conclusions

The revised FisherMap makes it possible to ask fishermen to map out their fishing ground in terms of percentage contribution to their livelihood. This addresses a key limitation noted with the original version, which did not have a common currency to describe the importance of grounds and target species across fisheries, vessel sizes and gear types.

The revised version also brings a simplification to the description of fishing gear, which is now in line with the system used by MFA and other agencies. This will make it simpler to bring together and compare various sources of data that describe fishing activities.

However, just as the original version, the revised FisherMap protocol provides data that cannot be directly validated with official landings or surveillance statistics. The temporal scale - an average over five years - and the fine description of the spatial scale of fishing grounds provide a different type of data, unique and much richer, that are directly useful to fishermen and marine spatial planners alike. An in-depth discussion of the cross-validation of different data sources by Cefas has also shown that for vessels under-15m fishing beyond 6 nautical miles FisherMap is currently the only source of information.

Once fishing grounds are recorded and their features understood, once biodiversity and habitat features in need of protection are defined and the needs of industrial developments at sea are mapped out, the challenge of planning an integrated and sustainable development at sea can be fully addressed. In particular, the participatory planning and management of our coastal ecosystems will have the means to take into account and build upon the livelihoods of communities that form an integral part of these ecosystems.

Seafish has brought its specialist knowledge and expertise to the revision of FisherMap. The MCZ regional projects contributed significant time and effort to the new protocol, and this timely revision

made sure that, despite their very tight time constraints, the new MCZ regional projects could use the best protocol available. This project also provided the new Liaison Officers with an awareness of commercial fishing and some basic interview training.

Seafish may also be able to provide other support for the regional MCZ projects to better understand the complexity of commercial fishing operations. In particular, the training Workshop showed that the new regional projects would immediately benefit from receiving electronic copies of the Seafish Species guides and Basic Fishing Methods Handbook.
The MCZ regional projects will also need expert advice with regards to their sampling strategy of fishing vessels in their region, to ensure that the numbers interviewed are adequate and provide a comprehensive image of the extent and types of fishing activities by fleet segments and communities along the coast.

Another important aspect concerns the collection and analysis of actual costs and earnings data that Seafish has published and developed over the years. The recent annual Seafish Economic Surveys provide benchmark data that all four regional MCZ projects will need to use in order to compile summary maps of fishing activities across fleet segments by sea area and project region. Data from the 2007 survey (Seafish, 2009b) in particular will be essential to obtain a better understanding of the economics of coastal vessels.

Finally, it will also be important for Seafish to provide advice to the fishing industry regarding the Economic Impact Assessment of the proposed MCZ networks and ensure that the economists recruited by the four MCZ regional projects have a well-documented understanding of fishing fleet economics in their region.

6   Glossary

BS   Balanced Seas – MCZ project for South-east England

Cefas   Centre for Environment, Fisheries and Aquaculture Science (CEFAS)

CCW   Countryside Council for Wales

Defra   Department for Environment, Food and Rural Affairs

FS   Finding Sanctuary – MCZ project for (South-west England)

IA   Impact Assessment

ICES   International Council for the Exploration of the Sea http://www.ices.dk/

ISCZ   Irish Sea Conservation Zone – MCZ project for the Irish Sea

JNCC   Joint Nature Conservation Committee

LO   Liaison Officer

LOA   Length overall

MCZ   Marine Conservation Zone

MSFD Marine Strategy Framework Directive

MPA   Marine Protected Area

NE   Natural England

NFFO National Federation of Fishermen's Organisations

NG   Net Gain – MCZ project for North-east England

PLN   Vessel's port letters and numbers (specific to homeport)

RSS   Registry of Shipping & Seamen (unique permanent vessel registration)

SAIF   Sustainable Access to Inshore Fisheries, Defra-funded programme

SFC   Sea Fisheries Committee

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Annex 1 - Tables

Table 1 Participants list - FisherMap revision Workshop Defra 15 October 2009

Institution	Participants
Seafish	Mark Gray
Defra - Defra Marine - MSE	Caron Montgomery, Jo Myers, Leila Fonseca
Defra - Natural Environment Economics	Zish Jawaid (pm)
NFFO	Dale Rodmell
Scottish Marine Lab.	Philip Boulcott
Cefas	Koen Vanstaen
Salacia-Marine (Shellfish questionnaire and maps)	Andy Woolmer
MCZ Irish Sea Conservation Zones	Greg Whitfield
MCZ Net Gains	Joanna Redhead (am), Ian Rowe
MCZ Balanced Seas	Sue Wells, Hannah Thomas, Greg Vaughan, Amy Pryor
MCZ SW Finding Sanctuary	Shaun Lewin, Spike Searle
Natural England	Mark Duffy, Chris Davis (am)
JNCC	Annabelle Aish
CCW	Clare Eno
Sussex Sea Fisheries Committee	Rob Clark
ENSIS facilitator /Database and GIS	Mike Hughes
ENSIS/UCL Organiser, facilitator for Seafish	Sophie des Clers

Table 2 Ecotrust OceanMap Survey sample questions (Scholtz et al, 2008)

Table 3 Participants list - Data Validation meeting Defra 13 November 2009

Institution	Participants
Defra - Natural Environment Economics	Zish Jawaid (pm)
Cefas	Koen Vanstaen
MCZ Balanced Seas	Hannah Thomas
MCZ Net Gains	Chiara Polce, Ian Rowe
MCZ SW Finding Sanctuary	Shaun Lewin
ENSIS/UCL for Seafish	Sophie des Clers

Table 4 Participants list - Impact Assessment meeting Defra 17 November 2009

Institution	Participants
Natural England	Mark Duffy (chair), Robbie Fisher and Rebecca Clark (by phone)
Defra - Natural Environment Economics	Kirsty Inglis and Zish Jawaid, Simon Maxwell (Defra – pm)
MFA	Kevin Williamson (pm)
MCZ Balanced Seas	Hannah Thomas
MCZ Irish Sea Conservation Zones	Greg Whitfield
MCZ Net Gains	Chiara Polce, Ian Rowe
MCZ SW Finding Sanctuary	Shaun Lewin
ENSIS/UCL for Seafish	Sophie des Clers

Table 5 Participants list - Training Workshop UCL 5 January 2010

Liaison Officers Institution	Participants
MCZ Balanced Seas	Jules Martin (ex-fisherman), Amy Pryor and Kate Mills; MCZ Planner Hannah Thomas,
MCZ Irish Sea Conservation Zones	Laura Bates, Holly Deary, Emily Hardman
MCZ Net Gains	Ian Rowe (senior liaison officer, ex-fisherman), Peter Hansell, Tammy Stamford, Dan Davis, Rebecca Radford; MCZ Planner Chiara Polce
MCZ SW Finding Sanctuary	David Murphy (ex-fisherman)
JNCC	Offshore MPA liaison Officer Sophie Elliott
Bangor University PhD students	Maria Hadjimichael and Ana Ruiz
Thames Estuary Partnership (www.thamesweb.com)	Jill Goddard and Rebekah Rochester
ENSIS/UCL Organiser, facilitator for Seafish	Sophie des Clers
Parallel meeting of GIS/Database Officers	Greg Vaughan - Balanced Seas Kieran Bell - Irish Sea MCZ Shaun Lewin - Finding Sanctuary

Table 6 MCZ regional projects GIS and Database specialists

Key	Contact
BS – Balanced Seas (SE)	Greg Vaughan, GIS Officer G.Vaughan@kent.ac.uk
FS – Finding Sanctuary (SW)	Shaun Lewin, GIS and Data Specialist
ISCZ – Irish Sea Conservation Zone	Kieran Bell, GIS Data Officer
NG – Net Gain (NE)	Chiara Polce, MCZ Planner

Table 7 Fishing gear classification (Feb. 2010)

Class	Gear	Parameter 1	Parameter 2
Bottom gear	Pair trawl	Rockhopper/clean/fine	
Bottom gear	Beam trawl	total beam length (m)	Chain mat/open gear
Bottom gear	Trawls	rig number	rockhopper/clean/fine
Bottom gear	Bottom Seine	Danish/Scottish/Pair	rockhopper/clean/fine
Bottom gear	Beach Seine	net length (m)	
Midwater trawls	Midwater trawl	mouth dimensions (m)	
Midwater trawls	Midwater pair trawl	mouth dimensions (m)	
Midwater trawls	Midwater Seine	Purse/ring net	net length
Nets	Drift net	total length of nets (m)	
Nets	Gill net	trammel/ tangle (no floats)/unspecified	total length of nets (m)
Nets	Shank net	total number of nets	
Nets	fixed net	hoop net/stake net/ fyke net	total number of nets
Pots and traps	Pots	inkwell/parlour/mixed/whelk pot	number of pots
Pots and traps	Traps	fish trap/cuttlefish trap	number of traps
Lines	Longline	drift/static	total number of hooks
Lines	Other lines	handline (inc Gurdy)/Rod and Line/trolling	total number of hooks
Dredges	Towed dredges	total number of towed dredges	
Dredges	Dredges	Suction/power/unspecified	
Hand	Picking	Surface/submerged	
Hand	Hand dredging		
Hand	Hand pushed nets		

Key	Parameter type	Example
parameter	A number	Beam trawl. Beam length = 4 metres
parameter	Choose option from list	Beam trawl. Open gear

Annex 2 - Revised FisherMap questionnaire

General Introduction – Liaison Officers to explain the concept of FisherMap and the MCZ project in the region, and invite interviewee to ask questions.

Informed consent. Personal identification details gathered during this project will only be accessible to the MCZ project staff, treated as confidential and securely stored. Please answer each statement concerning the collection and use of the data.	Yes	No
I understand the purpose of this project and have had my questions about FisherMap and the MCZ project answered satisfactorily.		
I agree for the information I provide to be used and combined anonymously with others for the purposes of the MCZ project. Analyses of this data will be used for the purposes of marine conservation zone planning and will be published in a range of media.		
I give the MCZ Project permission to share my data with researchers as part of a collection of anonymous records.		
I have the right to request the removal or correction of my data at any time. I fully understand that it will be impossible to isolate my contribution from any combined datasets.		
I would like to be given appropriate notice of any information review sessions that place – these review sessions may take the form of validation workshops or maps being made available for comment (either in an electronic or printed format).		
I would like my name acknowledged in the report and on the project web site (without linking it to content).		
I agree for my anonymous data to be transferred to an appropriate custodian and to be used by other researchers after the end of the MCZ projects.		
I agree for my name and contact details to be kept on your databases until the end of the MCZ project, at which point they will be erased.		
I would like to be kept informed about the MCZ project by e-mail.		
Name (printed) _____ Signature _____- _____		

FisherMap Participatory Mapping Questionnaire		Interview Date	D	D	M	M	Y	Y	FV anon. code	Ini	0	0	0

Table 1 to be printed at the back of the Consent Form and to be kept separate from rest of paper and electronic data files

Table 1. Contact details (data verification and your future data queries)	Gender: (circle) M F
1. Name:	
2. Address:	
3. Postcode:	4. Email:
5a. Tel (home):	5b. Mobile:

Table 2. Individual details			Notes
1. Are you a... Vessel Owner? (circle) Y N Skipper? (circle) Y N Other (specify)?			
2. Years fishing in local area	3. Age (or age decade)	4. Fisheries Producers Organisation (if any):	
5. Does fishing make up your entire income? Y N	6. If No, what % of time do you spend fishing?		
7. What other work makes up the rest of your income?			
8. Fishermen's Association	Secretary 's name	mobile N°	

Table 3. Fishing Vessel (if interviewee has more than one vessel, complete additional protocol sheets). Non-fishing vessels should be recorded in alternative protocols.

1. Vessel Name:	2. PLN [L] [L] [N] [N] [N] [N] 3. PLN changed in last 5 years?: Y N

4. Years fishing with this vessel?:	5. Vessel length (m):	6. Engine Power (kW):	7. VCU:	8. Year built:

9. Home port (port where the vessel is based):	10. Main landing port(s):

11. Number of crew, <u>including skipper</u>:   If crew is permanent, write TOTAL Nb _____   If crew no. varies, write MIN Nb:_____ and MAX Nb:

12. In a normal year, what proportion of the vessel's annual gross earnings comes from fishing?   _____%   *(please <u>note</u> earnings % here, not activity)*

13. What other commercial activities does this vessel do?

14. How many years have you been fishing roughly the same grounds you are currently fishing?

15. Over the last 5 years, what has the average annual gross vessel earnings been?   £_____   (or gross earnings to the nearest 10k)

16. Over the last 5 years, what were the approximate MIN   £_____ and MAX   £_____   annual gross earnings?

Table 4. Gear type and species combination codes (fill in as many as necessary)				
Code	**Gear Type**	**parameter 1**	**parameter 2**	**Main Fishery (List main target species, using Cefas name and code)**
A				
B				
C				
D				
E				
F				
G				
H				
I				

NOTES:

→ MAP FISHING GROUNDS onto charts with associated information recorded in Table 5.

Table 5. Economic importance by Fishing Gear and Species with seasonality (fishing grounds <u>current/last 5 years</u> with each polygon as a separate area)

Poly no.	Gear Code (Tbl 4)	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	% of annual vessel earnings	Notes
		span: *Indicate the season fished per polygon*													
1	A													65	
2	A													35	
Check this adds up to 100% →															

If some grounds are outside of the Regional Project area, establish:	ICES rectangles for any grounds outside regional project area:
	Over last 5 years, what proportion of the vessel's annual gross earnings has come from outside of the area? _____%

Table 6. Are there areas you think should be protected in any way? (permanently or seasonally, or for particular activities)		
Description and potential benefits (see table below)	Polygon No. (cont from T5)	Polygon colour

Table 7. Do you have any comments or suggestions for the MCZ project?

Table 8. Additional / anecdotal information to be recorded freely by the interviewer

Annex 3 - Data collection, GIS and databases - Workshop 15th October 2009

Summary of the discussion and comments received during breakout group discussions regarding database and GIS issues.

Data collection and technology

The FisherMap method (paper questionnaires and paper maps with acetates) is acknowledged to have worked well. Some comments on the FisherMap methodology:

- Finding Sanctuary was assisted by some volunteer work for data entry and digitising.
- An estimated time for each interview (including preliminary research in port, interview and data processing) was hard to pin down but seems to be about 1 interview per day.
- The interviewer must carry a full folio of charts and all available scales for the region and this can be very large and heavy (60 sheets for South West).
- Data entry into MS Access and digitising of overlays can take a long time.
- Each group is limited (to varying extents) by resources (people, time and money), any change in the process that can save time (and thus increase time available to interview fishermen) is welcomed.
- Most people talked about 'streamlining' the process as much as possible.
- A high quality A0 or A1 plotter is required for printing charts, or access to a commercial printing service

Several alternative data collection methods were proposed and discussed.

1) PDA for questionnaire / paper maps & acetates
   - PDA was not discussed much but could be useful for questionnaire data collection, very portable, however an application would need to be built to do this
   - Still requires papers maps and acetates as too small for maps

2) Laptop for questionnaire / laptop for maps / paper maps as backup
   - some people thought that a laptop was a bit of a barrier between interviewer and interviewee and that using a mouse to digitise fishing areas directly onto digital versions of charts might be a challenge for some
   - however others pointed out that most fishermen these days are very familiar with laptops and using a mouse, as they mostly use some kind of navigation software already
   - main advantages are being able to store all charts digitally, flexible scale selection, fishing area data are stored directly is GIS-ready format
   - downside is that interviewer would need some skills in ArcGIS for editing and creating vector files … e.g. what to do if fisherman wants to re-do a polygon or make an edit, a customised interface or tool could make the process easier
   - fishing areas outside the area could be captured if necessary and then easily clipped out of the GIS for handover to other group
   - the laptop should have the biggest screen available and be loaded with all possible charts
   - a few smaller-scale maps (covering larger areas) could be carried for use as orientation maps and general scene-setting
   - laptop process must be slick and well-rehearsed, time spent 'fiddling' about getting it working while a fisherman waits is to be avoided

3) As 2) but replace laptop with tablet PC
   - tablet PC allows use as normal laptop and turning into flat tablet with touch-screen and special pen
   - screen size might be too small

- ◦ tablet PC more expensive than standard laptop
4) Laptop for questionnaire / Adapx Pen and specially printed paper maps
- ◦ the Adapx pen is a digital device which digitises as it goes on special paper, is used alongside Capturx for ArcGIS for data integration, and can also be used to fill in attribute data by checking pre-printed boxes (thus negating some questionnaire data input)
- ◦ technology is untried let alone tested, GIS officers are attending a 1 day workshop by ESRI in Warrington 30th October to evaluate
- ◦ seems like a very attractive idea but still the interviewer would need to carry around a folio of maps and a laptop for questionnaire entry
- ◦ not clear whether pen also writes on the paper too – does it write on acetate? Can writing be turned off?
- ◦ The fishermen like to be able to see the areas they've drawn for one fishery alongside others, can this be done with this method?
- ◦ www.adapx.com
- ◦ Adapx equipment is expensive, £3.5K for software & pen?

There was some discussion around whether the protocol should dictate which methodology was used or whether a degree of flexibility should be allowed to each group? If different groups use different methods there was some concern about combining data for all groups (although no-one said why this might be necessary). Generally it was felt best for the protocol to recommend a preferred approach.

Raises the question of whether the outcome (maps in this case) is independent of approach used – probably not is the consensus. Also mooted was the idea that one approach might suit a certain fishery / gear-type better than another (e.g. potters vs. trawlers have very different modes of operation, the former suited to detailed digital maps, the latter to small-scale paper maps perhaps), however it is not really realistic to suggest an interviewer uses multiple approaches within his area, just too complicated.

CCW reported that the use of professional contractors for data entry and digitising could save time and money due to economies of scale. They had hand-annotated charts digitally scanned and automatically digitised by a company in Northern Ireland.

There were also some comments regarding data security and concerns about a laptop crashing or falling overboard and subsequent loss of data. However, the same mishaps could befall a stack of paper questionnaires and acetates so this is not a real concern. Also data protection and auditing – electronic versions of data provide just as robust an audit trail as paper versions, if not more so.

Note that some groups reported that laptops had already been ordered for their liaison officers. These are unlikely to be suitable for use as mapping tools since they will likely have smallish screens.

Annex 4 - Feb. 2010 Survey of MCZ regional projects data collection methods

Q1	Has data collection started in your region? If so, give start date, projected number of interviews and estimated time required per interview.
BS	Feb 2010, 30 mins-2 hrs per interview
FS	Oct 2007, 150 interviews completed, another 50-70 to go (maybe more), mostly commercial
ISCZ	Nov 2009, 20 done so far (mostly divers, a few commercial)
NG	Feb 2010, aim to reach 50-75% of each 'sector' population

Q2	Summarise the data collection methodology being used by your region - please include any technical notes on equipment used.
BS	Laptops used at interviews to collect responses (both spatial and textual) from interviewees.
FS	Acetates, pens and paper questionnaires. Interviewees carry out mapping under supervision. Maps at different scales are provided.
ISCZ	Primary data collection by interview, secondary collection by phone. Maps used are nautical chart replicas using OS data and SeaZone at 4 different scales (1:1,500,000, 1:500,000, 1:50,000 and 1:10,000). Maps are overlain with acetates (control points marked) and interviewee marks them up under supervision.
NG	Acetates, pens and paper questionnaires. Interviewees carry out mapping under supervision. Maps at different scales are provided.

Q3	How are map data and interview responses being captured electronically? What specialist staff do you have for this purpose?
BS	Data are entered directly into a custom-built ArcGIS application during interview.
FS	Map data (from acetates) are digitised on A2 tablet by trained temps. Interview data entered in MS Access database by interviewer / temps. Data management QA managed by GIS team.
ISCZ	Acetates are digitised (TabletWorks) into a Personal Geodatabase (ArcGIS/MS Access). Questionnaire data are also added to tables in database. Digitising carried out by one person but training up others to do this.
NG	Acetates digitised into ArcGIS and data stored in MS Access as per FS group. 2 GIS officers (1 FT, 1 temp) and 1 MCZ Planner.

Q4	Roughly, how much additional time per interview (other than the actual interview itself) is required for data entry, digitising?
BS	0, all done during interview
FS	1-2 hrs
ISCZ	1-2 hrs
NG	Not known yet

Q5	Please give data sources for paper charts and digital chart data. Also, some idea of costs would be helpful.
BS	SeaZone and some OS
FS	SeaZone HydroSpatial under JNCC licence, (formerly costs were in region of £70K)
ISCZ	SeaZone under JNCC licence (£10-15K?), and OS
NG	SeaZone HydroSpatial under JNCC licence, OS Boundary Line (mean high water)

Q6	How many interviewers have you got? What kind/amount of training did they get before interviewing for real?
BS	3 FT, 2 PT. 3 days training plus informal discussions
FS	2 (ex-fishermen), 1 (other). Training consisted of informal discussions about questionnaire, one interviewer had been interviewed when he was a Beam trawler captain so knew the process.
ISCZ	3 liaison officers, each had 1-2 days formal training. Liaison officers had been involved in original questionnaire design so knew the process well.
NG	5 liaison officers, 1 senior liaison officer. Training by senior LO where necessary, 1 day interview training (UCL), other training on request (e.g. sea survival, MS Office, risk assessment)