

UK National Data Collection Programmes under Council Regulation (EC) 199/2008, Commission Regulation (EC) 665/2008 and Commission Decision 2010/93/EU for the Collection, Management and use of data in the fisheries sector and support for scientific advice regarding the Common Fisheries Policy in 2011, 2012 and 2013

Revision for year 2013

Compiled by:

Marine Management Organisation, England

Agri-Food and Biosciences Institute, Northern Ireland

Marine Laboratory, Marine Scotland, Scotland

Centre for Fisheries, Environment and Aquaculture Science, England

Summary of changes to the UK National Programme for 2013

III.C Biological - metier-related variables

III.C. 1 Data acquisition

(b) Selection of metiers to sample

Clarification of the approach taken to sampling with regard to developments towards statistically sound sampling schemes: in particular the shift away from quota sampling of individual or merged metiers and towards the current probability based on sampling of a 'basket' of different metiers.

(c) Type of data collection

Scotland

- Sampling effort in 2013 will be maintained at the 'reduced' 2012 level (as accepted by STECF and the Commission).
- MSS will not carry out any pelagic observer trips in 2013 (as in 2012).
- 2013 to reflect the reduced demersal sampling effort that, initially seen in 2012. (as accepted by STECF and the Commission).

England & Wales

1. *Frame population for sea-based sampling &*
2. *Frame population for port sampling*
3. *Frame population for sea-based sampling*
4. *Frame population for port sampling*

Addition of references to approach with regard to probability-based sampling (as for Scotland)

Northern Ireland

- Change to sampling programme to reflect movement of sampling from *at market* to *at sea*.

(d) Target and frame population & Allocation of sampling effort between strata: At-sea sampling

- Addition of references to approach with regard to probability-based sampling (as for Scotland and England and Wales).

III.C.6 Derogations and non-conformities

Request for a derogation from fleet-based biological sampling for HMD_MOL_000 and DRB_MOL_0_0_0 (non scallop targeted).

Summary of agreements reached during RCM NS&EA on the need to sample métiers on-board for discards estimation

ANNEX 11

Working Document on discard rates from dredge fisheries (HMD_MOL_000 and DRB_MOL_000) from UK (E) data for RCM NS&EA 2012 (Ostend, Belgium) and RCM NA 2012 (Galway, Ireland). - **New**

III.D Biological - Recreational fisheries

North Sea (IV&VIId), Eastern Arctic (I&II), North Atlantic (V-XIV and NAFO areas)

Clarification of regional sampling schemes for recreational fisheries.

III.D.1 Data acquisition

Information on data collection for recreational fisheries in Scotland in 2012 and 2013

III.D.3 Data quality evaluation

Note on extension of survey work and analysis of recreational fisheries data into 2013.

III.D.6 Derogations and non-conformities

Information on situation with respect to sharks, skates and rays and sea bass in Scotland.

III.E Biological – Fully documented fisheries (Catch Quota Trials)

Additional section on fully documented fisheries in support of DCF and CFP objectives.

III.G Research surveys at sea

- *North Sea Herring Acoustic Survey NHAS; Areas IIIa, IV; June, July (Scottish NS Herring Acoustic Survey)*
- *Spawning/Pre spawning Herring acoustic survey; VIa, VIIa-g; July, Sept, Nov, March, Jan (Scottish Spawning/pre-spawning Herring Acoustic Survey)*

Details of survey vessels engaged in surveys.

III.G.2 Modifications in the surveys

- **Cefas Q1 Western Channel and Celtic Sea Multi-Gear Survey (UKQ1WCCSMGS)**
- **III.G.5 Derogations and non conformities**

Observations and conclusions from 39th PLENARY MEETING REPORT OF THE SCIENTIFIC, TECHNICAL AND ECONOMIC COMMITTEE FOR FISHERIES (PLEN-12-01))

IV.A Collection of data concerning aquaculture

IV.A.2 Data acquisition

Details of pilot study to be carried out to determine the feasibility of extending survey data collection to include economic variables.

Additional information on the proposed use of Annual Business Enquiry data for economic information.

VI Module for management and use of the data

2. Sampling data for metier and stock based biological sampling.

Data held on databases: Northern Ireland

Note on increase in available resources for database development.

UK National Correspondent:
Matthew Elliott
Marine Management Organisation

Area 3b, Ergon House,
Horseferry Road,
London SW1P 2AL
United Kingdom
tel: + 44 207 238 4670
fax: + 44 207 238 6750
matt.elliott@marinemangement.org.uk

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NP Proposal sections

I. General framework

This proposal sets out the UK programme for the NP years 2011-2013 to meet the requirements of the Data Collection Framework (DCF) as set out in COUNCIL REGULATION (EC) No 199/2008 of 25 February 2008 concerning the establishment of a Community framework for the collection, management and use of data in the fisheries sector and support for scientific advice regarding the Common Fisheries Policy, and COMMISSION REGULATIONS (EC) No 665/2008 of 14 July 2008 and Commission Decision 2010/93/EU laying down detailed rules for the application of Council Regulation (EC) No 199/2008.

The UK National Programme will be carried out by the UK authorities directly or in conjunction with bodies and agencies within the UK. The UK intends to meet its obligations under this legislation by:

Chapter III Module of Evaluation of the Fishing Sector

- A) *Collection of economic data:* Ensure the collection of required economic data for the fishing sector using vessel registration data obtained by the appropriate authorities on UK registered fishing vessels, landings data held on national fleet activity databases (supplemented by the collection of additional data by MMO, Marine Scotland and AFBI), subcontracting as necessary some survey work to appropriate bodies such as the Sea Fish Industry Authority, and utilising existing official sources of such information from the UK Office for National Statistics (details of the subcontracting to be undertaken are provided in Annex 1);
- B) *Collection of biological variables:* Implementation of appropriate sea-based and land-based sampling schemes by Marine Scotland, CEFAS, MMO and AFBI staff to provide length composition of landings and discards by specified fleet métiers, discards estimates, recreational fishery catches for defined species, and biological data for defined stocks, as required by the DCF, taking account of potential for international collaboration through the RCMs; Planning and carrying out specific data collection exercises related to inshore and marine fisheries related to eels and salmon using Marine Scotland, CEFAS, AFBI and Environment Agency staff.
- C) *Collection of transversal variables.* Collection of data on transversal variables (capacity, effort, landings) of UK fishing vessels landing in the UK and abroad, using staff in MMO, Marine Scotland, AFBI and the corresponding authorities in the Channel Islands and Isle of Man;
- D) *Research surveys at sea.* Planning and carrying out surveys of the abundance of marine fish using Marine Scotland, CEFAS and AFBI staff and research and charter vessels;

Chapter IV Module of evaluation of the economic situation of the aquaculture and the processing industry sectors

Ensure the collection of required economic data for the aquaculture and processing industries, subcontracting as necessary some survey work to appropriate bodies such as the Sea Fish Industry Authority, and utilising existing official sources of such information from the UK Office for National Statistics (details of the subcontracting to be undertaken are provided in Annex 1)

Chapter V Module of evaluation of the effects of the fisheries sector on the marine environment

Collection of vessel VMS and effort data (held on national fleet activity databases), discards data from sea-based sampling schemes, and biological data collected on board research vessel surveys, to allow calculation of indicators of the effects of fishing on the marine environment.

Chapter VI Module for the management and use of data collected under the Data Collection Framework.

- A) *Management of the data.* Maintain existing IT systems and when necessary, develop new systems (such as servers, databases etc.) to enable the data required under the legislation to be stored, maintained and accessed with appropriate security to ensure against improper access; Carrying out data archiving, and quality assurance of data.
- B) *Use of the data.* Production of sets of quality assured data by Marine Scotland, Cefas and AFBI for supporting scientific analysis by ICES and STECF groups as a basis for advice to fisheries management as referred to in Article 18(1)a of Regulation (EC) No 199/2008 including biological parameter estimates (age, weight, sex, maturity and fecundity) for stocks listed in Appendix VII, preparation of sets of data for stock assessments and bio-economic modelling and corresponding scientific analysis.

The UK will collaborate with other Member States in collection of stock-based biological data as agreed by the relevant RCMs (collaborative schemes are in place for VIIa and VIId sole).

Where it has not been possible to define quantitative targets for sampling programmes, in terms of precision or sample size, pilot surveys are proposed to evaluate the importance of the problem and address the utility and cost-effectiveness of future more detailed surveys (as specified in Commission Decision 2010/93(EC) Chapter II B (1)).

The indicative costs of the UK's programme for 2011-13 are:

- EURO -

Year	Planned eligible expenditure	Maximum Community contribution
2011	8,976,539.56	4,488,269.78
2012	8,993,940.32	4,496,970.16
2013	10,749,605.09	5,374,802.55
TOTAL	28,720,084.97	14,360,042.49

II. Organisation of the National Programme

II.A National organisation and co-ordination

The programme is co-ordinated by the Marine and Fisheries Agency under the National Correspondent Matthew Elliott, whose contact details are:

Matthew Elliott
Marine Management Organisation
9 Millbank (Area 8C)
London
SW1P 3JR
United Kingdom
tel: + 44 207 238 4670
fax: + 44 207 238 6750
matt.elliott@marinemangement.org.uk

The following UK fisheries departments / agencies (MMO, Marine Scotland, DARD, and Environment Agency) are responsible for providing fishery transversal variables, and economic data on the aquaculture and processing industries falling within the remit of the devolved UK administrations for England, Wales, Scotland and Northern Ireland:

Marine Management Organisation
Marine Management Organisation
Lancaster House
Hampshire Court
Newcastle upon Tyne
NE4 7YH

tel: +44 300 123 1032
fax: +44 191 376 2681
Email: info@marinemangement.org.uk

Marine Scotland
Pentland House, 47 Robb's Loan, Edinburgh, EH14 1TY, Scotland
Phone: + (44) 8457 741741
website: www.scotland.gov.uk

Department of Agriculture and Rural Development (DARD)
Fisheries Division, Dundonald House, Upper Newtownards Road, Belfast, BT4 3SB, Northern Ireland
Phone 028 9052 4999
Website www.dardni.gov.uk

Science co-ordinators from England and Wales (CEFAS and Environment Agency), Northern Ireland (AFBI) and Scotland (Marine Scotland) are responsible for delivery of UK fishery and survey data collected under the DCF. All three laboratories carry out shore-based and sea-based sampling of UK fleets operating in waters off each country, as well as conducting internationally-coordinated surveys. The Environment

Agency has a role in working with CEFAS in carrying out activities related to eels in river systems in England and Wales. All are involved in the carrying out and participating in international stock assessment Working Groups and other meetings funded by the DCF. Contact details are:

Marine Scotland

Marine Laboratory, PO Box 101, 375 Victoria Road, Aberdeen, Scotland, AB11 9DB.

Phone: +(44) 1224 876544

Fax: +(44) 1224 295511

Website: www.scotland.gov.uk

Centre for Environment, Fisheries and Aquaculture Science (CEFAS)

Pakefield Road, Lowestoft, Suffolk, England, NR33 0HT

Phone: +(44) 1502 562244

Fax: +(44) 1502 513865

Website: www.Cefas.co.uk

Agri-Food and Biosciences Institute (AFBI)

Newforge Lane, Belfast BT9 5PX, Northern Ireland, United Kingdom

Phone: +(44) 2890 255 236

Fax: +(44) 2890 255 004

Website: www.afbini.gov.uk

Environment Agency

Rio House, Waterside Drive, Aztec West, Almondsbury, Bristol BS32 4UD

Phone: +(44) 1224 876544

Fax: +(44) 1224 295511

Website: www.environment-agency.gov.uk

The UK national correspondent coordinates the UK commitment to the data collection programme. A management team comprising the national correspondent, the science co-ordinators and other key staff collaborate to:

- Promote co-ordination and harmonisation of scientific data collection in Scotland, Northern Ireland, England and Wales and ensure collaboration with international coordinators.
- Maintain communications and data collation within the UK for transmission to the Commission and other specified parties.
- Collate cost and administrative information from the different UK organisations involved in the programme.
- Ensure that activities specified under the DCF concerning scientific data are being effectively carried out within the UK.

It is estimated that in total this will comprise at least 1 man-year. The majority of co-ordination activity will occur through informal links (phone calls, e-mails etc.) but one formal UK meeting will be scheduled for the spring of 2011, 2012 and 2013 with the aim of co-ordinating the UK's data collection programme as set out above. The Commission will be invited to each of these National Coordination meetings.

II.B International co-ordination and international scientific meetings

Standard Table II.B.1. provides a preliminary list of meetings that will likely be attended by UK national experts (Planning Groups, Study Groups, Regional Co-ordination Meetings, etc.). The number of stock coordinators (attending stock assessment working groups) and years for which MS provides a chairperson are indicated. The EC has provided a list of eligible meetings for 2013 and the UK has updated appropriately in Table II_B_1 and in the UK budget proposal.

II.C Regional co-ordination

The UK will participate in the North Sea & East Arctic RCM and the North Atlantic RCM in each of the years 2011-13. The UK sampling programmes for 2011 - 2013 will be amended in light of the outcomes from the North Sea & East Arctic and the North Atlantic RCM meetings in each year, as detailed in the relevant NP proposal sections

III. Module of the evaluation of the fishing sector

III.A General description of the fishing sector

This section, and standard table III.A.1, gives a general and concise description of the UK national fisheries and provide an overview of (i) the geographical areas where UK fishing fleet operates, and (ii) the broader species assemblages it is exploiting. The UK NP Proposal contains planned sampling activities for these fleets or justifications for requested derogations. The descriptions make use of the information already available in the RCM reports. Where quantities landed from an area are too small to justify any sampling activities, this is justified in the section III.C.1 of the NP Proposal

The UK fisheries operate in the North Sea & Eastern Arctic and the North Atlantic regions. These regions share the same methodology and data acquisition protocols and are addressed together under single headers in sections III.C and III.D of the UK Proposal. For the economic variables, the headers refer to the supra-region as defined in Appendix II.

Annex 2 provides details about eels and salmon.

Areas I&II

The most important UK fisheries in Areas I&II are bottom otter trawls targeting cod, haddock and saithe, and midwater trawlers targeting herring. The majority of the catch is landed into non-UK ports in Norway, Denmark, Germany and the Netherlands.

North Sea (IV) and Eastern Channel (VIId)

The most valuable UK towed-gear fisheries in the North Sea include bottom otter trawl fisheries using 70mm+ mesh for *Nephrops*, bottom otter trawls, pair trawls,

multi-rig otter trawls and seine nets using 120mm+ mesh for demersal finfish such as haddock, cod, saithe, whiting, plaice and lemon sole, and midwater otter trawl and pelagic pair trawl vessels targeting herring and mackerel. A UK beam trawl fishery for sole in the southern North Sea using 100mm+ meshes lands mainly into the Netherlands whilst vessels typically using 80mm mesh land into the UK. A small UK fishery for brown shrimp (*Crangon* species) takes place as a component of a larger international fishery in the southern North Sea using fine mesh beam trawls which also take a by catch of small demersal roundfish and flatfish. A variety of gillnet and trammel net fisheries occur, targeting sole, bass, cod, rays, anglerfish and other demersal species with mesh sizes according to species and area fished. The gillnet fisheries for sole occur in UK coastal areas of the southern North Sea. Pot fisheries for crabs and lobsters occur over a wide area of the UK North Sea and are the fourth most valuable metier in the North Sea & eastern Channel region.

In the eastern Channel (VIId) the main fisheries are small-scale fisheries working within the coastal zone (0 - 12 miles), and include many <10m vessels. Beam trawl fisheries target sole and take a plaice by-catch; trammel nets and otter trawls are also used to catch sole. Cod catches originate from bottom otter trawlers and inshore gill-netters. Whiting is also caught. During the winter there is a pelagic fishery for herring. There are also long-line fisheries for dogfish, conger eel, bass and ling; a dredge fishery for scallops and a pot fishery for whelks and cuttlefish.

North Atlantic

West of Scotland (VIa)

The most valuable UK fishery in ICES Area VI is for pelagic species using pelagic pair trawl or single boat midwater trawl for (1) herring - undertaken by UK, Denmark, Faeroe, Norway, Sweden, Germany and Ireland; (2) mackerel - undertaken by UK, Ireland, Netherlands, Germany, Faeroe, Poland, Denmark and Norway; (3) horse mackerel - only UK vessels land into the UK, other participants land abroad; (4) blue whiting - undertaken by UK, Netherlands, Denmark, Faeroe, Norway, Sweden, Germany and Ireland.

Inshore waters of the region support the bulk of UK's aquaculture industry, consisting predominantly of salmon and shellfish farms (mainly mussels). Inshore rocky areas support a widespread crustacean (lobster and crab) potting fishery - mainly fished by small <10m boats. The inshore potting fishery is the third most valuable UK fishery in Area VI.

The majority of vessels in the demersal fisheries are locally based Scottish bottom trawlers but Ireland, Northern Ireland, England, France, Spain, Norway, Poland and Germany also participate in these fisheries. The main trawl fisheries target gadoids (e.g. cod, haddock and whiting) plus anglerfish (*Lophius* spp.) and *Nephrops*. The roundfish fisheries produce a by-catch of saithe, megrim and lemon sole. There is a small group of Scottish seiners targeting haddock. However most of these seine net vessels have converted to otter trawl – single or twin rig – and have moved to deeper waters, targeting anglerfish with a by-catch of megrim, ling and tusk (*Brosme brosme*). Further offshore, anglerfish, megrim and hake are also the subject of targeted fisheries.

The *Nephrops* fishery occurs within and outside the recognised Functional Units and is targeted by >10m and <10m vessels using 70 - 99 mm mesh size. There is also a sizeable static gear (pots) fishery within ICES area VIa.

Area VIb

At Rockall, there is a targeted fishery for haddock by Scottish and Irish trawlers. In recent years some of the Scottish vessels have diverted their activity towards deep-water fisheries including species such as orange roughy (*Hoplostethus atlanticus*), tusk (*Brosme brosme*), roundnose grenadier (*Coryphaenoides rupestris*) and black scabbard fish (*Aphanopus carbo*). However, the main fleet targeting the deep water species remains French middle water vessels operating out of ports in Brittany and Spanish trawlers.

Some vessels target deep water species in the Faeroe-Shetland channel such as Greenland halibut (*Reinhardtius hippoglossoides*), taking a by-catch of blue ling (*Molva dipterygia*), roughhead grenadier (*Macrourus berglax*), tusk (*Brosme brosme*), deepwater redfish (*Sebastes mentella*) golden redfish (*S. marinus*) and Arctic skate (*Raja hyperborea*).

Spanish gill-netters and long-liners, many of them operating under the UK flag, work along the shelf edge targeting anglerfish, hake and ling but occasionally moving into deeper water to fish for deep water sharks. There are vessels targeting deep water red crab (*Chaceon affinis*) during summer months.

Area Vb (Faeroe)

The most valuable fisheries in the Faeroe region are blue whiting (*Micromesistius poutassou*), saithe (*pollachius virens*), Greenland halibut (*Reinhardtius hippoglossoides*), blue ling (*Molva dipterygia*), roundnose grenadier (*Coryphaenoides rupestris*) and cod (*Gadus morhua*).

Due to the on-going international dispute with Faroe and the European community regarding the Faroese and Icelandic exploitation of pelagic species (mainly mackerel *Scomber scombrus*), landings of fish by Faroese vessels were banned into Scotland and other European ports during 2011 and 2012. No UK vessels have fishing access to Faroese waters at the moment. Therefore it is not predicted that any species will be sampled from this area in 2013.

Irish Sea (VIIa)

The largest and most valuable fishery in the Irish Sea is the *Nephrops* fleet using single and twin trawls with 70-99mm mesh. This fishery occurs predominantly in the muddy area west of the Isle of Man. The *Nephrops* fishery also takes by-catches of whiting, haddock, cod and plaice. Most whiting are discarded due to size and low market value. Some bottom otter trawl vessels target plaice and other small demersal fish using 70-99mm mesh during summer, and a declining fleet of vessels using midwater otter trawls with 100mm+ mesh seasonally target haddock, hake and cod. The Irish Sea beam trawl fishery for sole is currently of minor interest for UK vessels. Inshore, gillnets and tangle nets are used to catch cod, bass, grey mullet, sole and plaice. The large estuaries bounding the eastern Irish Sea support pot fisheries for

crab, lobster and whelk. There are also hydraulic dredge fisheries for razor fish and dredge fisheries for scallops. The main pelagic fishery in the Irish Sea is for herring; however, the number of vessels has declined to very low levels in recent years.

Southwest Ireland (VIIb,c,j,k)

The most valuable UK fishery in this area is midwater otter and pair trawls catching mackerel, horse mackerel, blue whiting and herring. Much of the catch is landed abroad. An Anglo-Spanish fishery uses bottom otter trawls to target hake, anglerfish, megrim, rays, Nephrops and edible crabs, gillnets set mainly for anglerfish, and long lines set mainly for hake.

Western Channel (VIIe)

The most valuable fisheries in VIIe are beam trawling using 80-90mm mesh for demersal fish and cuttlefish, pot fishing for crabs and lobsters, dredging for scallops and clams, and otter trawling using 70-99mm mesh.

Beam trawlers from Brixham and Plymouth target sole and cuttlefish in VIIe over the winter months. From March or April, many of the larger beam trawlers change to fishing on sole and plaice in the mid-Channel grounds some vessels may change to scallop dredges dependent on price of scallops and/or fuel. There is also a beam trawl fishery from Newlyn in VIIe-h targeting megrim and anglerfish with sole as a by-catch.

Bottom otter trawlers using 70-99mm mesh catch a diverse mix of species including lemon sole, plaice, sole, anglerfish, haddock, rays, John Dory, red mullet, bass, squid and cuttlefish. Squid are targeted in August-December, cuttlefish in September-November/December and lemon sole in December-April. Vessels targeting haddock in the western part of VIIe use 100mm mesh. A number of vessels can change over to scallop dredging if the availability/price of scallops is advantageous.

A variety of set gillnets using mesh sizes 100-219mm are deployed to catch spider crabs, pollack, anglerfish, ling, rays and other mixed demersal fish. Individual vessels may deploy a variety of gillnets during a trip. Tangle nets with mesh size 220mm+ are set for anglerfish, turbot, brill and elasmobranchs.

There are also pelagic trawl fisheries for mackerel and sprat, and some ring-netting for sardines.

Celtic Sea (VII f,g,h,)

The most valuable UK fisheries in VII f,g&h are beam trawling for demersal fish, pot fishing for crabs, lobsters and whelks, gill and tangle netting for demersal species, otter trawling for demersal species, and line fishing for mackerel and other species.

The smaller (<24m) beam trawl vessels catch sole, plaice, megrim, anglerfish in the more coastal areas of VII f&h whilst the larger vessels target anglerfish, megrim and other benthic fish species in offshore waters. A seasonal fishery for sole and plaice takes place close inshore off the north Cornwall coast in spring. This fishery is impacted by the Trevoise cod closure in February and March.

Bottom otter trawls using mostly 70-99mm and some 100mm+ nets target mixed demersal species including rays, bass, haddock, flatfish, squid and other species

according to season. A trawl fishery for *Nephrops* takes place seasonally on the Smalls grounds in VIIg.

A small fleet of midwater otter trawl and pair trawl vessels target mackerel and horse mackerel. The hand and pole fishery for finfish is mainly a fishery for mackerel, and also for bass and pollack.

As in VIle, a variety of set gillnets in the 100-219mm mesh range are deployed near wrecks, reefs and other grounds to catch pollack, ling, hake, anglerfish, ling, spider crabs, cod, rays and other mixed demersal fish. Larger mesh tangle nets (220mm +) are set for anglerfish, turbot, elasmobranchs.

Inshore there are a wide variety of fisheries for shellfish including crabs - edible crab (*Cancer pagurus*), velvet swimming crab (*Necora puber*), crawfish (*Palinurus elephans*), lobsters (*Homarus gammarus*), cockles (*Cerastoderma edule*) Whelks, and razor clams (*Ensis* spp.). These tend to be pot or creel based fisheries, although hydraulic dredges are often used for collecting cockles and razor clams.

Three ICES rectangles covering cod spawning grounds in the Celtic Sea are closed to fishing during spring. This also impacts the Dover Sole fishery in the area.

Long distance fisheries

UK involvement in areas covered by RCM on Long Distant-Fisheries is limited.

In the CECAF region there is one Anglo-Dutch vessel targeting small pelagic species which lands to either the Netherlands or Canaries.

In 2009 two Scottish pelagic vessels under contract to Morocco were catching from that country's pelagic quota for small pelagic species such as pilchards and landing to factories in Morocco. In 2010 and 2011 only one vessel worked off Morocco where it fished an EU quota for 10-14 days only. The remainder fishing time was under the Moroccan quota. In 2011 the vessel agreed to retain samples on board and scientists would examine them on the vessel's return to the UK.

In the areas covered by ICCAT and IOTC there is again limited effort by Anglo-Spanish vessels using longlines for tunids and sharks. The number of vessels has varied between 1 and 7 in recent years. Landings by these vessels are into South Africa, Namibia, Mauritius and occasionally Spain.

III.B Economic variables

Supra Region 3: North Sea (IV&VIId), Eastern Arctic (I&II), North Atlantic (V-XIV and NAFO areas)

III.B.1 Data acquisition

Background

For economic variables related to the catching sector, the UK will be engaging the Sea Fish Industry Authority (SEAFISH) who have historically carried out economic surveys of the fish catching sector. Vessel segmentation will be carried out according to Appendix III of *Commission Decision 2008/949/EC* on the basis of the information reported to the EU Fishing Vessel Register and the data on vessel activity in terms of fishing effort and landings from data reported on official logbooks, landing declarations and sales notes for individual landings as used to produce the information required for transversal variables.

The methodology can be split into five main stages: -

1. Agree scope and objectives;
2. Building industry support;
3. Fleet Survey preparation;
4. Fleet Survey; and
5. Data input and analysis.

Stage one will be carried out through discussions between statisticians in fisheries administrations and economists from SEAFISH to discuss the incorporation of requirements from the Data Collection Framework in the survey work.

Stage two, building industry support, will involve meeting key industry contacts in the UK. Extensive consultation with UK Producer Organisations, vessel agents, UK fishing federations, accountants, and local fishermen representatives will be carried out to promote and foster support for the project. Experience in earlier years has shown that gaining the support of local industry representatives is critical to achieving a good response rate, and the ultimate success of the project.

Stage three will consist of planning what sectors and areas of the country will be surveyed and when. Contact lists will be prepared in consultation with the fishing industry. Questionnaires and interview plans will be trialled with fishermen prior to launch. Considerable PR activity in the trade and local press will be carried out prior to the survey phase commencing.

Stage four will constitute the main survey phase of the project and will mainly consist of face to face interviews conducted at ports around the UK. Telephone interviewing and targeted mailing may also be carried out where required. SEAFISH staff are experienced in surveying the catching sector, and have excellent contacts gained through previous economic surveys. Previous expertise of this type of work will ensure that the most efficient survey techniques are employed to source the necessary information. Interviewing will be conducted mainly face-to-face, although when it is difficult to meet an owner or skipper a telephone interview or a postal questionnaire may be used. Flexibility is important (especially when dealing with the

catching sector). Previous experience suggests that many interviews can only be arranged when out surveying.

Stage five includes data input and analysis. Survey data and vessel financial data from accounts will be analyzed and compared to previous outputs. The sample data must then be used to produce estimates of variables required under the DCF for the entire UK fishing fleet. Where necessary, follow up investigation with fishermen will be carried out.

(a) Definition of variables

Seafish will collect data for the variables listed and defined in Appendix VI of Commission Decision 2008/949/EC (see Table 1, below).

The UK intends to follow the methodologies for calculation of capital value as given in the report of the study N° FISH/2005/03 on the evaluation of the capital value, investments and capital costs in the fisheries sector. Details of any deviation from this methodology that proves necessary will be provided.

The methodology for calculation of FTE will be in accordance with the Study FISH/2005/14 and amendments made by SGECA 07-01 report (15-19 January 2007, Salerno).

Regarding the production of estimates for Indicator 9 of Appendix XIII of Commission Decision 2008/949/EC, on fuel efficiency of fish capture, these will primarily be derived from post-hoc analysis of the individual vessel level information collected on energy costs within the economic survey – the survey questionnaire includes a separate question asking for expenditure on fuel oil/marine diesel fuel. This information on consumption will then be compared with the pattern of fishing activity of the vessel during the corresponding period of economic activity, taking into account period of non-fishing related time at sea (e.g. time spent on pipeline guard duty, support for oil and gas rig operations, etc.) to allow fuel consumption and fishing activity to be directly compared.

Table 1: List of economic variables and data sources

Variable group	Variables	Data sources
Income	Gross value of landings	Logbook
	Income from leasing out quota or other fishing rights	Vessel accounts
	Direct subsidies	Vessel accounts
	Other income	Vessel accounts
Personnel costs	Wages and salaries of crew	Vessel accounts
	Imputed value of unpaid labour	Vessel accounts
Energy Costs	Energy Costs	Vessel accounts
Repair and Maintenance costs	Repair and Maintenance costs	Vessel accounts
Other operational costs	Variable costs	Vessel accounts
	Non-variable costs	Vessel accounts
	Lease rental payments for quota or other fishing rights	Vessel accounts
Capital costs	Annual depreciation	Vessel accounts
Capital value	Value of physical capital: depreciated replacement value	Vessel accounts
	Value of physical capital: depreciated historic value	Vessel accounts
	Value of quota and other fishing rights	Vessel accounts
Investments	Investments in physical capital	Vessel accounts
Financial position	Debt/asset ratio	Vessel accounts
Employment	Engaged crew	Survey
	FTE National	Survey
	FTE harmonised	Survey
Fleet	Number	UK fleet register
	Mean LOA	UK fleet register
	Mean vessel's tonnage	UK fleet register
	Mean vessels power	UK fleet register
	Mean age	UK fleet register
Effort	Days at sea	Logbook
	Energy consumption	Vessel accounts
Number of fishing enterprises/units	Number of fishing enterprises/units	UK fleet register
Production value per species	Value of landings per species	Logbook
	Average price per species	Logbook

The survey will collect details on expenditure on fuel by individual vessels – the expenditure will be attributed to the individual days of fishing activity during the period using a combination of the share of total fishing time the activity involved along with a weighting factor to take account of the relative fuel intensity of the type of activity involved. The latter will be derived from both the results of the economic survey itself from the current and earlier years, as well as utilising other dedicated studies related

to identifying the relative fuel intensity of different fishing gears. This will allow a relatively accurate distribution of the costs of fuel to level 4 of the métier as defined in Appendix IV of Commission Decision 2008/949/EC and the split of annual data into quarterly estimates.

(b) Type of data collection

Standard Table III.B.3 sets out the different types of data collection schemes which will be used for the different segments and variables.

(c) Target and frame population

All vessels identified on the UK vessel register will be included – including foreign owned but UK flagged vessels and inactive vessels.

The fleet segmentation is described in Standard Table III.B.1, including information about the frame population and the number of vessels per segment.

Standard Table III.B.2 reports the segments that have been clustered. Clusters have been named after the biggest segment in terms of number of vessels.

The allocation of individual vessel to fleet métier and supra-regions is carried out at the same time as the analysis of activity for fleet métier. In brief, the information on total landings, value of landings, and fishing effort (days) is obtained from logbooks, sales notes and vessel register data. These data cover all sectors of the UK fishing fleets landing into the UK and abroad, including exhaustive data collected for <10m vessels. Each fishing trip is assigned to a specific fleet sector based on the definitions for the regions given in the fleet matrix in Commission Decision 2008/949/EC Appendix IV (1-5). As such the allocation of the information related to individual vessels (in terms of catches, effort, etc.) to regions is fully consistent with the determination of fleet métier data.

(d) Data sources

Table III.B.3 provides information on the data sources used to collect each variable per segment. A questionnaire will be used to collect information about a number of variables, including employment, and this will be provided in the Technical Report.

Information on the various economic indicators as required in Appendix II of *Commission Decision 2008/949/EC* will be collected for vessels classified to each segment as per Appendix III of the Decision. In most cases the information required will be collected as part of the dedicated economic survey. However some data for each segment will not be sourced from the survey, but instead will be derived from data extracted to meet the requirements related to transversal variables, to ensure consistency between the different sets of data and to minimize the complexity of the economic survey.

The data sources are:

- **Data on Value of Landings (Total and By Species) and Fishing Activity:** These are sourced from the sets of administrative control documents (logbooks, landings declarations and sales notes) that vessels are required to submit to report on their fishing. The logbook, landings declarations and sales notes are required from all UK over 10m vessels, and sales notes required for

all under 10m vessels. For these smaller vessels additional data sources (e.g. specific separate national requirements to report shellfish-focussed fishing activity). These are the same sources as used within the other modules of the DCF – this ensures consistency in the data held for vessels across the DCF.

- **Vessel accounts:** Accounts contain a profit & loss account for a period usually of one year, and a balance sheet of the business for the same period. There are also notes to the accounts which give further details regarding assets, payments to directors (in the case of limited companies) and depreciation and debt repayment. The profit and loss account includes data on fishing and vessel costs. The balance sheet includes data on investments and capital values.
- **Survey:** There is a short survey questionnaire designed to be conducted as an interview with the vessel owners. In some cases it may be completed by owners without interview and then submitted to Seafish. The survey questionnaire is attached as an Annex 3 to this National Programme. It provides data on fuel use rates, crew size, capital values and expenditure on and value of quota and fishing rights.
- **Vessel Capacity:** Data on the physical characteristics and age of vessels in the UK fishing fleet, including those which are not active, are taken from the UK Fleet Register. The registration of a vessel (and its associated licensing by administrations) on this UK-wide national registration system is a required precursor of any commercial fishing activity taking place. The register provides information on Data includes length overall, breadth, gross tonnage, year of build, power of main engine etc. – the use of this data in this module ensures consistency between the two sets of data

Given the different data sources to be used, the UK will take the following steps to ensure their consistency. In terms of the economic data for the fleet, during the preparation of the sample selection, SEAFISH receive summary information for each vessel related to the total quantity and value of landings made in recent years. This information is used to help validate the data reported in the sampling process. Thus while the detailed data for each segment in terms of landings by species etc. is derived from the logbook data, there is work to ensure that parameters such as total value of fish landings etc. are also collected during the economic survey data collection to allow such cross checking of data sources to take place. Discrepancies in the data seen are investigated. UK Fisheries Administrations operate a system of automatic cross-checks between the data received on the activity of vessels through the Community logbooks, landings declarations and sales notes information reported to them along with the information available from satellite surveillance and other sightings and inspection data. This system is part of the administrative control mechanisms in the UK and thus used to ensure the accuracy of the information held

on these systems, with discrepancies being investigated. Such discrepancies can result in official sanctions being initiated, which result in data corrections being made as necessary.

The UK intends to collect economic data each year in relation to the previous calendar year, e.g. during 2011, the survey and accounts data will relate to calendar year 2010.

(e) Sampling frame and allocation scheme

The sampling frame to be used will be the UK fishing fleet register. Regarding sampling strategy, involvement in the survey is voluntary. As such it thus involves a degree of self-selection and is not a true random sample of the fleet. In addition, in order to ensure an adequate level of response, part of the survey recruitment process involves obtaining agreement from the owners/operators for on-going involvement in future years. This is usually in terms of a 3-year permission to approach the accountants covering the vessel (where possible) rather than the owners/operators themselves as part of ensuring the quality of the reported data.

In addition, in order to ensure that adequate levels of involvement are achieved, a key aspect of the contact with fishermen is that as well as seeking permission to contact their accountants direct for the required information, agreements also sought for such access to their financial data to be allowed for subsequent years as well. As such, the sample for each segment can include some elements of a cohort analysis. It is thought that the benefits seen by this approach in terms of both ensuring a good level of response for each segment as well as allowing time series information on individuals to be gained that can be used to help validate the year on year results from each annual collection exercise, offsets the introduction of a potential bias in the results from the survey from the use of a non-random sampling approach.

With regards to sample size, as stated in Table III.B.1, the intention is to sample most fleet segments with a target of achieving a 10% sampling rate, Table 2 (below) shows the fleet segments population and planned sample number and rate. The segments marked with an asterisk have been clustered with other segments as outlined in Table III_B_2. A 10% sample rate has been selected for the majority of segments as this will provide a sample size large enough to robustly estimate variables for the entire segment population. For segments with a small population the sample rate is higher to ensure at least 2 vessels in that segment are included in the sample.

SEAFISH will also survey inactive vessels, vessels whose main source of economic activity (in terms of income) must be from activities other than commercial fishing, to collect and estimate information on capital costs as required under Commission Decision (2008/949/ec).

The proposed sample rate of 10% per fleet segment relates only to the costs, non-fishing income, investment and capital values elements of the survey. For value of fishing income and activity levels (days at sea) this information is available for every vessel in the fleet. In reality, this sample rate is usually exceeded substantially for the UK's major fleet segments.

Knowing the physical characteristics, activity levels and declared fishing income of all the vessels in each segment means that robust estimates of costs, non-fishing income, investment and capital values can be made for each segment based on an apparently small sample rate.

In addition to these points, of the c. 4,900 active vessels in the UK fleet, around 2,000 are what we describe as low activity vessels, with either annual earnings of less than £10,000 or active for less than 20% of the average activity level of the segment they would otherwise be in. The sample in 2008 represented 20% of the value of landings of the UK fleet.

Table 2: Fleet Segments and planned sample rates

Fleet segment	Target population no.	Frame population no.	Planned sample no.	Planned sample rate
Beam trawlers: 0-10m	32	32	3	10
Beam trawlers: 10-12m	16	16	2	10
Beam trawlers: 12-18m	28	28	3	10
Beam trawlers: 18-24m	16	16	2	10
Beam trawlers: 24-40m	39	39	4	10
Beam trawlers: 40m+	9	9	2	22
Demersal trawlers and/or demersal seiners: 0-10m	343	343	34	10
Demersal trawlers and/or demersal seiners: 10-12m	108	108	11	10
Demersal trawlers and/or demersal seiners: 12-18m	285	285	29	10
Demersal trawlers and/or demersal seiners: 18-24m	223	223	22	10
Demersal trawlers and/or demersal seiners: 24-40m	109	109	11	10
Demersal trawlers and/or demersal seiners: 40m+	15	15	2	10
Dredgers: 0-10m	119	119	12	10
Dredgers: 10-12m	22	22	2	10
Dredgers: 12-18m	55	55	6	10
Dredgers: 18-24m	21	21	2	10
Dredgers: 24-40m*	21	21	2	10
Drift and/or fixed netters: 0-10m	651	651	65	10
Drift and/or fixed netters: 10-12m	14	14	2	14
Drift and/or fixed netters: 12-18m	17	17	2	10
Drift and/or fixed netters: 24-40m*	13	13	2	15
Purse seiners: 40m+*	32	32	3	9
Vessels using active and passive gears: 0-10m*	4	4	2	50
Vessels using hooks: 0-10m	360	360	36	10
Vessels using hooks: 10-12m*	16	16	2	13
Vessels using hooks: 24-40m*	19	19	2	9
Vessels using polyvalent active gears only: 0-10m*	12	12	2	17
Vessels using polyvalent passive gears only: 0-10m	89	89	9	10
Vessels using pots and/or traps: 0-10m	1926	1926	193	10
Vessels using pots and/or traps: 10-12m	182	182	18	10
Vessels using pots and/or traps: 12-18m	76	76	8	10
Vessels using pots and/or traps: 18-24m*	15	15	2	13
* Clustered segment				

III.B.2 Estimation

The methods used to derive final estimates from sample data for each variable are outlined below.

The UK intends to follow the methods for calculation of capital value as given in the report of the study N° FISH/2005/03 on the evaluation of the capital value, investments and capital costs in the fisheries sector. Details of any deviation from this methodology that proves necessary will be provided. The sample data from vessel accounts will provide a depreciated value for the sample fishing vessel. This sample data can then be applied at a DCF segment level to the entire fleet based on a value per vessel capacity unit to estimate physical capital values.

The estimation of employment will be based on survey data collected from vessel owners around the UK ports. This will provide details on the number of engaged crew both full-time and part-time. This sample information will then be used to estimate total engaged crew based on the physical characteristics of the individual vessel and the vessels level of activity. Once total engaged crew has been estimated for all vessels in the UK fleet, FTE jobs can be estimated based on the national and harmonised definitions. The method for calculation of FTE will be in accordance with the Study FISH/2005/14 and amendments made by SGECA 07-01 report (15-19 January 2007, Salerno).

The UK will estimate costs for the entire UK fleet based on the sample data collected from vessels financial accounts. An appropriate and accurate means of estimating costs for the entire population based on the sample will be chosen by the research team at the time and this will reflect the quality of the sample data and its relationship to the total population. For example, in the past a mixture of simultaneous equations and weighted scaling has been used depending on the quality of the sample data.

The estimation methods of costs are:

- **Energy Costs** – method for estimating fuel cost is based on estimated fuel consumption for each vessel. Fuel is marine diesel.

For each vessel in the population:

Annual Fuel Cost = price * days * consumption rate

Where:

price = reference year average fuel price per litre (duty free price)

days = annual days at sea of each vessel

consumption rate = assumed daily consumption of fuel (litres), according to VCUs

Vessels in each segment are split into three size categories (small, medium and large) determined by their Vessel Capacity Units. For each of these size categories, a corresponding daily consumption of fuel in litres was applied. The

daily consumption figures are based on evidence from sample data fuel costs from vessel accounts and from interviews with skippers, many of whom know their average daily fuel consumption. Daily consumption for each vessel was then multiplied by each vessel's annual days at sea to give annual consumption in litres. Annual fuel use (litres) is then multiplied by the average fuel price per litre in the reference year (excluding duty).

- **Personnel costs:**

- **Wages and salaries of crew** – estimated crew wage cost is calculated based on each segment's average crew wage costs as a percentage of fishing income. Crew wage (share) is a well defined expense in most vessel accounts and there is not a great deal of variation in wages as percent of fishing income within each segment. Therefore this is a robust method for estimating this key cost.
- **Imputed value of unpaid labour** – unpaid labour is assumed to be zero for over 10m vessels, based on observations of crew (including skipper) wages in vessel accounts and interviews with skippers and vessel owners. For under 10m vessels, we have found that the vessel owner sometimes takes a wage which is lower than the market rate for a skipper, but also takes money from the business in the form of dividends or owners' drawings. Based on survey data, we estimate the market rate for a skipper for a full time working year, assuming 200 days at sea is a full working year. We then estimate for sample vessels what the actual declared skipper wage is compared to the market rate, adjusting for actual days at sea per vessel. We then estimate the difference as the imputed value of labour. Then for the segment population, we estimate crew cost as above (which includes skipper's wages) then assume for the segment population the same proportion of imputed value of labour to actual paid wages as we observed in the sample.
- **Other Fishing Costs** - Sample sizes vary for remaining individual fishing costs (shore labour, ice, boxes etc) for each sample vessel within a segment, we adopted a top down approach to calculating fishing costs which constrained the total value of fishing costs to the average from the segment and adjusted for each vessels individual fuel cost and crew share estimate as outlined above. The constrained total cost value was then split among key fishing costs (commissions, harbour dues, subsidies and levies, shore labour, boxes, ice, crew travel, food stores, quota leasing, days purchased, other fishing costs) using adjusted shares of each cost over total costs.
- **Vessel costs** - (Insurance, repairs, gear cost, hire and maintenance, other vessel costs, total vessel owner costs) were estimated based on sample data

and the average costs structure as a proportion of earnings for the sample vessels in each segments was applied to non-sample vessels.

- **Depreciation** – estimated based on sample data and the average costs structure as a proportion of earnings for the sample vessels in each segments was applied to non-sample vessels.
- **Interest** – estimated based on sample data and the average costs structure as a proportion of earnings for the sample vessels in each segments was applied to non-sample vessels.

III.B.3 Data quality evaluation

Standard Table III.B.3 gives details of the methods to be used to assess the quality of the data. The majority of the data will be collected by a probability sample survey. For these data, bias will be assessed by coverage rate and variability by CV. Data for the remaining variables will be collected by a Census-based approach.

III.B.4 Data presentation

With regards to timing, as the survey and processing of collected data is carried out by SEAFISH, and their economists are the main representatives at the various groups such as SGECA that meet to collate and analyse the economic data from MS, the exercise is carried out with a view to having data available at least in provisional form in time for supply to the required meetings.

In particular, economic data for any reference year R, will be collected during the following calendar year, R+1, and will be ready to upload to JRC by January of the year after collection, R+2. E.g. vessel accounts relating to year 2010 will be collected during 2011 and the aggregated data set will be ready by January 2012. Data collected by the government, e.g. activity and landings data, will be collected during the reference year and into the first few months of year R+1, then aggregated and made available to Seafish by the middle of year R+1.

Regarding confidentiality, in the UK a general position is taken that is consistent with the aggregation of enterprises done for business surveys and other exercises carried out by the UK Office for National Statistics. This involves application of a “rule of 5” so that any segment or other grouping where fewer than 5 vessels is involved needs to be suppressed. There is some flexibility in terms of choice of grouping to which the suppressed vessels are then combined which varies according to the gears used. This is different from a firm principle being applied, such that aggregation of groups is based on similarity of activity between groups rather than applying a set rule based solely on the physical dimensions of the vessels.

III.B.5 Regional coordination

The UK will continue to be involved in the various international working groups such as STECF/SGECA and others as arranged to take forward various issues such as the development of methods and measures related to assessing the precision of estimates. The UK will also participate in discussions on the collection of economic parameters that take place at the annual Regional Coordination Meetings, incorporating recommendations as necessary to the collection process. The UK has no formal multilateral agreements with other Member States.

The only RCM recommendation, requiring action from individual Member States is:

Economic variables: sampling strategy for the collection of economic variables		
RCM NS&EA 2009 Recommendation	The RCM NS &EA recommends the following: 1. the inclusion of a methodology report, as proposed by SGECA, would provide significant benefits 2. there would be merit in reviewing the SGRN guidelines as proposed by SGECA	UK's response: Details about the methodology employed, following the Commission's guidelines, are provided in section III.B
Follow-up actions Needed	On 1: Inclusion of a methodology report in NPs On 2: Review of the SGRN guidelines	
Responsible persons for follow-up actions	1. Commission and MS 2. SGECA Working Group, i.e. SGECA/DCF	
Time frame (Deadline)	1. March 2010 2. June 2010	

III.B.6 Derogations and non-conformities

No derogations are required.

III.C Biological - metier-related variables

North Sea (IV&VIId), Eastern Arctic (I&II) and NAFO areas, North Atlantic (V-XIV)

The UK sampling schemes for metier-related biological variables are the same for all sampled areas and are described for the supra-region.

Sample frames will be defined with respect to DCF regional boundaries and sampling will be 'within' region in all cases; however, attention is drawn to cases such as migratory species like NEA mackerel where sampling will be region-specific, but the allocation of sample effort will necessarily have to respond to the spatial and temporal development of the fishery throughout the fishing season.

III.C.1 Data acquisition

(a) Codification and naming convention

The metiers for the regions are as given in Commission Decision 2010/93/EU Appendix IV (1-5). Each fishing trip was assigned to a metier based on the definitions for the regions given in the fleet matrix in Commission Decision 2010/93/EU Appendix IV (1-5). The allocation rules used to fill in the matrix (Appendix IV (1-5) are summarised below:

1. Trips were assigned to a fishing ground within each region (I&II; IV&VIId; XII,XIV&Va; Vb; VI; VIIa; VIIbcjk; VIIe; VIIfgh; IX&VIIIc; and VIIIabde). Where trips occurred across two or more fishing grounds, the catch, effort and value were apportioned between the fishing grounds. The fishing grounds represented in tables III.C.1, III.C.2 and III.C.3 are in accord with the report of the 5th liaison meeting and this reflects the way in which data were extracted for ranking purposes and subsequent processing.
2. Trips in each fishing ground were assigned a Level 4 gear type, Level 5 target assemblage and Level 6 mesh size band according to log book data recorded by vessel skippers. Target assemblages "crustaceans", "demersal fish", "small pelagic fish", "deepwater species" and "molluscs" were identified using the procedure in the Footnotes to Commission Decision 2010/93/EU, Appendix IV (2) and IV(3), using ranked total landed weight and value per target assemblage. If molluscs or crustaceans were the single most valuable part of the landing, then the target assemblage was defined by that, otherwise it was defined by the highest ranked landing component by weight. Mixed target assemblages were not defined.

(b) Selection of metiers to sample

Initial ranking

All metiers for which fishing activity has been recorded during the reference years are given in Table III.C.1.

Métiers to sample were selected following the ranking system described in Commission Decision 2010/93/EU, Chapter III B.B1.3.(1)(b), using software provided by Marine Scotland to carry out the rankings. The information on total landings, value

of landings, and fishing effort (days) used for ranking was obtained from logbooks, sales notes and vessel register data. These data cover all sectors of the UK fishing fleets landing into the UK and abroad, including exhaustive data collected for <10m vessels. All vessel LOA classes were included in the initial ranking exercise, and vessels from Scotland, England, Wales and Northern Ireland were not distinguished.

All métiers falling within the top 90% based on landings or value or effort are indicated in Table III.C.1. In general, these métiers (taking into account some mergers and splits discussed under III.C.2) reflect those that have previously been identified by more formal multivariate analysis (EU FP6 Project 022644: "Capacity, F and Effort" [CAFE]. Note that the métiers identified in the CAFE project are based on fleet sectors at Level 5 of the DCR classification and do not explicitly account for different mesh bands.)

The metiers with landings abroad are mainly Anglo-Spanish and Anglo Dutch vessels. Bilateral agreements are in place with, IMARES (Netherlands) and vTI (Germany) to sample these vessels. A proposed bilateral is under discussion with IEO (Spain)

Merging of metiers

Merging of metiers was conducted by the UK primarily to define domains for data collection for which adequate data can be collected with feasible resources for sampling. In doing this, the UK has consulted the recommendations and guidelines provided by the joint ICES-STEFC Workshop on Methods for Merging Metiers for Fishery Based Sampling (WKMERGE), and has proposed merged metiers which will be treated in most cases as domains for which data will be provided according to the defined sampling frames, strata and sample selection schemes as described in Section II.C.1(c).

Horizontal merging: The overall length (LOA) of vessels was not taken into account in defining métiers. The LOA will however be a factor in stratification of sampling schemes, as described under section III.C.1(c).

Vertical merging within the top 90% UK métiers given in Table III.C.1 was carried out for fleet sectors expected to have similar species and size compositions. Results of previous statistical analysis of métiers (e.g. in the current EU CAFE project) were also reviewed in making decisions regarding métier definitions. Vertical merging also took place where the ranking procedure in III.C.1 used logbook information on aspects of fishing gears and fishing operations generally not known in advance when setting up randomized sampling schemes. These aspects include:

- i) Deployment of a range of different mesh sizes or gears in a single trip (for example vessels using fixed nets)
- ii) Uncertainties in defining métiers *a priori* due to short-term or within-trip tactical decisions made by skippers regarding species targeting and gear configuration depending on fish availability, market demands, quota uptake and weather and sea conditions. An important example is the UK small-mesh bottom trawl fleet, which may record dominant catches of crustacea (*Nephrops*), fin-fish or squid/cuttlefish catches using 70-89mm or 80-99mm mesh cod ends. The *post-hoc* métiers defined according to log-book data were merged into a single large 70-99mm bottom trawl métier for sampling.

As these represent a large sector of the UK trawl fleet, a large fraction of the planned sampling will cover this métier and it is anticipated that trips with different meshes and target assemblages will be adequately represented through random selection.

The merging of métiers for sampling is indicated in Table III.C.2, along with national métiers that have been further disaggregated. Elements of the top 90% métiers that are excluded from the UK sampling programme mainly due to landing overseas (requiring bilateral agreements for sampling) are also shown in Table III_C_2. The new métiers defined appear in Table III.C.3. Although the ranking in Table III.C.1 and the mergers in Table III.C.2 were conducted on combined UK fleet data, it was necessary to split the métiers into Scottish, English & Welsh and Northern Irish vessels landing into each of these UK jurisdictions for Table III_C3. This was required because fleets landing into each country are sampled by the Government laboratories/agencies in each country each with separately defined sampling frames.

In doing this, the mergers that are illustrated in Table III_C_2 also reflect the decisions taken for the UK 2010 National Programme and remain unchanged other than pair trawl is also now merged with single boat otter trawl. In reviewing the UK National Proposal for 2009-2010, SGRN 09-01 commented that: *“The member state has made a significant effort to comply with the new regulation. In common with other member states, there is no statistical evidence put forward to justify merging métiers but nevertheless the mergers that are proposed are sensible”*.

Subsequent to further developments towards statistically sound sampling schemes, most notably the shift away from quota sampling of individual or merged métiers and towards the current probability based sampling schemes in which a ‘basket’ of different métiers may be sampled within a given sampling frame, it is no longer relevant to focus too greatly on which métiers have been combined into groups for the purpose of merging under a quota-based sampling scheme. Consequently, Table III.C.2 maintains the same set of mergers as initially proposed on submission in 2010 of the current triennial sampling programme for 2011-2013. However, the move to probability-based sampling schemes and the choice of sampling frames that accompanies it means that it is not possible to predict the number of samples to be taken per mesh band range where more than one range exists within a single sampling frame. This has consequences for the projection of sample numbers in 2013 for demersal fisheries in which the 100mm-119mm range and >120mm range are nested within a common sampling frame. This is discussed further in section III.C.1.d when discussing frame populations for sea-based sampling and for port-based sampling.

(c) Type of data collection

The UK sampling schemes for collection of métier based biological variables will use probability sample surveys (type B) following the guidelines in ICES WKMERGE (ICES, 2010).

The UK programme includes concurrent sampling at sea for fleet segments where discards represent a significant component of the catch, supplemented by additional concurrent sampling of landings ashore. For métiers where discarding is minor or discard survival is expected to be high (e.g. pot fisheries), concurrent sampling is to be conducted on shore. Where concurrent sampling is not expected to provide sufficient samples to achieve the required precision for individual stocks, the sampling schemes will include representative selection of fishing trips of which a fraction will be sampled only for stocks for which additional stock-based samples are needed.

National approaches to concurrent sampling within the UK are described below:

England & Wales

The allocation of resources between at-sea and shore-based sampling is largely based on the availability of staffing resources to conduct each programme. For example, the Cefas at-sea programme has for several years been set at 600 person days at sea. The observers receive extensive training to meet stringent health and safety requirements for working at sea on fishing vessels, and this limits the participation of staff on sea trips to the specialised team of trained observers. The resources for at-sea and shore-based sampling must be met from within existing government budget lines and this determines the possible extent of the DCF fishery-sampling programme and the allocation and prioritisation of sampling activities.

The Cefas at-sea sampling programme covers all ranked and merged métiers and other métiers of vessels included in the random draw list of vessels in the sampling frames. All species are measured from a minimum of 60% of hauls on each trip. Hence for a number of métiers, the at-sea sampling is expected to meet the DCF minimum sampling requirement of one trip per month during the fishing season, using concurrent sampling scheme 1 (Table III.C.3).

Several fleet segments (including vessels using long lines, poles/lines, seine nets, and crustacean pots, and vessels targeting sprats in VIle) will be excluded from the at-sea observer scheme due to: 1) very small numbers of trips required (e.g. North Sea long lines), 2) sampling of the métier already covered by another country (e.g. North Sea seines), or expected low rates of discarding of dead individuals (e.g. poles/lines, pelagic sprat fishery, NEA crustacean pots). A derogation for sampling the line fishery and pot fishery for discards was agreed by the relevant RCMs in 2009, based on data on quantities of discards in these fisheries. In addition derogation from sampling HMD_MOL_0_0_0 and DRB_MOL_0_0_0 (non scallop targeted) for discards were agreed by RCM NS&EA and RCM NA in 2012.

Concurrent sampling will be conducted as follows:

- Scheme 1 will be applied to all at-sea sampling trips
- If the planned at-sea sampling trips will cover fewer than the required concurrent sampling minimum of 1 trip per month during the fishing season, additional Scheme 2 or Scheme 3 concurrent sampling at ports will be carried out to meet at least the DCF minimum requirement. The value of 'x%' in Commission Decision 2010/93(EC) section 3(1)(g)), i.e. the percentage of trips where all species are sampled concurrently, will be modified to accommodate this requirement. Scheme 3 will be applied for métiers where there are at-sea

sampling trips contributing to the concurrent sampling scheme, allowing collection of information on Group 3 species at sea. Scheme 2 is applied to metiers such as longlines and pot fisheries where no at-sea sampling is planned due to low discard rates.

The expected relative allocation of time to concurrent and stock-based sampling for a number of shore-based metiers has been revised in October 2010 due to a previous over-allocation to concurrent sampling. The metiers are GNS_DEF_0_0_0 in IV&VIId, VIle and VIIfgh; LHP_FIF_0_0_0 in VIle and VIIfgh; and OTB_CRU_70-99_0_0 in IV&VIId. This does not affect the cost of the programme.

Scotland

Reduced funding and a significantly reduced headcount for the fisheries sampling programme within MSS meant that it had to reduce its sampling effort in 2011 relative to that anticipated in the corresponding UK national programme and commensurate reductions were made in 2012. Sampling effort in 2013 will be maintained at the 2012 level and, as endorsed by STECF and the Commission, MSS will not carry out any pelagic observer trips in 2013 (as in 2012). This is because, as high-grading is now banned in these fisheries (Council Regulations 43/2009, 1288/2009 579/2011) landings now better reflect catches, and measurements of the biological characteristics (age and length frequencies) of the landings will be made at processing plants and factories.

2013 will also reflect the reduction in demersal sampling effort that was first seen in 2012. This too was accepted by STECF and the Commission. Relative to the original submission for the entire 2011-2013 National Proposal, it is known that sampling levels for the major North Sea demersal stocks could be reduced without adversely impacting on precision; however, that was not true for Scottish North Atlantic stocks, so as well as reduced sampling levels in the North Sea, some North Sea sampling effort was diverted to North Atlantic stocks in 2012 to attain the DCF precision levels and this will continue in 2013.

In terms of staffing levels, a number of new staff have been recruited in 2012 to backfill some of the earlier staff losses and an initiative is underway within Marine Scotland to incorporate additional sampling via fishery officers located at ports around Scotland; however, this initiative is in its early stages, not yet operational and of uncertain impact.

The allocation of resources between at-sea and shore-based sampling is largely based on the availability of trained staff to conduct each programme. For example, the Marine Scotland observer programme will undertake approximately ~~150~~ 95 trips per year onboard commercial fishing vessels during 2012. The observers receive extensive training to meet stringent health and safety requirements for working at sea on fishing vessels, and this limits the availability of staff for sea trips to the specialised team of trained observers. The resources for observer and shore-based sampling is met from within existing Scottish Government budget lines and this

determines the possible extent of the DCF fishery-sampling programme and the allocation and prioritisation of sampling activities.

The Marine Scotland observer sampling programme will be moving towards a probability based selection protocol for choosing demersal vessels to be sampled. It is anticipated that this will cover most ranked and merged metiers, and length sampling is concurrent for all species. The *Nephrops* fisheries comprise a special case where *Nephrops* length measurements per haul are taken separately from finfish length measurements – on one day hauls are sampled for *Nephrops* length measurements on the alternate day they are sampled for finfish length measurements. This approach was discussed in the context of sampling deep-water sharks and teleosts at SGRN–ECA 09-04 and put forward as a measure requiring consideration for other fisheries too. Where a ranked metier is not covered by the Scottish observer programme, that is due to the relatively small number of fishing trips within the metier and hence the low probability of observing one, or the lack of non-surviving discards (e.g. scallop dredge)

Concurrent sampling will be conducted as follows:

Scheme 1 will be applied to all port-based sampling trips for pelagic metiers. This is possible due to the seasonal separation of the major pelagic fisheries. For demersal and shellfish metiers at-sea sampling will comprise scheme 2. If the planned at-sea sampling trips cover fewer than the required concurrent sampling minimum of 1 trip per month during the fishing season, additional Scheme 3 concurrent sampling at ports could be carried out with an expectation of meeting at least the DCR minimum requirement. The value of “x%” in Commission Decision 2010/93(EC) section 3(1)(g)), i.e. the percentage of trips where all species are sampled concurrently, will be modified to accommodate this requirement for both the at-sea and port-based concurrent sampling. Experience has shown that concurrent sampling may not be possible at all ports, so additional sampling trips will comprise stock-based sampling at the market.

Northern Ireland

The allocation of resources between at-sea and shore-based sampling is largely based on the availability of staffing resources to conduct each programme. For example, the AFBI at-sea programme has since 2010 been set at 150 person days at sea. The observers receive extensive training to meet stringent health and safety requirements for working at sea on fishing vessels, and this limits the availability of staff for sea trips to the specialised team of trained observers. Part of the at-sea observer programme will be conducted on a subcontracting basis from 2012 onwards. The resources for at-sea and shore-based sampling must be met from within existing government budget lines and this determines the possible extent of the DCF fishery-sampling programme and the allocation and prioritisation of sampling activities.

The AFBI observer sampling programme covers most ranked and merged metiers, and length sampling is concurrent for all species. Hence for a number of metiers, the at-sea sampling is expected to meet the DCF minimum sampling requirement of one

trip per month during the fishing season, using concurrent sampling scheme 1 (Table III.C.3). The number of observer sampling trips for the *Nephrops* fleet, also includes a self-sampling element (initiated under the Irish Sea Enhanced Data Collection Scheme) and now incorporated into the overall DCF work. Due to the changes in fishing activities (i.e., no directed whitefish fleet for 2013 due to quota restrictions and selectivity devices fitted to the TR2 fleet) the at-market sampling opportunities have deteriorated and effort has shifted to at-sea sampling. This is reflected in the proposals of the 2013 sampling programme.

The crustacean pot fishery is excluded from the at-sea observer scheme due expected low rates of discarding of dead individuals. A derogation for sampling the pot fishery for discards was agreed by the relevant RCMs in 2009, based on data on quantities of discards in these fisheries. At-sea sampling (Scheme 2) of this fishery is still carried out, but only focussing on the landed component of the catch (similar to concurrent-at-market sampling).

Concurrent sampling will be conducted as follows:

- Scheme 1 will be applied to all at-sea sampling trips
- If the planned at-sea sampling trips will cover fewer than the required concurrent sampling minimum of 1 trip per month during the fishing season, additional Scheme 2 concurrent sampling at ports will be carried out to meet at least the DCR minimum requirement. The value of 'x%' in Commission Decision 2010/93(EC) section 3(1)(g)), i.e. the percentage of trips where all species are sampled concurrently, will be modified to accommodate this requirement..
- Scheme 2 will be applied for concurrent sampling where discard numbers at length are not collected for all species due to low discard rates (e.g. pot fisheries)

(d) Target and frame population

Sample frames will be defined with respect to DCF regional boundaries and sampling will be 'within' region in all cases; however, attention is drawn to cases such as migratory species like NEA mackerel where sampling will be region-specific, but the allocation of sample effort will necessarily have to respond to the spatial and temporal development of the fishery throughout the fishing season.

England & Wales

The target population is all fishing trips by UK-registered fishing vessels operating out of ports in England. The target population excludes flag vessels (e.g. Anglo-Spanish vessels) that operate from UK ports but offload catch directly into lorries that transport the catch to the continent for first sale. Bilaterals are established to cover sampling of these vessels at the country of landing.

Frame population for sea-based sampling

The sampling frames for at-sea sampling comprise vessel lists for UK-registered vessels operating out of UK ports. The lists are routinely updated. Fleet segments with minimal discarding (e.g. pole and line vessels) are not sampled, as agreed with RCMs. Until recent years, under-10m vessels have been excluded from the list frame due to unsuitability of many of these vessels to take observers. From 2008 onwards, under-10m vessels in some fleet segments and areas have been included in the list but in practice sampling has covered mainly the 9-10m LOA band with some smaller vessels sampled. Auxiliary variables that may be correlated with discarding or size composition will be collated for all non-accessible vessels, including vessels refusing access to observers for different reasons. These variables will be used for evaluating bias and potentially for imputation of values for missing data. The Primary Sampling Units of the frame are vessels, and secondary units are trips within vessels. The Vessel Lists used in the offshore trawl sampling frames encompass vessels operating with two mesh size ranges as recognised by the RCMs NA&EA and NA: 100-119 and ≥ 120 . It is not possible to project the number of samples that will be achieved within each mesh band under a probability-based sampling scheme, so for the purpose of Table III.C.3 the proposed number of samples within the demersal sea-based sampling frame encompasses both mesh ranges in a single value for a mesh range $\geq 100\text{mm}$.

Frame population for port sampling

From 2010 onwards, all on-shore sampling in England will be conducted by Cefas rather than MFA. Responsibilities for sampling in Wales are currently under discussion. The sampling scheme will use area frames comprising all access points providing access for sampling to all UK vessels in each segment landing into England. Separate area frames and associated PSUs are established for some fleet segments with very restricted landing sites (e.g. large pelagic trawlers, beam trawlers and scallop dredgers). The sampling frame comprises a wide range of sampling sites from large ports to minor harbours and slipways. The details of the sampling scheme for 2011-13 are currently under development, but the Primary Sampling Units for most fleet segments will comprise “sampling sites x a time window”. The sampling sites will comprise individual ports, or groups of neighbouring small sampling sites where these can be sampled together on a single trip. All sampling sites are potentially accessible. Secondary Sampling Units comprise individual trips of vessels as described below. Sampling of demersal fishing vessels in a port-based sampling frame encompasses vessels operating with two mesh size ranges as recognised by the RCMs NA&EA and NA: 100-119 and ≥ 120 . It is not possible to project the number of samples that will be achieved within each mesh band under a probability-based sampling scheme, so for the purpose of Table III.C.3 the proposed number of samples within the demersal sea-based sampling frame encompasses both mesh ranges in a single value for a mesh range $\geq 100\text{mm}$.

The sampling frame codes for England are summarised below:

- E1: Area frame of sampling sites providing access for shore-based sampling of $>10\text{m}$ and $<10\text{m}$ vessels using otter trawls, fixed nets and lines for demersal species.
- E2: List frame of UK-registered vessels operating out of English ports, for use in selecting vessels for at sea sampling of all fleet segments included in the

scheme (otter trawlers, beam trawlers, netters, mollusc dredgers, <10m polyvalent)

- E3: Area frame of sampling sites providing access for shore-based sampling of pelagic trawlers and seiners (which operate out of only a few major ports).
- E4: Area frame of sampling sites providing access for shore-based sampling of pot fisheries for shellfish.
- E5: Area frame of sampling sites providing access for shore-based sampling of beam trawlers (which operate out of only a few major ports).

Scotland

The target population is all fishing trips by UK-registered fishing vessels operating out of ports in Scotland. The target population excludes flag vessels that operate from UK ports but either offload catch directly into lorries that transport the catch to the continent for first sale or land directly into non-Scottish ports. Bilaterals are established to cover sampling of these vessels at the country of landing.

The Scottish sampling schemes have had to be modified in a number of ways to respect fully the outcome of the Joint ICES-STEFC Workshop on Methods for Merging Metiers for Fishery Based Sampling (WKMERGE) (ICES CM 2010/ACOM:40). The general approach is outlined below

Frame population for sea-based sampling

The sampling frames for at-sea sampling comprise fishing trips encompassed by vessel lists for UK-registered vessels operating out of Scottish ports. Separate sea-based sampling schemes will operate for pelagic, demersal and shellfish fisheries. For each, vessel lists will be maintained and updated annually to include all active vessels operating within their fisheries. The vessel list for demersal fisheries encompasses vessels operating with two mesh size ranges as recognised by the RCMs NA&EA and NA: 100-119 and ≥ 120 . It is not possible to project the number of samples that will be achieved within each mesh band under a probability-based sampling scheme, so for the purpose of Table III.C.3 the proposed number of samples within the demersal sea-based sampling frame encompasses both mesh ranges in a single value for a mesh range ≥ 100 mm.

Auxiliary variables that may be correlated with discarding or size composition will be collated for all non-accessible vessels including vessels refusing access to observers for different reasons. These variables will be used for evaluating bias and potentially for imputation of values for missing data.

The Primary Sampling Unit within each frame is vessel, and secondary units are trips within vessels.

Frame population for port sampling

Marine Scotland port sampling will consist of distinct schemes for pelagic, demersal and shellfish sampling, each scheme operating with a sampling frame of access sites; such as landing ports, fish markets and processors. The primary sampling unit will be a combination of "sampling site" x "a time window". Sampling of demersal fishing vessels in a port-based sampling frame encompasses vessels operating with

two mesh size ranges as recognised by the RCMs NA&EA and NA: 100-119 and ≥ 120 . It is not possible to project the number of samples that will be achieved within each mesh band under a probability-based sampling scheme, so for the purpose of Table III.C.3 the proposed number of samples within the demersal sea-based sampling frame encompasses both mesh ranges in a single value for a mesh range $\geq 100\text{mm}$.

Due to the relatively centralised nature of the industry supporting the respective fisheries, the vast majority of fishing vessel trips can potentially be sampled by covering relatively few sampling sites. However, not all landings are potentially accessible due to their being sporadic or infrequent, and occurring at remote and inaccessible ports. Adequate sampling coverage of shellfish landings is heavily dependent on being able to sample at processing factories. Estimates of the magnitude of inaccessible landings and inferences about their composition will be used to estimate potential biases in the missing data.

Northern Ireland

The target population is all fishing trips by UK-registered fishing vessels operating out of ports in Northern Ireland. The target population excludes flag vessels that operate from UK ports but offload catch directly into lorries that transport the catch to the continent for first sale. Bilaterals are established to cover sampling of these vessels at the country of landing.

Frame population for sea-based sampling

The sampling frames for at-sea sampling comprise vessel lists for UK-registered vessels operating out of Northern Ireland. The lists are routinely updated. Under-10m vessels have been excluded from the list frame due to unsuitability of many of these vessels to take observers. Auxiliary variables that may be correlated with discarding or size composition will be collated for all non-accessible vessels, including vessels refusing access to observers for different reasons. The Primary Sampling Unit within each frame is vessel, and secondary units are trips within vessels. The vessel list for demersal fisheries encompasses vessels operating with two mesh size ranges as recognised by the RCMs NA&EA and NA: 100-119 and ≥ 120 . It is not possible to project the number of samples that will be achieved within each mesh band under a probability-based sampling scheme, so for the purpose of Table III.C.3 the proposed number of samples within the demersal sea-based sampling frame encompasses both mesh ranges in a single value for a mesh range $\geq 100\text{mm}$. The size of this fleet deteriorated due to quota restrictions over the last number of years and it is unlikely that there will be a fleet deploying this gear in 2013.

Frame population for port sampling

The sampling scheme will use area frames comprising all access points at the three main Northern Irish fishing ports of Kilkeel, Portavogie and Ardglass. Separate area frames and associated PSUs are established for some fleet segments with very restricted landing sites (e.g. large pelagic trawlers). The Primary Sampling Units for most fleet segments comprise sampling sites on a weekly basis. The sampling sites comprise the individual ports which are accessible.

The sampling frame codes for Northern Ireland are summarised below:

- N1: Area frame of sampling sites providing access for shore-based sampling of >10m and <10m vessels using otter trawlers, seine netters, mollusc dredgers.
- N2: List frame of UK-registered vessels operating out of Northern Irish ports, for use in selecting vessels for at sea sampling of the OTM fleet segment targeting demersal fish
- N3: List frame of UK-registered vessels operating out of Northern Irish ports, for use in selecting vessels for at sea sampling of the OTB fleet segment targeting crustaceans/shellfish
- N4: List frame of UK-registered vessels operating out of Northern Irish ports, for use in selecting vessels for at sea sampling of the OTM fleet segment targeting pelagic species
- N5: List frame of UK-registered vessels operating out of Northern Irish ports, for use in selecting vessels for at sea sampling of the fleet segment using dredges
- N6: List frame of UK-registered vessels operating out of Northern Irish ports, for use in selecting vessels for at sea sampling of the fleet segment using pots and traps

The sampling of salmon and eels is described in Annex 2.

(e) Sampling stratification and allocation scheme

Sampling design (frames and strata) differ between UK jurisdictions. The allocation of effort for fleet-based (concurrent) length sampling was therefore carried out separately for each UK jurisdiction, but taking into account that the combined UK sampling effort in a fishing ground may meet the required minimum sampling level of e.g. one trip per month for a métier, even if the planned sampling in one jurisdiction is not expected to meet the required minimum. The national sampling allocation by métier and sampling scheme is given in Table III.C.3, and the scientific justification is given below.

England & Wales

Stratification for at-sea sampling

The primary sampling units for the vessel list frame for at-sea sampling are stratified as follows:

- By quarter
- By area (geographic strata linked to fishing grounds)
- By fleet segment (demersal otter trawlers, beam trawlers; netters; dredgers; polyvalent)
- By vessel LOA (under-10m; 10m and over, depending on fleet segment).

In some cases (e.g. beam trawlers and dredgers) the trips of the fleet segment strata are dominated by a single Level 6 métier (e.g. TBB_DEF_80-99_0_0 or

DRB_MOL_0_0_0), whilst others (e.g. otter trawlers and netters) may comprise a greater number of Level 6 metiers that may change dynamically from year to year).

Stratification for on-shore sampling

The primary sampling units for each area frame for on-shore sampling will be stratified as follows:

- By quarter
- By area (geographic strata linked to fishing grounds)
- By port size (sampling sites will be grouped according to “size”).

Allocation of sampling effort between strata

At-sea sampling. The Cefas sampling effort for at-sea sampling is capped to 600 person-days per year. The number of trips to sample at sea in each quarter-area-segment-LOA stratum (subject to an annual, overall limit of 600 person days at sea) is allocated according to the quarterly landings for each stratum in 2010, using weighting factors for each fleet segment to down-weight fleet segments such as beam trawlers that are inherently less variable (e.g. less variable catch rates due to longer trips; more restricted species targeting; less variability in Level-6 metier structure). Landings weighted by discards are used for sampling allocation ~~as the~~ where data are available for metiers for which at sea sampling is required. Effort data are not used because of the difficulty in comparing effort for gears such as gillnets and otter trawls. Statistical optimisations schemes based on historic discard sampling trips will be investigated during 2011-2013 to determine sampling allocations delivering the DCF precision requirements for groups of species, following the examples and proposals in WKMERGE (ICES, 2010), as sufficient data become available for such analyses. Due to major changes in the exploitation patterns by the fleet, especially for those vessels <15m OAL, and changes to fleet size and seasonality of landings the at sea programme has been amended based on 2010 data.

Shore-based sampling. Total species landings by stratum in 2008 were used as a guideline for allocating sampling effort between strata in each frame. As with at-sea sampling, the total sampling effort is constrained by available resources and is allocated between strata in a way that makes best use of the resources whilst delivering appropriate data for the domains of interest (Level 6 metiers). Statistical optimisations schemes based on historic port sampling data will be investigated during 2011-2013 to determine sampling allocations delivering the DCF precision requirements for groups of species. No major changes to the market sampling plan have been implemented, however any outcomes of WKPICS will be taken into account for any changes within 2012 subject to the current budgetary constraints.

Sample selection methods

At-sea sampling. Vessels in the vessel list are allocated uniform random numbers at the start of each quarter and the list is ordered by random number. Vessels to be sampled in each stratum are selected in order of occurrence in the list random number, skippers/owners are contacted and a trip is arranged at a suitable date.

On-shore sampling: The sample selection method for port sampling in 2011-13 is currently under development. It is likely to comprise a “lattice” type semi-systematic survey design in which the quarterly strata for each sampling frame are subdivided into shorter time blocks to ensure a more systematic spread of sampling over time whilst retaining elements of randomness (see WKMERGE report). The sampling will be designed to ensure that all sampling probabilities are adequately controlled. The findings of WKPICS will be used to improve sampling design.

Scotland

Stratification for at-sea sampling

Much of the detail and practical restrictions was more or less finalised in ~~2010~~2011 following trial programmes.

The sampling frames of vessel lists (for the distinct demersal, pelagic and shellfish schemes) are likely to be stratified as follows:

- by quarter for demersal and shellfish sampling;
MSS will not carry out any pelagic observer trips in 2012-13. However, as high-grading is now banned in these fisheries (Council Regulations 43/2009, 1288/2009 579/2011) landings now better reflect catches. Measurements of the biological characteristics (age and length frequencies) of the landings will be made at processing plants and factories. This will also remove the ‘observer effect’ when staff are on board vessels.
- by home port and/or operating port areas

It may also prove desirable to incorporate a further sub-stratification level reflecting some aspect of vessel size or power.

Stratification for on-shore sampling

The primary sampling units for port and access point sampling will be stratified as follows:

- by quarter;
- by area with a substratification of port/access point within area

Sampling sites for the demersal scheme are likely to be grouped as “major NE ports”, “Shetland”, west coast” and “other east coast”.

Sampling sites for the pelagic scheme are likely to be grouped as “major NE ports” and “Shetland ports”.

Sampling sites for shellfish sampling are yet to be finalised, but will probably broadly follow “major NE ports/processors”, “Shetland ports/processors”, “west coast” and “other east coast”.

Allocation of sampling effort between strata

At-sea sampling.

MS-S ordinarily has capacity to service approximately 60 demersal observer trips, ~~35 pelagic observer trips~~ and 55 shellfish observer trips. Demersal and shellfish trips will be allocated uniformly across temporal strata (quarters) as, broadly speaking, landings are also distributed in that way. See explanation above. Investigations will be undertaken during the period 2011-2013, as data accrue, to refine the allocation procedures in accordance with the outcomes of WKMERGE (ICES, 2010).

Shore-based sampling.

As with at-sea sampling, the total sampling effort is constrained by available resources. There will be a reduced frequency of demersal market sampling trips in 2012. It is known that sampling levels for the major North Sea demersal stocks can be reduced without adversely impacting on precision; however, that is not true for Scottish North Atlantic stocks, so as well as generally reducing sampling levels in the North Sea, some North Sea sampling effort will be diverted to North Atlantic stocks to attain the DCF precision levels.

Sampling landings is also subject to sub-contracting to the North Atlantic Fisheries College for Shetland ports.

Sampling effort will be allocated between strata to reflect the priorities of the respective sampling schemes. For the demersal sampling scheme the major NE ports handle the bulk of demersal landings and will receive a substantial proportion of the available sampling effort. Likewise, the Marine Scotland commitment to sampling in ICES divisions VIa and VIb in particular may also require a disproportionate allocation of resources to the west coast stratum.

Effort allocation for the Shetland stratum is governed by a Memorandum of Understanding with the North Atlantic Fisheries College and has been set at a level to provide the minimum number of samples for precision level calculation for the species and metier of interest.

Depending on the resources available, effort allocation to the stratum containing insignificant numbers of trips and landed weights will be low, and may well be zero. As for unobtainable samples, estimates of the magnitude of any unsampled stratum and inferences about their composition will be used to estimate potential biases in the missing data.

Sample selection methods

At-sea sampling. Vessels in the vessel list will be ordered randomly at the start of each quarter (demersal and shellfish.) Vessels to be sampled in each stratum will be selected in order of occurrence in the list. Specific details will be elaborated further in planning during 2010 and in the light of experience during 2011-2013.

On-shore sampling:

A randomised vessel selection procedure will be used to select the vessels to sample on each “port x time period” sampling visit. Incidences of refusal, i.e., non-response rates, will be quantified as part of this selection process.

When sufficient sampling opportunities occur the priority for sampling will be directed towards maximising the number of “species x vessel samples” collected as these constitute the source of greatest variability in any evaluation of the landed catch. However, it is anticipated that sufficient opportunities for obtaining concurrent samples will occur to meet DCF requirements.

Northern Ireland

The primary sampling units for the vessel list frames for at-sea sampling are stratified as follows:

- By quarter
- By area (geographic strata linked to fishing grounds)
- By fleet segment (demersal otter trawlers; demersal midwater otter trawlers; pelagic midwater otter trawlers; dredgers; potters)

Stratification for on-shore sampling

The primary sampling units for each area frame for on-shore sampling will be stratified as follows:

- By quarter
- By area (geographic strata linked to fishing grounds)
- By port

Allocation of sampling effort between strata

At-sea sampling: The AFBI sampling effort for at-sea sampling was capped to 150 person-days per year up to 2012. This has been increased due to the changes in fishing activities (i.e., no directed whitefish fleet for 2013 due to quota restrictions and selectivity devices fitted to the TR2 fleet) the at-market sampling opportunities have deteriorated and effort has shifted to at-sea sampling. This is reflected in the proposals of the 2013 sampling programme. The number of trips to sample at sea in each quarter-area-segment is allocated according to the quarterly landings for each stratum and weighted by observed historic variability in terms of species and catch composition. Pelagic trips will be scheduled for the distinct herring season, and will be allocated according to the real-time spatial and temporal development of the fisheries. The mollusc dredger trips will also be scheduled for the scallop season. Statistical optimisations schemes based on historic discard sampling trips will be investigated during 2011-2013 to determine sampling allocations delivering the DCF precision requirements for groups of species, following the examples and proposals in WKMERGE (ICES, 2010), as sufficient data become available for such analyses.

Shore-based sampling: As with at-sea sampling, the total sampling effort is constrained by available resources and is allocated between strata in a way that

makes best use of the resources whilst delivering appropriate data from all sampling sites within the area frame. Sampling effort will be allocated between strata in accord with recommendations from WKPRECISE and WKACCU. Details will be elaborated fully during 2011-2013.

Sample selection methods

At-sea sampling: Vessels in the vessel list will be ordered randomly at the start of each quarter (demersal, shellfish and pots) or season (pelagic and dredgers). Vessels to be sampled in each stratum will be selected in order of occurrence in the list. Vessels to be sampled in each stratum are selected in order of occurrence in the list random number, skippers/owners are contacted and a trip is arranged at a suitable date.

On-shore sampling: The intention is to elaborate a survey design in accord with the guidance and outcome of WKMERGE (ICES, 2010). This will be developed during 2010 and designed to ensure that all sampling probabilities are adequately controlled.

III.C.2 Estimation procedures

England & Wales

Discards estimates:

The analysis procedure follows the methods appropriate for stratified random, multi-stage sampling, taking into account recommendations from the ICES Workshop on discards raising procedures (WKDRP). As the PSUs for sea-based sampling are the vessels within strata, the sampled trips within each PSU represent one or more trips from the cluster of trips representing all the trips of that vessel in the stratum. Quarterly estimates of discard weights for a species are estimated by.

- 1) Raising from the sampled hauls to all hauls in a trip;
- 2) Combining over trips of the same vessel if two or more trips have been selected for that vessel in the sampling stratum, and raising from the sampled trips to all trips of that vessel in the stratum using appropriate raising factors. The raising factors in terms of numbers of trips, fishing effort or landings are derived from the fleet census data provided by EU logbook data and sales slips data (for <10m vessels without EU logbooks).
- 3) Combining the estimates for all sampled vessels in the stratum and raising to all vessels in the list frame for that stratum.
- 4) Combining estimates over all strata for which a combined estimate is required.

The analysis can be adapted to provide estimates for specified domains of interest, e.g. fishing grounds or Level 6 metiers, if sufficient trips have been sampled in each domain.

Length and age structure of catches

At-sea sampling: The same multi-stage raising procedure is adopted for raising length composition data as for estimation of discards volumes.

On-shore sampling: For any given fleet segment and vessel LOA stratum (e.g. beam trawlers or 10m and under polyvalent), the procedure for estimating quarterly length compositions at the fleet level from sampling of landings ashore is as follows:

- 1) Raising the length frequency sample to the total weight of the species landed from a sampled trip (this may involve collection of length data from individual EU size categories);
- 2) Combining the trip-raised estimates from sampled trips in the port x time PSU, to all trips recorded for the cluster of trips represented by the PSU. The raising factors in terms of landings per fleet segment in the cluster are derived from the fleet census data provided by EU logbook data and sales slips data (for <10m vessels without EU logbooks).
- 3) Combining the estimates for all selected PSUs in the port stratum and period within the quarter, and raising to all PSUs for that stratum and period.
- 4) Summing the raised length frequencies across port and period strata, then summing over 'period' within in each quarter. If a given within-quarter period is missed, the raised length frequencies summed over the sampled periods are raised to the total landings in the quarter.

For stock-based length frequencies, the above procedures for at-sea and on-shore sampling require post-stratification of the samples according to the ICES Divisions that make up a stock definition (e.g. VIIe-k cod), assuming representative selection of trips by fishing ground within each PSU cluster. Post stratification can also be applied to provide estimates for specified metiers if sufficient trips have been sampled in each metier (domain).

The length samples from which age material are collected will be recorded to ensure that the link between the samples can be maintained in analysis, where required.

Scotland

Discards estimates:

The analysis procedure follows the methods appropriate for stratified random, multi-stage sampling. As the PSUs for sea-based sampling are the vessels within strata, the sampled trips within each PSU represent one or more trips from the cluster of trips representing all the trips of that vessel in the stratum. Quarterly estimates of discard weights for a species are estimated by:

- 1) Raising from the sampled hauls to all hauls in a trip;
- 2) Combining over trips of the same vessel if two or more trips have been selected for that vessel in the sampling stratum, and raising from the sampled trips to all trips of that vessel in the stratum using appropriate raising factors. The raising factors in terms of numbers of trips, fishing effort or landings are derived from the fleet census data provided by EU logbook data and sales slips data (for <10m vessels without EU logbooks).

- 3) Combining the estimates for all sampled vessels in the stratum and raising to all vessels in the list frame for that stratum.
- 4) Combining estimates over all strata for which a combined estimate is required.

Length and age structure of catches

At-sea sampling: The same multi-stage raising procedure is adopted for raising length composition data as for estimation of discards volumes.

On-shore sampling: Within any sample stratum, the procedure for estimating quarterly length compositions at the fleet level from sampling of landings ashore is:

- 1) Raise the measured length frequency to the landed weight for the species for the sampled trip (this may involve the collection of length frequency data for graded size classes being raised to the landed weight for the size class and then summed).
- 2) If numbers at age estimates are required, an age-length key (ALK) will be formed from the age sample from the trip and weighted by the measured length frequency to estimate numbers at age for the trip.
- 3) The numbers at length (numbers at age) are summed for all sampled trips within the stratum. This is then raised using the ratio of the fleet landed weight within the stratum to the landed weight for the sampled vessels within the stratum to obtain numbers at length (numbers at age) estimates for the stratum.
- 4) Stratum estimates are summed over the quarter to obtain an annual estimate at the national level.

For stock based estimates by Division and/or metier, the above procedure requires the pre-stratification of the sample data, e.g., all samples for, say, haddock in sub-area IV for OTB_DEF_ >=120_0_0 would be raised by their respective sampling strata. The probability based selection procedures ensure that the appropriately weighted estimates combined from each stratum provide as far as is possible an unbiased estimate of the population of interest.

Precision estimates for strata will be generated by non-parametric bootstrapping of trip level numbers at length (numbers at age) data. The minimum number of replicates required for precision estimates within each stratum will generally be considered to be ten. Precision estimates at stock / metier / Division level will be aggregations of bootstrap realisations across the appropriate strata.

For stock-based length frequencies, the above procedures for at-sea and on-shore sampling require post-stratification of the samples according to the ICES Divisions that make up a stock definition (e.g. IV & VIId whiting), assuming representative selection of trips by fishing ground within each PSU cluster.

Northern Ireland

Discards estimates:

The analysis procedure follows the methods appropriate for stratified random, multi-stage sampling. As the PSUs for sea-based sampling are the vessels within strata, the sampled trips within each PSU represent one or more trips from the cluster of trips representing all the trips of that vessel in the stratum. Quarterly estimates of discard weights for a species are estimated by.

- 1) Raising from the sampled hauls to all hauls in a trip;
- 2) Combining over trips of the same vessel if two or more trips have been selected for that vessel in the sampling stratum, and raising from the sampled trips to all trips of that vessel in the stratum using appropriate raising factors. The raising factors in terms of numbers of trips, fishing effort or landings are derived from the fleet census data provided by EU logbook data and sales slips data (for <10m vessels without EU logbooks).
- 3) Combining the estimates for all sampled vessels in the stratum and raising to all vessels in the list frame for that stratum.
- 4) Combining estimates over all strata for which a combined estimate is required.

Length and age structure of catches

At-sea sampling: The same multi-stage raising procedure is adopted for raising length composition data as for estimation of discards volumes.

On-shore sampling: For any given fleet segment, the procedure for estimating quarterly length compositions at the fleet level from sampling of landings ashore is as follows:

- 1) Raising the length frequency sample to the total weight of the species landed from a sampled trip (this may involve collection of length data from individual EU size categories);
- 2) Combining the trip-raised estimates from sampled trips in the PSU, to all trips recorded for the cluster of trips represented by the PSU. The raising factors in terms of landings per fleet segment in the cluster are derived from the fleet census data provided by EU logbook data and sales slips data (for <10m vessels without EU logbooks).
- 3) Combining the estimates for all selected PSUs in the port stratum and period within the quarter, and raising to all PSUs for that stratum and period.
- 4) Summing the raised length frequencies across port and period strata, then summing over 'period' within in each quarter. If a given within-quarter period is missed, the raised length frequencies summed over the sampled periods are raised to the total landings in the quarter.

For stock-based length frequencies, the above procedures for at-sea and on-shore sampling require post-stratification of the samples according to the ICES Divisions that make up a stock definition (e.g., VIIa and VIa), assuming representative selection of trips by fishing ground within each PSU cluster.

III.C.3 Data quality evaluation

England

The Cefas at-sea sampling scheme covers vessels of 10m and under, however in practice only the larger vessels in this fleet segment (>8m) are suitable for accommodating observers. For vessels large enough to take observers, access may be refused for various reasons. Procedures to investigate bias will follow the recommendations of WKACCU. This includes recording all non-accessible vessels, and using the census data from logbooks and sales slips to compare the activities of observable and non-observable vessels. Previous UK Technical Reports have not provided precision indicators for discards from Cefas observer trips. The COST tools will be applied from 2010 onwards, and may lead to revisions to sampling levels by fleet segment to address any issues of poor precision.

Potential sources of bias in the on-shore sampling scheme could arise from non-accessibility of some landing sites or any departures from representative sampling caused by staffing or other logistical problems. The UK will be working towards applying the procedures outlined in WKACCU, and implemented using COST software, as part of the process of validating the data by investigating evidence for bias in the sampling scheme. Length frequencies of retained fish sampled ashore and at sea from the same métiers and fishing grounds will be compared to investigate systematic differences that could indicate bias in one or other of the sampling schemes.

The Cefas databases for archiving discards and port-sampling data include automated error trapping routines. Other QA/QC procedures adopted include checking data in the databases against raw data on log-sheets.

Cefas scientists contribute to all relevant ICES workshops, sample exchange schemes set up by PGCCDBS, IBTSWG or other planning groups to ensure consistent high standards in ageing, maturity identification, sampling design and other aspects of data collection. Planned attendance at workshops, planning groups etc. in 2011-13 is given in Table II.B.1.

Scotland

Marine Scotland will follow the recommendations of WKPRECISE, WKACCU and WKMERGE in identifying and seeking to mitigate potential sources of bias in its sampling scheme that is proposed for the period 2011-2013

Marine Scotland procedures for data checks and validation are described in Annex 4

Marine Scotland scientists take part in all relevant regional coordination meetings, PGCCDBS (and the workshops that it spawns), EU SGRN meetings of relevance to the DCF, research vessel survey planning groups and ICES workshops on precision and accuracy.

Northern Ireland

Similar to Scotland, AFBI will follow the recommendations of WKPRECISE, WKACCU and WKMERGE in identifying and seeking to mitigate potential sources of bias in its sampling scheme that is proposed for the period 2011-2013. However, as mentioned, above, details of its sampling scheme to account for the recommendations from WKMERGE, will only be elaborated fully during 2010.

The AFBI databases for archiving discards and port-sampling data include automated error trapping routines. Other QA/QC procedures adopted include checking data in the databases against raw data on log-sheets.

AFBI scientists contribute to all relevant ICES workshops, sample exchange schemes set up by PGCCDBS, IBTSWG, WGIPS or other planning groups to ensure consistent high standards in ageing, maturity identification, sampling design and other aspects of data collection. Planned attendance at workshops, planning groups etc. in 2011-13 is given in Table II.B.1.

III.C.4 Data presentation

Data and age material collected from at-sea and shore-based fishery sampling in 2011-2013 will be processed according to tightly controlled work schedules to ensure provision of aggregated data and biological parameters for ICES Expert Groups in the following year. The majority of data processing is in the first half of the year due to the March – May timing of most ICES stock assessment Working Groups relevant to the UK (WGNSSK; WGCSE; HAWG; WGHMM). Data for Expert groups later in the year (e.g. WGWIDE) are processed accordingly. The workload associated with providing datasets to ICES WGs in the first half of the year means that the laboratories would find it difficult to provide processed data sets for other stocks not scheduled for this period.

Standard data processing for ICES stock assessment Expert Groups comprises the following tasks which are included in the UK Financial Forms:

- 1) Data extraction followed by evaluation of data quality using COST and/or other tools and correction of detected errors;
- 2) Estimation of quarterly discard weights, and length compositions of retained and discarded catch for each assessed stock (for fleet definitions

required for input to InterCatch) using the estimation procedures described in Section III.C.2.

- 3) Estimation of age compositions of retained and discarded fish for stocks with catch-at-age assessments, together with associated weights at age, liaising with other Member States involved in collaborative age collection schemes.
- 4) Provision of other biological parameter estimates such as proportion mature at age, when requested by the Working Groups.
- 5) Preparation of archived national Annual Data Files for each stock.
- 6) Uploading of national data sets on InterCatch.
- 7) Compilation of international data sets by ICES stock coordinators located in the UK labs.

III.C.5 Regional co-ordination

UK sampling programmes for 2011 - 2013 will be amended in the light of the outcomes from the North Sea & East Arctic and the North Atlantic RCM meetings in 2010 and subsequent years.

There are currently a number of arrangements with other Member States for coordination of data collection, and these will remain in place pending RCM recommendations.

Study contracts projects FIEFA (97-0059) and SAMFISH (99/009) showed that Spanish and Anglo-Spanish vessels operating to the west of Ireland worked the same gear and followed the same discarding and market practises, and belonged to the same métiers. Spain undertook sampling of the Anglo-Spanish vessels and the data collected indicated that vessels fishing in the same métier worked the same gear, followed the same discarding and market practises. It was agreed that as long as Spain was sampling the métiers involved from Spanish vessels in the métier the same rates of discarding could be applied to the Anglo-Spanish vessels (same for length and age from the landings) also prosecuting the same métier. The agreement that the data collected from the two groups of vessels would be the same excluded the need to have to implicitly sample an Anglo-Spanish vessel.

The UK and Spain have opened discussions on implementing a pilot study looking at VMS and landings data to ensure this is still the case. Results of the study should be available for RCM NA 2012.

Landings and effort: The UK will collect and exchange information on landings by foreign vessels into the UK and obtain similar information of landings by UK vessels into foreign ports.

Discards: Agreement has not yet been reached with Spain that UK flag vessels landing directly in to Spain, belong to the same métier as the Spanish trawler fleet fishing to the West of Ireland, and that this métier would be covered under the Spanish discard programme.

Sampling for length and age: The UK has set up bilateral agreements with Belgium, Netherlands, Denmark, Germany, Norway, Sweden and Ireland. Copies of these bilateral arrangements are given in **Annex 5**. Following the 2011 RCM meetings, these bilaterals may be renewed or amended, or new bilaterals agreed, and these will be forwarded to the Commission when signed by the Member States involved.

Following recommendations from the North Sea & Eastern Arctic RCM, a collaborative system of otolith collections for VIId sole has been established between the UK, France, and Belgium and implemented since 1 January 2008. Following recommendations from the North Atlantic RCM, a similar collaborative exercise for VIIa sole otoliths is being implemented by the UK, Ireland and Belgium from 2009 onwards. The RCMs may agree a range of similar collaborations for other stocks.

A list of appropriate recommendations on métier-based variables from the relevant RCMs is given below, with brief description of the responsive actions that will be taken

Métier variables: Description of métiers to be sampled in National Programme	
RCM NA 2009 Recommendation	In compiling the National Programmes 2011-2013, MS should ensure that the information provided in describing the métiers to be sampled relates directly to the information provided to the RCM NA in the métier section.
Follow-up actions needed	National Correspondent (or person completing fleet / métier descriptions) to liaise with RCM participants responsible for compiling métier description templates for the RCM NA.
Responsible persons for follow-up actions	National Correspondents and RCM participants.
Time frame (Deadline)	March 2010 All to Action
UK Response	UK métier description follows information provided to the RCM NA in the métier section.

Métier variables: merging fleet segments and métiers for sampling and analysis	
RCM NA 2009 Recommendation	To ensure that all Member States' National Programmes for 2011-13 take account of the outcomes from WKMERGE, RCM NA 2009 recommends that all MS contribute to the workshop and ensure that their participants are able to carry out the required preparatory work.

Follow-up actions needed	<p>Member States to identify appropriate participants who are involved in the statistical design of national fleet-based biological sampling programmes, and to advise the WKMERGE chairs of the names of participants in sufficient time to allow preparatory work. The chairs will also seek participation of people with particular skill sets. Participants will be asked to prepare the following material for the meeting:</p> <p>Chapter VII All Member States participants to provide a Working Document describing the basis for national metier definition and merging in 2009&2010;</p> <p>Chapter VIII Identified participants to prepare European case studies for examining applications of metier-merging methods. The PGCCDBS will liaise with RCMs to identify suitable case studies. The data for these case studies are to be available at the Workshop in the COST format.</p>
Responsible persons for follow-up actions	All Member States (RCM members and National Correspondents)
Time frame (Deadline)	End 2009.All to Action
UK Response	Two UK scientists participated (one as co-chair). Outcomes of WKMERGE will be taken into account where appropriate in UK sampling schemes.

Métier variables: Inclusion of bilateral and RCM agreements in NP	
RCM NA 2009 Recommendation	<p>National Programmes to include appropriate reference to RCM NA report in relation to sampling agreement at metier level.</p> <p>National Programmes to include in annex formal bilateral agreements, using the template in annex XI.</p>
Follow-up actions needed	National Correspondents to ensure that National Programme includes appropriate reference to RCM and bilateral agreements in relation to sampling activities as referred to in the RCM NA report
Responsible persons for follow-up actions	National Correspondents
Time frame (Deadline)	March 2010 All to Action
UK Response	Bilateral agreements are included in an annex

III.C.6 Derogations and non-conformities

The UK wishes to seek derogation from fleet-based biological sampling for FPO_MOL_000. Within the UK the majority of effort for this metier is targeting whelks (*Buccinidae*). This fishery is associated with limited discarding apart from undersize individuals of the target species. In support of this request for a derogation from sampling a Fisheries Science Partnership (2009) report giving details of observed discards (given in ANNEX 7) was presented to RCMs NA and NS&EA in 2011. This derogation was supported by both RCMs.

The UK wishes to seek derogation from fleet-based biological sampling for HMD_MOL_000 and DRB_MOL_0_0_0 (non scallop targeted).

Within the UK the majority of effort in HMD_MOL_000 is targeting cockles (*Cardiidae*). This fishery is associated with limited discarding apart from undersize individuals of the target species.

DRB_MOL_0_0_0 covers both the mainly inshore fisheries for clams (*Veneridae*) and oysters (*Ostreidae*) and the mainly offshore fisheries for scallops (*Pecten maximus*). These fisheries are associated with limited discarding apart from undersize individuals of the target species. The inshore fisheries for clam and oyster show virtually no discarding apart from undersize individuals of the target species. Although the discards of finfish in the targeted scallop fisheries of DRB_MOL_0_0_0 is low it is felt sensible to continue sampling this sector of the metier to obtain a better understanding of variability of discarding within the scallop fisheries by area.

In support of this request for a derogation from sampling a Working Document giving details of observed discards (given in ANNEX 11) in the DRB_MOL_0_0_0 fisheries and results of a pilot study for HMD_MOL_000 targeting cockles was presented to RCMs NA and NS&EA in 2012. This derogation was supported by both RCMs.

RCM NA 2012

The UK submitted a working document (Annex 11) on dredge fisheries to seek support in removing the requirement for sampling at sea for the HMD_MOL_0_0_0 metier and the non scallop targeted DRB_MOL_0_0_0 metier in fishing grounds in area VII. The report was discussed by RCM NA 2012 and it was agreed that as there is limited discarding of non- finfish species and the majority of the discarded molluscs are returned alive there was no need for at sea sampling for this metier. These fisheries are also monitored by the Inshore Fisheries and Conservation Authorities (IFCA). Although the discards of finfish in the targeted scallop fisheries of DRB_MOL_0_0_0 prosecuted in area VII is low it is felt sensible to continue sampling this sector of the metier to obtain a better understanding of variability of discarding within the scallop fisheries by area.

Table 1 Summary of agreements reached during RCM NA on the need to sample metiers on-board for discards estimation

Metier	Area	RCM NA Comment	Sampling required	RCM NA
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				report
FPO_CRU_0_0_0	VI, VII (excl. VIId)	Onboard monitoring unnecessary owing to A. the small by-catch of finfish, and B. the return of undersized crustaceans alive.	No	2009
LHP_DEF_0_0_0	VIIa, VIIe, VIIfgh	Onboard monitoring for discards was unnecessary as the volumes of discards are small, and the same issues of practicality and safety apply to the placing of observers on hand-lining vessels that are predominantly <10m but frequently as small as 6m.	No	2009
GNS_DEF_120-219_0_0 GNS_DEF_>=220_0_0	VII fgh	Onboard observation still necessary as high rates of discarding were observed by France.	Yes	2009
DRB_MOL_0_0_0	VIIe	UK and France to conduct pilot studies		
PS_SPF_0_0_0	VIIIb VIIIc	Onboard monitoring unnecessary owing to low level of discarding (<2% by weight) observed in 2003 and 2004 by Spain.	No	2009
FPO_MOL_0_0_0	VI, VII (excl VIId).	Onboard monitoring of potting for Whelks (Busycon spp) unnecessary owing to Negligible by-catch of non-fish species and return of undersized molluscs alive.	No	2011
HMD_MOL_0_0_0	IV, VIId	Hand and suction dredge for molluscs where the majority of fisheries are highly legislated by IFCA (Inshore Fisheries and Conservation Authorities) with limited discards of finfish and shellfish	No	2012
DRB_MOL_0_0_0	IV, VIId	Boat dredge fisheries for molluscs – excluding the targeted scallop fishery - the majority of fisheries are monitored by IFCA(Inshore	No	2012

		Fisheries and Conservation Authorities) with limited discards of finfish and shellfish		
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RCM NS&EA 2011

Aim: provide scientific justification for not sampling certain métiers for discards...

The UK(E) submitted an 2009/10 Fisheries Science Report on Whelk (*Busycon* spp) Biology in order to seek support in removing the requirement for sampling at sea for the FPO_MOL_0_0_0 metier. The report was discussed by RCM NS&EA as it was during RCM NA and it was agreed that as there is limited discarding of non- finfish species and all the discarded molluscs a returned alive there was no need for at sea sampling for this metier.

The UK proposes to undertake pilot studies in relation to fleet-based biological sampling for HMD_MOL_000, targeting mussels (*Mytilus edulis*) and cockles (*Cerastoderma edule*), which are thought to have limited by-catch of species covered in Appendix VII. These results will be presented to the relevant RCMs in 2012 and the results used to decide upon future sampling levels should this be deemed appropriate.

UK métiers that cannot be adequately sampled in the UK due to landing abroad will be covered through the bilateral arrangements agreed at the RCM meetings.

Responsibility for the port sampling programme in England and Wales was transferred from the Marine and Fisheries Agency to Cefas in 2010. The opportunity was taken to redesign the sampling scheme utilising the recommendations in WKMERGE (ICES, 2010) for design-based sampling. The scheme will be evaluated as experience is gained in 2010 and this may result in some changes for 2011 onwards. However, this is not expected to lead to any discontinuity or inconsistency in the time series.

The UK also seeks a derogation from sampling pelagic observer trips. As high-grading is now banned in these fisheries (Council Regulations 43/2009, 1288/2009 579/2011) landings now better reflect catches. Measurements of the biological characteristics (age and length frequencies, sex and maturity) of the landings will be made at processing plants and factories.

RCM NS&EA 2012

The UK submitted a working document (Annex 11) on dredge fisheries to seek support in removing the requirement for sampling at sea for the HMD_MOL_0_0_0 metier and the non scallop targeted DRB_MOL_0_0_0 metier in IV, VIId. The report was discussed by RCM NS&EA and it was agreed that as there is limited discarding of non- finfish species and the majority of the discarded molluscs are returned alive there was no need for at sea sampling for this metier. These fisheries are also monitored by the Inshore Fisheries and Conservation Authorities (IFCA). Although the discards of finfish in the targeted scallop fisheries of DRB_MOL_0_0_0 prosecuted in IV, VIId is low it is felt sensible to continue sampling this sector of the metier to obtain a better understanding of variability of discarding within the scallop

fisheries by area. This information has been added to the summary of all exemptions from at sea sampling agreed at RCM NS&EA.

Summary of agreements reached during RCM NS&EA on the need to sample métiers on-board for discards estimation

Metier	Area	RCM NS&EA Comment	Sampling required	RCM NS&EA report
Sampling of metiers that only catch G3 species	All	Recommends that SGRN clarifies if metiers only catching G3 species need to be sampled. SGRN: these metiers have to be sample. In case MS disagree with this decision, MS should take this up in bilaterally with the Commission.	Yes	2009 (p 9)
DRB_MOL_0_0_0	VIIId, IV	Discard rate of fish is small while it is high on juvenile scallops. The importance of discard estimates for management then comes down to survival rate of scallop discards which is out of the scope of DCF. The necessity of sampling this metier for discard was discussed during the RCM NS&EA. If the RCMs were given the task to prioritise metiers for discard sampling the DRB_MOL_0_0_0 would be a candidate for not sampling discards.	?	2010 (p 20)
FPO_CRU_0_0_0	VIIId, IV	The necessity of sampling this metier for discard was discussed during the RCM NS&EA. If the RCMs were given the task to prioritise metiers for discard sampling the FPO_CRU_0_0_0 would be a candidate for not sampling discards.	?	2010 (p 21)
LHP_FIF_0_0_0	VIIId, IV	Discards assumed to be insignificant. Landings sampled at shore.	?	2010 (p 21)
LLS_DEF_0_0_0	VIIId, IV	Discards assumed to be insignificant. Landings sampled at shore.	?	2010 (p 21)
OTB_DEF_<16_0_0	VIIId, IV	It is an industrial fishery that does not discard and it is monitored for landings and by catches. Germany has planned to sample this metier at sea with 1 trip. Given the large sampling programme planned by	?	2010 (p 21)

Metier	Area	RCM NS&EA Comment	Sampling required	RCM NS&EA report
		Denmark, the RCM NS&EA suggests Germany to allocate this sampling effort to another metier.		
OTB_DEF_1631_0_0	VIIId, IV	Trawl for reduction purpose. This métier is operated by Denmark exclusively, does not discard and is monitored for landings.	?	2010 (p 21)
LH_FIF_0_0_0	IIIa	Sweden has asked for derogation to sample this métier.	?	2010 (p 27)
FPO_MOL_0_0_0	VIIId, IV	Coastal pot fishery for whelks and cuttlefish. Exclusively operated by France and UK. Discards assumed to be insignificant. Landings sampled at shore. + see Fisheries Science Report on Whelk submitted by the UK(E) in 2009/10.	No	2011 (p 31)
HMD_MOL_0_0_0	IV, VIIId	Hand and suction dredge for molluscs where the majority of fisheries are highly legislated by IFCA (Inshore Fisheries and Conservation Authorities) with limited discards of finfish and shellfish	No	2012 (P30)
DRB_MOL_0_0_0	IV, VIIId	Boat dredge fisheries for molluscs – excluding the targeted scallop fishery - the majority of fisheries are monitored by IFCA(Inshore Fisheries and Conservation Authorities) with limited discards of finfish and shellfish	No	2012 (P30)

III.D Biological - Recreational fisheries

North Sea (IV&VIId), Eastern Arctic (I&II), North Atlantic (V-XIV and NAFO areas)

The UK (England) sampling schemes for recreational fishery sampling are the same for all sampled areas and are described for the supra-region. For UK (Scotland) sampling is for cod in the North Sea and for salmon in the North Sea and North Atlantic.

III.D.1 Data acquisition

Commission Decision 2008/949/EC requires estimates of quarterly recreational fishery catches (presumed not to include catch-and-release) for the following stocks & areas:

Cod and eels in the North Sea and VIId

Salmon, sea bass and eels for ICES areas in the North Atlantic

Commission Decision 2010/93(EC) for 2011-13 includes sharks in all areas for recreational fishery sampling.

Council Regulation (EC) No. 1224/2009, (the revised regulation establishing the control regime for the CFP) includes at Article 55 a requirement for estimation of recreational fishery catches of recovery plan species. Paragraph 3 of that article states:

3. Without prejudice to Regulation (EC) No 199/2008, Member States shall monitor, on the basis of a sampling plan, the catches of stocks subject to recovery plans by recreational fisheries practised from vessels flying their flag and from third country vessels in waters under their sovereignty or jurisdiction. Fishing from shore shall not be included.

There is thus a significant overlap between the requirements under the DCF and the requirements under the Control Regulation. However, the detail of the requirements of the latter will be set by detailed implementing rules which have yet to be agreed. There are specific elements of these requirements that need to be defined – for example, the exact scope of vessels to be covered has yet to be defined – it is assumed that it will include boats that charter themselves out to recreational angling groups, but there are other types of activity – e.g. instances where the boat is hired out without the owners knowing what the use will be, as well as use of privately-owned boats for recreational sea angling. As such the work plan detailed below may be subject to revision once the detailed requirements for the Control Regulation are clear – this will be in order to ensure that both sets of obligations are met in the most efficient manner.

Annex 6 included in this National Programme contains a summary of estimates of catch data from previous work. More recent estimates are still under production and will be incorporated into the UK Technical Report on work in 2009.

The methodology for intercept sampling of recreational fisheries in Wales has been explored through Pilot Studies in 2007 & 2008 previously reported under the DCF. Experiences from these pilot studies are incorporated in the UK survey work planned for 2012.

During 2011 considerable work was conducted to plan a series of surveys of recreational sea angling to be carried out in England in 2012. This has involved substantial liaison with stakeholders to maximise the response rate for the surveys, and development of subcontracts to carry out the work. The design of recreational sea angling surveys will follow the general approaches proposed in the ICES Planning Group on Recreational Fishery Surveys. Estimates of catch will be obtained by combining estimates of fishing effort with independent estimates of mean catch per unit effort derived from probability-based sampling schemes. Two types of survey will be conducted in England during 2012:

1. A survey of charter vessels to be carried out by the Marine Management Organisation. Effort and CPUE will be obtained by sampling from a complete list frame of vessels.
2. A survey of shore-based and private-boat angling. Total effort will be obtained from questions added to a multipurpose government social survey of households in Great Britain. CPUE will be estimated by random-stratified on-site surveys to be carried out by the ten new Inshore Fisheries and Conservation Authorities in England under contract to Cefas.

The multipurpose government social survey is carried out UK wide on a regular basis each month, and provides options whereby government organisations, academic institutions and charities can commission a module as part of the survey. The survey has a monthly cycle and more information is available from the Office for National Statistics (ONS) web-site at:

<http://www.ons.gov.uk/about/who-we-are/our-services/omnibus-survey/index.html>

This survey has the benefits of being a national exercise and it uses random probability sampling. The survey collects general information about the households concerned, and thus provides overall demographic information to complement the results from the specific questions asked. This survey will thus be used to identify the following sets of information which will allow the overall levels of recreational fishing effort to be identified:

- The overall level of involvement in recreational sea angling in the UK
- A breakdown by location of activity – shore based, private boats, commercially operated recreational angling vessels
- Frequency of activity for each type (i.e. trips per year)
- Location of activity – this will be available from the demographic information collected on the households sampled as part of the survey as well as specific questions on the most frequent location of the activity around the UK coast.
- Type of activity – i.e. use of gears other than rod and line.

The ONS survey will be used to provide estimates of how fishing effort is distributed spatially, seasonally and by method of fishing, and to evaluate changes since previous similar surveys in the early 2000s. The data will guide the allocation of sampling schemes to estimate catch rates, particularly for shore-based and private boats for which there are no list frames available, and to provide raising factors.

The surveys to estimate catch rates of shore-based and private boat anglers will be stratified into the geographic regions covered by the ten Inshore Fisheries and Conservation Authorities. In each IFCA area, a 1-day sampling trip will be carried out in each of 40 weeks throughout 2012, using a probability-proportional-to-size approach to select survey sites, days of the week and times of day to conduct interviews with anglers fishing on shore or returning from private boat trips. The surveys will collect data on retained and released numbers of fish by species, as well as length frequencies of fish catches observed by the interviewers. The IFCAs are being subcontracted by Cefas to carry out the work, and the subcontracting costs given in the UK financial forms covers the costs of sampling trips and data entry.

The charter boat survey will involve a logbook system whereby a sample of charter boat operators from a vessel list frame are requested to complete a record of the activity taking place on their vessels over a set period of time. This will include details of the total number of trips in survey period. For each trip the operator will be asked to report the following information:

- number of anglers on board
- species targeted for the trip
- Type and location of activity (e.g. wreck fishing / indication of location of activity)
- Species caught, and for each species:
 - number and length of fishes caught
 - operators will be asked to provide the weight if possible, but it is thought unlikely that they will be able to provide such information, and as such it is envisaged that the use of keys to estimate weight from length obtained from other modules of the DCF will need to be used
 - Number of fish retained
 - Number of fish returned
 - Estimate of number of fish surviving return

As mentioned in previous years, whilst specific emphasis will be placed on the recording of species as required under the DCF, the requirements of the Control Regulation (Council Regulation (EU) 1224/2009 and its implementing requirements to be agreed later in 2011) will be incorporated. In addition, additional species will be covered as part of the exercise in order to validate the recording of information by respondents.

For Scotland, an appropriate sample frame of recreational charter vessels has been identified and they are being surveyed by questionnaire during 2012. Assessment of the initial survey results will inform the development of data quality targets and further development of sampling in 2013 – this will cover cod in the North Sea. Fishing from eels or sharks is not permitted.

For salmon in Scotland, data from recreational fisheries are routinely collected and published by the Scottish Government. Salmon fishery statistics are obtained from returns made in response to an annual questionnaire sent to the proprietors or occupiers of salmon and sea trout fisheries under the provisions of section 64 of the Salmon and Freshwater Fisheries (Consolidation) (Scotland) Act 2003. Data are combined geographically into 109 Districts around Scotland which are further aggregated into 11 Regions. Districts correspond either to a single river catchment together with adjacent coast or to groups of neighbouring river catchments.

Rod & line fisheries were asked to provide the monthly numbers and total weights of those salmon and grilse which were legally caught then released.

The catch data are collected to provide a measure of the performance of the 3 legal types of salmon and sea trout fisheries (i.e. fixed engines, net and coble and rod and line). In addition, interpretation of the catch trends is used to infer trends in the status of the stocks underpinning the fisheries. This information is provided to and used by expert groups in ICES (assessment role) and through NASCO (management role).

(a) Type of data collection

Data on recreational fishery catches will be collected using Probability Sample Surveys.

(b) Target and frame population

The target population is all recreational fishermen catching the species for which data are required. The population will be clustered (e.g. groups of fishermen on charter or head boats, individuals).

The sampling frames will be:

- Vessel list frames for licensed charter/head/for-hire vessels.

- Area (access point) list frames for surveys of shore and private boat recreational fishermen

- Household address lists for ONS surveys

(c) Data sources

As mentioned above, the Office for National Statistics “Opinions” survey will be used as a data source for overall levels of activity – this includes shore based activity, activity from private boats and activity from commercially available vessels. For shore angling and private boats, there are no list frames and the population must be estimated by survey as planned.

For charter vessels, head boats and for-hire companies with contact details linked to licenses and MCA documentation, an initial telephone census will be used to compile information on the vessels, such as location, type and frequency of trips, species targeting, number of anglers, recent catches etc. Data are also available from recent vessel censuses carried out by Cefas contractors at English and Welsh ports to estimate numbers of vessels targeting bass. Use will be made of the local knowledge from Marine Management Organisation local staff as well as staff in local Sea Fisheries Committees to update the details of vessels carrying out such activity.

The vessel list information will; be used to carry out a telephone census of vessels to validate the information held. Following this a stratified direct interview survey involving completion of logbooks will be set up based on the information from the telephone census to obtain detailed catch data during 2011 – 13 as outlined above

In previous exercises details of additional species have been recorded outside those required by the Data Collection Framework. This will continue to be the case in the future. The collection of such data helps to validate the data reported. In such voluntary surveys there is a distinct risk of receiving erroneous returns – for example, work carried out previously has identified that when carrying out logbook-based collection of data related to beach angling, there is a significant degree of variability in the accuracy of reports made by individuals. Whilst one option for dealing with this is to have observers present, this is a costly option. An alternative is to gather in a wider range of information on the activity of the individuals concerned within the data collection exercise. By doing this, a more accurate picture of the reporting practices can be determined and compared to the overall patterns of activity, helping in the identification of outliers in the reporting process (i.e. those that report either too low or too high a level of catch). As such whilst not covered by the requirements of the DCF, the collection of such additional data is an important element in assuring the quality of the collection processes themselves and the usability of the final results.

(d) Sampling stratification and allocation scheme

The Office for National Statistics Opinions survey uses random probability sampling broken into Government Office Region, proportion of households with no car, socio-economic classification and the proportion of people aged over 65 years. The survey draws its sample from the Royal Mail's Postcode Address File (PAF) of 'small users'. This PAF contains the addresses for approximately 27 million private households in the UK which receive fewer than 50 items of mail per day. It is the most up-to-date and complete address database in the UK. Each month 67 postal sectors are selected, with probability of selection proportionate to size. Within each sector, 30 addresses are chosen randomly giving a final sample of 2,010 addresses each month.

At the start of the interview, the interviewer determines the household composition and then he or she selects the respondent from among all those aged 16 and over. This selection is performed at random using a Kish grid. All household members over the age of 15 years are asked a set of classificatory questions but only one

person per household is selected to answer the Opinions module questions. Proxy responses are not permitted on the Opinions modules. As only one person per household is interviewed, the data are subsequently weighted to correct for the unequal probability of selection that this causes. Applying these weights will gross up the data by age, sex and region to the population control totals used on the Labour Force Survey (LFS). As well as accounting for the unequal probability of selection, these weights correct for certain types of non-response bias and improve precision for most variables.

When the sample for a particular month is selected by the ONS's Sampling Implementation Unit, a letter is sent out to the sampled address approximately one week before the start of the field period. This letter explains the purpose of the survey and advises the residents that an interviewer will be calling regarding the survey. As an incentive to respond to the survey, a book of postage stamps is included with the letter. The interviewer is required to call at all sampled addresses to ensure that they are residential and not business addresses. Businesses, institutions, temporary accommodation and vacant addresses are ineligible in most instances. The Opinions Survey interviews are conducted using Blaise questionnaire programming tool on a laptop and, in most instances, the interviewer enters the respondents' replies directly into the computer. If the questions are considered to be sensitive then respondents are given an option of self completion.

For the separate exercise related to recreational fishing from boats, vessel list frames for licensed charter vessels, head boats and for-hire vessels will be stratified by geographic region and season following the telephone census. Non-respondents will be recorded. Allocation of sampling effort (number of trips to sample) will be adjusted according to the number of vessels in each stratum. Raising will be from sampled trips of each sampled vessel to all the trips of that vessel in the stratum (determined from telephone contact or voluntary logbook), then raised to all vessels considered to be active in the strata, excluding non respondents from the initial telephone survey. Adjustment for non-response will be required. The species to be monitored will be those for which data are required by the DCF and by the Control Regulation.

III.D.2 Estimation procedures

Estimation procedures will adopt standard procedures for stratified random sampling. The ONS survey produces raising factors as part of the processing of data. For the collection of data on vessel based activity, raising factors will be determined from the numbers of trips sampled in a stratum to the estimated number of recreational fisherman units (individuals or vessels) based on the separate telephone census for licensed charter boat, head boat and for-hire boat owners, and also validated using the information collected from the ONS survey on overall levels of activity.

III.D.3 Data quality evaluation

Estimates of sampling error are produced as part of the ONS survey process. Sampling coverage for charter boats, head boats and for-hire boats will be evaluated using data on non-responses. Recall bias on telephone interviews will be evaluated. Precision estimates will be obtained using standard approaches for stratified random or probability-proportional-to-size sampling, taking account of any cluster sample effects. Data on additional species will be captured as a means of validating the collection processes used per se (see section III.D.1.(c)).

A major objective of the recreational fishery surveys around England in 2012 (ONS survey; on-site survey of shore and private boats; charter boat survey) is to identify the quality of data collected in 2012 and the most cost-effective methods of collecting data to meet the survey objectives. Some of the data collection will extend into 2013 (charter boat surveys), however there will be a need for an extended period of data analysis and evaluation in 2013 before any decisions can be made on future sampling programmes. This will impact the design of surveys for 2014, which will be reported to the Commission, but a full survey programme will not be conducted in 2013 whilst existing data are being analysed and future survey options evaluated.

III.D.4 Data presentation

It is assumed that the results will be taken into account by the work of WGNEW for bass, WGNAS and WGEEL. In addition, the Control Regulation specifies in Article 55, paragraph 5:

4. The Scientific, Technical and Economic Committee for Fisheries (STECF) shall evaluate the biological impact of recreational fisheries as referred to in paragraph 3. Where a recreational fishery is found to have a significant impact, the Council may decide, in accordance with the procedure referred to in Article 37 of the Treaty, to submit recreational fisheries as referred to in paragraph 3 to specific management measures such as fishing authorisations and catch declarations.

As such it is foreseen that there will need to be a supply of data to this group. In addition, given the level of interest that exists within the angling and wider community for the results, aggregate results will be made available more widely than just in response to requests made under the DCF.

As the provision of information will follow from sample surveys around the coast, data archiving and validation, and statistical analysis, a realistic time lag for provision of estimates would be similar to the lag for provision of raised discards estimates from commercial fisheries (see Section III.C.4). As with commercial fishery data, the data processing would be scheduled according to the timing of ICES, STECF or other end-user meetings.

Confidentiality – all primary data will be anonymised before release to third parties (see data presentation section for commercial fishery data).

III.D.5 Regional coordination

Attendance at the ICES Working Group on recreational Fishery Surveys will be scheduled to take advantage of any opportunities to collaborate or harmonise methods with other Member States with which recreational fisheries are shared.

III.D.6 Derogations and non-conformities

As per section III.D.1 (c) – collection of data on more than those species required under the DCF will be undertaken. This is needed as part of validating the data collection process; hence a derogation is sought for this wider collection.

For Scotland, for eel, the Freshwater Fish Conservation (Prohibition on Fishing for Eels) (Scotland) Regulations 2008 came into force on 26 January 2009 prohibiting fishing for eel. For sharks, the Sharks, Skates and Rays (Prohibition of Fishing, Transshipment and Landing) (Scotland) Order 2012 was before the Scottish Parliament in 2011 and came into force on 30 March 2012. Both these regulations apply to recreational fisheries as well as to commercial fishing. In light of these regulations, there is no recreational fishing for these species and therefore no sampling requirement.

For sea-bass in Scotland, anecdotal information indicates that only small numbers of bass are caught in Scottish waters, predominantly in the southwest and that they do not comprise a significant component of UK bass catches, recreational or otherwise.

III.E Biological - stock-related variables

North Sea (IV&VIId), Eastern Arctic (I&II)and NAFO

III.E.1 Data acquisition

(a) Selection of stocks to sample

Table III.E.1 identifies which stocks are going to be included in the UK sampling scheme and indicates derogations requested due to UK landings <200t or proportion of TAC <10%. The derogations and non conformities are listed below. Modifications to derogations are given in red.

Species	RFMO	Area / Stock	Species Group	Selected for sampling	Derogations
<i>Brosme brosme</i>	ICES	I,II	G2	No	<200t
<i>Gadus morhua</i>	ICES	I,II	G1	No	Bilateral with Germany
<i>Melanogrammus aeglefinus</i>	ICES	I,II	G1	No	Bilateral with Germany
<i>Pollachius virens</i>	ICES	I,II	G1	No	Bilateral with Germany
<i>Reinhardtius hippoglossoides</i>	ICES	I,II	G1	No	<200t
<i>Sebastes marinus</i>	ICES	I,II	G1	No	Bilateral with Germany
<i>Trachurus trachurus</i>	ICES	IIa, IVa, Vb, VIa, VIIa-c, e-k, VIIIabde	G2	No	<10% TAC
<i>Ammodytidae</i>	ICES	IV	G2	No	<10% of TAC
<i>Anarhichas spp.</i>	ICES	IV	G2	No	Derogation recommended by RCM NS&EA 2008
<i>Anguilla anguilla</i>	ICES	IV, VIId	G1	No	<200t
<i>Aspitrigla cuculus</i>	ICES	IV	G2	No	<200t
<i>Brosme brosme</i>	ICES	IV, IIIa	G2	No	<200t
<i>Centroscymnus coelolepis</i>	ICES	VII d	G1	No	<200t
<i>Crangon crangon</i>	ICES	IV, VIId	G2	No	<10% of EU landings
<i>Eutrigla gurnardus</i>	ICES	IV	G2	No	<200t
<i>Limanda limanda</i>	ICES	IV, VIId	G2	No	Bilateral with the Netherlands
<i>Molva dypterygia</i>	ICES	IV, IIIa	G1	No	<200t
<i>Mullus surmuletus</i>	ICES	IV, VIId	G2	No	<10% of EU landings
<i>Nephrops norvegicus</i>	ICES	IV FU05	G1	No	Bilateral with the Netherlands
<i>Nephrops norvegicus</i>	ICES	IV FU10	G1	No	Derogation 2007
<i>Nephrops norvegicus</i>	ICES	IV FU32	G1	No	<200t
<i>Nephrops norvegicus</i>	ICES	IV FU33	G1	No	<200t
<i>Phycis blennoides</i>	ICES	IV	G2	No	<200t
<i>Platichthys flesus</i>	ICES	IV	G2	No	<200t
<i>Pleuronectes platessa</i>	ICES	IV	G1	No	Bilateral with the Netherlands
<i>Psetta maxima</i>	ICES	All areas	G2	No	Bilateral with the Netherlands

Species	RFMO	Area / Stock	Species Group	Selected for sampling	Derogations
<i>Reinhardtius hippoglossoides</i>	ICES	IV	G2	No	<200t
<i>Salmo salar</i>	ICES	IV	G1	No	<200t
<i>Scophthalmus rhombus</i>	ICES	IV, VIId	G2	No	Bilateral with the Netherlands
<i>Sebastes mentella</i>	ICES	IV	G1	No	<200t
<i>Shark-like selachii nei</i>	ICES	IV	G1	No	<200t
<i>Shark-like selachii nei</i>	ICES	IV, VIId	G1	No	<200t
<i>Solea solea</i>	ICES	IV	G1	No	< 10% of TAC
<i>Sprattus sprattus</i>	ICES	IV	G1	No	< 10% of TAC
<i>Trachurus trachurus</i>	ICES	IIa, IVa, Vb, VIa, VIIa-c, e-k, VIIIabde	G2	No	<10% TAC
<i>Trachurus trachurus</i>	ICES	IIIa, IVbc, VIId	G2	No	<10% TAC
<i>Trigla lucerna</i>	ICES	IV	G2	No	<200t
<i>Zeus faber</i>	ICES	IV, VIId	G2	No	<200t UK seeks derogation in terms of cost required to provide full data for scientific assessment including setting up an agreed ageing criteria
<i>Gadus morhua</i>	NAFO	SA 1	G1	No	Single multi area trip in 2008 including I,II, XIV covered by Bilateral with Germany

(b) Type of data collection

Age material for estimating the age compositions of landings and discards are collected using quarterly targets for length-stratified collection of otoliths by stock., in some cases (VIId sole) on an international coordinated basis. All age material can be linked to an individual length sample collected from a multi-stage sampling scheme and hence the data collection scheme can be described as a probability sample survey (B) although sample weights are not normally applied when compiling ALKs”.

Data for estimating growth curves by length or weight, and sex ratio and proportion mature at length and age for males and females, are mainly collected during DCF trawl surveys and some non-DCF funded surveys and are therefore collected using a probability sample survey (B) as all samples are associated with individual stations.

(c) Target and frame population

The target populations for the species listed in Table III.E.1 are the stocks within their geographic boundaries as defined in Appendix VII of Commission Decision 2008/949/EC. Where at-sea surveys are the source of data, the frame populations are the trawl tows accessing clusters of individuals of the components of the stocks occurring within the boundaries of the surveys. Where additional samples are collected from fishery catches, the sampling frames are the vessel list frames and area frames used for sampling fishery length compositions.

(d) Sampling stratification and allocation scheme

Table III E.2 gives an overview of the long-term sampling strategy with respect to 'Stock related variables', and indicates for each parameter (age, weight, sex ratio, maturity and fecundity) the year that data collection has taken place or is planned. Sex ratios, maturity and fecundity are referenced to age for all species that can be aged, and to length for other species listed (for example *Nephrops* and elasmobranchs). Data sources for each parameter are listed in the Table. Data on maturity and sex ratio will be collected primarily from standard DCF surveys and some non-DCF national surveys at appropriate times of year. Additional material will be collected from commercial fishery catches where appropriate, particularly for species where numbers collected on surveys is inadequate. Species for which triennial sampling is required are indicated in Table III E.2.

Table III E.3 provides an overview of the planned sampling for age, weight, sex ratio, maturity and fecundity. The numbers given may be amended following the RCM meetings from 2010 onwards.

III.E.2 Estimation procedures

Data on length, age, weight, sex and maturity are collected on surveys using length-stratified sampling unless catch numbers are small. The data are therefore weighted using numbers at length from the random samples of length composition at the survey stations in order to calculate length and age based maturity ogives by sex, and for estimating length and weight at age for computing growth parameters.

For relatively rare species, collected from a variety of survey and fishery sources, the individuals are treated as independent samples from the population

III.E.3 Data quality evaluation

Sampling will take into account the recommendations of the ICES workshop on sampling and estimation of maturity (WKMAT and WKMOG), with respect to adequacy of stock coverage and timing of sampling relative to the spawning season.

Precision will be estimated using bootstrap or other appropriate procedures accounting for cluster sampling. For VIId sole, where an international coordinated programme of otolith collection is currently underway involving England, France and

Belgium, the programme has been designed to meet the DCF precision target at the regional level.

Estimates of biological parameters at the population level pre-supposes representative sampling of the relevant population components across the geographic range of the stock, and accurate recording of the appropriate parameters such as age and maturity. Where information is collected using surveys such as IBTS, it is assumed that the stocks are well covered and that samples can be appropriately weighted to reduce bias. For species where survey data cannot provide sufficient samples, samples may be collected from commercial fisheries at a suitable time of year. In this case, the distribution of fishing activities across the range of the stock will need to be examined to evaluate potential biases. For stocks ranging beyond the geographic boundaries of the UK sampling programmes, estimation of biological parameters will require analysis of data collected by all member States sampling the stock. It is now acknowledged that identification of maturity can be inaccurate outside of the period of the year when gonads are maturing, and the recording of maturity for spring-spawning species such as cod and plaice is no longer carried out on summer IBTS surveys.

III.E.4 Regional coordination

The collection of VIId sole otoliths is presently coordinated between the UK, Belgium and France and this arrangement will continue for 2011-2013.

A list of appropriate recommendations on metier-based variables from the relevant RCMs is given below, with brief description of the responsive actions that will be taken

Stock-based variables – Maturity sampling	
RCM NS&EA 2009 Recommendation	The RCM NS&EA recommends MS to refer to the table in Annex 5 of this report for elaborating maturity sampling programmes, when drafting their National Programme proposals 2011-2013
Follow-up actions needed	STECF/SGRN and the European Commission when evaluating the National Programme proposals 2011-2013.
Responsible persons for follow-up actions	Member States, STECF/SGRN, European Commission.
Time frame (Deadline)	Early 2010
UK Response	Taken into account by the UK

RCM coordination agreement for the collection of otoliths for VIId sole (Solea solea) in order to provide an International Age Length Key (ALK)

Discussions at the RCM NS&EA, Uddevalla, Sweden, 2007 between France, Belgium and the UK resulted in a framework for the collection of age data in relation

to an international ALK being agreed for implementation from 1 January 2008. . Belgium (ILVO - Fisheries), France (IFREMER) and the UK (Cefas) have agreed to undertake a coordinated sampling plan in order to provide the ALK required to assess VIIId sole.

On a yearly basis, the total number of otoliths to be taken is Belgium 900, France 1450 and UK (E&W) 1300.

A complete framework for facilitating the use of the sole VIIId international ALKs for assessment purpose will be agreed at RCM NS&EA. The proposed framework includes (i) international exchange of otoliths to ensure consistent estimates between readers, (ii) international database available to all parties on a real time basis, (iii) yearly updates of the sampling strategy and (iv) availability of the final international ALKs in due time for the preparation of data for assessment purpose..

France (IFREMER) will be responsible for coordinating the entire framework for sole VIIId.

III.E.5 Derogations and non-conformities

No additional derogations required other than given in III.E.1a.

The Commission has stated that the following derogations for sampling could not be granted with the justifications supplied by the UK. In response to the Commission's request for further information, the UK has added the final column, elaborating on the reasons for the derogations and explaining inconsistencies:

Species	Region	RFMO	Area / Stock	Reason for not granting derogation	Additional comments by UK
<i>Mallotus villosus</i>	North Sea and Eastern Arctic	ICES	I,II	Average Landings above 200t; share in EU landings not given	This relates to a single landing by a Norwegian vessel in 2008 – no EU landings.
<i>Crangon crangon</i>	North Sea and Eastern Arctic	ICES	IV, VIIId	Average Landings above 200t; share in EU landings not given	EU landings were omitted – corrected in table UK share 2.9%.
<i>Eutrigla gurnardus</i>	North Sea and Eastern Arctic	ICES	IV	Average Landings above 200t; share in EU landings not given	This figures includes all gurnard spp for the UK. VIIId landings removed and corrected. UK share 7.4.%.
<i>Nephrops norvegicus</i>	North Sea and Eastern Arctic	ICES	IV FU05	Average Landings above 200t; share in EU landings not given	Covered by bilateral with the Netherlands
<i>Zeus faber</i>	North Sea and Eastern Arctic	ICES	IV, VIIId	Share in EU landings over 100%; needs explanation	Only UK landings on Eurostat – rounding accounts for percentage difference.

					RCM NA 2010 gives landings as 45t.
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North East Atlantic (V-XIV)

III.E.1 Data acquisition

(a) Selection of stocks to sample

Table III.E.1 identifies which stocks are going to be included in the UK sampling scheme and indicates derogations requested due to UK landings <200t or proportion of TAC <10%. The derogations and non conformities are listed below: Modifications to derogations are given in red.

Species	RFMO	Area / Stock	Species Group	Derogations
<i>Ammodytidae</i>	ICES	Vla	G2	<200t
<i>Aphanopus spp</i>	ICES	V, VI, VII (excluding d), VIII, IX, X, XII, XIV	G1	<200t
<i>Aspitrigla cuculus</i>	ICES	V, VI, VII (excluding d), VIII, IX, X, XII, XIV	G2	<200t
<i>Centrophorus granulosus</i>	ICES	V, VI, VII (excluding d), VIII, IX, X, XII, XIV	G1	<200t
<i>Centrophorus squamosus</i>	ICES	V, VI, VII (excluding d), VIII, IX, X, XII, XIV	G1	<200t
<i>Centroscymnus coelolepis</i>	ICES	V, VI, VII (excluding d), VIII, IX, X, XII, XIV	G1	<200t
<i>Centroscymnus crepidater</i>	ICES	V, VI, VII, IX, X, XII	G1	<200t
<i>Clupea harengus</i>	ICES	VIIj	G1	<200t
<i>Conger conger</i>	ICES	V, VI, VII (excluding d), VIII, IX, XII, XIV	G2	<10% EU landings
<i>Coryphaenoides rupestris</i>	ICES	V, VI, VII (excluding d), VIII, IX, X, XII, XIV	G1	<200t
<i>Dipturus batis</i>	ICES	V, VI, VII, VIII	G1	<200t
<i>Dipturus oxyrinchus</i>	ICES	V, VI, VII, VIII	G1	<200t
<i>Etmopterus spinax</i>	ICES	VI, VII, VIII	G1	<200t
<i>Glyptocephalus cynoglossus</i>	ICES	VI, VII	G2	Proposed bilateral with Spain
<i>Helicolenus dactylopterus</i>	ICES	V, VI, VII (excluding d), VIII, IX, X, XII, XIV	G2	<200t
<i>Lamna nasus</i>	ICES	V, VI, VII (excluding d), VIII, IX, X, XII, XIV	G1	<200t
<i>Limanda limanda</i>	ICES	VIIe	G2	<200t and RCM NA recommendation 2008
<i>Limanda limanda</i>	ICES	VIIa, f-h	G2	<200t and RCM NA recommendation 2008
<i>Loligo vulgaris</i>	ICES	V, VI, VII (excluding d), VIIIabde, IXb, X, XII, XIV	G2	Figure includes all loligo species - covered by Proposed bilateral with Spain
<i>Melanogrammus aeglefinus</i>	ICES	Va	G1	<200t
<i>Merlangius merlangus</i>	ICES	VIIb	G1	<200t
<i>Merlangius merlangus</i>	ICES	VIIa	G1	<200t
<i>Molva dypterygia</i>	ICES	V, VI, VII (excluding d),	G1	Proposed bilateral with

Species	RFMO	Area / Stock	Species Group	Derogations
		VIII, IX, XII, XIV		Spain
<i>Mullus surmuletus</i>	ICES	V, VI, VII (excluding d), VIII, IX, X, XII, XIV	G2	<200t
<i>Mustelus asterias</i>	ICES	VI, VII, VIII, IX	G1	<200t
<i>Nephrops norvegicus</i>	ICES	VII FU16	G1	Proposed bilateral with Spain
<i>Nephrops norvegicus</i>	ICES	VII FU19	G1	<200t
<i>Nephrops norvegicus</i>	ICES	VII FU20	G1	Proposed bilateral with Spain
<i>Octopus vulgaris</i>	ICES	V, VI, VII (excluding d), VIIIabde, IXb, X, XII, XIV	G2	<200t
<i>Phycis blennoides</i>	ICES	V, VI, VII (excluding d), VIII, IX, X, XII, XIV	G2	Proposed bilateral with Spain
<i>Pleuronectes platessa</i>	ICES	VIIIh-k	G1	<200t
<i>Polyprion americanus</i>	ICES	X	G2	<200t
<i>Prionace glauca</i>	ICES	V, VI, VII (excluding d), VIII, IX, X, XII, XIV	G1	<200t
<i>Reinhardtius hippoglossoides</i>	ICES	V, XIV	G1	< 10% of TAC
<i>Reinhardtius hippoglossoides</i>	ICES	VI	G1	<200t
<i>Sebastes marinus</i>	ICES	V, VI, XII, XIV, SA 2+ (Div. 1F+3K)	G1	< 10% of TAC
<i>Solea solea</i>	ICES	VIIIab	G1	<200t
<i>Sparidae</i>	ICES	V, VI, VII (excluding d), VIII, IX, X, XII, XIV	G2	Proposed bilateral with Spain
<i>Trachurus trachurus</i>	ICES	IIa, IVa, Vb, VIa, VIIa-c, e-k, VIIIabde	G2	<10% TAC
<i>Zeus faber</i>	ICES	V, VI, VII (excluding d), VIII, IX, X, XII, XIV	G2	<10% EU landings
<i>Gadus morhua</i>	ICES	V, VI, VII (excluding d), VIII, IX, X, XII, XIV	G2	Single multi area trip in 2008 including I,II, XIV , NAFO covered by Bilateral with Germany

(b) Type of data collection

Age material for estimating the age compositions of landings and discards are collected using quarterly targets for length-stratified collection of otoliths by stock., in some cases (VIIa sole) on an international coordinated basis. All otoliths can be

linked to an individual length sample collected from a multi-stage sampling scheme and hence the data collection scheme can be described as a probability sample survey (B) although sample weights are not normally applied when compiling ALKs”.

Data for estimating growth curves by length or weight, and sex ratio and proportion mature at length and age for males and females, are mainly collected during DCF trawl surveys and some non-DCF funded surveys and are therefore collected using a probability sample survey (B) as all samples are associated with individual stations.

(c) Target and frame population

The target populations for the species listed in Table III.E.1 are the stocks within their geographic boundaries as defined in Appendix VII of Commission Decision 2008/949/EC. Where at-sea surveys are the source of data, the frame populations are the trawl tows accessing clusters of individuals of the components of the stocks occurring within the boundaries of the surveys. Where additional samples are collected from fishery catches, the sampling frames are the vessel list frames and area frames used for sampling fishery length compositions.

(d) Sampling stratification and allocation scheme

Table III E.2 gives an overview of the long-term sampling strategy with respect to 'Stock related variables', and indicates for each parameter (age, weight, sex ratio, maturity and fecundity) the year that data collection has taken place or is planned. Sex ratios, maturity and fecundity are referenced to age for all species that can be aged, and to length for other species listed (for example *Nephrops* and elasmobranchs). Data sources for each parameter are listed in the Table. Data on maturity and sex ratio will be collected primarily from the standard surveys, with additional material collected from commercial fishery catches where appropriate, particularly for species where the number collected on surveys is inadequate. Species for which triennial sampling is required are indicated in Table III E.2. The years for sampling may be amended following the RCMs to ensure appropriate international coordination.

III.E.2 Estimation procedures

Data on length, age, weight, sex and maturity are collected on surveys using length-stratified sampling unless catch numbers are small. The data are therefore weighted using numbers at length from the random samples of length composition at the survey stations in order to calculate length and age based maturity ogives by sex, and for estimating length and weight at age for computing growth parameters.

For relatively rare species, collected from a variety of survey and fishery sources, the individuals are treated as independent samples from the population

III.E.3 Data quality evaluation

Sampling will take into account the recommendations of the ICES workshop on sampling and estimation of maturity (WKMAT and WKMOG), with respect to adequacy of stock coverage and timing of sampling relative to the spawning season.

Precision will be estimated using bootstrap or other appropriate procedures accounting for cluster sampling. For VIIa sole, where an international coordinated programme of otolith collection is currently underway involving England, Ireland and Belgium, the programme has been designed to meet the DCF precision target at the regional level. Precision targets for other stocks are as given in the Commission Decision.

Estimates of biological parameters at the population level pre-supposes representative sampling of the relevant population components across the geographic range of the stock, and accurate recording of the appropriate parameters such as age and maturity. Where information is collected using surveys such as IBTS, it is assumed that the stocks are well covered and that samples can be appropriately weighted to reduce bias. For species where survey data cannot provide sufficient samples, samples may be collected from commercial fisheries at a suitable time of year. In this case, the distribution of fishing activities across the range of the stock will need to be examined to evaluate potential biases. For stocks ranging beyond the geographic boundaries of the UK sampling programmes, estimation of biological parameters will require analysis of data collected by all member States sampling the stock. It is now acknowledged that identification of maturity can be inaccurate outside of the period of the year when gonads are maturing, and the recording of maturity for spring-spawning species such as cod and plaice is no longer carried out on summer IBTS surveys.

III.E.4 Regional coordination

An internationally coordinated sampling scheme for VIIa sole otolith collection between the UK, Belgium and Ireland was agreed by RCMNEA for 2009 onwards and will continue to be in place for 2011 – 2013.

A list of appropriate recommendations on metier-based variables from the relevant RCMs is given below, with brief description of the responsive actions that will be taken

Stock related variables: Maturity sampling	
RCM NA 2009 Recommendation	The RCM NA recommends MS to refer to the table in Annex X of this report for elaborating maturity sampling programmes, when drafting their National Programme proposals 2011-2013
Follow-up actions needed	STECF/SGRN and the European Commission when evaluating the National Programme proposals 2011-2013.
Responsible persons for follow-up actions	Member states, STECF/SGRN, European Commission.
Time frame (Deadline)	Early 2010 All to Action
UK Response	Annex X followed in setting up UK sampling scheme

Stock related variables: increase of age sampling	
RCM NA 2009 Recommendation	The RCM NA recommends that sampling for age should be increased in order to meet the required sampling levels for saithe (Vb), turbot (all areas) and John Dory (all areas).
Follow-up actions needed	Implementation of (increased) sampling for age by the relevant countries: - saithe (Vb) : - turbot (all areas) : BEL (VIIa,VIIIfg, VIIIab) - John Dory (all areas) :
Responsible persons for follow-up actions	MS to include in their NP proposal 2011-2013
Time frame (Deadline)	March 2010 All to Action
UK Response	UK derogation sought for John Dory

RCM coordination agreement for the collection of otoliths for VIIa sole (Solea solea) in order to provide an International Age Length Key (ALK)

At the 2007 RCM NEA in Brest, France, it was proposed that member states produce a working document to investigate the possibility of working towards the co-ordinated collection of age data in order to produce an international Age Length Key (ALK) for sole in ICES Division VIIa.

Belgium, Ireland and the UK (E&W) are responsible for virtually all landings of sole from VIIa.

Belgium (ILVO - Fisheries), Ireland (MI) and the UK (Cefas) have agreed to undertake a coordinated sampling plan in order to provide the ALK required to assess VIIa sole.

The total number of otoliths to be taken is Belgium 1500, Ireland 900 and UK (E&W) 600.

Modifications to the sampling strategy for future years will be agreed at RCM NA.

UK (Cefas) will coordinate the exchange of data to the required assessment deadlines.

III.E.5 Derogations and non-conformities

No additional derogations required other than given in III.E.1a.

The Commission has stated that the following derogations for sampling could not be granted with the justifications supplied by the UK. In response to the Commission's request for further information, the UK has added the final column, elaborating on the reasons for the derogations and explaining inconsistencies.

Species	Region	RFMO	Area / Stock	Reason for	Additional
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				not granting derogation	Comments by UK
<i>Aphanopus spp</i>	North Atlantic	ICES	V, VI, VII (excluding d), VIII, IX, X, XII, XIV	>2000t of landings and no details for share in EU landings;	Landings into UK by French vessels for first sale in France. EU landings not available on Eurostat.
<i>Centroscymnus coelolepis</i>	North Atlantic	ICES	V, VI, VII (excluding d), VIII, IX, X, XII, XIV	>800t of landings; Share in EU landings over 100%; needs explanation	Landings into UK by French vessels for first sale in France and limited Faroese landings.
<i>Coryphaenoides rupestris</i>	North Atlantic	ICES	V, VI, VII (excluding d), VIII, IX, X, XII, XIV	>2500t of landings; Share in EU landings over 10%	Landings into UK by French vessels for first sale in France and limited Faroese landings.
<i>Loligo vulgaris</i>	North Atlantic	ICES	V, VI, VII (excluding d), VIIIabde, IXb, X, XII, XIV	Over 200t of landings; Share in EU landings not specified	UK data includes all Loligo spp. High proportion of landings by Anglo Spanish vessels and for first sale in Spain.
<i>Molva dypterygia</i>	North Atlantic	ICES	V, VI, VII (excluding d), VIII, IX, XII, XIV	>3000t of landings; Share in EU landings over >70%	Landings into UK by French vessels for first sale in France and limited Faroese landings.
<i>Octopus vulgaris</i>	North Atlantic	ICES	V, VI, VII (excluding d), VIIIabde, IXb, X, XII, XIV	Share in EU landings over exceeds 500%; explanation needed	Eurostat allows for recording of landings of mixed octopus and squid. UK landings given against declared landings of octopus vulgaris only. High proportion of landings by Anglo Spanish vessels and for first sale in Spain.
<i>Phycis blennoides</i>	North Atlantic	ICES	V, VI, VII (excluding d), VIII, IX, X, XII, XIV	>500t of landings; Share in EU landings > 30%	Landings into UK by French vessels for first sale in France.
<i>Sebastes marinus</i>	North Atlantic	ICES	V, VI, XII, XIV, SA 2+ (Div. 1F+3K)	>500t of landings; Share in EU landings not	Landings into UK by French vessels for first sale in France and

				specified	limited Faroese landings.
<i>Gadus morhua</i>	NAFO areas	NAFO	SA 1	>200t of landings; Share in EU landings over 10%	Single landing into Germany in 2008.
<i>Sardina pilchardus</i>	CECAF FAO 34	CECAF	All areas	>12.000t of landings; Share in EU landings over 30%	Scottish pelagic vessels under contract to Morocco. Catching from that country's quota and landing to factory.
<i>Sardinella aurita</i>	CECAF FAO 34	CECAF	All areas	>8000t of landings; Share in EU landings over 12%	Anglo Dutch vessels landing to the Netherlands and the Canaries.

Long Distance Fisheries

III.E.1 Data acquisition

Table III.E.1 identifies which stocks for which derogations are requested due to UK landings <200t or proportion of TAC <10%. The derogations and non conformities are listed below.

The STECF recommendation recognises that the UK's interests in long-distance fisheries (e.g. CECAF) are minimal and to not merit the inclusion of the UK in the RCM on Long-Distant Fisheries. The only vessels prosecuting these fisheries are either Anglo-Dutch or Anglo-Spanish or contracted to fish for non-EU quota, with the landings being outside of the UK for all species.

From the table below it can be seen that in all instances the tonnes landed by these flag vessels is less than 3% of the total EU landings by species and the vessels on no occasion land to the UK. The majority of landings of *Lamna nasus* are from ICES Sub Area VII and already covered by the sampling plan for that area. The cost to obtain meaningful data for the other species would be at excessive cost and due to UK financial constraints at the cost of data collected for other stocks under the remit of RCMs NS&EA and NA. Additional funds would also be required in order for the UK to both attend the meetings of RCM Long-Distant Fisheries and gain expertise in relation to the stocks identified.

Given the STECF recommendation and excessive costs in relation to the fisheries taken into consideration by the RCM on Long-Distant Fisheries the UK would ask for derogations from sampling for these areas.

Species	RFMO	Species group	Average landings	As % of EU landings	Trip length	vessels	Landed to
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<i>Species</i>	RFMO	Species group	Average landings	As % of EU landings	Trip length	vessels	Landed to
<i>Isurus oxyrinchus</i>	ICCAT , IOTC	G1	12t	0.1	40 – 102 days	Between 1 – 7 Anglo-Spanish vessels per year	South Africa, Namibia, Mauritius and occasionally Spain
<i>Lamna nasus</i>	ICCAT , IOTC	G1	0t	3	40 – 102 days	Landings from Area VII covered in sampling plan	UK – ban on landings
<i>Prionace glauca</i>	ICCAT , IOTC	G1	558t	2	40 – 102 days	Between 1 – 7 Anglo-Spanish vessels per year	South Africa, Namibia, Mauritius and occasionally Spain
<i>Shark-like selachii nei</i>	ICCAT , IOTC	G1	172t	0.2	40 – 102 days	Between 1 – 7 Anglo-Spanish vessels per year	South Africa, Namibia, Mauritius and occasionally Spain
<i>Thunnus alalunga</i>	ICCAT , IOTC	G1	88t	0.1	40 – 102 days	Between 1 – 7 Anglo-Spanish vessels per year	South Africa, Namibia, Mauritius and occasionally Spain
<i>Thunnus albacares</i>	ICCAT , IOTC	G1	46t	0.1	40 – 102 days	Between 1 – 7 Anglo-Spanish vessels per year	South Africa, Namibia, Mauritius and occasionally Spain
<i>Thunnus obesus</i>	ICCAT , IOTC	G1	31t	0.2	40 – 102 days	Between 1 – 7 Anglo-Spanish vessels per year	South Africa, Namibia, Mauritius and occasionally Spain
<i>Thunnus thynnus</i>	ICCAT , IOTC	G1	4t	0.1	40 – 102 days	Between 1 – 7 Anglo-Spanish vessels per year	South Africa, Namibia, Mauritius and occasionally Spain
<i>Xiphias gladius</i>	ICCAT , IOTC	G1	802t	2	40 – 102 days	Between 1 – 7 Anglo-Spanish vessels per year	South Africa, Namibia, Mauritius and occasionally Spain

<i>Species</i>	RFMO	Species group	Average landings	As % of EU landings	Trip length	vessels	Landed to
<i>Sardinella Madeira</i>	CECAF	G1	449t	3	14 – 68 days	1 Anglo-Dutch vessel	Covered by bilateral with the Netherlands
<i>Trachurus spp</i>	CECAF	G1	328t	1	14 – 68 days	1 Anglo-Dutch vessel	Covered by bilateral with the Netherlands
<i>Rajidae nei</i>	WECAF	G1	0t	1.7	35 – 108 days	1 Anglo-Spanish vessel	No landings in reference period

FAILURE TO GRANT THIS DEROGATION COULD COMPROMISE THE UK'S ABILITY TO MEET OUR SAMPLING COMMITMENTS FOR THE REST OF THE PROGRAMME

III.E.2 Estimation procedures

No data collected directly by the UK

III.E.3 Data quality evaluation

No data collected directly by the UK

III.E.4 Regional coordination

From the report of RCM LDF the only fleet with UK involvement in the CECAF area that is included in the rankings is OTM_SPF>=40_0_0. Sampling of this fleet is now covered in the bilateral on sampling with the Netherlands (Annex 5).

III.E.5 Derogations and non-conformities

No additional derogations required other than given in III.E.1a.

III.E Biological – Fully documented fisheries (Catch Quota Trials)

North Sea (IV&VIId), Eastern Arctic (I&II), North Atlantic (V-XIV and NAFO areas)

III.E.1 Data acquisition

The current Common Fisheries Policy is underpinned by a quota system that is based on quantities of fish landed rather than fish caught (total fishing mortality). This system, coupled with effort limitation schemes, provides little incentive for fishermen to avoid catching and discarding unwanted fish.

In October 2009 a joint statement by UK, German and Danish Ministers agreed that further work on piloting fully documented catch quota systems using CCTV as a catch verification tool should be carried out. The rationale being that fully documented fisheries (FDF) has the potential to significantly reduce discards by making fishermen account for all catches against their quota. The catch quota system is based on placing an absolute cap on fishing mortality. All fish caught are accounted for and when fishermen reach their quota limit they have to stop fishing. It is anticipated that the fishing industry would adopt a greater sense of responsibility in ensuring sustainability of fishing opportunities under such a system.

Since 2009 a number of trials have been run by European Member States including the UK which have largely concentrated on North Sea cod. In 2011 the English scheme was expanded to include Western Channel sole as well as plaice and anglerfish stocks. In 2012 the scheme was further expanded to provide evidence on operating catch quotas for multiple stocks and for a wider variety of fishing activities in the North Sea and Western Channel fisheries. This approach will be continued into 2013. Further information on the operation of the trials is at Annex 13.

(a) Type of data collection

CCTV information, observer data and administrative information (logbooks, sales notes and landing declarations).

(b) Target and frame population

The project in 2012 allowed for 25 vessels to participate in the trials which included 12 North Sea vessels in respect of cod and 6 West Channel vessels in respect of sole. Eligibility criteria are set out at Annex X. Species and gear types targeted are set out in the table below. Vessels were primarily based in the ports of Scarborough, Whitby, Grimsby, Peterhead, Plymouth and Brixham. The number participating in 2013 will depend on take up by vessels and this is anticipated to be lower for the North Atlantic than in 2012.

Species	Fishery
North Sea cod	Trawl/Net
North Sea plaice	Beam Trawl
North Sea haddock	Trawl
West Channel sole	Beam Trawl
VII megrim,	Beam trawl/Trawl/Net
VII angler	Beam trawl/Trawl/Net

VII hake	Beam trawl/Net/Line
VII d/e plaice	Beam trawl
VII b-k haddock	Trawl/beam trawl
VII b-k cod	Net/Trawl
VIIId cod	Trawl
By-catch	Dredge

(c) Data sources

All vessels operating in the scheme are required to complete an EU logbook and all catches of CQMS stocks must be recorded in the logbook. Vessels must also complete additional trip details as required by the MMO.

Each vessel engaged in the trials will be accompanied by an observer for up to one trip. The main responsibility of the observer will be to assess whether the set-up of the REM and CCTV equipment is adequate and to provide advice on improvements on the installation and practices of the Master and crew to allow improved monitoring. Observers will gather a information on: the weight of catch quota species by haul; length sampling of catch quota species by haul and any other data as required within the project scope.

Data sources comprise the following:

1. Logbook data for +10m vessels, either electronic, paper or both. Haul-by-hauls logbook data available from vessels working in the Norwegian sector.
2. Landing declarations from +10m vessels.
3. Sales notes by species and grade for all vessels.
4. Haul-by-haul records of catch quota species.
5. REM and CCTV data for all trips, including winch activity, vessel position and speed and CCTV footage.
6. Control data from observer trips (as specified above).

III.E.2 Data quality evaluation

CCTV footage analysis will provide adequate control of catches and identify non-compliance in terms if catch quota species discarding. Other assessments may be made, for example to quantify discards of non-catch quota species.

There needs to be sufficient confidence that no discarding of catch quota species takes place at any stage of the trip and in the level of accuracy of estimates from observed hauls. 100% observation of CCTV footage is not viable and it is assumed that there is potential for discarding or undeclared landing out of camera view (i.e. outside of the hauling and sorting operation).

In the case of high value, low volume species such as Dover sole there needs to be sufficient confidence that there is not a continuous under-declaration of catches that could allow a degree of high grading out of camera view. A simple check that no

discarding is taking place on a random selection of hauls is not sufficient to assume that no discarding is taking place.

The analysis of footage and corresponding records will therefore cover the following checks to ensure:

1. Comparison of total haul estimates (master's record) against landed weight (sales note).
2. Comparison of haul data against logbook data.
3. Comparison of 10% of haul records against corresponding CCTV/REM data.
4. Percentage of data capture, total CCTV/REM time compared to total trip time.

There is likely to be variance in the ability of CCTV observers to estimate catches in the absence of a defined methodology. This will be partly dependant on experience and knowledge and is likely to be influenced by vessel type and variance in sorting operations. An important objective of the trial is to assess the confidence in assessing different fisheries and it is therefore important to have a way of assessing the variance across different observers and the accuracy against verifiable data.

Quality assurance 'tests' as outlined below should provide information on levels of confidence:

1. 'Blind' observer estimates (i.e. without haul records from the vessel) and comparison of estimates between different observers.
2. Comparison of observer estimates against known weights from at-sea observer data.

III.E.3 Data presentation

Reporting will be as follows:

- Interim 2013 project report to be produced by October 2013.
- Final 2013 project report to be produced by October 2014.

Reporting will cover the following project objectives/topics:

- Improvement in catch monitoring methodologies for mixed species catch quotas (e.g. improving accuracy of catch quantification, developing time saving techniques, and simplifying reporting processes, identifying limits of species ID and assessment of grades of fish).
- Effectiveness of catch quota management to reduce fishing mortality in high discard fisheries if quota is made available.
- Enforceability and effectiveness of REM in the context of a wider range of mixed fisheries.

- Potential for enhanced data gathering using 8 camera systems and real time transmission of REM data.
- Assess data on catch compositions in terms of compatibility with current technical measures.
- Assess catches of potential choke species such as cod and haddock.
- To prepare a scoping document on the compatibility, or otherwise, of current technical and control regulations with catch quota management.
- To prepare a scoping document on the economic impacts of a catch quota system in terms of enforcement and surveillance costs and potential efficiencies.
- To assess the use of REM as a means of quantifying by-catches of protected and sensitive species (subject to industry consultation).
- To consider the implications of discard survivability studies for catch quota management.
- Contribute and feed data into scientific assessments on the effectiveness of CQ pilots in reducing discards and catch mortality.
- To consider efficiency savings for analysing REM data – Data management and flexibility of server access for different locations.

III.E.4 Regional coordination

The UK will participate in the Regional Coordination meetings for the North Sea/East Arctic and North Atlantic and advise on progress with this work as required.

III.E.5 Derogations and non-conformities

Whilst outside the Catch quota trials will to allow investigation of options to maximise the use of technology in the collection of data for a range of DCF related purposes.

III.E.5 Derogations and non-conformities

Whilst outside the Catch quota trials will to allow investigation of options to maximise the use of technology in the collection of data for a range of DCF related purposes.

III.F Transversal variables

III.F.1 Capacity

III.F.1.1 Data acquisition

In the UK the Registry of Shipping and Seamen (RSS) and the corresponding registries in the Channel Islands and Isle of Man already collect and maintain information on registered fishing vessels including their gross tonnage and their maximum continuous engine power as defined in Council Regulation 2930/86, as amended by Council Regulation 3259/94. These data are made available to Fisheries Departments and will be used to meet this requirement for data. These data are already provided to the Commission under Regulation 2090/98 and include information on the age of the fishing vessel. The UK supplies this information to the Commission as its returns to the EU Fishing Vessel Register, available on-line at: <http://ec.europa.eu/fisheries/fleet/index.cfm>

III.F.1.2 Data Quality evaluation

The bulk of the UK fishing fleet are registered and operate from the UK mainland and are thus registered by the UK Marine and Coastguard Agency who operate the UK Register of Shipping and Seamen. More information on their procedures can be found on-line at:

<http://www.mcga.gov.uk/c4mca/ukr-home.htm>

Data quality assurance procedures are built into the registration process. For example, every UK fishing vessel must be surveyed before it can be registered. The general principle followed is for this to be carried out by specially employed surveyors from the RSS, but in certain circumstances an external surveyor may be allowed. This survey process includes the validation of the physical measurements and capacity of the vessel both in tonnage and engine power terms. In addition, as part of supplying data to the EU fishing Vessel Register there are set quality control checks that data submissions must go thorough before submitted data is regarded as acceptable. Details of these business rules can be obtained from the Commission.

III.F.2 Effort

III.F.2.1 Data acquisition

For over 10m vessels the three key official documents (Community logbooks, landings declarations and sales notes) are the key source for transversal variables. For effort variables, the community logbook is the key source of data. Administrations systems have been developed such that for any particular fishing gear reported on the logbook there are several associated effort elements that should be reported by fishermen on their logbook, and then captured in the data entry process. These additional effort variables, when combined with system variables

automatically generated when the data is entered (e.g. days of fishing activity) and when the activity of vessels are linked to the vessel capacity data, allow nearly all of the variables within the fishing effort heading of Appendix VIII to be derived. For example, for towed gears such as demersal trawls, details of the number of hauls and length of time for the haul are collected. For beam trawl gear additionally information is collected on the length of the beam used. For towed lines details of the numbers of lines, hauled, and numbers of hooks per lime are collected.

For most variables the derivation of the data required under appendix VIII is thus a straightforward extraction of data entered into administrations systems, as detailed below:

Variable	Comments
Number of vessels	Derived from summation of logbook activity data
Days at sea	Recorded in a system variable derived at data entry from the date/time of departure and the date/time of return. There are several ways this is recorded in systems – either as per Chapter 1 on a 24 hour basis, or in terms of the calendar days involved in the trip
Hours fished	Reported as an effort data for mobile gears – for passive gears the effort is recorded more frequently in terms of the days involved, which can be multiplied to give the hours fished.
Fishing days	Derived from logbook data – separate recording required for each 24 hour period of activity with each being captured and recorded separately
KW * fishing days	Linkage of fishing days with capacity data
GT * fishing days	Linkage of fishing days with capacity data
Number of trips	Summation of logbook data
Number of rigs	Summation of logbook data
Number of fishing operations	Summation of logbook data
Number of nets / length	For passive net gears there is a requirement to record details of the average length and number of nets in use per day
Number of hooks / lines	For lime fishing the number of lines hauled and average number of hooks per line is reported
Number of pots / traps	The daily number of pots hauled is recorded
Soaking time	Summation of logbook data (See comments below)

One problem variable is the recording of soaking time for passive gears. With regards to pots and traps, gear can frequently be left out for several days at a time, with the length of time being dependent on factors such as the time of year, the local

conditions where the pots are set and also the abundance of fish/shellfish in the area. The recording of activity in the Community logbook is based on the date/time when the actual capture/harvesting from the sea takes place. As such during any one day a fishermen could bring to the surface pots and traps that had been soaking for a range of days, and thus the calculation of total soak time for all pots harvested that day would thus be a complex calculation to expect a fishermen to carry out at the same time as actually carrying out the activity. It is thus difficult to see how the soak time reported for such activity could be identified accurately. In addition, there is the question of how to use such data. The recording of fishing effort for pots and traps is a function of the total number of pots owned by a fisherman, how many are in the sea at any one time and the length of time they are left to soak.

Similarly the collection of data on soaking time for other passive gears such as nets will need to be investigated. Effort data is required for the average total length of nets in use per day of activity which can be translated into an estimated soak time. However, soak time alone does not give a relevant estimate of effort without relating to the length of nets involved. During 2010 and 2011 an assessment of the accuracy of using logbook data as the source of soaking time was carried out – this has indicated possible improvements that might be possible through the use of additional data collected on the activity of shellfish related activity in the form of daily monitoring forms. As such changes to data collection procedures are currently under discussion and are likely to be adopted during 2012 to improve the accuracy of estimates of soak time

For the 10 metre and under fleet (including vessels under 8 metres), during 2005 the UK introduced a system requiring the registration of buyers and sellers of fish at the point of first sale, and an associated requirement for all such sales to have sales notes reported and provided to fisheries authorities within 48 hours of the sale. More information on this change is available on-line at <http://www.defra.gov.uk/marine/fisheries/fishman/regist.htm>.

Data from these sales notes are captured as part of the UK integrated data systems that have been put in place, with data collected for sales related to all UK vessels, be they under or over 10metres in length. When the sales note related to activity by 10 metre and under vessels are entered onto data capture systems, estimates of the associated fishing effort are entered as well. After a period of assessment and quality assurance in the late 2005 and the early part of 2006, UK fisheries authorities have now moved over to use these sales notes data as the key source of information on the activity of vessels 10 metres and under overall length, and this will continue to be the case during 2009 and subsequent years. The use of the data reported on sales notes replaced the historic system of using the knowledge of local data collectors on the activity of the local small fleets and their usual patterns of effort, and of evidence of the observed fish landings seen at local fish markets. The requirement in the UK is for sales notes for all such landings by these smaller vessels to be reported to fisheries authorities, and as such the results are regarded as providing a more complete and exhaustive source of information than the previous system. Thus the system in place in the UK is considered to be a census based approach and thus more complete and reliable than a sampling approach.

In addition to sales notes as mentioned above, many 10m and under vessels also provide voluntarily EU format logbooks and landings declarations covering their

activity. For example, those that operate as members of Producer Organisations are generally required to complete such documentation as part of their being able to fish against the allocations of quota given to such groups in the UK. Additionally, those involved in shellfish fishing activity are also required to report their activity in the form of monthly diaries of activity and landings. This information is all received at local port offices around the coast for entry onto computer systems. These local offices carry out local enforcement functions such as licensing, vessel and market inspections etc. As such they have a detailed knowledge of the vessels that operate in their local area. This local knowledge on the activity of the vessels together with the above mentioned sources of data allow local staff to either enter fishing effort if it has been reported, or to construct estimates of the fishing effort involved. For example, if sales notes are the sole source of information, staff use factors such as the type of fish reported as caught by the vessel, knowledge of the type of activity the vessel usually carries out as well as if necessary requesting such information from the vessel operator as well to allow the effort associated with the landings to be estimated.

III.F.2.2 Data quality evaluation

The enforcement regime that operates in the UK to ensure logbooks are completed accurately helps to maintain the quality of the data being reported for mandatory variables. As such the absence of or any identified errors in the reporting of key variables is pursued with the owners and operators of the vessels to ensure accurate data is reported.

However, as many of the more detailed effort variables are of a voluntary nature rather than compulsory, there are instances where the full information may not be reported by fishermen for all of the required effort fields. In these instances, as the data entry of this information is by staff at port offices local to the fishermen's usual base of operations, they are able to contact the fishermen to obtain estimates of the missing data. When entered, such information is identified on the system as either supplied or estimated, and as such the quality of the data can be assessed when used.

UK fisheries authorities introduced during 2006 a system of integrated databases bringing together into a single UK system the information on UK fishing vessel activity at sea, landings and sales of fish. These data systems known as IFISH (Integrated Fisheries System Holding data warehouse) and MCSS (Monitoring Control and Surveillance System) are the main sources for the effort data required for the various fleet segments of the UK fleet. These systems sit within an overall system which carries out several cross checks of information between the various sources, including checks between activity data as reported in EU logbooks and that derived from satellite surveillance systems and other vessel monitoring inspection systems. This cross-check system highlights to administrations various apparent errors in reported data, with actions taken as necessary to resolve the errors.

III.F.2.3 Data presentation

As the data are obtained from administrative sources, they are collected via an ongoing process during each year. As such data are extracted for end-users as and when needed.

III.F.2.4 Regional coordination

The UK will participate in the Regional Coordination meetings for the North Sea/East Arctic and North Atlantic look to amend systems and methodology in light of any discussions and recommendations for these data that come from those meetings.

III.F.2.5 Derogations and non-conformities

None requested.

III.F.3 Landings

III.F.3.1 Data acquisition

Landings data are gathered from the same key sources as detailed in Section III.F.2.1. Data on landings by 10m and over vessels are derived from the combination of the community logbook, landing declarations and sales notes. These provide the key details on the species, presentation, weight and value of fish being landed that is entered onto computer systems at local port offices. The current sets of conversion factors incorporated in UK data entry systems are included in Table III.F.2. For information, the UK has implemented the requirements of Commission Regulation 409/2009 and introduced the use of harmonised conversion factors for certain key species and presentations. As such Table III.F.2 included these harmonised factors and national factors as well – the UK applies article 4 of the regulation in terms of when the harmonised conversion factors or alternate factors are used when data is processed onto UK systems.

Landed weights are used as the initial entered data, with live-weights calculated as the products of the landed weight and the appropriate conversion factors for that species and presentation of fish involved. The total landed weight of each species is taken from the landing declaration. Sales notes information give the details of the breakdown of the landed weight of each species in term of each presentation (and grade) sold. This proportionate breakdown is then applied to the total weight for each species so that the total live weight equivalent of the total landed weight is then allocated across the presentation types seen for the landing.

For vessels of 10m and under overall length, the source of data on landings is as detailed in section III.F.2.1. A similar process is used as for over 10 vessels, with the exception that in most cases the landed weight of fish is derived from the quantities of landed weight of fish reported in sales notes rather than landings declarations. The same conversion factors as used for over 10m vessels are then applied to the details of species, landed weight and presentation from sales notes to give live weight equivalents of the landed weight.

Average prices for each species will be calculated on the basis of live-weight quantities. This effectively weights the overall price thus calculated to the most prevalent presentation used for landings each species for both over 10m vessels and 10m and under vessels.

Summary data on the level of landings in the UK and by UK vessels in total are published on a regular basis by the Statistics and Analysis Team of the Marine Management Organisation. The summary is available to users free of charge via the MMO web-site at:

<http://www.marinemanagement.org.uk/fisheries/statistics/monthly.htm>

Whilst not in the DCF format (in terms of the segmentation of vessels, etc.), this release along with the more regular (weekly) updates on levels of UK quota uptake meets the needs of most users. Fuller details are made available to users in response to individual requests for information received by the team, tailored to the needs of the individual users.

III.F.3.2 Data quality evaluation

The same quality control procedures as detailed in Section III.F.2.2 apply.

III.F.3.3 Data presentation

As the data are obtained from administrative sources, they are collected via an ongoing process during each year. As such data are extracted for end-users as and when needed.

III.F.3.4 Regional coordination

The UK will look to amend systems and methodology in light of any discussions and recommendations for these data that come from the Regional Coordination Meetings.

III.F.3.5 Derogations and non-conformities

None requested.

III.G Research surveys at sea

III.G.1 Planned surveys

The following section provides descriptions of UK planned surveys listed in Appendix IX of Commission Decision 2008/949/EC, and given in Table III.G.1. The UK will try to ensure continuity with previous survey designs to maintain input to ICES Assessment Working Groups. Full descriptions of the surveys were provided in the UK proposals for 2002 & 2003. The official survey names from 2008/949/EC Appendix IX have been used and, for sake of clarity, the 'national' survey names included in brackets. It should be noted that in some cases, two or more of the surveys given here belong to a single survey heading in DCF Appendix IX.

North Sea (ICES areas IIIa, IV and VIId) and Eastern Arctic (ICES Areas I& II

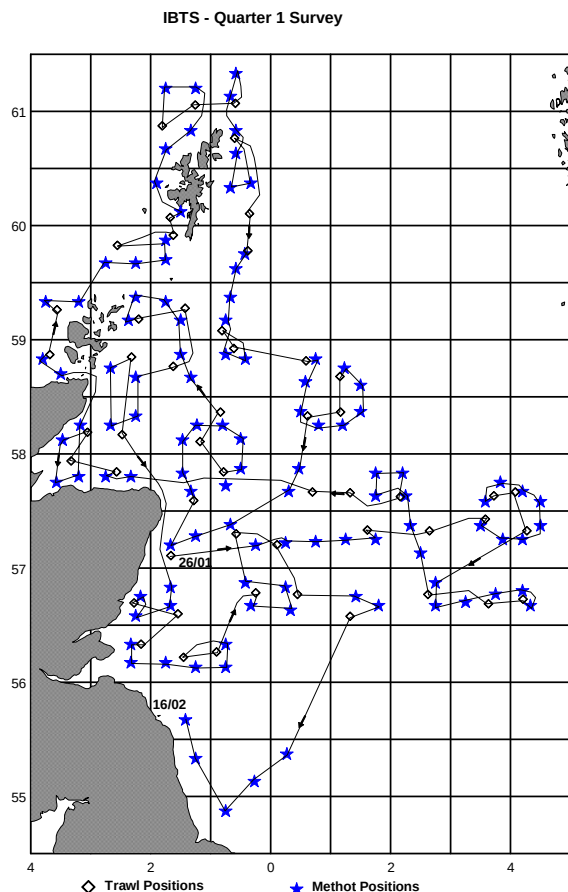
International Bottom Trawl Survey IBTS Q1; Areas IV, IIIa; 1st Quarter (Scottish International Bottom Trawl Survey)

Aims: A pre-recruit survey undertaken during Q1 in the North Sea as one component of the ICES International Bottom trawl survey (IBTS). The survey is targeted towards young (1-group) cod, haddock, whiting, saithe, Norway pout, herring and mackerel by utilising a GOV trawl fitted with an internal 20 mm liner. In addition pre-metamorphosing herring larvae are sampled at night by deploying a Methot mid-water net.

Data Collection: the survey will be undertaken by FRV *Scotia*. 52 semi-randomly selected stations will be surveyed for hydrographic information coupled with the deployment of a GOV trawl for 30 minutes. Numbers at length and age will be acquired for all target species with all other fish species being measured and counted. Further biological data will be gathered for species listed in Appendix VII of the Data Collection Regulations (see also section 9). It is also planned to survey the abundance of pre-metamorphosing herring larvae in all 52 ICES rectangles visited by the vessel by use of a Methot net.

Data Storage: data will be stored electronically in Marine Scotland-Science (MS-S) data banks with a copy being sent to ICES for storage in the DATRAS database. Plankton samples (from Methot net) will be stored in a dedicated building onsite.

Suitability of the survey for the calculation of the ecosystem indicators 1 to 4 listed in DCR appendix XIII: YES



Scottish IBTS Q1

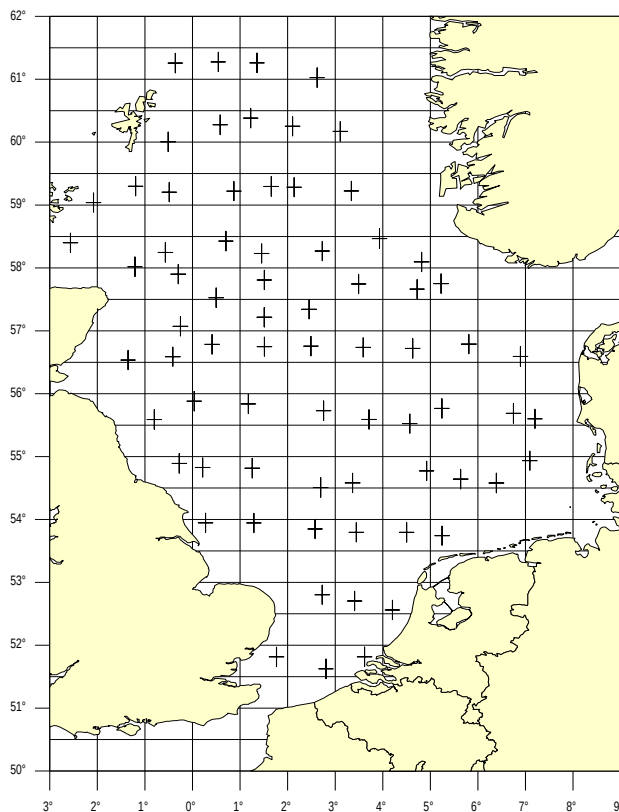
International Bottom Trawl Survey IBTS Q3; Areas IV, IIIa; 3rd Quarter (English International Bottom Trawl Survey)

Aim: The survey provides estimates of abundance of recruiting year classes and CPUE-at-age series for cod, haddock, whiting, and Norway pout to the North Sea and Skagerrak Demersal Working Group (WGNSSK). These are used for tuning purposes.

Data Collection: 30 days and 75 prime stations are planned in area IV between 51 to 62 deg. N, and between 4 deg. W to 8 deg. E. All fish caught will be identified to species and measured. Age samples and biological parameters will be taken from all target species and species listed in DCR Appendix VII. Hydrographic data will be collected at each station. Any anthropogenic waste material will be recorded and weighed.

Data Storage: The resultant data will be input to a computer database using the CEFAS Electronic Data Capture System. All data will also be transmitted to ICES for input to the DATRAS database.

Suitability of the survey for the calculation of the ecosystem indicators 1 to 4 listed in DCR appendix XIII: YES for indicators 1-3. Maturity data for Q3 suitable for only a few species.



English IBTS Q3

International Bottom Trawl Survey IBTS Q3; Areas IV, IIIa; 3rd Quarter (Scottish International Bottom Trawl Survey)

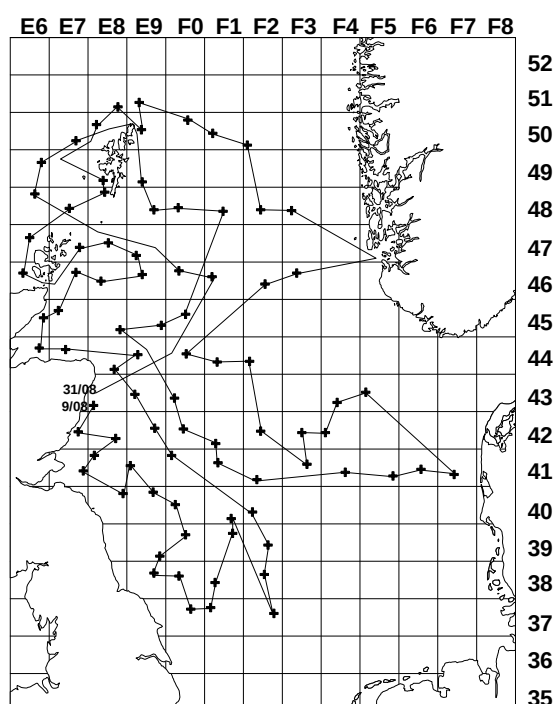
Aims: A pre-recruit survey undertaken during Q3 in the North Sea as one component of the ICES International Groundfish survey. The survey is targeted towards young (0 and 1-group) cod, haddock, whiting, saithe, Norway pout, herring and mackerel by utilising a GOV trawl fitted with an internal 20 mm liner.

Data Collection: the survey will be undertaken by FRV *Scotia*. 85 semi-randomly selected stations will be surveyed for hydrographic information coupled with the deployment of a GOV trawl for 30 minutes. Numbers at length and age will be acquired for all target species with all other fish species being measured and counted. Further biological data will be gathered for species listed in Appendix VII of the Data Collection Regulations (see also section 9).

Data Storage: data will be stored electronically in MS-S data banks with a copy sent to ICES for storage in the DATRAS database.

Suitability of the survey for the calculation of the ecosystem indicators 1 to 4 listed in DCR appendix XIII: YES for indicators 1-3. Maturity data for Q3 suitable for only a few species.

Quarter 3 - Groundfish Survey Track



Scottish IBTS Q3

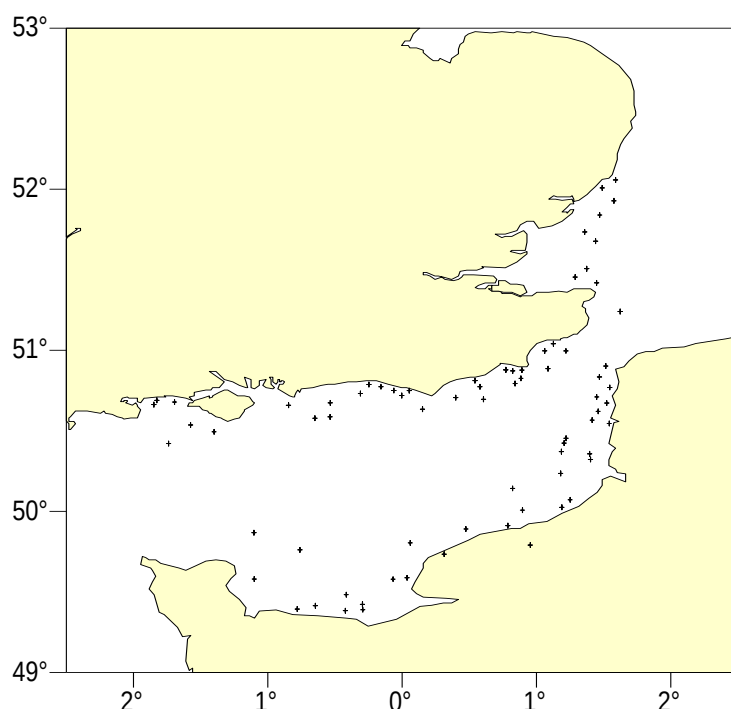
North Sea Beam Trawl Survey BTS; Areas IVb, IVc, VIId; 3rd Quarter (English Beam Trawl Survey)

Aims: To provide estimates of abundance of recruiting year classes and CPUE-at-age series for plaice and sole to the North Sea and Skagerrak Demersal WG (WGNSSK). These are used for tuning purposes.

Data Collection: 91 stations are planned and all fish caught will be identified to species and measured. Age samples and biological parameters will be taken from all target species and species listed under Appendix VII of the DCR which are caught. Benthos and crustacea will be identified to the species level wherever possible and recorded as present. Hydrographic data will be collected at each station.

Data storage: Data will be held on a surveys database at CEFAS and provided in summarized form to the WGNSSK. The resultant data will be input to a computer database using the CEFAS Electronic Data Capture System. All data will also be transmitted to ICES for input to the DATRAS database.

Suitability of the survey for the calculation of the ecosystem indicators 1 to 4 listed in DCR appendix XIII: YES for indicators 1-3. Maturity data for Q3 suitable for only a few species.



Eng beam trawl survey Q3

Demersal Young Fish Survey; DYFS; coasts of NS; 3rd/4th Quarter (English Demersal Young Fish Survey) This survey has been removed from the bid for 2012 and 2013

The justification for this change is as follows : the Demersal Young Fish Survey (DYFS) comprises a number of inshore surveys of 0-gp and 1-gp plaice and sole carried out by several countries including the UK, and covers waters within 6n.miles along the coasts of the southern North Sea and the eastern Channel. The UK has contributed only to the North Sea component since 2007. The use of this survey by ICES has in recent years been restricted to input to the RCT3 model for forecasting recruitment of plaice and sole. Since 2005, only the 0-gp indices have been used. The WGNSSK 2011 report (ICES CM 2011/ACOM:13) and earlier reports of WGNSSK show that the DYFS index has large prediction errors in RCT3 and often has a low weighting. For the 2009 and 2010 year classes of North Sea plaice and sole, the 0-gp DYFS index gave the following results in RCT3:

Species	Year class	CV	R ²	weighting
Plaice	2010	0.91	0.27	12%
	2009	0.93	0.25	7%
Sole	2010	1.07	0.33	27%
	2009	1.06	0.33	5%

The predictions have very high CVs close to 1.0, and low R². Although WGNSSK provides these results annually, and has used the RCT3 prediction for the 2009 plaice year class (where DYFS carries only 7% of the weight), it reverted to a

geometric mean recruitment for estimating the 2010 year class of plaice and the 2009 & 2010 year classes of sole.

The WKFLAT 2010 benchmark assessment of North Sea sole (ICES CM 2010/ACOM:37) excluded the use of the DYFS, but proposed that the use of the Cefas North Sea Beam Trawl Survey, which extends from VIId into IVc could be explored.

The STECF review of surveys (SGRN 10-03, October 2010) gave the DYFS relatively low scores for categories harmonisation, use in management, and data access. STECF also noted that although coordinated by WGBEAM, different widths of the shrimp trawls were being used by different countries: BEL: 6 m, GE: 3 m, NL: 3-6 m, UK-Eng: 2 m. The survey is entirely focussed on very inshore waters (inside 6 mile), and by its nature (chartering of very small vessels with limited working space) the UK survey is limited in ability to deliver any additional DCF/MSFD/GES indicators.

In view of the relatively small contribution of the DYFS to recruitment predictions for North Sea plaice, and the non-use of the survey by ICES for North Sea sole, it was considered there was no justification under current government spending controls to continue funding the survey at the expense of other DCF work that contributes more effectively to local and international fisheries management.

International Ecosystem Survey in the Nordic Seas; ASH; Area IIa; May

The UK will contribute to this survey by providing funds and staff equivalent to 22% of the survey costs.

North Sea Herring Acoustic Survey NHAS; Areas IIIa, IV; June, July (Scottish NS Herring Acoustic Survey)

Aims: to conduct an acoustic survey to estimate the abundance and distribution of herring in the north western North Sea and north of Scotland between 58°15N to 61°45 N and 4°W to 2°E, excluding Faroese waters. The results will be combined with those of Germany, Netherlands, Norway & Denmark to produce an age disaggregated abundance index for herring.

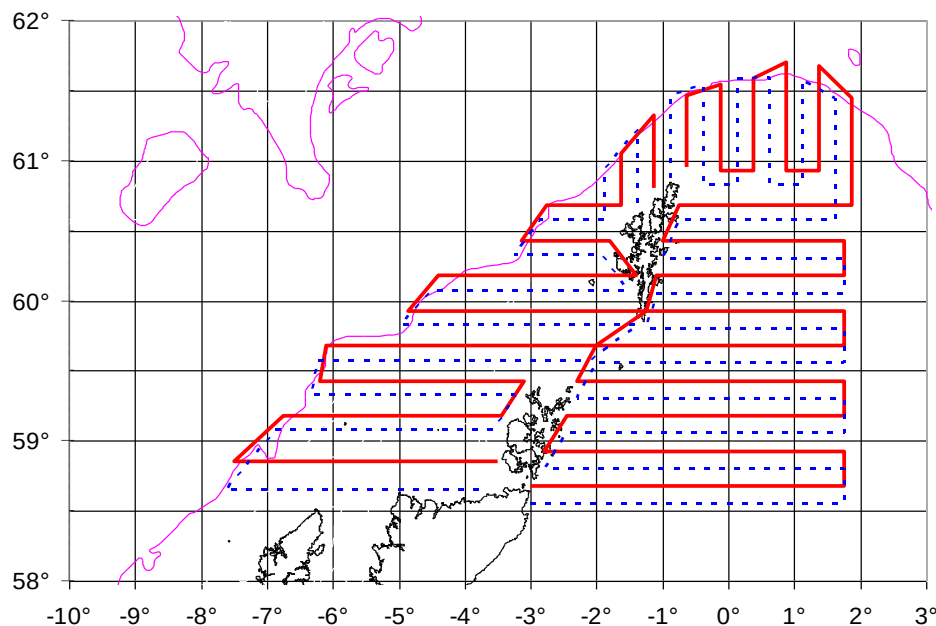
From 2011 the Scottish North Sea herring acoustic survey and the Scottish North Atlantic herring acoustic survey (Spawning/Pre spawning Herring acoustic survey; VIa, VIIa-g; July, Sept, Nov, March, Jan (Scottish Spawning/pre-spawning Herring Acoustic Survey)), which traditionally ran concurrently on two vessels covering the separate ICES areas, were combined in a way that FRV Scotia now covers the entire survey area in IV and VI and a charter vessel, paid for at national expense using scientific quota, shadows Scotia.

Data Collection: FRV Scotia will undertake an acoustic survey by following a pattern of parallel transects running east to west. It is projected that in excess of 2500

nautical miles will be surveyed at four different frequencies (18, 38, 120 and 200 kHz). A pelagic trawl will be deployed approximately 30 times to 'ground truth' the acoustic data.

Data Storage: all acoustic data will be stored in data banks at MS-S. Subsequent post survey analysis will be provided to the relevant ICES working groups.

Suitability of the survey for the calculation of the ecosystem indicators 1 to 4 listed in DCR appendix XIII: Yes for indicators 1 - 3 (mostly only target species caught but all species caught are sampled).



Scottish combined North Sea and N Atlantic herring acoustic surveys

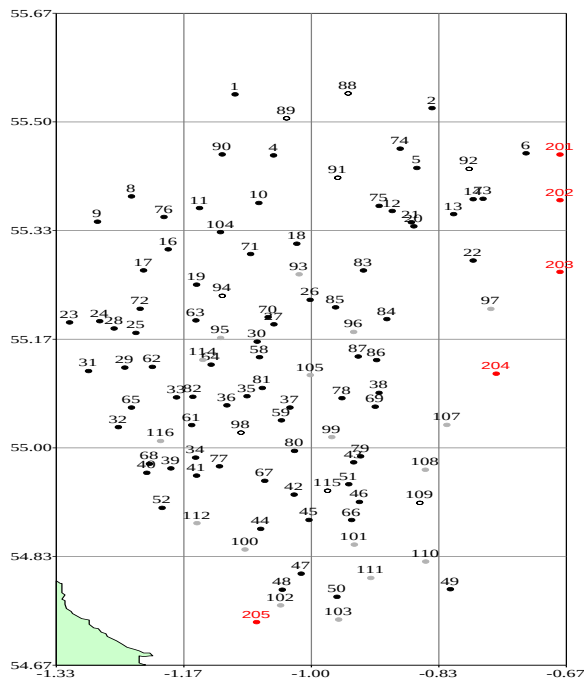
Nephrops TV survey (FU 6) NTV6 IVb September. (CEFAS Farne Deeps *Nephrops* TV survey)

Aims: To provide fishery independent information on distribution and abundance of *Nephrops* in the Farne Deeps for use alongside analytical results by WGNEPH and to examine trends in stock size using underwater cameras. This survey is scheduled to occur in the North Sea during the second quarter.

Data Collection: It is expected that approximately 105 UWTV tracks will be surveyed over 8 days on RV *Endeavour* with the results captured on video tape.

Data Storage: the video recordings will be analysed and the results conveyed to the relevant ICES working groups.

Suitability of the survey for the calculation of the ecosystem indicators 1 to 4 listed in DCR appendix XIII: Not suitable



Cefas FU6 Nephrops TV survey

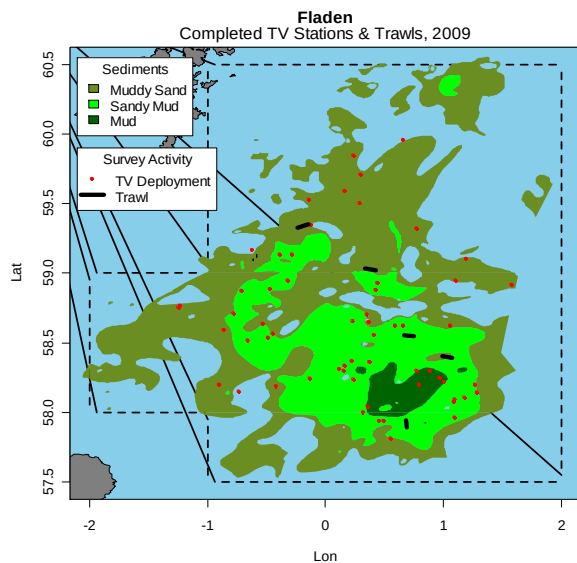
Nephrops TV survey (FU 7) NTV7 IVa 2nd or 3rd Quarter. (Scottish Fladen Nephrops TV survey)

Aims: to obtain estimates of distribution and abundance of *Nephrops* in the Fladen Ground using underwater television. This survey will be conducted by *Scotia* undertaking one extensive survey that includes both the North Sea (IV) and the west of Scotland (VIa). However, for clarity, and to conform to the list of surveys in Appendix IX of the Data Collection Regulations, the survey will be divided into, and reported by, North Sea and NE Atlantic sectors.

Data Collection: Approximately 9 days will be allocated to the North Sea sector and during this time period it is hoped to complete approximately 70 TV tracks and 3 fishing hauls. Additionally, information on size at maturity will be obtained as per Appendix VII of the Data Collection Regulations.

Data Storage: the video recordings will be analysed and the results conveyed to the relevant ICES working groups - North Sea Demersal WG (WGNSSK) where they will provide the major input to the *Nephrops* stock assessment.

Suitability of the survey for the calculation of the ecosystem indicators 1 to 4 listed in DCR appendix XIII: Not suitable



Scotland Nephrops TV in FU7

Nephrops TV survey (FU 8) NTV8 IVb 2nd or 3rd Quarter. (Scottish Firth of Forth Nephrops TV survey) and Nephrops TV survey (FU 9) NTV9 IVa 2nd or 3rd Quarter. (Scottish Moray Firth Nephrops TV Survey).

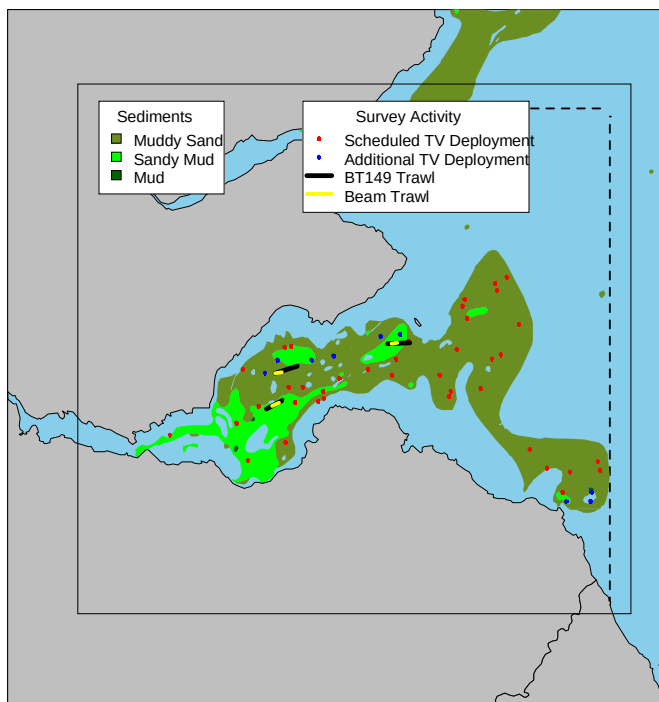
{NOTE: The surveys for Nephrops in FU8 and FU9 are undertaken as one survey but the results will be presented separately in the Technical Report}.

Aims: To provide fishery independent information on distribution and abundance of *Nephrops* in the Firth of Forth and Moray Firth for use alongside analytical results by WGNPEH and to examine trends in stock size using underwater cameras. This survey is scheduled to occur in the North Sea during the second quarter.

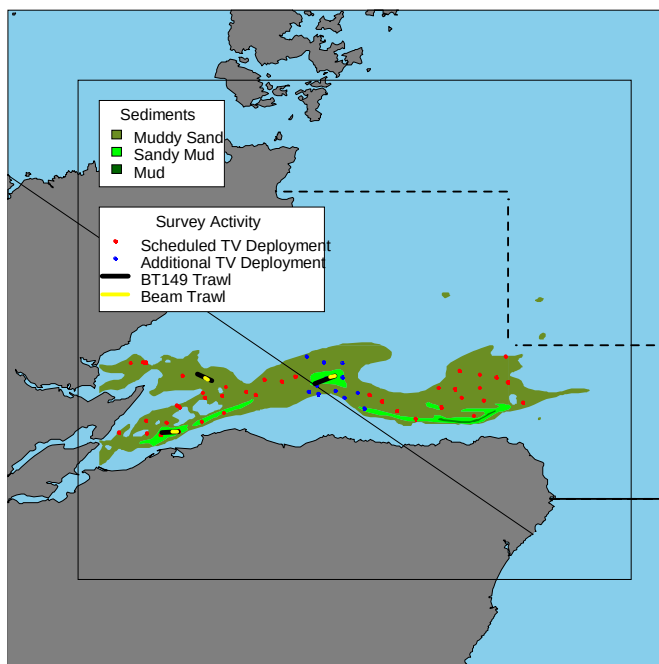
Data Collection: it is expected that, in total, approximately 80 TV tracks will be surveyed with the results captured on video tape. 4 fishing hauls are planned. Additionally, biological and morphometric data will be obtained as per Appendix VII of the Data Collection Regulations.

Data Storage: the video recordings will be analysed and the results conveyed to the relevant ICES working groups - North Sea Demersal WG (WGNSSK) where they will provide the major input to the *Nephrops* stock assessment...

Suitability of the survey for the calculation of the ecosystem indicators 1 to 4 listed in DCR appendix XIII: Not suitable



FU8 nephrops tv



FU9 nephrops tv

North Atlantic (ICES Areas V-XIV and NAFO areas)

Western IBTS 4th quarter; IBTS Q4; VIa, VII; 4th Quarter (Scottish Western IBTS)

Aims: to participate in the ICES co-ordinated western division bottom trawl survey in quarter 4. The survey is very similar to the North Sea IBTS surveys and is also targeted towards young (0 and 1-group) cod, haddock, whiting, saithe, Norway pout, herring and mackerel by utilising a GOV trawl fitted with an internal 20 mm liner. Hydrographic data are collected at each station.

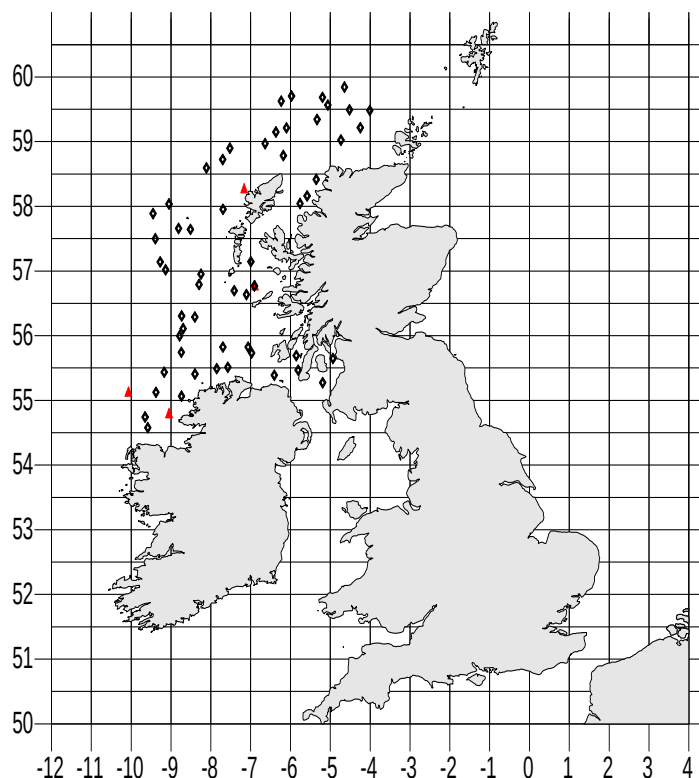
Data Collection: the survey will be undertaken by FRV *Scotia*. Approximately 81 semi-randomly selected stations will be surveyed for hydrographic information coupled with the deployment of a GOV trawl for 30 minutes. Numbers at length and age will be acquired for all target species with all other fish species being measured and counted. Further biological data will be gathered for species listed in Appendix VII of the Data Collection Regulations.

Data Storage: data will be stored electronically in MS-S data banks with a copy sent to ICES for storage in the DATRAS database

Suitability of the survey for the calculation of the ecosystem indicators 1 to 4 listed in DCR appendix XIII: YES for indicators 1-3; maturity data in Q4 suitable for a range of species depending on spawning dates.

The groundgear, sweeps configuration and survey design of the DCF co-funded Scottish Western IBTS (IBTS Q1) and IBTS Q4 have been changed. The survey formerly comprised a systematic survey design providing CPUE indices for cod, haddock and whiting in Division VIa. The extent of hard ground, to which the survey ground gear was unsuited, has historically meant that a significant part of the entire survey area was unsampled. This created a likely bias in the survey indices that was in addition to the known likelihood of increased bias in systematic survey designs compared with random sampling designs. The new groundgear allows the survey's spatial coverage to be extended into the area of hard ground and the sweeps configuration is now more closely aligned to the ICES IBTSWG recommendations. The move to a new groundgear, modified sweeps configuration and random sampling also harmonises the gear and survey design with the corresponding Irish survey in the area. Details of the changes were presented to the ICES IBTS working group meeting in March/April 2011 (ICES CM 2011/SSGESST:06).

As this does represent a change to the methodology used for the survey, additional information on the changes are presented in Annex 9 in terms of an extract of the paper presented to the WG. These changes were highlighted by the 2011 STECF EWG(11-19) that reviewed the UK National Proposal amendments for 2012 and referred to the Commission. The Commission chose neither to reject the changes nor to subject them to further scrutiny by STECF.



Scottish western IBTS Q4

Western IBTS 4th quarter; IBTS Q4; VIa, VII; 4th Q (English Western IBTS) This Survey has been removed from the bid for 2012 and will be replaced by a new survey in Quarter 1 2013 for inclusion in the 2013 cost sheets

This survey was originally set up as a Q1 survey. It ran from 1986 to 2004 providing information on populations of cod, haddock, whiting and other species. The change in 2004 was to bring the survey in line as part of the IBTS-coordinated Quarter 4 programme of work as a whole. For several years CEFAS continuing to operate a separate Q1 survey outside of any funding under the DCF before discontinuing it due to spending constraints.

The data that has been collected under this survey has not been used in assessments by any of the stock assessment working groups for the sea areas covered (i.e. WGCSE, WGHMM, WGWIDE). Where it has been used (i.e. WGEF) the use has been limited to contributing to overall results of analyses of species composition, size distribution etc and not any specific annual data. Annex 10 provides more information on the rationale for the change. It lists several limitations that have emerged with regards to the Q4 survey based on the practical problems of carrying out the survey at that time of year as well as issues related to the results seen from the survey itself. In addition, there are also detailed several benefits of Quarter 1 surveys that, when taken with the level of coverage by other elements of the IBTS programme of survey work, point to there being appreciable advantages to the changes proposed in terms of improved data on maturity and a delivering a wider range of data for assessments and for MSFD.

Scottish Western IBTS; IBTS Q1; VIa & VIIa, 1st quarter (Scottish West Coast, Young Fish Survey)

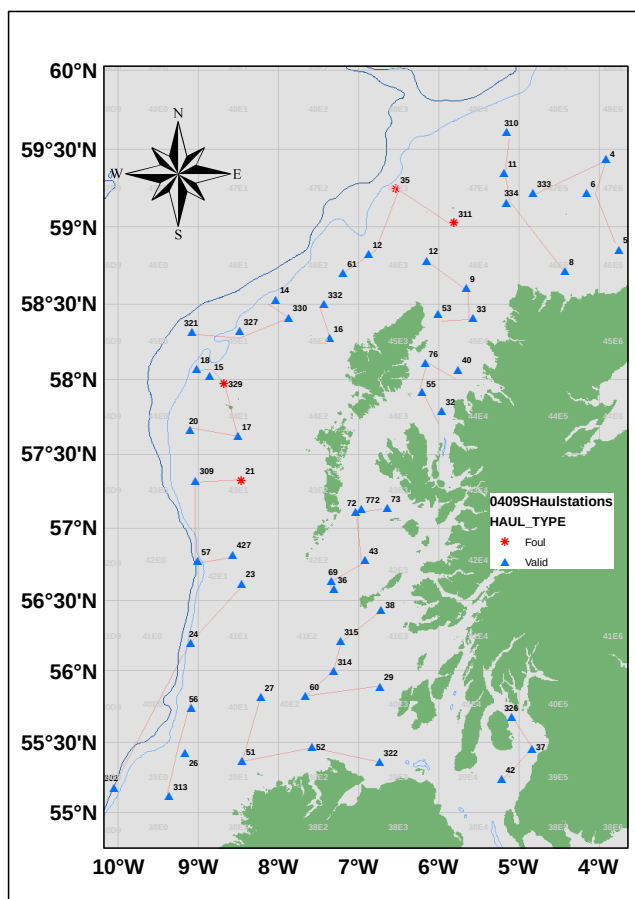
Aims: to survey ICES areas VIa and VIIa during quarter 1. The survey is almost identical to the corresponding survey in the North Sea and provides CPUE-at-age series for cod, haddock, whiting and saithe to WGN SDS. These are used for tuning purposes. It also provides data for ages 1 & 2 mackerel to WGMHSA.

Data Collection: the survey will be undertaken by FRV *Scotia*. Approximately 56 semi-randomly selected stations will be surveyed for hydrographic information coupled with the deployment of a GOV trawl for 30 minutes. Numbers at length and age will be acquired for all target species with all other fish species being measured and counted. Further biological data will be gathered for species listed in Appendix VII of the Data Collection Regulations.

Data Storage: data will be stored electronically in MS-S data banks with a copy sent to ICES for storage in the DATRAS database.

Suitability of the survey for the calculation of the ecosystem indicators 1 to 4 listed in DCR appendix XIII: YES for indicators 1-4.

The groundgear, sweeps configuration and survey design of the DCF co-funded Scottish Western IBTS (IBTS Q1) and IBTS Q4 have been changed. See text above with IBTS Q4. These changes were highlighted by the 2011 STECF EWG(11-19) that reviewed the UK National Proposal amendment for 2012 and referred to the Commission. The Commission chose neither to reject the changes nor to subject them to further scrutiny by STECF.



Scottish western IBTS Q1

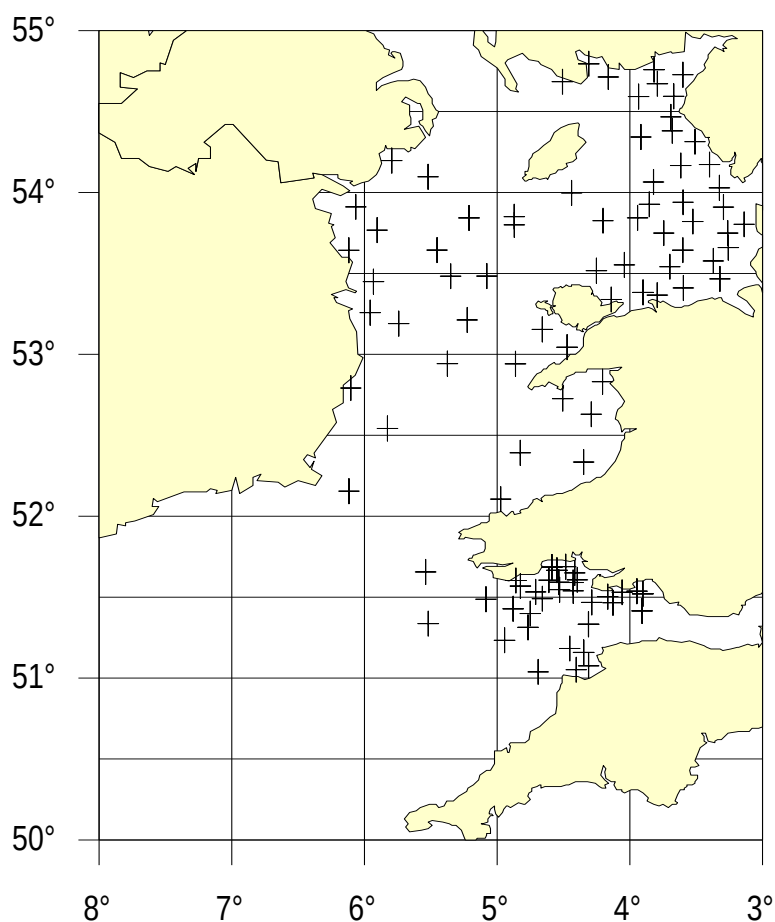
ISBCBTS September; VIIa,f,g; September (Irish Sea & Bristol Channel Beam Trawl Survey)

Aims: To provide estimates of abundance of recruiting year classes and CPUE-at-age series for plaice and sole to the North Sea and Skagerrak Demersal WG (WGNSSK). These are used for tuning purposes.

Data Collection: A total of 108 stations have been planned. Age samples and biological parameters will be taken from all target species and all species listed under Appendix VII of the DCR which are caught. Hydrographic data will be collected at each station.

Data Storage: Data will be held on a surveys database at CEFAS and provided in summarized form to the Northern Shelf Demersal WG (WG NSDS). The resultant data will be input to a computer database using the CEFAS Electronic Data Capture System. All data will also be transmitted to ICES for input to the DATRAS database.

Suitability of the survey for the calculation of the ecosystem indicators 1 to 4 listed in DCR appendix XIII: YES for indicators 1-3; maturity data in September suitable for only a few species.



ISBCBTS Q3

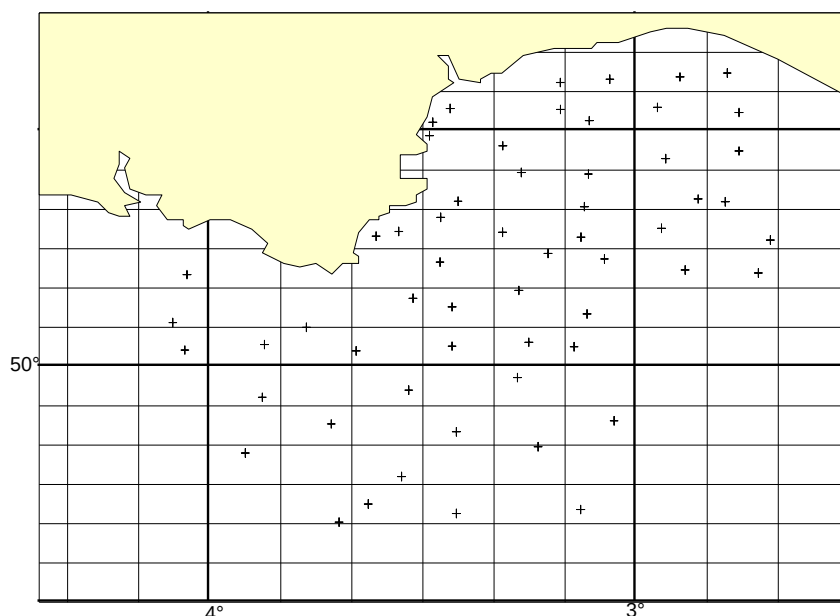
*WCBTS; VIIeBTS; October (Western Channel Beam Trawl Survey, VIIe, 4th quarter):
UK Prog 7.1.13*

Aims: The survey provides CPUE-at-age series for plaice and sole to the ICES Southern Shelf WG for tuning and recruitment estimation purposes and distribution and abundance estimates

Achievements: 8 sea days and 58 hauls have been planned for this cruise. Age samples and biological parameters will be taken from plaice and sole. All other fish will be identified to species and measured. Hydrographic data will be collected at each station.

Data Storage: Data will be held on a surveys database at CEFAS and provided in summarized form to the Southern Shelf Demersal WG (WG SSDS) and to the Beam Trawl Survey WG (WG Beam)

Suitability of the survey for the calculation of the ecosystem indicators 1 to 4 listed in DCR appendix XIII: YES for indicators 1-3; maturity data in September suitable for only a few species.



WCBTS Q4

Blue whiting survey; VI, VII; 1st and 2nd Quarter

The UK will contribute towards vessel costs according to the agreed funding formula for the ASH and blue whiting surveys. In addition the Scottish institute will provide one member of staff for the two surveys which will be operated by the Netherlands and Ireland. The cruise map can be seen in the Dutch or Irish NPs.

International Mackerel and horse mackerel egg survey (Triennial) MEGS; Area VIa, VII, VIII, IXa; January – July 2013 (Scottish Mackerel & Horse Mackerel Egg Survey)

Part I

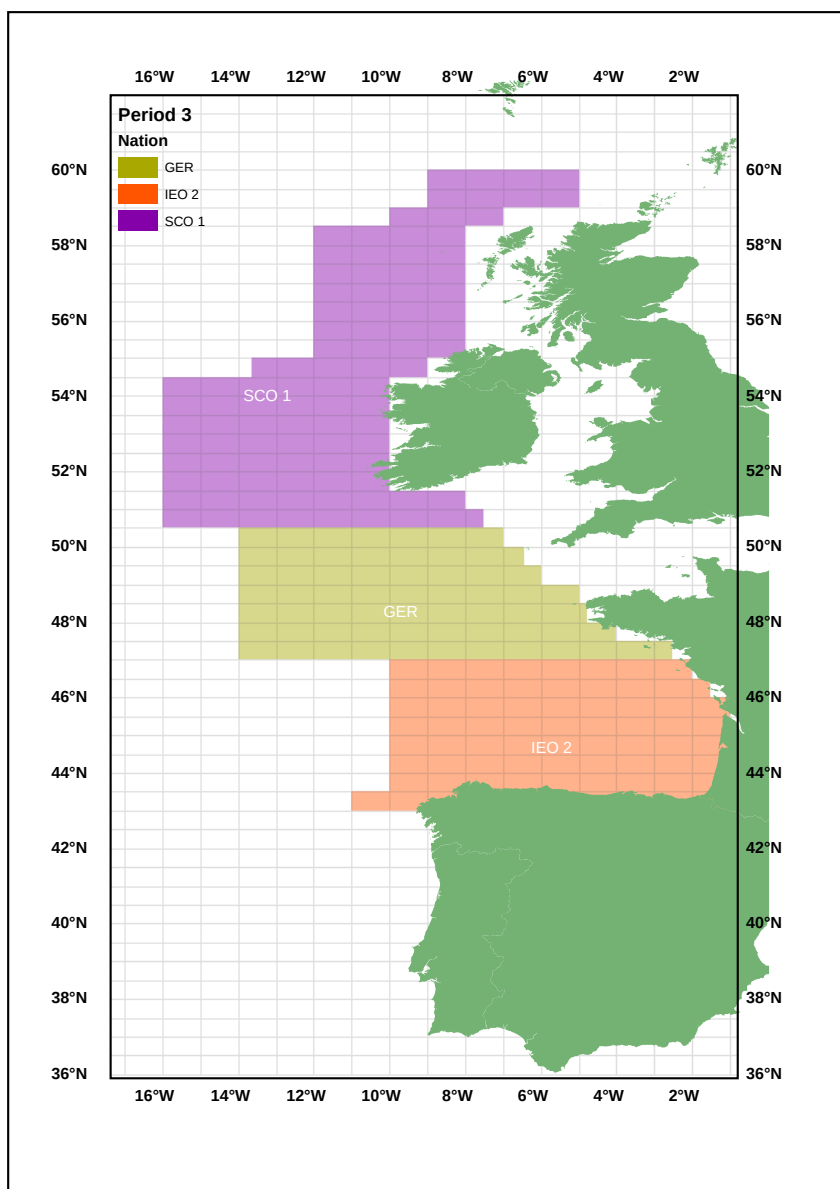
Aims – to participate in the triennial ICES mackerel egg survey on the shelf and shelf edge to the west of the British Isles between 53°N and 60°N.

Please note: the survey areas that each MS will cover have not been fully decided yet.

Data Collection: the number of scheduled plankton stations are not defined at this stage nevertheless it is expected that approximately 140 plankton stations will be sampled, together with a small number of calibration stations.

Data Storage: the plankton samples will be stored in a dedicated building on site in Aberdeen; the results of the post survey analysis being made available to the relevant ICES working groups.

Suitability of the survey for the calculation of the ecosystem indicators 1 to 4 listed in DCR appendix XIII: No. Fish are sampled principally for fecundity and atresia.



Part II

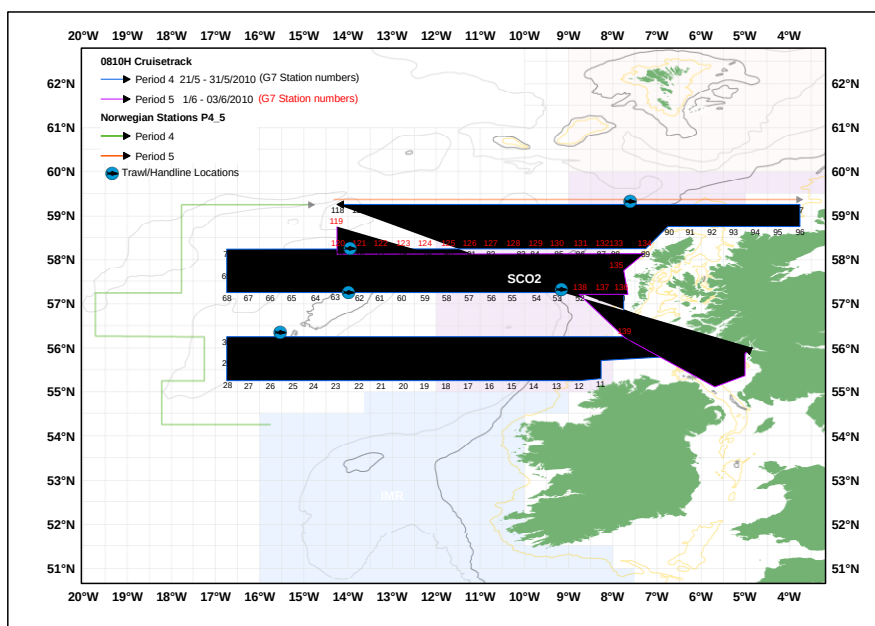
Aims – to participate in the triennial ICES mackerel egg survey on the shelf and shelf edge to the west of the British Isles between 50°N and 60°N.

Please note: the survey areas that each MS will cover have not been fully decided yet.

Data Collection: the number of scheduled plankton stations are not defined at this stage nevertheless it is expected that approximately 140 plankton stations will be sampled, together with a small number of calibration stations.

Data Storage: the plankton samples will be stored in a dedicated building on site in Aberdeen; the results of the post survey analysis being made available to the relevant ICES working groups.

Suitability of the survey for the calculation of the ecosystem indicators 1 to 4 listed in DCR appendix XIII: No. Fish are sampled principally for fecundity and atresia.



Part III

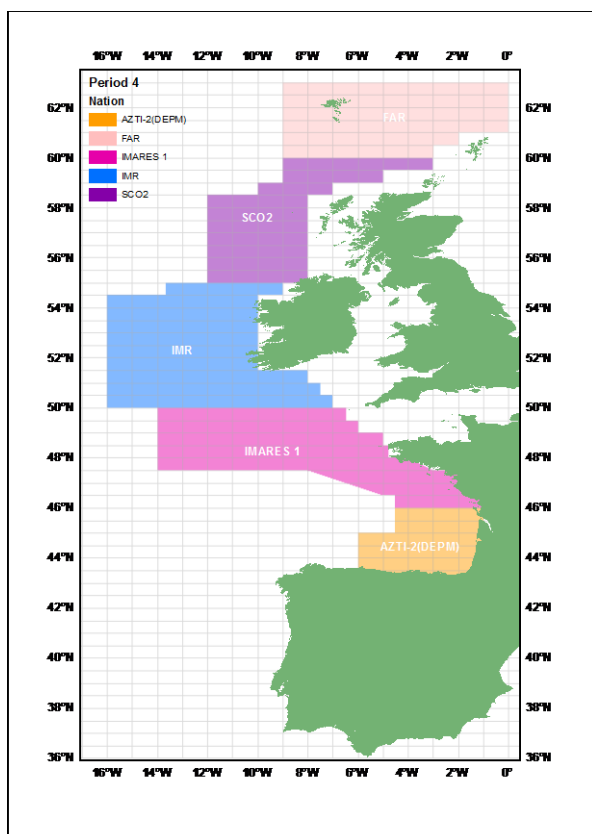
Aims – to participate in the triennial ICES mackerel egg survey on the shelf and shelf edge to the west of the British Isles between 50°N and 58°N.

Please note: the survey areas that each MS will cover have not been fully decided yet.

Data Collection: the number of scheduled plankton stations are not defined at this stage nevertheless it is expected that approximately 95 plankton stations will be sampled, together with a small number of calibration stations.

Data Storage: the plankton samples will be stored in a dedicated building on site in Aberdeen; the results of the post survey analysis being made available to the relevant ICES working groups.

Suitability of the survey for the calculation of the ecosystem indicators 1 to 4 listed in DCR appendix XIII: No. Fish are sampled principally for fecundity and atresia.



As in 2010, Scotland plans to undertake 3 mackerel egg surveys
Justification of incorporation of a 3rd mackerel egg survey is stated below.

Incorporation of an additional triennial Mackerel / Horse mackerel egg survey in 2010 by the Marine Laboratory, Marine Scotland (UK).

In the previous mackerel egg surveys, which took place in 2007, the UK (CEFAS) requested a derogation so as to withdraw from undertaking one of the three surveys normally conducted by the UK. This request was denied and FRS Scotland (now Marine Scotland) undertook a third survey at national expense. The additional samples required for fecundity and atresia studies were also collected on this survey.

In 2007 WGMEGS stated “... *The WG regret this decision, and hope that CEFAS may be able to review this at some point and return to the survey. The impact will be to decrease the accuracy of the survey and make it more vulnerable to operational exigencies*”.

In 2009 WGMEGS expressed “*extreme concern about the limited resources being made available in 2010*” (referring to more than one MS) and pointed out that it is becoming increasingly difficult to survey all spawning areas satisfactorily given the allocated ships’ time.

In the UK 2009–10 UK National Proposal 2 Mackerel / Horse mackerel egg surveys undertaken by the Marine Lab, Aberdeen have been listed. In light of the concern of WGMEGS, SGRN and the North Atlantic RCM, Scotland now proposes to undertake a third survey in May 2010 which will positively affect the accuracy of the surveys and ensure better coverage of the spawning area.

Approximately 95 plankton hauls and 4 fishing hauls are planned. These numbers are adaptive, depending on indications and catches within the area.

The survey will take place on a chartered commercial vessel in May 2010. The costs for this extra survey are submitted.] Accepted by the Commission.

Spawning/Pre spawning Herring acoustic survey; VIa, VIIa-g; July, Sept, Nov, March, Jan (Scottish Spawning/pre-spawning Herring Acoustic Survey)

Aims: to conduct an acoustic survey to estimate the abundance and distribution of herring in the north western North Sea and west of Scotland (ICES area VIa(N)) as part of the ICES International North Sea Herring Acoustic Survey. The results are combined with those of Germany, Netherlands, Norway & Denmark to produce an age disaggregated abundance index. This is the only fishery independent data for herring in VIa(N) and is used as a tuning factor in the assessment by HAWG.

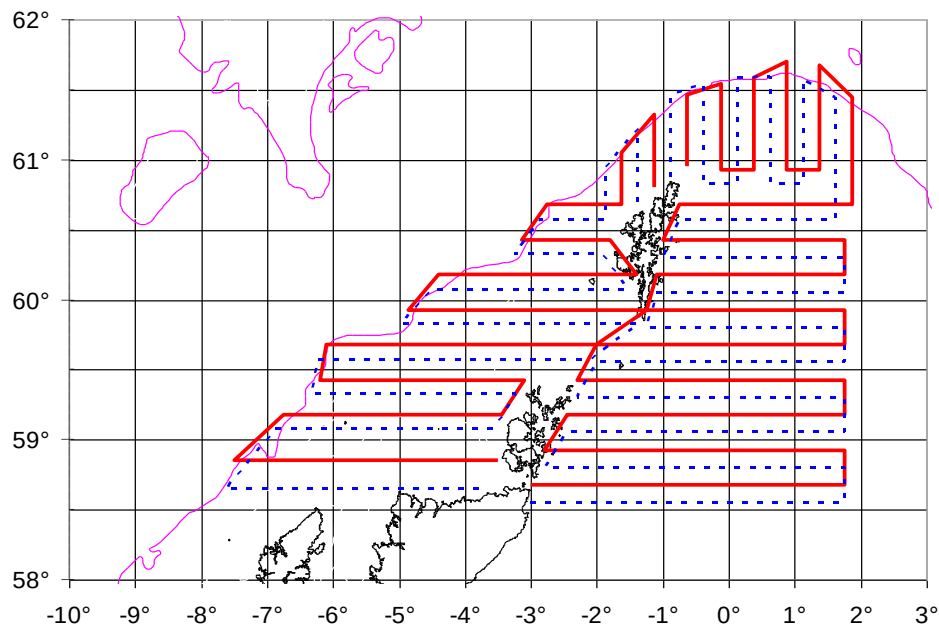
From 2011 the Spawning/Pre spawning Herring acoustic survey; (Scottish North Atlantic herring acoustic survey) and the Scottish North Sea herring acoustic survey NHAS, which traditionally ran concurrently on two vessels covering the separate ICES areas, were combined in a way that FRV Scotia now covers the entire survey area in IV and VI and a charter vessel, paid for at national expense using scientific quota, shadows Scotia. Only staff costs and consumables are included in the NP budget

Data Collection: It is projected that in excess of 2800 nautical miles will be surveyed at four different frequencies (18, 38, 120 and 200 kHz).

Data Storage: all acoustic data will be stored in data banks at MS-S. Subsequent post survey analysis will be provided to the relevant ICES working groups.

Suitability of the survey for the calculation of the ecosystem indicators 1 to 4 listed in DCR appendix XIII: Yes for indicators 1 - 3 (mostly only target species are caught but all species caught are sampled).

Scottish Herring acoustic survey in ICES areas IV and VIa map



Broken line = proposed charter vessel cruise track. (Solid line = FRV Scotia cruise track).

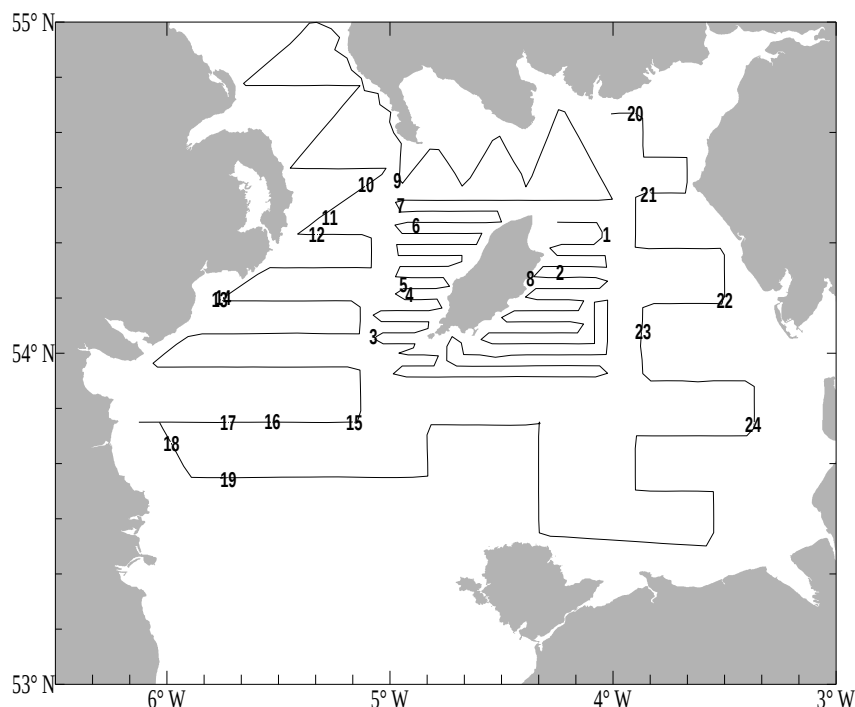
Spawning/Pre spawning Herring acoustic survey; VIa, VIIa-g; July, Sept, Nov, March, Jan (Northern Irish Spawning/pre-spawning Herring Acoustic Survey)

Aim: To carry out an acoustic survey for herring in the Irish Sea and west of Scotland.

Data Collection: Approximately 1200 nautical miles will be surveyed and approximately 24 pelagic trawl stations will be fished to ground truth acoustic data. Indices of herring abundance will be obtained by age class and used for tuning an Integrated Catch at age Analysis (ICA). The abundance estimate will be used by HAWG with two larval abundance indices to tune the assessment of Irish Sea herring.

Data Storage: All acoustic data will be stored in data banks at AFBI. Subsequent post survey analysis will be provided to the relevant ICES working groups

Suitability of the survey for the calculation of the ecosystem indicators 1 to 4 listed in DCR appendix XIII: No: Survey targets only a few species.



Northern Ireland Herring Acoustic survey

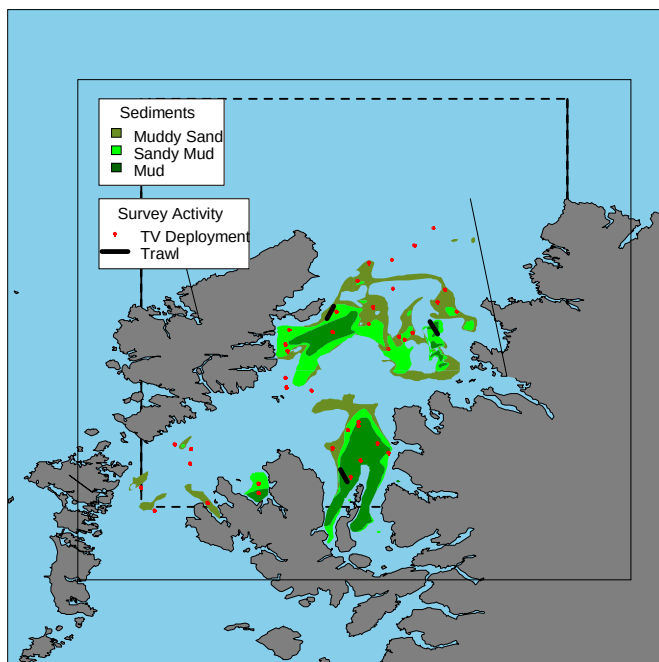
Nephrops UWTV survey (offshore); UWTV (FU 11-13) VIa; , 2nd quarter (Scottish Underwater Television Surveys, ICES area VIa)

Aims: to obtain estimates of distribution and abundance of *Nephrops* in the Firth of Clyde, North Minch, South Minch and Stanton Banks using underwater television. (The western component of the previous offshore survey).

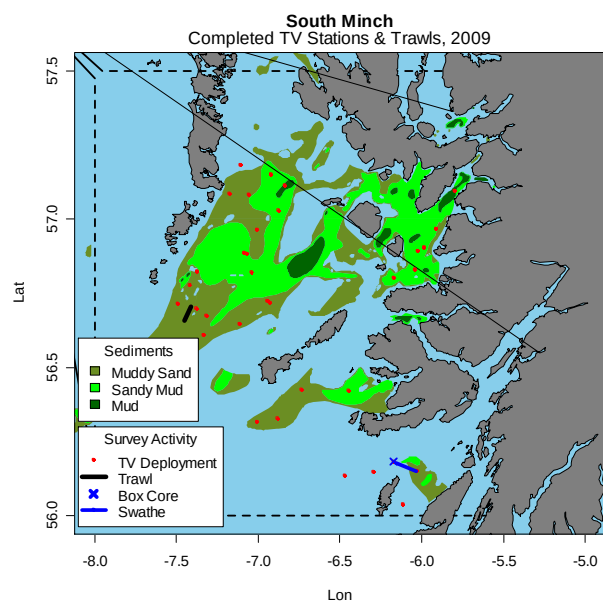
Data Collection: As previously mentioned, the west of Scotland is surveyed during an integrated North Sea/west of Scotland survey. Approximately 12 days of *Scotia* time will be allocated to this area and in excess of 120 TV tracks and 5 fishing hauls are planned. All information will be captured on video tape. Additionally, information on size at maturity will be obtained as per Appendix VII of the Data Collection Regulations.

Data Storage: the video recordings will be analysed and the results conveyed to the relevant ICES working groups Celtic Seas WG (WGCSE) where they provide the major input to the *Nephrops* stock assessment.

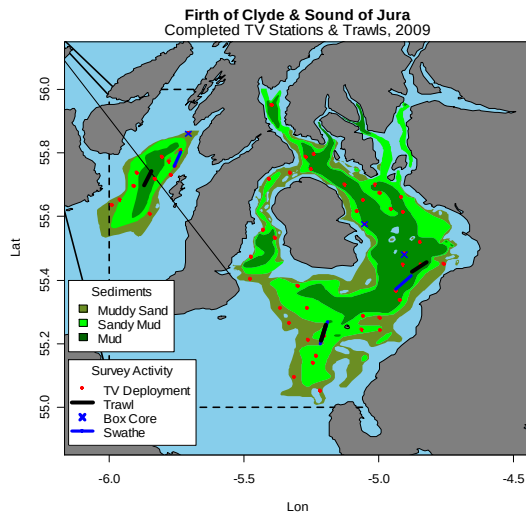
Suitability of the survey for the calculation of the ecosystem indicators 1 to 4 listed in DCR appendix XIII: Not suitable



Scottish Nephrops tv survey FU11



Scottish Nephrops tv survey FU12



Scottish Nephrops tv survey FU13

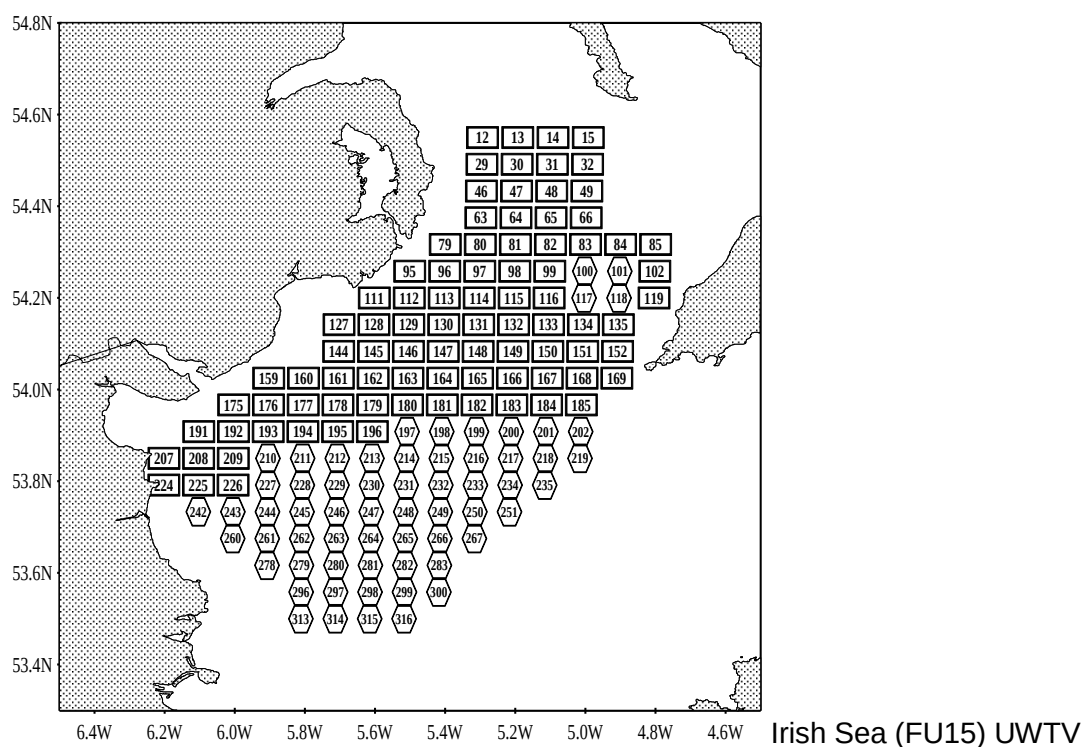
Nephrops UWTV Irish Sea UWTV (FU 15); VIIa; August: (AFBI *Nephrops* camera survey)

Aims: To investigate the distribution, biology and population structure of *Nephrops* in the western Irish Sea, using underwater television.

Data Collection: The survey will take place over 10 days. A total of 100 camera tracks are planned. In addition, approximately 24 trawl stations will be sampled using a commercial *Nephrops* otter-trawl with 70mm mesh net and 45mm cod end which will be towed for 30-60 minutes at fixed-position stations to investigate the distribution, biology and population structure of *Nephrops* in the western and eastern Irish Sea. The trawl catch will be sorted and quantified to species level, and length compositions recorded for all species. Data on *Nephrops* will be collected by sex and maturity stage. Additional data on epibenthos will be recorded using a small beam trawl deployed after each station.

Data Storage: Catch data and video recordings will be analysed and presented at the Celtic Seas WG (WGCSE) where they will provide the major input to the *Nephrops* stock assessment.

Suitability of the survey for the calculation of the ecosystem indicators 1 to 4 listed in DCR appendix XIII: Not suitable



III.G.2 Modifications in the surveys

Due to the requirement to find efficiency savings within Cefas, a budget reduction of 3% has been applied across all surveys for maintaining the stock of fishing gear spares and of complete trawls. Two Cefas surveys; 3rd Quarter (English International Bottom Trawl Survey) (International Bottom Trawl Survey IBTS Q3, Area IV); and September (Irish Sea & Bristol Channel Beam Trawl Survey) (ISBCBTS September; VIIa,f,g) have had their duration reduced by one day. The loss of one day from each survey will not directly affect the primary aims as no stations have been removed from the plan. These changes have been detailed in the financial forms.

Cefas Q1 Western Channel and Celtic Sea Multi-Gear Survey (UKQ1WCCSMGS)

Currently, the quarter-1 IBTS surveys do not extend into the Celtic Sea. This is a severe disadvantage given the data deficiencies for the assessments of many stocks in this region, and leaves a gap in the coverage of spawning populations around the British Isles. This survey would be in place of the English Western IBTS Q4 and not increase overall costs of the work programme. Costs for the survey will be in the 2013 bid.

The proposed new survey will be designed to provide extensive data sets on flatfish, roundfish and elasmobranch species and their environment in Divisions VIIe,f,g,h,&j using a variety of sampling gears. It will merge an IBTS-type survey using standard IBTSWG approved otter trawl gears and methods with a beam trawl survey meeting ICES-BTSWG standards, and achieve efficiencies compared to separate stand-alone surveys at different times whilst providing continuous coverage of the marine ecosystem in the Celtic Sea and western English Channel. The beam trawl

survey component will build on an existing non-DCF funded survey of Vlle conducted by Cefas using a random stratified design to monitor abundance and population structure of flatfish such as sole, plaice, lemon sole, dab, megrim, turbot and brill, other demersal species including anglerfish and skates/rays, and shellfish species such as cuttlefish and crustacea, whilst collecting a wide range of environmental and habitat data. The otter trawl component will provide assessment data for cod, haddock, whiting, anglerfish, skates/rays and a wide range of other species from the diverse populations of the Celtic Sea as well as continuing the environmental and habitat data collection. The combined survey will provide comprehensive data on the Celtic Sea ecosystem and provide a platform for ecosystem studies including diet analysis and stock structure analysis.

Both portions of the survey will ensure the UK meets its biological sampling targets for almost all DCF species in the first quarter, assisting the production of maturity ogives for all key species. Together with the additional environmental and ecosystem data that will be collected (temperature, salinity, chlorophyll, multi-beam data, litter and macro benthic community data), the survey will support descriptors 1,2,3,4,5,6 and 10 of the MSFD.

Additional information has also been incorporated as follows in other sections of the NP:

- Page 85 related to the discontinuation of the Demersal Young Fish Survey; DYFS; coasts of NS; 3rd/4th Quarter (English Demersal Young Fish Survey);
- Page 92 and Annex 9 – related to modifications to the Western IBTS 4th quarter; IBTS Q4; VIa, VII; 4th Quarter (Scottish Western IBTS);
- Page 93 and Annex 10 – related to modifications to the Western IBTS 4th quarter; IBTS Q4; VIa, VII; 4th Q (English Western IBTS) to move it to Q1.

From 39th PLENARY MEETING REPORT OF THE SCIENTIFIC, TECHNICAL AND ECONOMIC COMMITTEE FOR FISHERIES (PLEN-12-01))

Observations

STECF noted that the Western IBTS Quarter 4 survey was eligible for the DCF co-funding but had not been considered in any stock assessments as fishery independent information. The proposed change by the UK is to withdraw its English (CEFAS) part of the Autumn survey in 2012 and thereafter, while the Scottish part will be continued. Furthermore, the plan for 2013 is to restart, under the DCF, the English (CEFAS) bottom trawl survey in Q1 in the Celtic Sea which was not previously run under the DCF and was terminated in 2004. These changes are justified by UK because they deliver improved abundance indices in quarter 1 during the spawning season, and with the ability to collect biological information such as fish maturity.

Conclusions

STECF notes that the Western IBTS Quarter 4 survey was eligible for the DCF co-funding but had not been considered in any stock assessments as fishery independent information. The proposed change by the UK is to withdraw its English (CEFAS) part of the Autumn survey in 2012 and thereafter, while the Scottish part will be continued. Furthermore, the plan for 2013 is to restart, under the DCF, the English (CEFAS) bottom trawl survey in Q1 in the Celtic Sea which was not previously run under the DCR and was terminated in 2004. These changes are justified by UK because they deliver improved abundance indices in quarter 1 during the spawning season, and with the ability to collect biological information such as fish maturity.

North Sea herring acoustic survey NHAS / *Spawning/Pre spawning Herring acoustic survey*

The Scottish North Sea and North Atlantic herring acoustic surveys have been combined into one bigger survey. The 2 ships now cover both ICES areas.

III.G.3 Data presentation

All UK trawl surveys except the Q3/Q4 Demersal Young Fish Survey in the North Sea use electronic data capture systems, and data on catches and length compositions are (in principle) available as soon as the data have been quality assured. However, age material may require one or more months to process and this is scheduled to meet the deadlines for the relevant stock assessment working groups (WGNSSK, WGCSE, and WGHMM).

Data from acoustic surveys (North Sea Herring Acoustic Survey; spawning/prespawning herring acoustic survey in VI and VIIa-g) are available following scrutiny and analysis of the acoustic records, and processing of otoliths. Processing is scheduled to meet deadlines for relevant ICES assessment working groups (HAWG).

Data from Underwater TV surveys for *Nephrops* area available once all video records have been scrutinised and the data quality assured. Processing is scheduled to meet deadlines for relevant ICES assessment working groups (WGNSSK, WGCSE).

Data from the International Mackerel and Horse Mackerel egg survey are available once all plankton and fecundity samples have been processed, entered on databases and quality assured. Processing is scheduled to meet deadlines for WGWISE.

III.G.4 Regional coordination

All surveys in the UK DCF list are subject to international coordination (IBTSWG for otter trawl surveys; WGBEAM for beam trawl surveys; WGIPS for herring acoustic surveys and WGMEGS for mackerel egg surveys.

III.G.5 Derogations and non conformities

The Cefas Young Fish Survey (UKYFS) was removed from the program at Cefas for 2011. Although it was a DCF eligible survey, Cefas is coming under increasing pressures from Defra to show value for money in all its science. The main reasons that it was removed were;

1. WKFLAT did a benchmark assessment in 2010 and did not want to use the YFS. They were far more interested in getting better use of the 7dBTS survey fishing in 4c.
2. The YFS has never been used in the assessment of either plaice or sole in the North Sea.
3. Internally the savings would allow the other DCF funded surveys to maintain their robustness and deliver all primary aims, in particular the requirements of the DCF (indices and other biological data)
4. It is entirely focussed on very inshore waters (inside 6 mile), and does not have the capacity to deliver any additional DCF/MSFD/GES than it already does, due to restricted working environment, and hence its review of surveys score by STECF would have been low.

Given the lack of use by assessments working groups and the financial pressures Cefas are under, the removal of the survey from the plan was the only viable option open to Cefas.

From 39th PLENARY MEETING REPORT OF THE SCIENTIFIC, TECHNICAL AND ECONOMIC COMMITTEE FOR FISHERIES (PLEN-12-01))

Observations

STECF notes that the international DYFS 3rd/4th quarters has always been co-financed through DCR/DCF and originally covered the coasts in ICES Sub-area IV (North Sea) and Subdiv. VIId (Eastern Channel). UK had already ceased its contribution to this survey coverage in VIId in 2007. This reduction in survey coverage did significantly impair the management advice for stock assessments of sole and plaice in VIId and the short term forecasts of stock size and catches for sole (ICES CM 2009, 2010 and 2011).

STECF notes that the UK contribution to the international DYFS since 2007 covered ICES Subarea IV only. STECF notes that based on the respective model diagnostics (ICES 2009, 2010 and 2011), the international DYFS has had negligible impact on the stock estimates of plaice and sole in Subarea IV. STECF also notes that the UK contribution to the DYFS in Subarea IV is also insignificant as far as these two stock assessments and the derived management advice is concerned.

Conclusions

STECF concludes that the proposed withdrawal of the UK contribution to the international DYFS 3rd/4th quarters in ICES Div. 4 is in line with the developed survey review criterion 'to inform management decisions' (STECF, 2010). The survey has had a negligible influence on the results of stock assessments of sole and plaice in Subarea IV and its withdrawal from the DYFS is unlikely to influence the results of the assessments or the quality of scientific advice. STECF concludes that the proposed withdrawal would help to maximize the effective use of both national budgets and the DCF budgets (national sampling plans for 2012 and 2013).

IV. Module of the evaluation of the economic situation of the aquaculture and processing industry

IV.A Collection of data concerning aquaculture

IV.A.1 General description of the aquaculture sector

The relative importance of the aquaculture sector varies around the UK. For example, nearly all of the UK farmed salmon is produced in Scotland and the majority of farmed mussels are produced in Wales. In 2008 there were approximately 400 active fish and shellfish farming businesses in the UK operating on more than 800 sites, directly employing some 1900 people with a total industry turnover in 2008 of some €600m. Total finfish production was 144,000 tonnes in 2008, dominated by farmed salmon (129,000 tonnes) and rainbow trout (13,000 tonnes). There is limited production of other species on a niche or emerging basis, such as tilapia, sea bass, halibut, and turbot. Other species, e.g. various carp, are produced more for recreational (restocking) or ornamental markets. Farmed shellfish production was around 36,000 tonnes in 2008. Mussels are the largest production (80% of tonnage and 53% of value), then Pacific Oysters (12% by weight but 40% of value).

Investment by public bodies in aquaculture overlaps with expenditure on fish health research to protect the environment and investment to develop the rural economy in general. Government and academic research bodies and the aquaculture sector jointly sponsor research to promote the sustainable development of the aquaculture sector, the maintenance of high fish health and welfare status of farmed and wild fish stocks, and the evaluation of alternative species for cultivation. Wild lobster populations are supported through hatcheries in Cornwall, Orkney and Shetland based round collecting gravid females from fishers.

The table below summarizes some information on the scale of aquaculture in the UK. More information is presented in the tables in Annex 5 including summary details of the number of enterprises involved in aquaculture as recorded by the UK Office for National Statistics in their business register, as well as data, including details on the level of production and other key economic indicators for the aquaculture industry compared to the other fisheries sectors. The number of enterprises is smaller than the number of sites and reflects an industry that includes large international concerns down to individual artisanal and part-time activity. This is indicative of one quality issue that might be seen with the proposed work on the collection of economic data for this sector (see section IV.A.3 below).

The UK aquaculture sector in 2008						
	No. of aquaculture sites producing in 2008		Tonnes produced (fish and shellfish)		No. Employed (full and part time)	
	No.	%	tonnes	%	No.	%
England and Wales	315	39%	24891	14%	882	46%
Scotland	394	49%	144,079	80%	834	44%
Northern Ireland	100	12%	10,872	6%	160	8%
Total	809	100%	179842	100%	1900	100%

IV.A.2 Data acquisition

(a) Definition of variables

Data on production is collected by species through the separate fish health inspection regimes in England and Wales, Scotland and Northern Ireland that carries out a mandatory obligation to inspect fish farms and review their activity at least once during each year. Data on numbers employed (but not costs) is also collected.

Volume of sales will be available as recorded production.

Turnover will be calculated as volume production times an estimated farm-gate unit price.

Numbers employed classified by gender and full/part-time.

Number of enterprises will be derived from the numbers surveyed.

The introduction of the requirement for economic data related to the aquaculture industry was discussed with those in fisheries administrations and fisheries laboratories with an interest in the area, as well as some discussions on the topic with the industry to gauge their reaction to a potential new data collection exercise. The general response was that there would be a negative reaction from the industry to being asked to provide extra economic data on operations as well as production data currently asked for. Because of this anticipation of a poor level of response, and because of the fact that there would be a high level of costs involved in establishing a new separate dedicated exercise to collect this economic data, the method to be adopted is to make use of the data collected on individual enterprises classified to this industry under results of the Annual Business Inquiry (ABI) for this industry to allow the requirements under the data collection regulations to be met with the minimum cost to UK fisheries administrations and involving minimal additional burdens to UK businesses.

This census approach to the collection of production data will allow a full classification of enterprises in terms of the segmentation under the DCF. The

intention is thus to develop a correspondence link between the details of enterprises held in the ONS's business register with that created for the aquaculture production data. The ONS will allow access to the detailed data responses received for these enterprises to allow the segmentation as required under the DCF to be applied to the economic data already collected, and thus allow estimates for the economic variables for the aquaculture industry to be produced. The Statistics Analysis Team of the Marine Management Organisation will be carrying out this analysis on behalf of the UK fisheries administrations.

Details of the methodology used to define the variables collected under the ABI can be seen at:

http://www.statistics.gov.uk/abi/variable_info.asp

At the same time as this work is being carried out for the aquaculture industry, a similar exercise will be carried out for the fish processing industry in order for a quality assessment exercise to be carried out as part of the planned work by SEAFISH to carry out a full exercise to collect economic data on the fish processing industry. This will inform the use of a similar approach for the use of the ABI data as the source of economic information on the fish processing industry in the future as well.

The Commission's second set of comments on the UK's 2011-13 National Programme requested further information about the variables required as set out in Annex X of Commission Decision 93/2010/EU.

In submitting its National Programme, the UK had anticipated that estimates for all of the variables would be available from the two sources of data described in section (d), i.e. the production survey undertaken by Cefas (and others) and the Annual Business Inquiry conducted by the Office for National Statistics. After further exploration it appeared that only some of the variables can be provided by these sources:

- Turnover
- Wages and salaries
- Volume of sales
- Employment
- Number of enterprises

For the remainder of the variables, there are no known reliable data sources readily available. However further work will be conducted in 2013 to establish whether the ONS hold more detailed information than is published. This will be reviewed in conjunction with information on disaggregation of economic information for aquaculture from a Europe wide study which was presented to the STECG Working Group on the Economic performance of the aquaculture sector (EWG 12-13 - Economics – Aquaculture)

One solution would be to collect the additional information required through an existing or new survey. However, this could be difficult to achieve in view of:

- Budget constraints following the UK Comprehensive Spending Review of October 2010

- What might be deemed as an unacceptable additional burdens on businesses.

The practicalities of collection of collection of economic data will be further explored in 2013 through a pilot study to be conducted by the SEAFISH. The key aims of the pilot are to examine problems associated with collection of economic data on the UK marine aquaculture industry and advise the most appropriate methods for future data collection including:

- Problems associated with negative reactions and possible low response rates should be examined.
- The feasibility/desirability of linking data collection to collection of production data through fish health inspectorates

The study should look at the existing definitions for DCF economic variables and utilise the experience gained from the English Farm Business Survey and from other MSs in collecting aquaculture data consistent with the Farm Accountancy Data Network (FADN).

(b) Type of data collection

As noted, production and employment will be derived from a census that experience has shown achieves very high coverage (well over 90%). Costs and other financial data were to be derived from the ABI sample survey, but further options are currently under consideration for variables that cannot be derived either directly or indirectly from the results of the ABI.

(c) Target and frame population

All aquaculture enterprises in Great Britain and Northern Ireland. The frame for the aquaculture census is the list of aquaculture production businesses (APB) registered under the Aquatic Animal Health (England and Wales) Regulations 2009.

The Annual Business Inquiry (ABI) estimates cover all UK businesses registered for Value Added Tax (VAT) and/or Pay As you Earn (PAYE), classified to the 1992 or 2003 Standard Industrial Classification or UK Standard Industrial Classification (SIC) 2007 headings listed in the tables. The register used for the ABI is the IDBR, which consists of companies, partnerships, sole proprietorships, public authorities, central government departments, local authorities and non-profit making bodies. The main administrative sources of the IDBR are HM Revenue and Customs (HMRC) for VAT and PAYE details. Fish hatcheries and farms form SIC (2007) class A03.2.

(d) Data sources

Data from the APB production survey are collected separately within by the regional governments within the UK. Statistics for:

- England and Wales are collected by the Centre for Environment, Fisheries and Aquaculture Sciences (Cefas), an executive agency of Defra, operating under the Aquatic Animal Health Regulations 2009. These require all producers to register and to be subject to inspections to protect animal and human health.

- Scotland are collected by Marine Scotland Science (MSS. Formerly Fisheries Research Services, FRS), a Directorate of the Scottish Government, operating under the Aquatic Animal Health Regulations 2009.

- Northern Ireland are collected by the Fisheries Division of the Department of Agriculture and Rural Development (DARD) under the Fisheries Act (Northern Ireland) 1966. Under section 11(2) of the Fisheries Act (Northern Ireland) 1966, as amended, DARD can include such conditions in a fish culture licence as it considers appropriate. In relation to aquaculture statistics, it is a condition of any fish culture licence granted that the Licence Holder shall keep an annual record of the quantities of all intakes and disposals of fish or shellfish at the fish farm, that such records shall include the quantity and value of all sales of fish or shellfish and that this information, together with any other statistical information, shall be provided to DARD on request.

MSS and DARD forward the regional returns to Cefas who collate these and the England and Wales return into UK totals.

Data from the ABI will be provided through the Office for National Statistics.

(e) Sampling stratification and allocation scheme

Production data will be collected from a census.

The ABI uses a stratified random sample of about 66,971 businesses (2008 inquiry) from the register of legal units. The inquiry population is stratified by SIC(92)/ SIC(2003)/ SIC(2007), employment, and country using the information from the register. The sampling scheme is designed to give best estimates of the population totals for a given sample size and involves selecting all the largest businesses with a progressively reducing fraction of smaller businesses. This method ensures the sample size is kept to a minimum.

IV.A.3 Estimation

Totals will be generally derived using Horvitz-Thompson estimators. Since registration is a requirement for the licence to operate, compliance is very high and missing data can be assumed to be missing at random and only within the smaller enterprises. Where necessary, data for 2009 will be imputed from previous years' returns.

For the APB survey, the totals are derived from what is virtually a complete census, so there is no raising of the data in practice.

Details of the methodology used for raising the ABI results are provided in <http://www.statistics.gov.uk/abi/downloads/ABI-BG-Info.pdf>. In particular:

Sample Design

The sample was designed as a stratified random sample of about 66,971 businesses (2008 inquiry) from the register of legal units. The inquiry population is stratified by SIC(2007), employment, and country using the information from the register. The sampling scheme is designed to give best estimates of the population totals for a given sample size and involves selecting all the largest businesses with a progressively reducing fraction of

smaller businesses. This method ensures the sample size is kept to a minimum.

The inquiry results are grossed up to the register population, so that they relate to all active UK businesses on the IDBR for the sectors covered. For 2002 data published on 29th June 2004 and 2003 data published on 16 December 2004 Northern Ireland was collected and processed by DETINI. However 2002 and 2003 revised data published on 23 June 2005 was collected by DETINI but processed by ONS.

Estimation

Factors were produced to enable estimates for all businesses classified to each SIC(2007) to be compiled from data provided by responding businesses. These factors were calculated for each employment size-band within each SIC(2007) and are equivalent to the ratio of responding businesses to the total number of businesses. Northern Ireland and Scotland are sampled and estimated for separately, England and Wales are sampled separately but are combined for the estimation procedure.

Returns for the few large non-responders were estimated for individually. This estimation was normally based on summary data received from the business, or on the business's return to the inquiry in the previous year adjusted to take account of the likely change in the value of trading over the period. The Commission has asked the UK to provide more details on estimating FTE and the imputed value of labour:

Data on fish farm staff (number of full-time and part-time staff, and FTE for the latter) are collected during the inspection visits. These are linked to licensing and give well over 90% coverage each year, with 100% coverage over a small number of years, so the employment estimates are quite precise.

For the imputed value of labour, it is proposed to take the value from the ABI and raise it to be the numbers identified in the Cefas survey.

IV.A.4 Data quality evaluation

Coverage for the production census has typically been well over 90% of enterprises and approaching 100% of production. Non-sampling errors may be due to errors in record keeping or interpretation of terms; these are hard to quantify and could act in either direction so do not introduce a recognisable bias.

Quality measures for the ABI are described at http://www.statistics.gov.uk/abi/2007-archive/quality_measures.asp. Further details about quality evaluation are included in the ONS's Summary Quality Report for the ABI - see Annex 8. In addition, work is in progress with ONS to explore its sources of data to ensure that they are of sufficient quality and consistency to meet the DCF requirements.

IV.A.5 Data presentation

Data for calendar year X are collected during year X+1 and published by the end of year X+1. Data will be made available linked through the ONS website. Discussions

will continue between ONS, MFA and Cefas on best methods of presentation for end users.

IV.A.6 Regional coordination

The UK will look to amend systems and methodology in light of any discussions and recommendations for these data that come from the Regional Coordination Meetings.

There are no recommendations from relevant RCMs or bilateral agreements with other Member States relating to Processing Industry variables.

IV.A.6 Derogations and non-conformities

None requested.

IV.B. Collection of data concerning the processing industry

IV.B.1 Data acquisition –

SEAFISH will be employed under contract to collect data on the processing industry in the UK.

Following the original submission, and in order to meet the DCF requirements, additional work will be subcontracted to the Seafish Industry Authority to be undertaken in 2011 at a cost of £19,000. This involves (a) collection of financial data for reference year 2009 by questionnaire in early 2011 and (b) estimates of number of enterprises in 2009, based on 2008 and 2010 data.

The data to be collected by Seafish is for enterprises where fish processing is the main activity. In addition, the DCF requires the collection of the following data, in 2011 (the first year of the programming period), for enterprises where fish processing is not the main activity:

- The number of enterprises
- The turnover attributed to fish processing

It is planned to collect this information from the Office for National Statistics (ONS), including its survey on PROducts of the European COMMunity (PRODCOM), a harmonized system across the European Community for the collection and publication of product statistics. Unless indicated otherwise, the remainder of this section refers to the SEAFISH data collection exercise.

(a) Definition of variables

Data will be collected that meets the requirements of EC Decision 2008/949/EC in accordance with the UK national programme (Table 1).

Variable Group	Variable
Income	Turnover
	Subsidies
	Other Income
Personnel Costs	Wages and salaries of staff
	Imputed value of unpaid labour
Energy Costs	Energy costs
Raw Material Costs	Purchase of fish and other raw materials for production
Other Operational Costs	Other operational costs
Capital Costs	Depreciation of capital
	Financial costs net
Extraordinary Costs	Extraordinary costs net
Capital Value	Total value of assets
Net Investments	Net Investments
Debt	Debt
Employment	Number of persons employed
	FTE National
Number of enterprises	

The methodology for calculation of FTE will be in accordance with the Study FISH/2005/14 and amendments made by SGECA 07-01 report (15-19 January 2007, Salerno). FTEs are actual figures gathered in survey of the industry. Part time employees are calculated as working 21.1 hours on average of a 37 hour week. Seasonal workers are transformed to FTEs by using their weeks worked per year / 52 weeks.

(b) Type of data collection

The type of data collection to be used is set out in Table IV.B.2

Seafish will employ two different types of data collection scheme:

1. A telephone census of the entire UK seafood processing industry asking six basic questions (including employment but not including financial information) – this will be based on a dedicated business register SEAFISH maintain, being kept up to date through industry contact, information in the industry press and other information sources. The telephone survey will require us to try to identify new companies not previously contacted and will involve contacting a range of companies to establish whether they fall within the scope of our survey. For companies with over 100 employees, the project manager will contact the business to ensure that accurate employment figures are collected.
2. A full survey to capture detailed information as outlined above in the project scope. Methods used to collect data will include face to face interviews and postal questionnaires. Published accounts will also be collected from several sources including for companies who may choose not to take part in the full survey.

The Commission has requested a further description on how the consistency of data coming from different sources will be ensured. Data regarding financial variables will be collected from publicly available company accounts and direct from companies on a short survey questionnaire, consistent with the variable required under the DCF. A master database is kept by Seafish of businesses surveyed in the phone census, which gives details of FTEs and type of fish processed etc. Comparisons of average rates such as turnover per employee will be made between the companies whose data was returned on survey forms and companies whose data was taken from published company accounts to ensure consistency. Published accounts usually also give number of employees and this data will be checked against data collected by census survey.

As the ONS data requires no effort or cost to collect, it is not included in Standard Table IV.B.1 and IV.B.2, nor in Table B2 of the financial forms.

(c) Target and frame population

Standard Table IV.B.1 gives a general outline of (i) the population nos. by segment, (ii) the planned sampling levels and sample rates (columns 'Planned sample no.' and 'Planned sample rate'), and (iii) the sampling method(s) that will be used (column 'Sampling strategy').

Included in the scope of the data collection will be companies:

- of any size
- engaged in any type of processing (primary, secondary, mixed)
- that process any type of fish: demersal fish, shell fish, cephalopods, exotic fish, pelagic fish, salmon
- that also carry out other fish-related activities such as trading in which 50% or

more of the turnover is generated from seafood / salmon processing (with the exception of collecting employment data from all fish processing companies)

Excluded from the scope will be:

- Companies engaged in farming and distribution only
- Processors located in Isle of Man and Channel Islands
- Financial analysis of businesses processing a wide range of food, of which fish is a small volume

For the purposes of the survey, all companies have been allocated to one of four segments based on the number of Full Time Equivalent employees. For each of these segments, the number of the companies in the sampling frame is the same as the number in the population.

(d) Data sources

The data sources planned to be used are provided in Standard Table IV.B.2. Any questionnaires used will be provided in subsequent Technical Reports.

Work has been carried out by SEAFISH and the MMO to analyse the official statistics produced for the activity within this area from collection exercises operated by the Office for National Statistics in the UK through its Interdepartmental Business Register and Annual Business Inquiry. As a first step, comparisons have been made between the business register and Seafish's own list of companies. Further comparisons are planned in as much detail as possible, of data reported for key variables under each exercise. This comparison will be carried out to allow issues previously identified with the use of the results from these generic business surveys (e.g. differences in business classification, impact of cut-off thresholds for inclusion in the survey etc.) to be assessed and their impact on the quality of results identified.

PRODCOM is compiled from United Kingdom manufacturers on both an annual and quarterly basis and covers approximately 25,000 businesses annually and 4,500 quarterly. Data are available on a number of variables including turnover. PRODCOM began in respect of 1993, classified to the Standard Industrial Classification of Economic Activities 1992, replacing the quarterly sales inquiry (QSI) and annual sales inquiry (ASI), started in 1969 and 1989 respectively. Under PRODCOM there was an increase in both the number of contributors and in the number of products covered.

Results from the annual survey are currently published from around nine months after the reference year and quarterly data currently becomes available approximately five months after the end of the quarter, with a view to reducing the time to publication as time progresses.

PRDCOM results are available free of charge from the ONS website.

(e) Sampling stratification and allocation scheme

Tables IV.B.1 and IV.B.2 provide details of the sampling strategy to be used.

Employment data will be collected through a telephone census and other variables by a non-probability sample survey. For the latter, companies will be allocated to one of four strata, based on their size, defined by the number of Full Time Equivalent employees. These population segments and the planned sampling rates are:

- 1 to 10 FTE: sampling rate of at least 10 per cent
- 11 to 49 FTE: sampling rate of at least 10 per cent
- 50 to 249 FTE: sampling rate of at least 20 per cent
- At least 250 FTE: sampling rate of at least 40 per cent

No further stratification within segments is planned

The target sampling rates have been chosen in order to maximise the effective use of the resources available of the survey, with a view to ensuring the sample is as representative as possible

No significant changes to the sample size are envisaged over time nor is it proposed to substitute sample units from one year to another.

The Commission requested further details about targets used to determine the sample size and why these targets have been chosen. The target sampling rates for financial variables are higher for the segments of larger size enterprises. This approach has been chosen to ensure that survey effort is designed to give more robust segment population estimates for the segments which produce the highest levels of turnover. The segment with fewest employees per enterprise has a much larger population and so the same sample rate would be much harder to achieve (bearing in mind that there is no legal obligation on enterprises to supply the data). The extra survey effort and cost, if successful, would achieve a more robust estimate but only for the lowest value segment of the processing sector. For this reason, it was decided to focus survey effort on the segments that contribute the greater part of the value of the sector.

IV.B.2 Estimation

Analysis and estimation of variables is made using SPSS software.

Data are transformed using the methods which are most appropriate in the circumstances given the sample size and the data gathered. For example, data may be transformed using multiple regressions and log linear multiple regressions. The method used is dependent upon which of the methods shows the most significance between the variables and the calculated variable.

For individual variables:

- Financial data will be collected directly from fish processors via a questionnaire, and / or submitted copies of their accounts, and from published accounts of limited companies
- Energy costs and the cost of raw materials will not generally be available through published accounts so will predominantly be gathered through questionnaires and interviews with individual companies.
- Data relating to business capital investment, expenditure and income will be mainly gathered from published annual accounts as Balance Sheet information is more readily available in this form.

Efforts are made to include information from non-respondents – for example, for certain companies where published accounts are available, information is drawn from the accounts to provide additional data points for the estimates for these parameters

Data on FTEs are collected by census and therefore on the whole are not estimated.

There is a very low rate of non-response from companies to the question about employment. Companies which cannot be reached by telephone are few (<1% of the population) and all of these, in Seafish's experience, are small companies. In the case of being unable, after multiple attempts, to contact a company from which we have a previous survey response, we would contact either a nearby business or a trade association to ascertain if the company is still trading. We would try to verify this information via searches using the internet. If this business is still trading, we will use the employee numbers obtained at the previous survey. If the business is reported to have ceased trading, we will note that on our database and list employment for the reference year as zero.

In the event that we are able to contact a company but they will not tell us the number of their employees, or if we cannot contact a company which is reported to be trading but for which we have no previous survey response, we would estimate the FTEs for the reference year based on one of the following sources, in the given order of preference:

- a) employment figures provided in published accounts for the company;
- b) an estimate provided by a trade association or nearby business;
- c) an estimate based on a survey response to Seafish in a previous year.

The imputed value of labour is taken to be zero. This assumption is based on knowledge arising from previous surveys which has led us to believe that processing businesses do accurately record their labour costs.

IV.B.3 Data quality evaluation

Standard Table III.B.3 gives details of the methods to be used to assess the quality of the data. Both bias and variability will be assessed for all of the data collected by a non-probability sample survey, the former by coverage rate and the latter by an

indicator of precision. Data for the remaining variables will be collected by a Census-based approach.

IV.B.4 Data presentation

With regards to timing, the survey and processing of collected data is carried out by SEAFISH, and their economists are the main representatives at the various groups such as SGECA that meet to collate and analyse the economic data from MS. The exercise is carried out with a view to having data available at least in provisional form in time for supply to the required meetings.

In particular, data on financial variables for any reference year R, will be collected during the following calendar year, R+1, and will be ready to upload to JRC by March of the year after collection, R+2. E.g. financial variables relating to year 2010 will be collected during 2011 and the aggregated data set will be ready by March 2012.

Variables relating to number of enterprises and employment will be collected during the reference year to which they apply and would be ready by the end of the reference year

Regarding confidentiality, in the UK a general position is taken that is consistent with the aggregation of enterprises done for business surveys and other exercises carried out by the UK Office for National Statistics. This involves application of a “rule of 5” so that any segment or other grouping where fewer than 5 vessels is involved needs to be suppressed. There is some flexibility in terms of choice of grouping to which the suppressed vessels are then combined which varies according to the gears used. This is different from a firm principle being applied, such that aggregation of groups is based on similarity of activity between groups rather than applying a set rule based solely on the physical dimensions of the vessels.

IV.B.5 Regional coordination

The UK will look to amend systems and methodology in light of any discussions and recommendations for these data that come from the Regional Coordination Meetings.

There are no recommendations from relevant RCMs or bilateral agreements with other Member States relating to Processing Industry variables.

IV.B.6 Derogations and non-conformities

None.

V. Module of evaluation of the effects of the fishing sector on the marine ecosystem

Regarding calculation of ecosystem parameter 9 (fuel efficiency of fish capture), data on the value of the landings and fuel costs will be collected as follows.

- **Landings and relating data** for vessels 10m and over vessels are derived from the combination of the community logbook, landing declarations and sales notes. These provide the key details on the species, presentation, weight and value of fish being landed that is entered onto computer systems at local port offices. For the 10 metre and under fleet, during 2005 the UK introduced a system requiring the registration of buyers and sellers of fish at the point of first sale, and an associated requirement for all such sales to have sales notes reported and provided to fisheries authorities within 48 hours of the sale. The requirement in the UK is for sales notes for all such landings by these smaller vessels to be reported to fisheries authorities, and as such the results are regarded as providing a more complete and exhaustive source of information than the previous system. Thus the system in place in the UK is considered to be a census based approach and thus more complete and reliable than a sampling approach.
- **Fuel costs** will be collected through the Economic Survey of the Fishing Fleet, as set out in Section III.B.1(a).

Table V1 lists the fishery derived indicators 5-9 that can be provided by the UK. VMS data is currently available for UK vessels of 15m and over (Commission Regulation (EC) No 2244/2003) and will be available for vessels of 12m and over from 1 January 2012 (Council Regulation (EC) No 1224/2009) at a resolution of 2-hour position records.

Ecosystem Indicators 1 - 4

Surveys which can contribute to the collection of data for the calculation of ecosystem indicators 1-4 are specified in section III.G.1. The coverage of the surveys and the time series of data define the temporal and spatial coverage of the data that will be collected in order to allow the calculation of the ecosystem indicators specified in Appendix XIII of Commission Decision 2010/93/EU.

Ecosystem Indicators 5 - 7

VMS speed and position data for fishing vessels with LOA in excess of the 15m statutory minimum are currently logged by the UK authorities using a 2-h transmission interval. Spatial resolution is better than the 2n.mile grid cell specified by the DCF. Algorithms for filtering data to include only positions during fishing, and to link individual records to the UK Fleet Activity Database to identify fishing gear and other métier-related variables have been developed within the UK. Cefas and Marine Scotland have developed algorithms linking VMS data to log-book records for all

vessels > 15m. Further efficiency improvements and harmonisation of methods is taking place in the EU Studies project “Development of tools for logbook and VMS data analysis” (MARE/2008/10 Lot 2).

Ecosystem Indicator 8

The UK at-sea observer programmes carried out by AFBI, Marine Scotland and Cefas will provide estimates of discarding rates of commercially exploited species by fleet métier, as identified in Table III.C.3. By-catches of seabirds, reptiles and marine mammals are recorded during these trips.

Ecosystem Indicator 9

Fuller information on the derivation of this indicator is given in section II.B.1. Fuel costs from the economic survey will be related to the information on fishing activity of the vessel during the corresponding period of economic activity, taking into account periods of non-fishing related time at sea (e.g. time spent on pipeline guard duty, support for oil and gas rig operations, etc.) to allow fuel consumption and fishing activity to be directly compared. To ensure adequate accuracy in the estimation of this indicator at the métier level, account will be taken of the differing levels of fuel consumption in cases where vessels report the use of more than one type of fishing gear.

Additional comments

The UK Department of Environment, Food and Rural Affairs (Defra) has funded a 5-year research programme at Cefas (2007 - 2012; Project code MF-10-1) to develop and pilot an Ecosystem Approach to Fisheries (EAF), supported by indicators and management tools. Specifically, it will involve (i) the development, testing and reporting of indicators that allow managers and stakeholders to assess the status of the ecosystem and the impacts of fishing, and (ii) the development of decision tables that allow managers and stakeholders to see the effects of different management options and to choose among them. The form of indicators required by the DCF will be investigated in the project. The project will focus on the development of a pilot application of the EAF in the southwest of England. The project will establish the links between these indicators of ecological state and indicators of fishing pressure (effort and mortality), as measured for the main fisheries in the southwest of England and taking account of environmental variation and change. From knowledge of the links, the project will determine the management actions needed to achieve the desired values of indicators and hence the desired state of vulnerable species, vulnerable habitats, and the fish community. This information will be used to develop decision tables that allow managers and stakeholders to see the consequences of different management options for the fishery, target species, and other parts of the ecosystem. Although some DCF time is included by the UK in Financial Tables C to deal with specific requests for data and analysis, it is expected that considerable additional development of the ecosystem indicator approach will take place within the Defra contract MF10-1.

VI. Module for management and use of the data

The UK is to be represented on the Regional database steering group in 2012 for both RCM NA and RCM NS&EA. The UK will also be attending the regional database training workshops.

1. Fleet activity data.

Data held on databases

The UK maintains the following databases containing primary data meeting the requirements of the Data Collection Framework related to transversal variables and fishery impacts on the ecosystem, as well as variables required for raising biological samples from fishing vessels to the fleet level.

- An integrated UK database exists (known as IFISH) where primary data related to individual trips by UK registered vessels and foreign vessels landing in the UK (species landed weight by presentation, dates, fishing locations, landing port, gear type, mesh size, fishing effort etc.) is stored. This system came into operational use by fisheries administrations in the UK in 2006. It brings together data from the three key administrative data sources - the official logbooks, landings declaration and sales notes - into a centralised data repository. Individual databases also continue to be maintained in England & Wales, Scotland and Northern Ireland, as the data entry for this information is primarily carried out at local port offices around the coast of the UK – this allows for their local knowledge to play a part in the validation of data reported by fishermen.
- The UK fishing vessel register, which maintains a complete and regularly updated list of vessels and associated attributes, and is used for providing capacity data.
- The UK Vessel Monitoring System, which records satellite tracking information for vessels required to provide such data.

The maintenance of these databases is part of the on-going development and enhancement of control systems in the UK, and it is not envisaged that any significant level of costs will be involved in ensuring that data are available in the formats and level of detail required under the Data Collection Framework.

Due to the complexity of the administrative data source, aggregated data tend to be extracted on a bespoke basis from this central UK data store. Examples of the statistics available can be seen within the annual UK Sea Fisheries Statistical Tables:

<http://www.marinemanagement.org.uk/fisheries/statistics/annual.htm>

Data exchange systems

The IFISH database and UK Vessel Monitoring System are accessible to all fisheries administrations within the UK, on the condition that primary data are not made available to third parties in a form that allows identification of individual vessels.

Access is also available to fisheries scientists as well, either direct access for certain users or access to specific extracts of data. Data can be downloaded and converted to specified formats in EC calls for DCF data.

Centralisation of data bases (Comm. Reg. 665/2008 Art. 8(2))

The UK IFISH database is a centralised UK data base on fleet activity providing cost efficient exchange of data within the UK, and is accessible by all UK fishery departments. There is a specific section of the MFA web-site related to the Data Collection Framework and how it operates within the UK:

<http://www.marinemanagement.org.uk/fisheries/statistics/dcf.htm>

In addition, those involved in the work under the Data Collection Framework have a secure SharePoint working area for working on preparing the national programme, technical and financial reports

Structure of the database and technical measures necessary to protect such data (Art. 13 of Reg. 199/2008).

The centralised IFISH database is a complex relational database made up of 23 reference/lookup tables and 9 tables that contain the active data for activity, landings and sales, with these being updated on a regular (twice daily) basis from the data entry systems within each administration. As it contains the full detail on activity carried out by all UK vessels since 1/1/2000, the data store is large in size. Given its complexity, there are limited access rights to the raw unprocessed data as errors in setting up the linkages between tables can very easily result in erroneous data being extracted. These limitations are not due to any wish to limit access to the information – for example, requests for information received by the MFA that require extractions of data (for example, requests from the general public outside of any formal request made under the Data Collection Framework) are not subject to any charge.

This limited access to the detailed data has the benefit of ensuring that the detailed data is stored securely. The security requirements vary slightly between the fisheries administrations. They are each accredited by Information Security Officers within each organisation, and are thus in most instances compliant with the overall requirements of the Government Secure Internet system – this is compliant with UK standards as in BS7799 (equivalent to ISO 27001 (v2: 2005)).

In terms of aggregation of primary data, to avoid disclosure of confidential data, the principles and guidance set out by the UK Office for National Statistics are followed. In brief, the implementation of this advice in fisheries administrations results in a rule of 5 being followed, such that if any cell of the matrix of information requested contains information on less than 5 individual vessels, then the data will be regarded as disclosive and thus aggregated with neighbouring cells of information. More information on these procedures and guidance can be found at:

<http://www.ons.gov.uk/about-statistics/ns-standard/cop/index.html>

Any use of VMS data, for example for scientific purposes, requires permission from the authorities responsible for the primary data to ensure that the rules for protection of confidential data are met.

Transformation of primary socio-economic data into metadata (data inventory)

The guidance notes for the completion of this section of a Member State's National Programme are as follows:

Chapter VI section A.(2) states that MS have to describe the transformation process of the primary socio-economic data into metadata (data inventory) referred to in Article 13(b) of Regulation 199/2008.

More clarification on what is required for this section would be welcome – by definition metadata is there to help describe the detailed data held within a data collection system, rather than being a process by which the data is transformed into higher level data. For the former, given that the collection of socio-economic data is of a relatively small scale when compared with the other sets of data collected, such as administrative data, the structure of metadata required is limited. The definitions of variables used within the collection of this data follow the guidelines within the Commission Decision 2010/93(EC), and such information is stored as part of the systems that hold the data.

For the latter, following initial validation checks basic data processing takes place within an SPSS database. Significant efforts have to be made to correct the estimates so derived at the fleet segment level, depending on the parameter being calculated and the degree of homogeneity within the segment. A simultaneous equations model was developed and used to estimate the total costs and earnings for each segment from the sample - this method negates the need to split the data by segment/length as these characteristics are built in to the model. The coefficients from the model were then used to calculate each variable. The appropriateness of this model is checked for each segment – when found to not be the best approach a weighted scaling method is used. Multiple regression analysis is used to calculate employment and financial position parameters.

Storage of requests and transmission of data, as required by Commission regulation 665/2008, Article 9.

For the moment an informal electronic log of such requests for information is made – a formal database will be developed during 2010. The UK Technical Report for work in 2009 under the DCF will contain a summary of the data requests received under the DCF and responses made.

Quality, validation and completeness both of the primary data collected under national programme, and of the detailed and aggregated data derived

For the data on capacity, landings and effort data, Section III.F on transversal variables contains details on the quality measures in place for individual groups of variables involved. As a general principle, for administrative data sources there exists a system of cross-checks between the various sources of data as required by Council Regulation (EC) 2847/1993 and its successor Council Regulation (EC)

1224/2009 establishing a Community control system for ensuring compliance with the rules of the common fisheries policy. These checks as well as national data validation procedures built into the data entry systems help to ensure the quality, validity and completeness of the official data used for the national programme in these areas. In terms of data derived from these systems, during each extraction of data, those extracting the data are required to carry out additional checks on the quality of results (e.g. comparing them with a previous year or comparing them with an alternative set of data) before the aggregated data is released to users. In addition, users are encouraged to carry out their own checks on the data, with any discrepancies investigated for potential errors in data – if such are found they are corrected.

Means for ensuring the processing, analysing and estimating of the parameters, in complement of the information already given in the 'Estimation procedures' sections

The estimation procedures sections for specific modules and variables give the information required.

2. Sampling data for metier and stock based biological sampling.

Data held on databases: England & Wales

Cefas will use two separate data bases to hold primary data collected during sampling of UK(E&W) fisheries at ports and at sea:

- The Biological Sampling System (BSS) holds primary data on species length frequencies collected at ports at the trip level by staff of Cefas (and by MFA staff up to 2009), and sex, weight, age and maturity data for individual sampled fish. The BSS links into the UK(E&W) Fleet Activity Database to retrieve data on fishery landings required to raise length and age compositions for sampled vessels to the fleet level for defined area and time aggregation, as required for ICES stock assessment Working Groups. The BSS is being completely re-developed in 2010 to ensure it accepts all types of primary data required by the DCF. Options for data processing modules are currently under review.
- The Fishery Observer database holds primary data on species catches and length frequencies of discarded and retained fish recorded at sea by Cefas staff at the resolution of individual hauls, and sex, weight, age and maturity data for individual sampled fish, together with details of vessels, gear, area etc.

Development of the Cefas BSS data base will take into account the needs for transmission of data to any regional data bases that may be developed with a view to facilitating international coordination of fishery sampling.

Aggregated data are produced during the annual production of stock data files, which contain quarterly raised length and age compositions, discards estimates and survey indices. The tables for these reports are currently stored as Excel files. Aggregated data are also exported in InterCatch format for transmission to ICES.

Data held on databases: Scotland

All Scottish biological data from: 1) sampling for length and age at ports (retained fish and shellfish) and 2) sampling on board commercial vessels (since 2008) are held as raw (primary) data on the Fisheries Management Database FMD, which has the facility to produce aggregated data and which holds raised data (needed for assessment WG) and many other reports necessary for customers, ICES, the EU etc. For 2009 data onwards, data will be raised using COST tools, with sample data being exported to the COST tools (using the FishFrame/COST exchange format) and raised data being imported from COST tools.

Currently aggregated data for ICES stock assessment working groups are still collated by species and provided in the format required by individual WGs. These data are also re-formatted into InterCatch format using current stock and fleet definitions. It is Marine Scotland's intention to produce InterCatch-format data directly from FMD using the new metier definitions as and when agreed 'fleet' definitions become available.

Marine Scotland further developed its data output streams using the FishFrame/COST exchange format to populate regional databases and successfully responded to RCM data calls in 2012.

Depending on the final UK interpretation of the requirement for a national DCR database, MS-S will populate it appropriately using one or both of the FishFrame and DATRAS exchange formats.

Data held on databases: Northern Ireland

Port sampling and observer data collected by AFBI in Belfast are archived in databases at AFBI. Data extraction routines have been developed to process the data to provide aggregated data, raised data (needed for assessment WG) and many other reports necessary for customers, ICES, the EU etc. as well as appropriately formatted primary or aggregated data for transmission. The staffing and resource allocation problems that have been experienced in Northern Ireland for a number of years in relation to database development has improved in 2012. Additional staff costs have been added to reflect these (see details in fiche labelled "A1+A2+A3 Costs DM&DU – AFBI" within the Excel file)

Data exchange systems

England, Scotland and Northern Ireland have routines in place to extract fishery biological sampling data in FISHFRAME/COST format.

Centralisation of data bases (Comm. Reg. 665/2008 Art. 8(2))

Regulation 665/2008 Art. 8(2) state that: *“Each Member State shall have one central website serving as an information deposit for all information related to the data collection framework of Council Regulation (EC) No 199/2008. The website shall be accessible to all participants involved in the national data collection programme.”*

There is currently no common database or system for centralisation of the fishery sampling databases in England, Scotland and Northern Ireland, on the premise that each laboratory is capable of extracting data in a common format (e.g. COST format) for use in any integrated analysis or compilation of UK-wide data in response to data calls. A SharePoint web-site acts as an information deposit mainly for information required for National Programme proposals and annual Technical Reports.

Structure of the database and technical measures necessary to protect such data (Art. 13 of Reg. 199/2008).

Article 13 of EC 199/2008 states that *“The data referred to in this Regulation should be put into national computerised databases so that they are accessible to the Commission and can be transmitted to end-users. It is in the interest of the scientific community that data which does not allow for personal identification is available to any party who has an interest in its analysis”*.

Primary data from fleet and stock based biological sampling are held on separate databases in each UK jurisdiction. Primary data includes length compositions and discard quantities for named fishing vessels. The data are therefore treated as confidential. Provision of primary or aggregated data are potentially available to any party who has an interest in their analysis, but the data will be suitable anonymised before transmission. This may go beyond the removal of vessel names but may also involve removal of vessel variables that could identify specific vessels or individual businesses and companies.

Storage of requests and transmission of data, as required by Commission regulation 665/2008, Article 9.

Article 9 of 665/2008 states that *“1) For the purpose of Article 20 of Regulation (EC) No 199/2008 Member States shall compile in a computerized database and make available upon demand by the Commission, information concerning the data requests they have received and the responses they have provided. 2). The database, referred to in paragraph 1, shall contain information on the following: (a) the requests, the date of requests, the type and purpose of requested data, the specification of the end-user; (b) the responses, the date of responses and the type of data transmitted.”*

Quality, validation and completeness both of the primary data collected under national programme, and of the detailed and aggregated data derived

All fishery biological sampling data collected by the UK will be subject to Quality Control and Assurance procedures to detect errors. Cefas is currently developing portable electronic data capture systems for fishery sampling, which will reduce errors caused by data entry from hard copies. These should be in use by 2011.

The UK will take all reasonable steps to comply with the ICES Quality Assurance Framework, and will implement data screening procedures developed in COST tools, and other procedures, to validate aggregated data sets prior to transmission to end users.

Annex 4 provides information on current Scottish quality and validation procedures. In addition, Marine Scotland staff take part in two separate 'training and maintenance' weeks during which individual skills and knowledge are updated/shared outwith the normal attendance at otolith reading workshops etc.

Means for ensuring the processing, analysing and estimating of the parameters, in complement of the information already given in the 'Estimation procedures' sections

All procedures for data processing, analysis and parameter estimation are covered in the Estimation procedures sections.

2. Survey data.

Data held on databases: England & Wales

Cefas: The Fishing Survey System holds primary data on species catches, length compositions, and sex, weight, age and maturity data for individual sampled fish, at the resolution of individual hauls on trawl surveys. It includes a processing system which manipulates raw data and provides a wide range of reports to support stock assessment. Suitably formatted primary data are produced for transmission to DATRAS. Further development will be required to provide ecosystem indicator outputs. Survey Metadata are available in

Nephrops underwater TV camera footage is archived on DVD and primary data (burrow counts per frame] are archived in an ACCESS database.

Data held on databases: Scotland

All Scottish biological data from sampling on board research vessels or charter vessels are held as raw (primary) data on the Fisheries Management Database FMD, which has the facility to produce aggregated data and many other reports necessary for customers, ICES, the EU etc. Data from IBTS surveys are transmitted to DATRAS in the agreed exchange format.

Acoustic data from the Scottish herring surveys are collected and raw data archived, using SIMRAD file structures. After filtering into Echoview software, the data are stored in Echoview format on secure network drives. Associated data from trawl hauls for target identification and collection of biological data are held in raw form on spreadsheets and processed into a SMART database, each held securely on network drives..

Primary data on mackerel and horse mackerel egg abundance by station during the triennial mackerel egg surveys are held in spreadsheets on secure network drives. Associated fecundity data for estimation of population parameters for the egg production biomass estimates are sent in agreed format for archiving at IMARES.

Nephrops underwater TV camera footage is archived on DVD, with plans to transfer these to secure network drives (currently addressing file compression issues). Primary data (burrow counts per frame) are archived in spreadsheets on secure network drives.

Data held on databases: Northern Ireland

Survey data collected by AFBI in Belfast are archived in a survey database at AFBI. Data extraction routines have been developed to process the data to provide aggregated data, raised data (needed for assessment WG) and many other reports necessary for customers, ICES, the EU etc. as well as appropriately formatted primary or aggregated data for transmission (e.g. DATRAS).

Acoustic data from the Northern Irish herring surveys are collected using Echoview software and archived as Echoview files [raw acoustic and post scrutinised data files are archived on a secure network drive], whilst the data from trawls for target identification and collection of biological data are held on data base.

Nephrops underwater TV camera footage is archived on DVD and primary data (burrow counts per frame) are archived in spreadsheets on secure network drives.

Data exchange systems

The common format for trawl survey data exchange is DATRAS.

Data exchange formats for herring acoustic data are defined by WGIPS using the FishFrame acoustic data storage format.

Data exchange formats for mackerel and horse mackerel egg surveys are defined by WGMEGS.

Centralisation of data bases (Comm. Reg. 665/2008 Art. 8(2))

Regulation 665/2008 Art. 8(2) state that: “Each Member State shall have one central website serving as an information deposit for all information related to the data collection framework of Council Regulation (EC) No 199/2008. The website shall be accessible to all participants involved in the national data collection programme.”

The UK does not maintain a central website or database for UK-wide survey data, on the basis that each UK jurisdiction can provide exchange data in the appropriate format from the databases held locally.

Structure of the database and technical measures necessary to protect such data (Art. 13 of Reg. 199/2008).

Article 13 of EC 199/2008 states that *“The data referred to in this Regulation should be put into national computerised databases so that they are accessible to the Commission and can be transmitted to end-users. It is in the interest of the scientific community that data which does not allow for personal identification is available to any party who has an interest in its analysis”*.

None of the survey databases maintained by the UK contain personal data or commercial-in-confidence data from organizations and commercial enterprises.

Storage of requests and transmission of data, as required by Commission regulation 665/2008, Article 9.

Article 9 of 665/2008 states that *“1) For the purpose of Article 20 of Regulation (EC) No 199/2008 Member States shall compile in a computerized database and make available upon demand by the Commission, information concerning the data requests they have received and the responses they have provided. 2). The database, referred to in paragraph 1, shall contain information on the following: (a) the requests, the date of requests, the type and purpose of requested data, the specification of the end-user; (b) the responses, the date of responses and the type of data transmitted.”*

Quality, validation and completeness both of the primary data collected under national programme, and of the detailed and aggregated data derived

Quality assurance procedures for trawl, acoustic, egg and Nephrops camera survey data are developed by the relevant planning groups (IBTSWG, WGBEAM, WGIPS, WGMEGS, and SGNEPS)

All UK trawl surveys except the Q3/Q4 Demersal Young Fish Survey in the North Sea use electronic data capture systems which include basic error trapping routines during data collection. The trawl survey databases held by each UK jurisdiction also incorporate a range of error trapping procedures.

All UK staff participating in trawl surveys undergo prior training and in-situ training in species identification and sampling techniques. Annex 4 provides information on current Scottish quality and validation procedures. In addition, Marine Scotland staff take part in two separate ‘training and maintenance’ weeks during which individual skills and knowledge are updated/shared outwith the normal induction training of staff taking part in surveys and/or attendance at survey planning groups.

Quality procedures for collecting and analysing acoustic data on herring surveys are agreed through WGIPS. All acoustic systems are calibrated at the start and end of each survey (two calibrations are not always possible due to survey logistics or poor weather in which case at least one calibration is performed). WGIPS also serves as a forum for discussing problems with scrutinising echograms, but no formal procedure is in place to ensuring consistent and accurate target identification during scrutinizing echograms across surveys. Institutionally, consistency is obtained by keeping the target identification task limited to one or two experienced staff.

There are several quality procedures in place for Nephrops underwater TV surveys, comprising: a reference set of DVD footage; following recommendations of SGNEPS, e.g. discounting the first 3 minutes observations on a 10 minute footage set; pre-survey refresher courses; documented protocols and independent verification (by two staff) 'off-line' of the 'live' observations made during the survey.

For mackerel and horse mackerel egg surveys, protocols and include attendance at workshops, e.g. on the standardisation of maturity keys, and standard pictorial reference keys are used for egg staging.

Means for ensuring the processing, analysing and estimating of the parameters, in complement of the information already given in the 'Estimation procedures' sections

All estimation procedures for DCF surveys are as agreed by the relevant Planning Groups.

2. Economic data for aquaculture and processing sectors.

Data held on databases:UK

For the surveys carried out by SEAFISH on the economic activity of the fleet, SEAFISH staff created an input database using the SPSS software package. The characteristics of all vessels targeted through the mailing (Length, power, GT, VCU, Days at sea etc) were added to this database and survey returns of economic data were input using SPSS data builder, with this SPSS database being used to produce the final estimates of parameters for each DCF segment. For the economic data related to the fish processing industry, data collected is stored in a dedicated Microsoft Access database, with analysis carried out using SPSS software. Both databases are held by SEAFISH as part of agreements to preserve the confidentiality of the data reported to them under these surveys. The results of the analyses of both surveys are made available via the publication of summary results by SEAFISH as well as by providing the results to the various Commission groups (e.g. SGECA etc.) – the costs of producing such publications are not claimed under the DCF.

Data exchange systems

Data can be readily exchanged in a system of either Excel or CSV format files.

Centralisation of data bases (Comm. Reg. 665/2008 Art. 8(2))

Regulation 665/2008 Art. 8(2) state that: “Each Member State shall have one central website serving as an information deposit for all information related to the data collection framework of Council Regulation (EC) No 199/2008. The website shall be accessible to all participants involved in the national data collection programme.”

The UK does not maintain a central website or database for UK-wide survey data, on the basis that each UK jurisdiction can provide exchange data in the appropriate format from the databases held locally. SEAFSH maintain a database of data for the UK related to the processing sector.

Structure of the database and technical measures necessary to protect such data (Art. 13 of Reg. 199/2008).

Article 13 of EC 199/2008 states that *“The data referred to in this Regulation should be put into national computerised databases so that they are accessible to the Commission and can be transmitted to end-users. It is in the interest of the scientific community that data which does not allow for personal identification is available to any party who has an interest in its analysis”*.

Storage of requests and transmission of data, as required by Commission regulation 665/2008, Article 9.

Article 9 of 665/2008 states that *“1) For the purpose of Article 20 of Regulation (EC) No 199/2008 Member States shall compile in a computerized database and make available upon demand by the Commission, information concerning the data requests they have received and the responses they have provided. 2). The database, referred to in paragraph 1, shall contain information on the following: (a) the requests, the date of requests, the type and purpose of requested data, the specification of the end-user; (b) the responses, the date of responses and the type of data transmitted.”*

Quality, validation and completeness both of the primary data collected under national programme, and of the detailed and aggregated data derived

Means for ensuring the processing, analysing and estimating of the parameters, in complement of the information already given in the 'Estimation procedures' sections

General comment on quality assurance

The UK devolved administrations are subject to a Joint Code of Practice for Research which applies to all types of research funded by government departments with the aim of giving confidence that the processes and procedures used to gather and interpret the results of the research are appropriate, rigorous, repeatable and auditable.

Within the UK, a Code of Practice for Official Statistics provides a comprehensive statement of good practice for both the producers and the user of Official Statistics: <http://www.statisticsauthority.gov.uk/assessment/code-of-practice>. The Code is

consistent with the *United Nations Fundamental Principles of Official Statistics* and the *European Statistics Code of Practice*.

The Code sets out a number of principles, including some relating to the collection of statistical data: Meeting User Needs, Impartiality and Objectivity, Integrity, Sound Methods and Assured Quality, Confidentiality, Proportionate Burden, and Resources, Frankness and Accessibility. Complementing these are Protocols relating to User Engagement, Release Practices, and the Use of Administrative Sources for Statistical Purposes.

VII. Follow-up of STECF recommendations

UK responses to SGRN recommendations/comments

A2- Biological variables

North Sea

The United Kingdom is requested to detail the following items:

- Discards sampling equipment and maintenance
- Port sampling equipment and maintenance

UK response: This item covers the following expenditures for 2009/10(in £stlg):

Item	North Sea Discards	North Sea Ports
Sampling equipment (purchase and maintenance of measuring boards, callipers, dissecting equipment)	1,000	762
Purchase of fish samples	2,000	1,500
Balance maintenance & replacement		500
Electronic Data Capture system costs		2,250
Otolith Packets & Forms	1,500	1,500
Resin, Slides, Blades for otolith processing	1,500	1,215
Other consumables		420
Total	6,000	8,147

North East Atlantic (eels)

United Kingdom is requested to explain which expenditure is covered under “ICES meeting”.

UK response: This is for Environment Agency staff to attend the WGEEL meeting - should be moved to “coordination and support to scientific advice: 5/ Stock Assessment Working Groups”.

North East Atlantic (salmon)

United Kingdom is requested to explain what is the item “PPE” for 4,000 UKP? Which action is covered by the mention “site maintenance” and which items are included under “scale packet” for 6,000 UKP?

UK response: - PPE is “Personal Protective equipment” which is not an eligible expenditure and is erroneously included. This will be removed.

- Site maintenance refers to maintenance of salmon traps which are equipment providing a primary source of data on salmon moving through rivers.
- Scale packets refers to pre-printed packets used for collecting of salmon scales for ageing.

Metier-related variables

- Excluding métiers from the ranking system is to be avoided, as their relative importance can not be assessed. There is a provision in the DCF for “undefined” métiers and it is coded MIS for the use of miscellaneous gear. This coding is acceptable as long as the “undefined” metier remains marginal. The UK shall resubmit a full table III_C_1.

UK response: By excluding metiers for species for which the UK has no requirement to collect data, other metiers (for species for which there is a requirement to collect data - if ranked) will be elevated into the top-ranking 90%. If the UK includes the 'no requirement' metiers in the ranking process then these more relevant metiers may be excluded from the UK's sampling programme. If that is really the Commission's aim, then the UK will observe this requirement.

- The naming convention and fishing grounds delimitation agreed during the RCM NA in 2008, are to be followed by the UK.

UK response: The RCM NA report was not available at the time the revised national proposal was submitted. Sampling in 2009 will respect the agreed naming conventions and fishing ground delimitations in 2009, and any subsequent revision to proposals for 2010 will reflect them explicitly.

- The excessive use of the mesh size coding “TODD” which means no information is available concerning the mesh size used has to be avoided. The UK is invited to follow the recommendation made by RCM NA 2008 stating that “*MS are invited to investigate closely on the mesh size range actually used*”.

UK response: The UK fully understands the need for detail and any re-submission of the 2010 national proposal will address this point explicitly.

- The merging of métiers across fishing grounds is not permitted in the DCF. The RCM NA has undertaken inter-session work to address the issue of coordination of sampling the small pelagic fisheries, without questioning the relevance of referring to every fishing grounds impacted.

UK response: The UK understands this comment to refer to the 'merging' of métiers across fishing grounds in relation to the mid-water trawl mackerel fishery. It is the intention of the UK to sample fishing grounds discretely (i.e. not merged), but to allocate its sampling effort across grounds in 'real-time' and in relation to the development of the fishery. This means the UK cannot precisely define the actual number of sampling trips etc per ground in advance of the fishery. So, to that extent, the sampling effort is 'merged' across grounds for annual planning purposes, although samples themselves will not be merged across areas.

- The UK shall implement a sampling programme or bring all supportive information for not sampling the métiers below:
 - The following métiers selected by the ranking system have no plans for sampling discards and landings
 - OTM_SPF in ICES area V

UK response: In the reference year, OTM_SPF in V comprised only four fishing trips, plus a further two that we now know to have been miscoded by gear (see comment on "OTB_SPF in most fishing areas", below). This comprises ca 3% of the Scottish pelagic (herring) fishing trips from the combined area IV and V. We cannot target the trips that eventuate in V, given that they occur with such low frequency, for either market or discard sampling. We can only sample from V if, by chance, we have an observer aboard a vessel whose skipper elects to move to V during a trip or if a landing from V is made at the same time that we have a sampling team at the harbour/factory.

The remaining métiers listed

- GNS_DWS V, VIII & IX either not landed into UK or not for first sale limited time window and access to full catch not available
- OTB_DEF_70-89 VIIa Merged with OTB_CRU
- OTB_DEF_79-89 VIIbck Sampling covered under Spanish bi-lateral landed abroad
- OTB_SPF VIIbck Scotland + landings abroad
- GNS_DEF VIIbck landed abroad
- GNS_DEF VIIfghj Sampling covered under combined GNS
- LLS_DWS VIIbck Landed abroad
- LLS_DEF VIIbck Landed abroad
- OTB_CRU VIIbck Landed abroad
- OTB_MOL VIIe Sampling covered under OTB_DEF
- GNS_CRU VIIfghj Sampling covered under GNS_DEF
- GNS_SPF VIIfghj Sampling covered under GNS_DEF
- - In addition, the following métiers selected by the ranking system have no plans for sampling discards
 - OTB_SPF in most of fishing areas.

UK response: A check of fishery office records indicates that the OTB_SPF fishery in V and VI represents a misinterpretation of codes on data entry. These erroneous records will be corrected. For VI the fishery will be sampled for discards as specified under OTM_SPF in VI in Table III.C.3. For V, see comment relating to "OTM_SPF in ICES area V", above.

- SGRN recommends the UK to report the outcomes of the scientific analysis of sampling at sea the métiers FPO_CRU and LHM_FIF to the RCM North Atlantic.

3

UK response: No immediate action needed.

A3 - Research Surveys at sea

Four surveys are listed in Table II.G.1 and also described in the texts that do not appear in Appendix IX of decision 2008/949/EC: (Rockall survey, deepwater survey, UK North-Ireland western IBTS Q1, UK North-Ireland western IBTS Q4). Please note that these surveys are not eligible in the DCF and therefore the requested budget is not accepted. A new version of this table, as well as the relevant corrections in the financial tables shall be submitted by the UK.

UK response: Dealt with in national correspondent's letter to CION.

The objectives, methodology, data storage and ecosystem indicators are given for all surveys, but not any maps of the area coverage. SGRN recommends MS to provide maps of area coverage of the surveys in the programme adjusting 2010 NP proposal

UK response: Maps were omitted in error and provided immediately.

Western BITS 4th quarter

Comments_UK_NP_2009-10_final

United Kingdom is requested to justify the increase of 1.000 UKP for the net repairs between 2009 and 2010 and from 500 UKP for the replacement of the ground gear in the category Consumables and computing costs.

Mackerel egg survey

Please explain the need for a crane hire to move container and for a container upgrade.

The proposed costs for "welding" shall be explained.

UK response: The estimated cost of net repairs has increased from £4500 to £5000 (+£500) from 2009 to 2010 in line with the perceived increase in retail cost in the period from February 2009 to November 2010 (the period that the surveys take place). The estimated cost of replacement groundgear was increased from £4500 to £5000 (+£500) from 2009 to 2010 as explained above. This is based on the average increase in price over the last few years. In reality, over the years FRS has never needed to claim the full costs of nets and groundgear built into our national proposals and would hope that this situation remains.

The container upgrade is listed under the survey 'Spawning/ pre-spawning Herring Acoustic survey (Sco)', not the Mackerel Egg surveys. The survey takes place in ICES sub area VI. It is necessary for FRS to charter a commercial vessel for this

survey as an equivalent survey takes place in ICES sub area IV at the same time. The Scottish research vessel is used in area IV.

Commercial vessels do not have fish houses or dedicated areas for setting up e.g. microscopes, so FRS converted a container, at national expense, that could be used as a portable fish house/lab. This container is transported to the commercial vessel for use by scientific staff. **The upgrade should only have been listed against 2009** and has been entered into the 2010 financial fiche in error. The upgrade includes cutting and converting the outside wall to allow permanent passage and housing for water and electricity supplies and the construction of a dedicated area for analysis of samples preserved using chemicals. The upgrade cost was removed from 2010 proposal.

Crane hire: A crane is required to move the container from the institute to a lorry then, at the harbour, move the container onto the ship. Crane hire appears for the herring acoustic survey North East Atlantic and both 2010 mackerel egg surveys. The difference in price is due to the fact that a smaller container is used for the mackerel egg surveys which take place on our own ship and leave from our home port. The crane is normally only required at the institute. The charter vessel is always at a different port from the institute so, concerning the herring acoustic charter, the crane is required at the institute and at another port, where the costs are higher. Crane hire is also necessary at the end of the survey.

Welding: appears under the 'Spawning/ pre-spawning Herring Acoustic survey (Sco)' and is required to secure and stabilise the container to the deck of the charter commercial vessel and for removal at the end of the survey.

C. Evaluation of the Effects of the Fishing Sector on the Marine Ecosystem

There is a description of what will be done based on an algorithm that is being developed. The timeline for development of this algorithm should be stated by MS.

UK response: CEFAS and FRS have completed their separate development of algorithms linking VMS data to log-book records for all vessels > 15m, and have moved towards implementation.

Further development will entail efficiency improvements and harmonisation of methods rather than additions to functionality. In view of Lot 2 - Development of tools for logbook and VMS data analysis (Studies for carrying out the common fisheries policy - Open call for tenders No MARE/2008/10), this subsequent development will take place within the international context of that contract, and report with respect to its agreed timelines.

D. Coordination and Support for Scientific Advice

The following information is to be provided:

- The NP is missing the description of the databases for surveys in certain areas, economic and processing industry variables.

UK response: For DCF surveys, it is a pre-condition for eligibility for funding that data are available for scientific end users. UK trawl survey data are forwarded to ICES for inclusion in its DATRAS system.

For non-trawl surveys, the following applies (FRS, Scotland):

Herring - all acoustic data are stored in data banks at FRS. Subsequent post survey analysis is provided to the relevant ICES working groups.

Mackerel – the data are stored in data banks at FRS. The plankton samples are stored in a dedicated building on site in Aberdeen; the results of the post survey analysis are provided to the relevant ICES working groups.

Nephrops - the data are stored in data banks at FRS. Survey analysis and data are provided to the relevant ICES working groups.

- There is no description of the methods used for controlling the quality and validating the data stored in the databases.

UK response:

1. Data collection according to defined quality principles and accepted procedures

Fisheries data are collected through two main systems: (i) national administration census data of fish landings and activity (so-called log-book data) and (ii) scientific sampling, including: research vessel surveys, fish market sampling and observer sampling aboard commercial fishing vessels.

All of these fisheries data are collected according to the European Union Data Collection Framework (DCF):

- (COUNCIL REGULATION (EC) No 199/2008 of 25 February 2008 concerning the establishment of a Community framework for the collection, management and use of data in the fisheries sector and support for scientific advice regarding the Common Fisheries Policy (<http://eur-lex.europa.eu/LexUriServ/LexUriServ.do?uri=OJ:L:2008:060:0001:0012:EN:PDF>)).
- COMMISSION REGULATION (EC) No 665/2008 of 14 July 2008 laying down detailed rules for the application of Council Regulation (EC) No 199/2008 (<http://eur-lex.europa.eu/LexUriServ/LexUriServ.do?uri=OJ:L:2008:186:0003:01:EN:HTML>)).

Specific requirements governing the data to be collected are outlined under COMMISSION DECISION of 6 November 2008 adopting a multiannual Community programme pursuant to Council Regulation (EC) No 199/2008 (<http://eur-lex.europa.eu/LexUriServ/LexUriServ.do?uri=OJ:L:2008:346:0037:0088:EN:PDF>).

Within the DCF, log-book data relevant to Marine Scotland – Science's (MS-S) interests are collected by the former Scottish Fisheries Protection Agency (an agency

subsumed into the new Marine Scotland framework and operating as Marine Scotland – Compliance) and entered into a computerised database (the FIN system) through the front-end VIVAFISH system, a relatively new data capture system deployed at Fishery Offices that aims to improve the quality of fisheries data through better designed user input screens and improved validation of the data entered (see paragraphs 14 & 16 of:

<http://www.scotland.gov.uk/Publications/2005/12/0594523/45241>). The Scottish Government recognises that the harmonisation of statistical classifications and methods within the UK is important for the reliability, consistency and usefulness of its data and it has contributed to the harmonisation of variables and codings between the Scottish fishery data (FIN) and the England, Wales and Northern Ireland data (FAD) via the IFISH data warehouse (see paragraph 20 of: <http://www.scotland.gov.uk/Publications/2005/12/0594523/45241>).

For data collected directly by MS-S, it operates under both external and internal codes of practice (for external, see: Joint Code of Practice for Research issued by the Biotechnology and Biological Sciences Research Council, the Department for Environment, Food and Rural Affairs, the Food Standards Agency and the Natural Environment (http://www.defra.gov.uk/science/documents/QACoP_V8.pdf); for internal, MS-Se has its own Code for Scientific Conduct).

Data collection is undertaken in accord with both international and national protocols governing surveys, fish market sampling and observer sampling, including those of the international calibration workshops (e.g. age-reading and maturity staging) and methodological workshops (e.g. on fisheries data accuracy and precision) to which MS-S also contributes.

Feedback to MS-S on its data collection is received via the EU STECF (SGRN review of national proposals and review of technical reports – see, e.g., meeting schedules, terms of reference and reports at <http://fishnet.jrc.it/web/stecf/home>) and via the international workshops organised under the auspices of the ICES Planning Group on Commercial Catch, Discards and Biological Sampling (see, e.g., meeting terms of reference and reports at <http://www.ices.dk/workinggroups/ViewWorkingGroup.aspx?ID=40>). Within MS-S, internal feedback on its data collection programme is facilitated through quarterly sampling programme co-ordination meetings.

The internal FRS protocols and manuals for fisheries data collection, including quality checks, are not yet maintained under a formal system of version control; however, only the 'live' version of any such manual is held on an accessible network drive and copies of these can be made available to external assessors on request.

STECF-endorsed recommendations from 2009

Notwithstanding the above section, on review of the 2009 STECF plenary reports (PLEN-09-01, PLEN09-01 & PLEN-09-03), there were no relevant recommendations as commented upon or endorsed by STECF covering the SGRN reports that had

been submitted to it for consideration. Nevertheless, the UK has included its response to SGRN queries, above. The recommendations that were endorsed by STECF in 2009 were:

SGRN/SGECA 09-01:

- to review the guidelines for the submission of NP proposals 2011-2013 during the SGRN/SGECA 09-02 June 2009 meeting. The general comments within the SGRN/SGECA 09-01 report and the reports of the 2008 RCMs (Anon. 2008 a,b,c,d.) appear as a useful preparatory work for this task.
- to develop working procedures for the review of NP proposals during the SGRN/SGECA 09-02 June 2009 meeting. In particular, a clear, standardized and applicable methodology for the evaluation of the NP proposals by modules and by regional subgroups should be developed and the expertise covering all the modules of the new DCR should be ensured. STECF supports the idea of an initial screening of the NP by a group of experts familiar with the DCF, who could work by correspondence. This report would then be used by SGRN as a starting point for the National Programme reviews.
- to review the list of research surveys that are funded under the DCF. This review should be carried out in January 2010, before Member States submit their 2011 to 2013 National Programmes in March 2010.

SGRN/SGECA 09-02:

STECF endorses the recommendations of SG-RN/ECA-09-02 for a workplan that foresees:

- review of the guidelines and standard tables by the RCMs in Sep-Oct 2009
- a meeting of the 'Guidelines and Procedures Group (GPG)' in Oct. 2009 to complete guidelines and tables
- subsequent endorsement of the by STECF at its November Plenary

STECF **recommends** that at least Cyprus, France, Germany, Greece, Italy, Lithuania, Malta, The Netherlands, Portugal and Spain should participate in the RCM on Long-Distant Fisheries, considering their fisheries in the CECAF area, South Pacific, Indian Ocean and 'other regions where fisheries are operated by EU vessels and managed by RFMOs'. Regarding the species list for economic data collection from the aquaculture sector (Table IV.A.1), STECF **recommends** to leave the list open (groups of species instead of exact species names) in order to include species that might become important for aquaculture in future.

None of these impact on individual Member State obligations

VIII. List of derogations

List of requests for derogations:

Short title of derogation	NP Proposal section	Derogation approved or rejected ¹	Year of approval or rejection of past requests for derogations
To Note – Non-random sampling in collection of economic data for fleet	III.B.6		
Sampling of pot fishing for discards	III.C.1. (c)	a	2009 RCM's
Revision to recreational fishing sampling plans later in 2010	III.D.6	n/a	New
Collection of data for more species than specified under DCF	III.D.6	n/a	New
Stocks where UK landings less than 200 tonnes or less than 10% TAC <ul style="list-style-type: none"> North Sea (IV&VIId), Eastern Arctic (I&II) and NAFO (page 46) North East Atlantic (V-XIV) (page 49) 	III.E.1 (a)	A but revision requested	
Stock related variables – increase of age sampling – derogation for John Dory	III.E.4	n/a	New

¹ Insert 'a' for approved or 'r' for rejected

IX. List of acronyms and abbreviations

ABI	Annual Business Inquiry
AFBI	Agri-Food and Biosciences Institute
CEFAS	Centre for Environment, Fisheries and Aquaculture Science
CPUE	Catch per Unit Effort
DARDNI	Department of Agriculture and Rural Development, Northern Ireland
DATRAS	Database Trawl Survey
DCF	Data Collection Framework
DEFRA	Department of Environment Food and Rural Affairs
EC	European Commission
EMP	Eel Management Plan
GOV trawl	Grand Overture Verticale trawl
HAWG	Herring Assessment Working Group for the area south of 62° N
IBTS	International Bottom Trawl Survey
ICES	International Council for the Exploration of the Seas
MIK	Methot-Isaacs Kidd frame trawl
MCGA	Marine and Coastguard Agency
MFA	Marine and Fisheries Agency
MMO	Marine Management Organisation
MS	Marine Scotland
NEA	North East Atlantic
NI	Northern Ireland
ONS	Office for National Statistics
PGCCDBS	Planning Group on commercial catch, discards and biological sampling
PGHERS	Planning Group for Herring survey
RCM	Regional Co-ordination Meeting
RSS	Registry of Shipping and Seamen
SE	Scottish Executive
SEERAD	Scottish Executive Environment and Rural Affairs Department
SEAFISH	Sea Fish Industry Authority
SG	Scottish Government
SGRN	Study Group on Research Needs
SMP	Salmon Management Plan
SSB	Spawning stock biomass
STECF	Scientific, Technical and Economic Committee, Fisheries
SQL	Standard query language
WGBEAM	Working Group on Beam trawl surveys
WGEEL	Working Group on Eels
WGMEGS	Working Group on Mackerel and Horse Mackerel Egg Surveys
WGMHSA	Working Group on the Assessment of Mackerel, Horse Mackerel, Sardine and Anchovy
WGNAS	Working Group on the Assessment of North Atlantic Salmon
WGCSE	Working Group on the Celtic Seas Ecosystem
WGNSSK	Working Group on the Assessment of Demersal Stocks in the North Sea and Skagerrak

X. Comments, suggestions and reflections

The UK has experienced problems in compiling the National Programme in view of the exceedingly short timescale and the need to include contributions from the substantial number of organisations within the UK which contribute to it. The resulting text is very long making it unwieldy to manage. This has not been helped by the requirement for the whole of the programme, including annexes and associated documents, to be provided in a single document.

A peer reflection will take place later in the year, and the Commission provided with comments, e.g. at the Regional Coordination Meetings.

XI. References

The following bibliographic references appear in the main body of this National Programme:

- Cefas MF1203 pre-report on UK Recreational Fisheries
- EU FP6 Project 022644: "Capacity, F and Effort" [CAFE].
- Study N° FISH/2005/03 on the evaluation of the capital value, investments and capital costs in the fisheries sector
- Study FISH/2005/14 and amendments made by SGECA 07-01 report (15-19 January 2007, Salerno).

Annexes

ANNEX 1

SUMMARY OF SUBCONTRACTING COSTS: 2012			
Worksheet	Description	Amount - Euros	Justification
A1 – E	Collection of economic variables to be sub-contracted to Seafish Industry Authority	€ 169,039	SEAFISH is regarded as a source of expertise within the UK in this area of activity as it has operated a periodic survey of these sectors for several years (i.e. before the DCR came into being), and as such its reputation with the industry is regarded as an aid to ensuring that there are adequate levels of response to the survey.
A2 - NS Cefas	Cefas subcontracted observers: salaries, T&S, hotel bills	€ 23,077	These costs relate to instances where it is necessary to hire external agency staff for at-sea or port sampling at locations and times where there are insufficient CEFAS staff available to carry out the DCF sampling programme.
A2 - NS Cefas	Data collection subcontracted to Inshore Fisheries Conservations Authorities in England	€ 58,409	These costs relate to instances where CEFAS has reached agreements with these regulatory bodies within the UK to use their staff to carry out sampling work at locations and times where there are insufficient CEFAS staff available to carry out the DCF sampling programme.
A2 - NS Mar Sco	NAFC contract to undertake sampling of demersal, pelagic, industrial and shellfish around the Shetland Islands	€ 27,693	The collection of fisheries biological data from landings into the Shetland Isles incurs large costs, both financially and for staff time. The fisheries college on the islands are contracted to collect data according to DCF guidelines. Marine Scotland staff time is more usefully directed to landings and observer trips on the mainland. Only 50% of the contract costs are being charged to the EU

SUMMARY OF SUBCONTRACTING COSTS: 2012			
Worksheet	Description	Amount - Euros	Justification
A2 - NA Cefas	Cefas subcontracted observers: salaries, T&S, hotel bills	€ 57,694	These costs relate to instances where it is necessary to hire external agency staff for at-sea or port sampling at locations and times where there are insufficient CEFAS staff available to carry out the DCF sampling programme.
A2 - NA Cefas	Data collection subcontracted to Inshore Fisheries Conservations Authorities in England	€ 58,409	These costs relate to instances where CEFAS has reached agreements with these regulatory bodies within the UK to use their staff to carry out sampling work at locations and times where there are insufficient CEFAS staff available to carry out the DCF sampling programme.
A2 - NAAFBI	AFBI-NI subcontracted observers: salaries, T&S, hotel bills	€ 34,616	These costs relate to instances where it is necessary to hire external agency staff for at-sea or port sampling at locations and times where there are insufficient AFBI-NI staff available to carry out the DCF sampling programme.
A2 - NA Rec Fisheries	cost of Countryside Commission for Wales Sea Angling Project	<p>€ 121,373</p> <p>The UK's NP 2010, accepted by the Commission, included an amount of some 116,000 Euros for the Countryside Council for Wales (CCW) Recreational Sea Angling project; uncertainties about the public finance situation in the UK have led to delays in the work for this project being progressed. As a result, it now seems unlikely that any costs will be incurred during 2011. However, budget settlements have recently been made and it is anticipated that the project will now be undertaken during 2012 instead. In view of this,</p>	The CCW is regarded as a source of expertise within the UK in this area of activity. It has previously undertaken survey work of recreational fisheries which it proposes to build upon.

SUMMARY OF SUBCONTRACTING COSTS: 2012			
Worksheet	Description	Amount - Euros	Justification
		the previous bid for CCW Recreational Sea Angling work in 2011 is represented here.	
A2 – NS Rec Fish A2 – NA Rec Fish	Cost of Office for National Statistics (ONS) general household survey for overall activity data	€ 51,232 (total of NS and NA)	The ONS survey is a national exercise and uses random probability sampling. The survey collects general information about the households concerned, and thus provides overall demographic information to complement the results from the specific questions asked. As such it is understood to be the only source of data fit for purpose.
A3 – Surveys at Sea	CEFAS contractual arrangement whereby the provisions of Research Vessel services (RV Endeavour)	€ 895,531 (total of NS and NA)	CEFAS's financial structure operates such that they have established a contractual arrangement with P&O Shipping for them to provide the research vessel needed for most trips.
A3 – Surveys at sea	CEFAS contractual arrangements – Chartering of individual vessels	€ 36,924 (total of NS and NA)	The sum of the individual chartering contracts entered into with fishing vessel owners and others for the provision of vessels to carry out data collection work.
B2	Collection of fish processing industry variables to be subcontracted to Seafish Industry Authority	€ 41,184	See comments above on collection of economic variables by Seafish
Total		€1,575,181	

ANNEX 2

EELS and SALMON

I Collection of data related to Eels

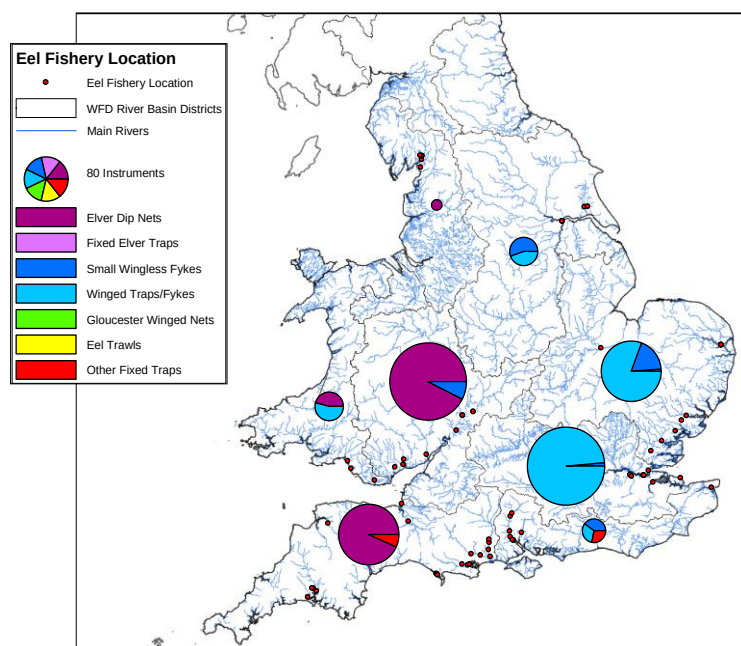
1.A Data Acquisition

Brief information is given below on the fisheries that exist within each fisheries administration. This is relevant as it sets out some of the planned management actions for 2011-2013 that will have an impact on the collection of data under the Data Collection Regulations.

England & Wales

Eel fishing in England and Wales is managed by the Environment Agency through a system of annual licences. Such licences are issued on the basis of separate regions within England and Wales and are non-transferable, so whilst there is no limit on the number of licences that are issued there is a limit to the ease with which effort can be diverted. The licences have a legally enforceable status in England and Wales, controlling the gear that can be used (by type and size) as well as how, when and where they can be used, with a requirement that each licensed piece of gear carries an identity tag. In addition, licence holders are required to report on their activity – days fished, location and type of water fished, total weight of eel caught and retained, including nil returns, with limitations on their catch (i.e. all eel (apart from glass eel) less than 300mm in length must be returned to the water. The glass eel fishery is restricted to two zones – (a) parts of Wales and the North West of England, and (b) South West of England – see figure 1.A.1 below)

Figure 1.A.1 – distribution of eel fisheries throughout England and Wales. Proportional size pie charts represent the number of each instrument type used in each WFD River Basin District

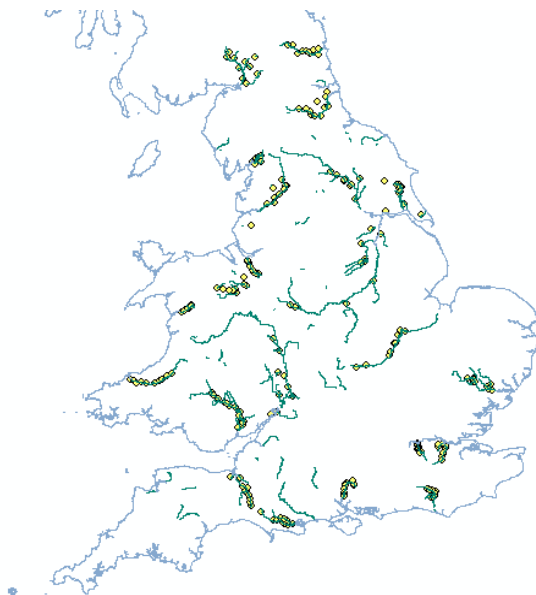


Details of stock monitoring work specifically focussed on eels are given below. It is planned for this work to continue in 2010 to 2013 [NOTE – with regards to the costs elements listed against eels only part of the costs are included related to 3 glass eel sites, 110 yellow eel sites and 5 silver eel sites. Work related to eels in the River Leven system is carried out in a joint programme with Salmon, and as the focus is primarily on salmon the costs have been included in the salmon programme].

The amount of eel specific monitoring will increase from 2009 onwards as follows:

- Glass eel (elver) are monitored annually at three sites using traps on fixed structures.
- Yellow eel monitoring as part of the National Fisheries Monitoring Programme (NFMP) previously covered 3 rivers, this has now been increased to 22 rivers (Figure 1.A.2). A minimum of 10 sites on each river are monitored biennially. The sampling method of choice is quantitative electric fishing with fyke netting being used in rivers unsuitable for electric fishing.
- Silver eel are monitored annually at five sites using a combination of existing silver eel traps, fyke netting and acoustic monitoring (DIDSON).

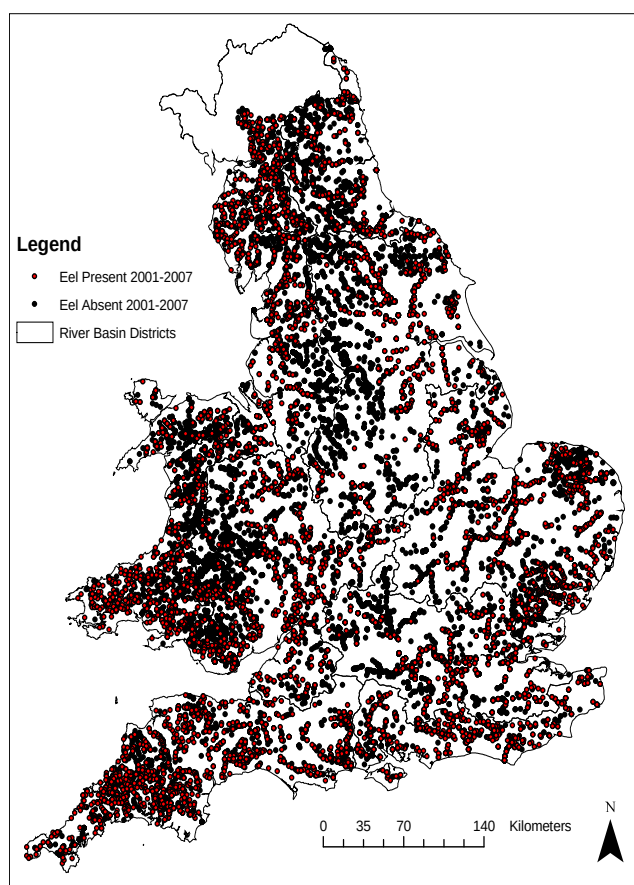
Figure I.A.2 - Regional distribution of eel-specific monitoring by the Environment Agency in England and Wales



In addition to the eel specific surveys we carry out over 3000 fisheries surveys annually (Figure 1.A.3), all eel caught on these surveys are measured and recorded. We are looking at the methods we use on these non eel specific surveys to see if we can improve the eel data we collect for example by adding additional runs targeting eels to our multi species catch depletion surveys.

. Note – as these are multi-species surveys rather than solely eel-related, their costs are not included in the UK programme.

Figure I.A.3 - Environment Agency data on eel presence and absence in England and Wales, 2001-2007



Scotland

Neither the Scottish Government (SG) nor Marine Scotland Science are aware of any current eel fisheries in Scotland. Further, it has been illegal for eel fisheries to operate since 1 January 2009. Therefore, as no fisheries exist, a lethal (as otoliths are required) sampling programme would impose undesirable mortalities on the population that are being protected. In addition, with respect to the Scottish Eel Management Plan, there is no requirement for age structure information and consequently we would have no use for the suggested data collection. As such while there will continue to be studies carried out of a non-lethal nature to study the state of the populations it is not planned to carry out sampling as required under Appendix IV (for the métier related to glass eel fishing) and Appendix VII (species sampling specifications) of the DCF.

Northern Ireland

Commercial activity – Fishing for glass eels is not allowed in Northern Ireland, other than for the purposes of relocation to help restock the Lough Neagh river system, where it is used to supplement stocking by the purchase of glass eels from other sources. The Lough Neagh fishery is one of the largest commercial wild eel fisheries in the EU – producing 25% of the total recorded EU wild catch and supplying 3% of the EU market. Fishing rights related to all stages of the eel life-cycle within this system are owned by a local cooperative society. Scientific surveys of eels of various life stages are undertaken on the Lough Neagh system throughout the year;

- Glass eels / elvers – sampled twice a month from their arrival in February/March to August – 50 juveniles per sample to give numbers per Kg and length frequencies
- Yellow Eel – Weekly samples of 20 eels over 20 weeks from March to September, chosen to reflect all size ranges caught and analysed for length and age. In addition, the entire ungraded landings of two fishing crews fishing on one day each month is sampled (usually 400-600 eels) and measured for length.
- Silver eels – At weekly intervals over a 12 week period (October to December) the previous night's haul (when of at least 400 fish) is measured for length, with 10 eels chosen representing the catch size range sacrificed for age measurement.

In addition to the Lough Neagh fishery, the eel population of the cross-border Lough Erne system is shared with the Republic of Ireland. On approval and implementation of the trans-boundary eel river basin management plan for the Erne system, all licensed commercial exploitation of eel will cease. A conservation fishery has been initiated to capture emigrating silver eels and transport these downstream past two run-of river hydro-electric power stations on the out-flowing River Erne. This conservation fishery enables quantitative estimation of the total emigration of silver eels through associated mark-recapture and tracking studies.

A third Eel river basin management plan has been drawn up for the rivers draining east from Northern Ireland to the Irish Sea. Eel stocks are small by comparison with the Neagh-Bann and Erne systems, and there is no commercial exploitation in this region. Eel stocks are monitored through WFD freshwater fish monitoring programmes.

For Northern Ireland eel, the target population is all eel fishing conducted by LNFCS and its licensed eel fishing boats on Lough Neagh. These are 8m open boats. The sampling site is at Toomebridge, where each individual boat's catches are delivered for packing and marketing. Silver eels caught at weirs on the River Bann are also processed through and sampled at the same facility. There is no significant recreational exploitation of eel in NI, requiring no sampling programme.

I.B Data Quality

England and Wales –there is a degree of variable and apparent under-reporting of glass eel (elver) catches to the Environment Agency under the licensing regime. As such alternative sources of information, such as details from analysis of import and exports data from Her Majesty's Revenue and Customs department are also used, although this alternative source does not include an accurate differentiation between life stages, with such distinctions only being possible on the price differentials seen between individual export consignments.

On 15th January 2010, The Eels (England and Wales) Regulations 2009 came into force. This Eels Order requires buyers and sellers of live eels, at all life-stages, to fill

out and sign a consignment note that is to accompany the transported stock. The original source of the stock and the final destination are needed to be included on the form. This requirement will help in ensuring a more accurate estimate of the catch.

In addition, it is known that the eel population estimates obtained from the routine multi-species surveys carried out by the Environment Agency are not as accurate as from their targeted surveys.

I.C Regional Coordination

Although the European eel stock is considered to be a single stock throughout its distribution, the EU Regulation (EU COM 1100/2007) recognised that, “there are diverse conditions and needs in the Community which require different specific solutions” and that “Decisions should be taken as close as possible to the locations where eel are exploited”, and therefore allows Member States to develop and implement their own EMPs, regional coordination of work per se is not a major element. The UK will continue to be involved in the international working groups related to assessing the state of the European eel stock at the international level, and as such an estimate of costs related to participation in the ICES/EIFAC WGEEL is included in the estimates of funding required for 2009-2010.

In addition during each year there are several meetings within the UK of the experts involved to coordinate this work. In the past these have been separate meetings and have not been conducted at the same time as the annual UK coordination meeting for work under the DCF, because the work in this area was not covered by the DCF and because the people and issues involved are different from those for other DCF work areas. While the DCF will now cover this work, to incorporate this meeting into the single national meeting usually allowed would make that meeting lengthier, involving more people and thus more complex to organise and hold. As such it is requested (see below) that the UK be allowed to split the national coordination meetings into two to allow for a more efficient management of the work.

I.D Derogations and non-conformities

As mentioned above, from 1/1/2009 commercial fishing for eels in Scottish river systems will be banned as a measure to help recovery of these eel stocks. As such no sampling of eels is planned for these river systems as required under the DCF on the grounds that the sampling work would be an additional anthropogenic cause of eel mortality in the river systems, and thus working against the objectives of the closure of these fisheries. Work will continue to monitor the state of the stocks in Scottish river systems using non-lethal methods of observing species presence, abundance etc.

In addition, it is requested that funding be allowed for a separate national coordination meeting specifically related to coordination of national work within the UK on eels (and salmon). This reflects the distinct nature of the work in this area, involving different experts than the other work under the DCF which focuses on marine systems. Having a separate meeting would allow a more efficient and effective use of the time of the staff involved – it would not involve additional travel costs as it would be the same people involved as if there would be a single national meeting, but it would allow the national coordination process to be a more efficient

process, involving for example two separate one day meetings rather than needing to be a single 2-3 day meeting.

2 Collection of data related to Salmon

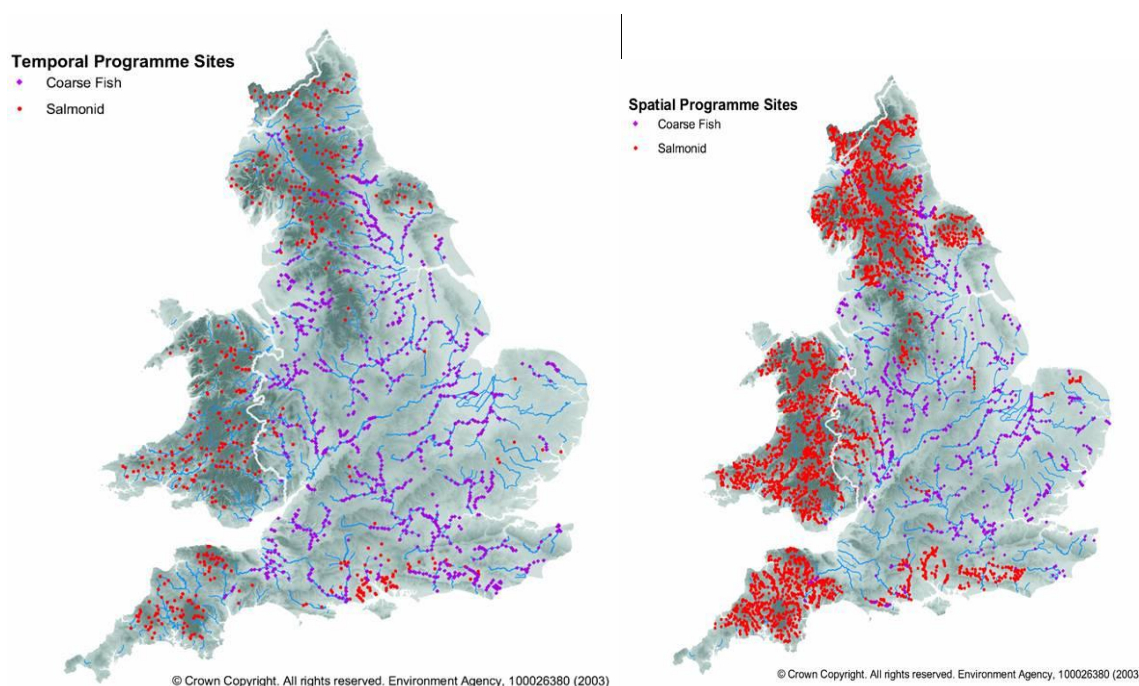
2.A Data Acquisition

England & Wales

The National Fisheries Monitoring Programme for England and Wales has the following components, designed to allow coverage of assessment of the fish stocks including net and recreational catch and effort data:

- **Juvenile** – for the identification of spatial and temporal trends in the juvenile population through a combination of annual quantitative and quin-quennial semi-quantitative surveys. There are a total of 380 temporal sites providing information on changes at specific sites over time, and 3,030 spatial sites that, together with the temporal sites, allows trends over larger areas to be determined. The distribution of these sites in England and Wales is illustrated below.

On two of the index rivers – Tamar and Dee – smolt trapping and tagging programmes operate annually, primarily to estimate for salmon: (i) smolt-to-adult return rates ('marine survival') and (ii) exploitation by marine fisheries. This programme is run in collaboration between CEFAS and the Environment Agency. Salmon return estimates for the Dee and Tamar are reported to the ICES NASWG as part of the stock assessment submission for E&W.



- **Adult** – The size of adult populations returning to rivers can only be estimated for 68 rivers in England and Wales. For four index rivers estimates of the stock size are produced as follows, with this work continuing in 2009 and 2010 (NB biological data – weight, age and spawning history) are collected on all four rivers:
 - **Rivers Tyne and Lune** – estimates based on fish counter plus biological data – at least 10% of the run of fish are sampled in a stratified manner.
 - **River Dee** – recapture is used to estimate the size of the adult population (precision of estimates is $\leq \pm 30\%$ with 95% confidence) validated by an independent estimate via a fish counter.
 - **River Tamar** – estimates are as per the Tyne and Lune, with independent estimates of stock size also available through a mark recapture programme. The latter is also being introduced on the Tyne

Information collected from each of the sites under the juvenile monitoring programme is stored on a National Fish Population Database, which stores information on the site, details of the sampling carried out at the site as well as the results of sampling. Adult catch data from rod and net fisheries are retrieved through the licence returns system – these data are stored separately from the juvenile monitoring system. For the adult monitoring system there are separate local data stores for each index river system. The long term plan is to link these sources together with other data on habitats collected by the Environment Agency – consideration will be given to incorporation of a plan of work under this heading for the 2010-2013 programme.

Scotland

Data collection in Scotland is focussed on providing information that can be utilised at a national scale (for the Scottish Government) and at an international scale (for the International Council for the Exploration of the Sea (ICES) at the Working Group on

North Atlantic Salmon. More details on the latest results of this work are available on-line at:

<http://www.frs-scotland.gov.uk/FRS.Web/Uploads/Documents/SCSB08.pdf>

Activities in support of these aims are as follows:

- Collection of catch statistics.
- Sampling salmon catches.
- Operation of 3 monitored sites:
 - North Esk river
 - Girnock Burn (tributary of the river Dee)
 - Baddoch Burn (tributary of the river Dee)
- For these sites information collected includes redd counts, juvenile numbers and densities, smolt counts/estimates, adult return enumeration and spawning stock counts/estimates.
- Attendance at ICES.

Northern Ireland

Data collection is conducted under Salmon Management Plans (SMPs) operated in both fishery jurisdictions (Fisheries Conservancy Board and Loughs Agency) within N. Ireland. Salmon Management Plans are based around a number of conservation databases which are monitored annually on a series of index rivers. The longest standing and most important index catchment in Northern Ireland is the River Bush on which the population dynamics of Atlantic salmon have been studied since the early 1970's. The biological information compiled through the SMPs represents a central part of Northern Ireland's commitment to international protocols on salmon conservation and forms a core component of reporting to ICES and NASCO through the WGNAS (ICES Working group on North Atlantic Salmon) where the data is detailed.

Index Rivers within the Fisheries Conservancy Board area include the Rivers Bush, Glendun, Main, Blackwater, Moneycarragh and Garvary whilst in the Loughs Agency area monitoring is conducted on the River Foyle and its tributaries in addition to the Roe, Faughan, Culdaff and Clanrye.

Data collection includes;

- Habitat inventories are collated from habitat surveys conducted on index catchments.
- Enumeration of spawning escapement is assessed through a fish counter programme on the index catchments.
- Juvenile stock surveys are conducted annually through extensive semi quantitative electric fishing programmes on each index catchment.
- Exploitation data from recreational and commercial fisheries for salmon and sea trout is derived from carcass tagging schemes conducted in both jurisdictions.
- The River Bush project includes additional data collection work inclusive of a long term stock : recruitment study, assessment of freshwater survival rates and assessment of marine survival and commercial exploitation rates from a coded wire tagging programme.

2.B Data Quality

England and Wales

The juvenile monitoring programme was derived from statistical first principles to ensure that the data collected would be of adequate quality to detect spatial or temporal changes in fish populations at the desired levels of accuracy - the programme has been designed to detect an annual change of <0.8 and >1.25 and difference between sub-catchments of 0.45 with 5% significance and 80% power. The inclusion of an assessment of habitat (HABSCORE) can increase the detectable difference of the spatial surveys by a further 1.1 – 22.1%, depending on life stage.

Scotland

The fisheries catch statistics account for greater than 95% of all known salmon fisheries in Scotland. Catch sampling is carried out in a manner that is representative of the catch throughout the fishing season. Juvenile survey data are collected to the agreed national protocols and data collection and processing at the 3 monitored sites is undertaken using the same standard operating plans.

Northern Ireland

The Salmon Management Plan data collection is based largely based around peer reviewed science generated from the Bush project. Juvenile surveys, for example, are based on a semi-quantitative electric fishing technique developed at the River Bush Salmon Station and are designed to assess the density and distribution of salmon recruitment on a catchment wide scale. The semi-quantitative nature of this technique allows the investigation of a large number of survey sites with limited resources during a relatively short field season. The fish counter programmes are validated regularly using a range of approaches including pseudographical comparison, direct observations, video image analysis and authentication of downtime.

For Northern Ireland Salmon, the individual populations spawning in each of the Index Rivers are targeted as monitoring units, in order to inform local management decisions to address the specific needs of each population unit.

2.C Regional Coordination

The UK will continue to be involved in the international working groups (i.e. ICES Working Group on North Atlantic Salmon) related to assessing the state of stocks, and as such an estimate of costs related to participation in such international meetings is included in the estimates of funding required for 2011-13. In addition during each year there are several meetings within the UK of the experts involved to coordinate this work. In the past these have been separate meetings not carried at the same time as the annual UK coordination meeting for work under the DCF, given that the work in this area was not covered by the DCF and also due to the fact that the people and issues involved are different from those from the rest of the DCF work areas. While the DCF will now cover this work, to incorporate this meeting into the single national meeting usually allowed would make that meeting lengthier, involving more people and thus more complex to organise and hold. As such it is requested (see below) that the UK be allowed to split the national coordination meetings into two to allow for a more efficient management of the work.

2.D Derogations and non-conformities

As mentioned in relation to eel sampling work, it is requested that funding be allowed for a separate national coordination meeting specifically related to coordination of national work within the UK on salmon (and eels). This reflects the distinct nature of the work in this area, involving different experts than the other work under the DCF which focuses on marine systems. Having a separate meeting would allow a more efficient and effective use of the time of the staff involved – it would not involve additional travel costs as it would be the same people involved as if there would be a single national meeting, but it would allow the national coordination process to be a more efficient process, involving for example two separate one day meetings rather than needing to be a single 2-3 day meeting.

Annex 3

Economic Survey of the Fishing Fleet conducted by Seafish Industry Authority: Survey Form

	<small>Name of interviewer</small>
Fishing Vessel Accounts Permission Form	
<p>Industry organisations, RACs and fisheries departments need to have accurate information on fleet economics to contribute to better fisheries management.</p> <p>To provide this essential information, Seafish conducts surveys to report on the financial performance of all major segments of the UK fishing fleet.</p> <p>So that we get enough accurate information, it would help if you supply your year-end accounts. In return, we can offer a personal benchmark report for your vessel.</p> <p>Your information will only be used anonymously, for Seafish reports and in contribution to fisheries economics working groups in Europe and the UK.</p> <p>No individual vessel will be identified in any report.</p>	
<p>I hereby give permission for Seafish to obtain from my accountant my complete financial accounts for 2007/2008 and the next three financial years (until 2010/2011).</p> <p>(Signature) _____</p> <p>I hereby give permission for Seafish to obtain from my accountant my complete financial accounts for 2007/2008.</p> <p>(Signature) _____</p> <p>Vessel Name: _____ Vessel PLN: _____ Vessel Length: _____</p> <p>Vessel owner name (print): _____ Date: _____</p> <p>Phone no. of vessel owner: _____</p> <p>Main Gear type and area(s) fished: _____ <small>(e.g. North Sea twin rig trawl)</small></p> <p>Accountancy firm: _____ Contact name: _____</p> <p>Accountant Address: _____</p> <p>Accountant Phone: _____</p> <p>Please tick this box if you would like a personal benchmark report for your vessel ☐</p> <p>If you would like to receive a copy of Seafish reports relevant to your fleet segment please write your contact address here:</p> <div style="border: 1px solid black; height: 30px; margin-top: 10px;"></div> <p style="text-align: center;"><i>All information obtained will be treated in strict confidence in line with Seafish policy</i></p> <p style="text-align: center;">Thank you!</p>	

1) Did your vessel switch fishing method during 2008? Yes / No

If yes, please give gear types: _____

2) How many trips did your vessel make in 2008? _____

3) How many **litres** of fuel did your vessel typically use per **trip** in 2008? _____

4) Please indicate the **number and age** of ALL your crewmembers (entire crew, including rotation)

	Number and age of crew members					
	16-20	21-30	30-39	40-49	50-59	60+
Full Time (over 37 hours per week)						
Part time (under 37 hours per week)						
Temporary						

5) How many foreign (not of UK origin) crew do you employ? _____

6) Do you rotate the crew? Yes / No If yes, how many crew are on board per trip? _____

7) How many hours per day does each crew member work on average? _____

8) Please estimate the total cost of purchasing quota units in 2008 (£) _____

9) Number of Days at Sea purchased in 2008 _____ Total Cost (£) _____

10) Please give details of the share ownership of your vessel: You ____% Family ____% Other ____%

11) Please give details of the current level of borrowings in relation to the vessel (£) _____

12) For each of the following please specify the replacement and insurance values (if different):

	Insurance	Replacement
Hull	£	£
Engine	£	£
Electronics	£	£
Other Equipment	£	£
ALL	£	£

13) Please specify the following:

a) Estimated value of Licence (inc. entitlements) £ _____

b) Estimated value of quota units £ _____

14) What were the major factors affecting your financial performance in 2008?

15) How has the change in management regime (kW days at sea) affected your performance so far in 2009?

16) Looking forward, what do you think will be the three main issues facing your sector of the industry over the next five years?

17) What do you think can be done to address these issues?

Annex 4

Marine Scotland data collection: post-collection data checks/validation

Data Collection

Marine Scotland – Science addresses quality issues in fisheries data collection through:

- Adherence to the UK Joint Code of Practice for Research (see http://www.defra.gov.uk/science/documents/QACoP_V8.pdf);
- Adherence to national and international protocols for data collection;
- External review of data collection programmes via the EU STECF SGRN annual reviews of Member State Technical Reports and National Proposals for data collection;
- Participation in the ICES PGCCDBS and RCMs
- Participation in international workshops on methodology and calibration

Data are collected through two main systems: (i) national administration census data of fish landings and activity (so-called log-book data and fish sales data) and (ii) scientific sampling, including: research vessel surveys, fish market sampling and observer sampling aboard commercial fishing vessels.

Log-book and sales note data relevant to Marine Scotland's interests are collected by the former Scottish Fisheries Protection Agency (an agency subsumed into the new Marine Scotland framework and operating as Marine Scotland – Compliance) and entered into a computerised database (the FIN system) through the front-end VIVAFISH system, a relatively new data capture system deployed at Fishery Offices that aims to improve the quality of fisheries data through better designed user input screens and improved validation of the data entered (see paragraphs 14 & 16 of: <http://www.scotland.gov.uk/Publications/2005/12/0594523/45241>). The Scottish Government recognises that the harmonisation of statistical classifications and methods within the UK is important for the reliability, consistency and usefulness of its data and it has contributed to the harmonisation of variables and codings between the Scottish fishery data (FIN) and the England, Wales and Northern Ireland data (FAD) via the IFISH data warehouse (see paragraph 20 of: <http://www.scotland.gov.uk/Publications/2005/12/0594523/45241>).

For data collected directly by Marine Scotland - Science, the Marine Laboratory, Aberdeen, operates under both external and internal codes of practice and data collection is undertaken in accord with both international and national protocols governing surveys, fish market sampling and observer sampling. In addition, Marine Scotland – Science contributes directly to the international calibration workshops (e.g. age-reading and maturity staging) and methodological workshops (e.g. on fisheries data accuracy and precision) concerned with the DCF.

Feedback to Marine Scotland on its data collection is received via the EU STECF (SGRN review of national proposals and review of technical reports and via the international workshops organised under the auspices of the ICES Planning Group on Commercial Catch, Discards and Biological Sampling. Within Marine Scotland, internal feedback on its data collection programme is facilitated through quarterly sampling programme co-ordination meetings.

In addition, Marine Scotland -Science quality assures data in the following manner¹:

Research vessel surveys

- 1 Raw data are punched at sea, usually within 4 hours of being obtained. The input software performs rudimentary checks and the operator undertakes a visual check that is validated by a second person.
- 2 On returning from sea the data are transferred to a SQL Server database and during the process of transfer in-house software undertakes further checks of the data, e.g.
 - a) Trailing space errors
 - b) Matching “Number of Foul Hauls” declared against the number then given.
 - c) Matching first Haul No in the chron block with the first Haul No in the header.
 - d) Matching last Haul No in the chron block with the last Haul No in the header.
 - e) Ensure that there are no ‘missing hauls’ – i.e. no gaps in the Haul numbers.
 - f) Validity of Dates and Times.
 - g) Ensure that Date/Time of Haul is later than Date/Time of previous Haul.
 - h) Ensure that Duration equals End Time less Start Time
 - i) Ensure that supplied Lat/Long values match the Statistical Rectangle declared – for both Start and End positions.
 - j) where an area based (M)ALK² exists all hauls included in that (M)ALK belong to that area.
 - k) Any species providing age information must provide an age for every distinct length that is recorded.

¹ Although following similar principles for data checking and validation, differences do exist between the demersal, pelagic and inshore fisheries observer data checking procedures; although in part due to the separate development of these programmes, the differences also reflect the nature of data collection across the various fleet segments.

² (Maturity-) Age-Length Key

- 3 Before data are transferred to the servers at ICES a final check is made via the ICES checking program. An example of the checking routines can be found at:

<http://www.ices.dk/datacentre/datsu/selrep.asp>

If any of the three checking stages reveal any outliers from the strictly defined parameters the data are referred back to the survey's chief scientist and the survey data processing is suspended until the query is either verified or corrected.

Demersal Observer Programme

- 1 Data are collected in accordance with the Demersal Observer Sampling manual and raw data are entered into the appropriate data sheets.
- 2 On returning from sea, the data sheets are manually screened in accordance with a standard check list to ensure that a series of data headings, fields and totals are completed appropriately.
- 3 Data are then entered into SQL Server database with a series of visual and built in checks to ensure that:
 - a) Unique ID code is allocated and recorded on data sheets
 - b) All chronological information relating to hauls falls within expected ranges.
 - c) Ensure that Lat/Long values given match the Statistical Rectangle declared – for both Start and End positions.
 - d) Ensure that haul duration matches end time less start time
 - e) The relative number of haul data sets matches the number of hauls sampled
 - f) The relative number of species entered matches the number of species declared.
 - g) allocated area, gear, port and species codes match the defined fields
 - h) data entered for length frequencies fall within the declared range of lengths
 - i) Any species providing age information must provide an age for every distinct length that is recorded.
 - j) Visual checks on database outputs for individual trips are carried out to ensure that quantities discarded and sampled match, number of hauls, effort and total demersal figures match.

- 4 During the raising of individual trip data to fleet level (monthly data) data are screened by experienced staff to identify outliers, followed by re-examination of the original data for validation or correction.
- 5 Ongoing dialogue between the data collector, data processor and observer coordinator to ensure data sets are representative of fleet activity.

Inshore Fisheries Observer Programme

- 1 Data collection is done in accordance with the IFG Observer Sampling Manual with length frequency data stored on PDAs (when using the electronic method) or in notebooks (when using non-electronic methods). Ancillary data are also stored in notebooks.
- 2 On returning from sea, the data sheets are written up. When electronic formats are used the data are downloaded from the PDA and processed by in-house software to produce the relevant length frequencies. Additional ancillary data are manually entered.
- 3 All completed sheets are returned to the observer data manager to visually check and query/correct as required. Weights landed and the area fished are cross checked with the log book records in FIN.
- 4 Data are then entered into SQL Server database with a series of visual and built in checks to ensure that;
 - a) Unique ID code is allocated and recorded on data sheets
 - b) All chronological information relating to hauls falls within expected ranges.
 - c) Ensure that Lat/Long values given match the Statistical Rectangle declared – for both Start and End positions.
 - d) Ensure that haul duration matches end time less start time
 - e) The relative number of haul data sets matches the number of hauls sampled
 - f) The relative number of categories entered matches the number of categories declared.
 - g) Allocated area, gear, port and species codes match the defined fields.
 - h) Visual cross-checking of data entered with IFG data summary spreadsheet derived from the hard copies to enable validation/correction.
- 5 During the raising of individual trip data to fleet level (monthly data) secondary cross-checking is performed to ensure data remain correct. Once raised, comparisons are made with the previous year's data where any patterns or

anomalies are discussed between staff (including re-examination of original data if required).

- 6 Once satisfied with the outcomes the data are accepted into the system.
- 7 Throughout, consultations can be held with the observer that gathered the data, the data manager and the observer co-ordinator.

Pelagic observer programme

1. Data are collected in accordance with the Pelagic Observer Sampling manual and raw data are entered on to appropriate data sheets
2. On returning from sea, the data sheets are manually screened in accordance with a standard checklist to ensure that a series of data headings, fields, and totals are completed appropriately
3. Data are then entered into SQL Server database with a series of visual and built in checks to ensure that:
 - a) Unique ID code is allocated and recorded on data sheets.
 - b) All chronological information relating to hauls falls within expected ranges.
 - c) Ensure that haul Lat/Long positions recorded are correct to the statistical rectangle allocated to the haul.
 - d) Ensure that haul duration matches end time less start time.
 - e) The relative number of haul data sets matches the number of hauls sampled.
 - f) The catch and discard estimates for each haul within a trip match the summary totals declared for the trip.
 - g) Allocated area, gear, port and species codes match the defined fields.
 - h) Any otoliths that cannot be aged are removed from the biological data sheets and totals adjusted accordingly.
 - i) data entered for length frequency fall within the declared range of lengths.
4. During the raising of individual trip data to fleet level (monthly data) data are screened by experienced staff to identify outliers, followed by re-examination of the original data for validation or correction.

Integrated Market Sampling Programme

1. Data are collected at various locations in the field in accordance with the Integrated Market Sampling manual and raw data are entered to appropriate data sheets.
2. Use of record sheets to ensure appropriate samples are targeted and the relevant number of age samples is collected.
3. On returning from the 'field', the data sheets are manually screened in accordance with a standard check list to ensure that a series of data headings, fields and totals are completed appropriately, and that age sample specimens match the paper record.
4. Data are then entered into a SQL Server database with a series of visual and built in checks to ensure that;
 - a) Allocated area, gear, port and species codes match the defined fields
 - b) Unique ID code is allocated and recorded on data sheets and associated sample material.
 - c) Declared statistical rectangle matches declared area.
 - d) The relative number of landed categories entered matches the number of categories declared.
 - e) data entered for length frequencies fall within declared range of lengths
 - f) Total number in length frequency matches the total declared.
 - g) Visual checks on database outputs for individual trips are carried out to ensure that species sampled, quantities landed, quantities sampled, number of landed categories entered, start length, end length and totals match between data sheets and database outputs.
 - h) Any species providing age information must provide an age for complete length range within requested sample stratum³ (area/gear/period).
 - i) That log book landings data are available for the declared strata (area/gear/period).
5. That the log book data fall within recognised area boundaries for specific species and gears.

³ This condition will be modified as of 2009 to comply with the revised EY data collection framework, in which it is legitimate to sample age independently of length provided that population age-length data from multiple commercial samples cover the observed multi-sample length frequency within any metier per quarter

6. During the raising of individual species sampling data to fleet level (monthly data), data are screened by experienced staff to identify outliers, followed by re-examination of the original data for validation or correction.

Annex 5: Agreed bilaterals.

Bilateral Agreement between the UK (Cefas) and Belgium (ILVO-Fisheries) for the collection of length and age samples in accordance with EC Regulation 665/2008, laying down detailed rules for the application of Council Regulation (EC) 199/2008, and its Commission Decision 2010/93/EU.

Agreement:

The UK and Belgium have agreed that samples of fish landed by Belgian vessels into the UK and transported for first sale into Belgium will be sampled upon arrival in the Belgian auctions by ILVO - Fisheries as part of the Belgian National Programme under the requirements of the EC Data Collection Framework (199/2008). The eventual additional sampling costs will be covered within the Belgian National Sampling Programme from 2011-2013. This agreement builds on the practice which has been already adopted and carried out since 2004.

In addition Belgium has agreed to provide age determination for all turbot (*Psetta maxima*) and brill (*Scophthalmus rhombus*) otoliths collected by the UK as part of the UK National Programme. In return the UK (Cefas) will undertake the age determination of VIIa cod (*Gadus morhua*) otoliths collected as part of the Belgian National Programme.

Description of sampling:

Landings: - Sampling will be for length and age of landings, sampling will be carried out in accordance with the Belgian National Sampling Programme.

Age determination: - Sampling will be carried out at the levels required within the National Sampling Programmes of UK and Belgium.

Sampling Intensity:

Levels and coverage at the metier level will be as agreed at the annual co-ordination meetings of RCMs NS&EA and NA.

Data responsibility:

Both countries will be responsible for submitting the data to the relevant ICES Expert Groups, and to the EC under the requirements of its Data Collection Framework. The aged samples are to be made available for the deadlines required by the relevant ICES Expert groups, and the EC.

Contact persons:

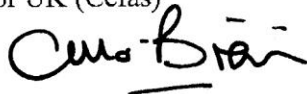
In the UK (Cefas) S Warnes: - steve.warnes@cefas.co.uk

In Belgium (ILVO-Fisheries) : els.torrele@ilvo.vlaanderen.be

CMB
31.3.14

Signatures:

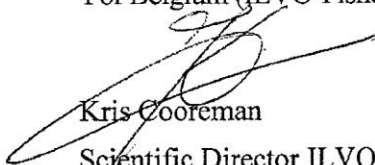
For UK (Cefas)



Carl O'Brien

Fisheries Division Director

For Belgium (ILVO-Fisheries)



Kris Cooreman

Scientific Director ILVO-
Fisheries/National
Correspondent

Date: 31.3.14

Date:

X

Bilateral Agreement between the UK (CEFAS) and Netherlands (Centre for Fisheries Research) for the collection of length and age samples in accordance with EC Regulation 665/2008, laying down detailed rules for the application of Council Regulation (EC) 199/2008, and its Commission Decision 2010/93/EU.

Agreement:

- (1) Landings and discards by Anglo-Dutch vessels fishing on the UK register, which land for first sale into the Netherlands, will be sampled as part of the Netherlands National Programme under the requirements of the EC Data Collection Framework (199/2008). This agreement builds on the practice which has been already adopted and carried out by the Netherlands since 2000. The eventual additional sampling costs will be covered within the Netherlands National Sampling Programme from 2011 onwards.
- (2) Scallops landed by Dutch vessels fishing for Scallops in area VII which land for first sale in the UK will be sampled for biological parameters as part of the UK National Programme from 2011 onwards. The eventual additional sampling costs will be covered within the UK National Sampling Programme from 2011 onwards.
- (3) The Netherlands holds the obligation to sample bass for biological parameters triennially. The age reading of these samples will be carried out by CEFAS. This agreement builds on the practice which has been already adopted and carried out by the UK since 2006
- (4) Landings and discards by Anglo-Dutch vessels fishing on the UK register, participating in metier OTM_SPF $\geq$ 40_0_0 in the CECAF region, will be sampled as part of the Netherlands National Programme under the requirements of the EC Data Collection Framework (199/2008) for 2012 and 2013.

Description of sampling:

- (1) The sampling will be for length and age of discards and landings, sampling will be carried out in accordance with the Netherlands National Sampling Programme.
- (2) The sampling will be carried out in accordance with the UK National Sampling Programme
- (3) Not relevant
- (4) The sampling will be for length and age of discards and landings, sampling will be carried out in accordance with the Netherlands National Sampling Programme.

Sampling Intensity: (1) & (2) Levels and coverage as agreed at the annual meeting of RCM NS&EA and NA. (4) Levels and coverage as agreed at the annual meeting of RCM LDF

Data responsibility:

- (1) The Netherlands is responsible for submitting the data to the relevant ICES Expert Groups, and to the EC under the requirements of its Data Collection Framework. The Netherlands will provide the required data for the species that are requested by the relevant ICES Expert Groups, and the data for the additional species to the UK as and when requested.
- (2) The UK is responsible for submitting the data to the relevant ICES Expert Groups, and to the EC under the requirements of its Data Collection Framework. The UK will provide the required data for the species that are requested by the relevant ICES Expert Groups, and the data for the additional species to the Netherlands as and when requested.
- (3) Not relevant.

- (4) The Netherlands is responsible for submitting the data to the relevant ICES Expert Groups, and to the EC under the requirements of its Data Collection Framework. The Netherlands will provide the required data for the species that are requested by the relevant ICES Expert Groups, and the data for the additional species to the UK as and when requested

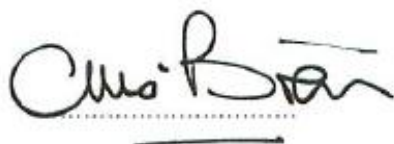
Contact persons:

In The Netherlands: Sieto Verver (sieto.verver@wur.nl)

In UK: Steve Warnes (steve.warnes@cefas.co.uk)

Signatures:

For CEFAS



Carl O'Brien

For CVO



Sieto Verver

Defra Chief Fisheries Science Adviser

CEFAS

Dpt. Head Centre for Fisheries Research

CVO

Date: 12-10-2011

Date: 12-10-2011

**Bilateral Agreement between the UK (Cefas) and Germany (vTI-SF)
for the collection of length and age samples in accordance with EC
Regulation 665/2008, laying down detailed rules for the application
of Council Regulation (EC) 199/2008, and its Commission Decision
2010/93/EU**

Agreement:

Fishing activities of UK vessels in ICES Sub-Area I & II, which land for first sale into Germany, will be covered within the German National Programme under the requirements of the EC Data Collection Framework (199/2008). Sampling costs will be included within the German National Sampling Programme from 2011- 2013.

Description of sampling:

These UK vessels are operating in the same metier as the German fleet and follow the same practices. Sampling for length and age of landings will be covered in accordance with the German National Sampling Programme. The metier is sampled by onboard observers.

Sampling Intensity:

Levels and coverage at the metier level will be as agreed at the annual co-ordination meeting of RCM NS&EA.

Data responsibility:

Germany will be responsible for submitting the data to the relevant ICES Expert Groups, and to the EC under the requirements of its Data Collection Framework. Germany will provide the required data for the species that are requested by the relevant ICES Expert Groups, and the data for the additional species to the UK as and when requested.

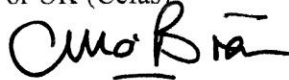
Contact persons:

In the UK (Cefas): S. Warnes: steve.warnes@cefas.co.uk

In Germany (vTI-SF): K. Panten: kay.panten@vti.bund.de

Signatures:

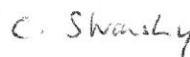
For UK (Cefas)



Carl O'Brien

Fisheries Division Director

For Germany (vTI-SF)



Dr. Christoph Stransky

German National Correspondent

Date: *19th March 2010*

19 March 2010

Johann Heinrich von Thünen-Institut
Bundesforschungsinstitut für
Ländliche Räume, Wald und Fischerei
Institut für Seefischerei
Palmallee 9 • 22767 Hamburg
104

Bilateral Agreement between the Marine Institute Ireland and Marine Scotland (for the collection of length, maturity and age samples in accordance with EC Regulation 665/2008, laying down detailed rules for the application of Council Regulation (EC) 199/2008, and its Commission Decision 2008/949/EC.

Agreement: Twenty five vessels fishing on the Irish register, which operate and / or land into the UK for first point of sale will be sampled as part of the 2011-2013 National Programme under the requirements of the EC Data Collection Framework (199/2008). A portion of these vessels land into Scotland. The eventual additional sampling costs will be covered within the Scottish National Sampling Programme from 2011.

Description of sampling: The sampling will be for length maturity and age of Demersal and Pelagic landings; sampling will be carried out in accordance with the Scottish National Sampling Programmes.

Sampling intensity: Sampling intensity will be in accordance with the guidelines set down by Commission Decision 2008/949/EC.

Data responsibility: Scotland is responsible for submitting its data to the relevant ICES Expert Groups, and to the EC under the requirements of its Data Collection Framework. Scotland will provide the required data for the species that are requested by the relevant ICES Expert Groups, and will forward any data collected from Irish registered vessels and sampled by Scotland to the relevant Irish scientists.

ALSO:

Agreement: A portion of forty five vessels fishing on the UK register, which operate and / or land for first sale into Ireland, will be sampled as part of the 2011-2013 National Programme under the requirements of the EC Data Collection Framework (199/2008). The eventual additional sampling costs will be covered within the Irish National Sampling Programme from 2011- 2013.

Description of sampling: The sampling will be for length maturity and age of Pelagic landings. Sampling intensity will be in accordance with the guidelines set down by Commission Decision 2008/949/EC.

Sampling intensity: Sampling intensity will be in accordance with the guidelines set down by Commission Decision 2008/949/EC.

Data responsibility: Ireland is responsible for submitting its data to the relevant ICES Expert Groups, and to the EC under the requirements of its Data Collection Framework. Ireland will provide the required data for the species that are requested by the relevant ICES Expert Groups, and will forward any data collected from Scottish registered vessels and sampled by Ireland to the relevant Scottish scientists.

Landings of Scottish vessels into Ireland and landings of Irish vessels into Scotland are obviously subject to change over the period of this bilateral agreement and will need to be monitored on an on-going basis.

Contact persons: frank.obrien@marine.ie National Correspondent

Marine Institute, Ireland

Signed:

Date:

16/3/10



Marine Institute
Fóras na Mara

Rinville
Oranmore, Galway
Tel: 353 91 387 200
Fax: 353 91 387 201
Email: institute.mail@marine.ie

Scotland (Marine Scotland)

Signed:

Date:

Margaret Bell
23/3/10



**Bilateral Agreement between University of Agricultural Sciences (SLU),
Institute of Marine Research Sweden and Marine Scotland (Science), United
Kingdom for the collection of length and age samples in accordance with EC
Regulation 665/2008, laying down detailed rules for the application of Council
Regulation (EC) 199/2008, and its Commission Decision 2010/93/EU**

Mackerel is one stock were the sum of MS having a share of quotas/landings less than 10%, altogether exceeds 25%. In Area IV, Sweden has an average landings of mackerel of 4 475 tonnes (< 1 % of the EU TAC) and where approximately 77 % of the Swedish landing is taken place in UK. In area IIIa, average landings of 160 tonnes, which is below the threshold for sampling. It has been agreed that in some cases it would be perfectly acceptable that sampling by MS for these stocks may not be necessary (RCM NS& EA 2010).

Agreement:

While mackerel is managed as one stock (II, IIIa, IV, V, VI, VII, VIII, IX) it has been agreed that the stock is well covered concerning biological samples, by the United Kingdom Marine Scotland National Programme under the requirements of the EC Data Collection Framework (199/2008). This agreement will be on-going during 2012 and 2013 and will be reviewed for the 2014 National Proposals.

Description of sampling:

The sampling will be carried out in accordance with the UK (Scotland) National Sampling Programme.

Data responsibility:

The United Kingdom will submit all data to the relevant ICES Expert Groups, and to the EC under the requirements of its Data Collection Framework.

Contact persons:

In Sweden (SLU): Maria Hansson: maria.hansson@slu.se

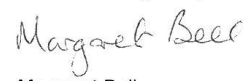
In United Kingdom: Margaret Bell: m.bell@marlab.ac.uk / Margaret.bell@scotland.gsi.gov.uk

Signatures:

For Sweden (SLU)


Maria Hansson
Sweden National Correspondent

For United Kingdom (MS-S)


Margaret Bell
DCF manager (Scotland)

Date: 1 January 2012

Verbal agreement for length and age sampling with non EU country.

Scotland UK and Norway have a verbal agreement that Norway will provide biological data of samples taken from Scottish boats fishing in Norwegian waters or in ICES areas I and II.

Verbal agreement for length and age sampling with EU country.

Scotland UK has a verbal agreement with Denmark to rescind the bilateral agreement between the two MS, which has been in place for three years, regarding the sampling of blue whiting. It has been agreed that the need for the bilateral can be re-instated at any time, depending on the changing pattern of the fishery landing ports. This will be discussed at the NS RCM 2010.

Proposed Bilateral Agreement between the UK (Cefas) and Spain (IEO) for the collection of length and age samples in accordance with EC Regulation 665/2008, laying down detailed rules for the application of Council Regulation (EC) 199/2008, and its Commission Decision 2010/93/EU.

Agreement:

Anglo -Spanish vessels fishing on the UK register, which operate and land for first sale into Spain, will be sampled as part of the Spanish National Programme under the requirements of the EC Data Collection Framework (199/2008). The eventual additional sampling costs will be covered within the Spanish National Sampling Programme from 2011- 2013.

Description of sampling:

These vessels, operating at the metier level, follow the same practices and work in the same way as the Spanish fleets. Sampling will be for length and age of discards and landings, sampling will be carried out in accordance with the Spanish National Sampling Programme.

Sampling Intensity:

Levels and coverage at the metier level will be as agreed at the annual co-ordination meeting of RCMs NS&EA and NA.

Data responsibility:

Spain will be responsible for submitting the data to the relevant ICES Expert Groups, and to the EC under the requirements of its Data Collection Framework. Spain will provide the required data for the species that are requested by the relevant ICES Expert Groups, and the data for the additional species to the UK as and when requested.

Contact persons:

In the UK (Cefas) S Warnes: - steve.warnes@cefas.co.uk

In Spain (IEO)

Signatures:

For UK (Cefas) For Spain (IEO)

Carl O'Brien
Fisheries Division Director

Date:

Annex 6

A review of surveys of marine recreational fishing activity around the United Kingdom.

Andrew Bailey and Mike Armstrong

Centre for Environment, Fisheries and Aquaculture Science, Lowestoft, UK

Corresponding author: mike.armstrong@cefas.co.uk

March 2009

Executive summary

This document is a pre-report of a study funded by the Department of Environment, Fisheries and Rural Affairs (Defra UK) on management of recreational sea angling. The report was requested by the European Commission in support of the UK National Programme for 2011-13 under the EU Data Collection Framework. The report reviews all available studies carried out on recreational sea angling in UK waters in order to evaluate the information base available to support the design of recreational fishery surveys required by the DCF (Commission Decision 2010/93/EU) and the EU Control Regulation (Council Regulation (EC) No 1224/2009).

Recreational sea angling is a widespread activity around the UK coastline (1 – 2 million anglers, with regional variations). The largest participation is shore angling, although average catch rates are smaller than reported for boat fishing. No studies are available that provide information on non-angling recreational fishery catches. Effort and catch rates are skewed, with avid anglers accounting for a disproportionate fraction. All intercept surveys will require adjustment for the over-representation of the more avid anglers who fish more often. Recall bias is a major source of error, and any sampling scheme must include elements to minimise the bias. Any dependence on memory recall should be limited to the immediate past.

As there are no complete lists of UK recreational fishermen, large-scale telephone surveys remain the most feasible approach to estimating the population of residents who go shore fishing or use private boats. However the “omnibus” type survey (where a payment is made to add questions to a more general population survey) is an inefficient method of collecting data on recreational fishing due to the limited number of questions possible, the occurrence of recall bias, and the inability to have stratification appropriate for angling. However it could potentially be used to recruit anglers to a more appropriately stratified “telephone diary” type approach (ICES, 2009) minimising recall bias, if sufficient funding is available.

Intercept surveys for shore and private-boat anglers are a possible alternative to telephone surveys for quantifying overall angling effort and catch, and provide the most accurate data on catch composition and discarding with minimal recall bias. However, such a survey would require a substantial sampling effort to quantify catches by species at the required precision (CV of 20% on annual estimates), and with minimal bias, given the relatively long and varied coastline and the spatio-temporal variability in catch rates and catch composition. The very variable results in the reviewed studies arise partly from small sample sizes and localised sampling. Further work is needed in the present project (Defra MF1203) to predict sampling levels needed to achieve this precision, and optimal allocation of sampling effort.

The fleet of vessels available for angling charters can probably be established with sufficient completeness to allow a sampling scheme based on a suitably stratified list frame. However the available data are not sufficient to design a fully optimised sampling scheme for shore and private boat fishermen. It is recommended that the initial year of coast-wide sampling uses list frames for sampling charter-boats and for-hire vessels, and area frames for intercept sampling of shore-based and private boat fishermen, to provide the information on spatio-temporal variability needed to develop more optimal sample design and allocation, and to evaluate cost-benefit in terms of achievable precision. It is likely that several waves of nation-wide stratified random digit dialling telephone survey would be needed to estimate the overall population of recreational fishermen in the UK with the required precision. Lists of angling club members could provide a separate sampling stratum.

Introduction

The EU Data Collection Framework (Council Regulation (EC) 199/2008, Commission Regulation (EC) 665/2008 and Commission Decision 2010/93/EU) requires EU member States to provide quarterly estimates of recreational fishery harvests of defined species in each fishery region. For the United Kingdom, this includes cod, eels (*Anguilla* spp) and sharks in the North Sea and eastern English Channel, and bass, salmon, eels and sharks in North Atlantic areas including the western Channel. In addition, the EC Control Regulation (Council Regulation (EC) No 1224/2009) states that *“without prejudice to Regulation (EC) No 199/2008, Member States shall monitor, on the basis of a sampling plan, the catches of stocks subject to recovery plans by recreational fisheries practiced from vessels flying their flag and from third country vessels in waters under their sovereignty or jurisdiction. Fishing from shore shall not be included.”*

The estimation of recreational fishery catches in UK waters remains a potentially very difficult and expensive exercise due to the relatively long coastline with extensive but seasonally and spatially variable fishing activities on shore and in private boats, for-hire boats and charter vessels. The development of sampling schemes will also have to involve four separate Devolved Administrations controlling separate budgets and fishery management and control infrastructures for waters under their jurisdiction.

To meet the requirements of the DCF, the UK has previously submitted a number of pilot study reports. The most recent UK technical report for its National Programme in 2008 included a report carried out in Wales by the Countryside Commission for Wales, which provided the results of a localised study of angling participation and catch rates. The 2009-2010 UK National Programme included a further pilot project comprising a 3-year Defra-funded contract MF1203 aimed at improving the understanding and management of recreational sea angling. This project included the development and piloting of methods to estimate the level of recreational participation and catches in bass fisheries, and socio-economic methods to evaluate costs and benefits related to potential management options for bass fisheries. The project would provide improved knowledge of recreational sea angling activity and potential options for management for a number of important UK marine species (bass, cod, tope and grey mullet). This would involve the development of an existing fishermen's logbook scheme operated by Cefas related to sea bass, to be extended to the other fisheries.

The Defra contract MF1203 encountered difficulties in 2009 due to the lack of success in recruiting a socio-economist at Cefas to carry out the economic evaluation, and a withdrawal of cooperation in the log-book scheme from an influential angling body. The latter withdrawal stemmed from objections to early drafts of the new EC Control Regulation which implied the introduction of control measures to regulate angling activities. It was therefore decided to re-structure contract MF1203 to focus more specifically on the information needed to establish the design

and magnitude of recreational fishery surveys following the methodology in ICES (2009). The additional objectives for this aspect of the contract were:

1. Collate and evaluate all available information on populations, sampling frames and magnitude / distribution of recreational fishing activities relevant for designing a recreational fishery survey in the UK.
2. Evaluate the applicability and likely costs of different survey approaches described in the recent ICES Workshop on Sampling Methods for Recreational Fisheries (WKSMRF, ICES, 2009).
3. Develop a sampling scheme for inclusion in the UK National Programme for 2011-13, and trial a limited-scale application.

This report deals with the first of these revised objectives.

Objectives of the sampling schemes for marine recreational fisheries

The first step in designing a sampling scheme is to specify the objectives of the programme, such as target precision levels or specification of particular domains of interest. The objectives of a UK sampling scheme should include:

- 1) Estimation of quarterly recreational fishery harvests (removals) of cod and sharks in the North Sea and eastern English Channel, and bass and sharks in North Atlantic areas specified in Commission Decision 2010/93/EU. Large sharks will be taken exclusively from boats. (Recreational catches of eels (*Anguilla* spp) in all areas, and salmon in the North Atlantic, are principally freshwater activities under the control of fishery departments and environment agencies in the Devolved Administrations and are not covered here.)
- 2) Achieving a target precision level 1 for data collected under the DCF (CV of 20% on annual catches).
- 3) Estimation of the catches of stocks subject to recovery plans by recreational fisheries practiced from vessels flying the UK flag and from third country vessels in waters under UK sovereignty or jurisdiction, as required by the EC Control Regulation (Council Regulation (EC) No 1224/2009). Fishing from shore is not included.

Target populations and sampling frames

The target population for meeting the DCF objectives is all UK recreational fishermen and visiting recreational fishermen catching the defined species in the defined areas relevant to the UK, as specified in the DCF legislation. The sampling frames and primary sampling units providing access to the population for sampling will vary according to the availability of suitable list frames (e.g. lists of known charter or for-hire vessels, or lists of angling club members). Where no direct lists are available (i.e. the population is not defined), indirect sampling frames will be required, for example:

- Telephone number lists for random digit dialling schemes to establish recreational fishery participation;
- Area lists defining sites where shore-based or boat-based recreational fishermen can be intercepted for sampling.

For the EC Control Regulation, the target population is all recreational fishery vessels flying the UK flag, and from third country vessels in waters under UK sovereignty or jurisdiction, and which take species subject to EU recovery plans. Clarification is currently being sought as to the definition of “vessels flying the national flag” in the context of recreational fisheries. The sampling frames for these vessels are expected to be list frames of vessels whose owners can be contacted directly or by telephone to establish the nature of their activities.

In order to better define the target populations, a detailed literature review was conducted based on previous surveys of marine recreational fishing in UK waters. The review is given in the following section.

Defining the target populations and their characteristics based on previous surveys

The quantification of the participation and catch of the marine recreational fishery in the UK has received little attention from governments and research institutions compared with the data collection effort for commercial fisheries. A principal focus of most studies has been to evaluate the socio-economic impact of the recreational sector but this has not been extended to any extensive biological impact assessment. The studies drawn upon in the present report are given in Table 1 together with the sampling method and sampling coverage.

Drew Associates report (2004)

The most up to date and extensive report on the recreational sector has been produced by Drew Associates (2004) entitled “Research in to the Economic Contribution of Sea Angling”. The primary function of the report was to evaluate the significance of sea angling economically in England and Wales. The survey involved:

- A telephone (“omnibus”) survey of over 10,000 households providing regional and national estimates of participation rates. (An omnibus survey is a general population survey where payments are made to add questions on a particular subject).
- A much smaller scale intercept and postal questionnaire survey to gather more in-depth economic data, with questions gathering biological data also included. An estimation of catch rates (fish per trip) for different platforms (e.g. shore-based and boat-based) were made from these surveys but unfortunately this was not down to species level.

The telephone survey allowed the chance to sample less avid anglers to a greater extent than an intercept survey approach, meaning that despite the potential recall bias inherent in a telephone survey, the Drew report was able to give one of the better estimates of effort (days per year) for any of the currently available reports.

Cappell and Lawrence report (2006).

This report collated data on recreational fishing in the South West of England for inclusion in a “cohesive management strategy” for this region. It used a relatively limited telephone and intercept survey based on a fishing club membership list (<200 observations) together with participation rates based on those produced by Drew (2004). The report attempts an estimation of total angling catch of different species in the South West, including cod and bass. Limitations of the methods include potential recall bias in data on catch rates, avidity bias due to sampling only fishing club members, and the validity of some assumptions made.

Countryside Commission of Wales study (Goudge *et al.* 2009).

This pilot study used an intercept survey to quantify sea angler activity in North Wales. Overall participation was not estimated, and fishing effort was estimated from recall answers. However the project did attempt to accurately record the catch of participating anglers.

Dunn *et al.* study (1989)

This study estimated the bass catch of anglers in England and Wales (excluding NE England where bass were not present at the time) based on intercept and postal surveys. Despite the age of the report, it is still the most statistically sound quantification of total catch for any species taken by UK sea anglers. The data were collected by an intercept survey, accounting for avidity bias. Participation rates were obtained from the 1980 National Angler Survey. The results may suffer from some recall bias, as fishing effort and catch quantities of bass were recalled from the previous year by participants. The report is also useful in producing effort estimates for all anglers in the region surveyed despite the study being targeted at bass angling.

Smith *et al.* study, 2009 (draft manuscript)

This angler survey was conducted in relation to the establishment of marine conservation zones in England, using intercept, postal and internet surveys covering NE, NW and SE England. Data on effort and catch were also gathered during the intercept survey. The survey included some limited coverage of boat anglers, particularly charter boat anglers. The results were weighted to account for avidity bias.

Other studies

Two reports have been published assessing the economic impact of recreational sea angling in Wales and Scotland. The report to the Welsh National Assembly by

Nautilus Consultants (2000) on inland and sea fisheries in Wales contains a brief section on sea angling which attempts to estimate the number of sea anglers in Wales based on consultation with sea angling experts. The Radford *et al* (2009) report to the Scottish Government is an extensive report on the economic impact of recreational sea angling in each region of Scotland. Although the report focuses on economics, it provides figures of participation rates and fishing effort based on an omnibus telephone survey of 15,000 adults in Scotland. This approach is similar to Drew (2004) making the participation rate and effort estimates similarly robust.

A National Angling Survey has been conducted at roughly 10-year intervals in England and Wales by a number of different public bodies. The aim is to gather information to facilitate inland recreational fisheries management, but the survey provides data on participation rates for sea angling. The survey was completed in 1970, 1980, 1994 and 2005. The Environment Agency (Simpson and Mawle, 2005) National Angling Survey report “Public Attitudes to Angling” was based on a face-to-face omnibus survey of 1839 adults and 419 under-16’s, weighted to be representative of the population for gender, age, social grade and region.

Cefas bass logbook scheme

Cefas has operated two independent logbook schemes to quantify the catches of bass in the inshore fishing fleet in England and Wales. The first is targeted primarily at inshore commercial fishing vessels (10m and under) that do not have to submit EC logbooks, and for which catch data have historically been poorly quantified. The logbook scheme involves two stages:

1. A coast-wide survey of the inshore fishing fleet carried out by a consultant, to estimate the number of vessels that catch bass;
2. Completion of logbooks by a random selection of vessels identified from the port survey as catching bass.

The logbook scheme has been used for computing bass landings by the inshore fleet for use in scientific assessments (Pawson, Kupschus and Pickett, 2007). A similar approach could be adopted for angling charter vessels, although the logbook scheme has unfortunately been terminated in 2010 due to funding cut-backs.

The second scheme has involved completion of logbooks by anglers volunteering to participate in the scheme (Defra contract MF1203). Uptake of this scheme has however been very low, partly due to withdrawal of support by an influential angling body when proposals were being drafted for inclusion of articles on recreational fishery catches in the new EC Control Regulation.

Table 1 – Overview of the literature available on recreational sea fishing in the UK

Authors	Commissioning Agency	Published Date	Sampling Dates	Area Covered	Type of Survey	No. of Anglers Sampled
Drew Associates	Defra	2004	Jul - Oct 2003	England & Wales	Household Omnibus Telephone	10,980*
					Intercept	514
					Postal	383
Cappell & Lawrence	Invest in Fish SW	2006	Summer 2004	SW England	Intercept	138
					Telephone	176
Goudge <i>et al</i>	CCW	2009	Dec 2007-Mar 2008	N Wales	Intercept	124
Dunn <i>et al.</i>	MAFF	1989	Bass season 1987	England & Wales (except NE England)	Intercept	406
					Postal	98
Smith <i>et al.</i> **	Natural England / Cefas	-	Jan 2009	NE, NW & SE England	Intercept, Postal, Internet	286
Radford <i>et al.</i>	The Scottish Government	2009	-	Scotland	Omnibus Telephone	15,037
Nautilus Consultants	National Assembly for Wales	2000	-	Wales	"Sea Angling Specialists" opinions	-

Authors	Commissioning Agency	Published Date	Sampling Dates	Area Covered	Type of Survey	No. of Anglers Sampled
Simpson & Mawle	Environment Agency	2005	Mar - Apr 2005	England & Wales	Omnibus Intercept	2,258
National Rivers Authority	National Rivers Authority	1995	1994	England & Wales	Household	7,436
National Angling Survey	-	1980	-	England & Wales	-	-
National Angling Survey	NERC	1970	-	England & Wales	-	-

* Omnibus survey sampling unit households not individual anglers.

** Unpublished Cefas draft report

Overall Participation

Five independent estimates of the participation in sea angling in England & Wales since 1970 range from 1.1 to 2.0 million people, with no obvious trend over time (Table 2).

Table 2 – Estimates of the total number of sea anglers participating at least once a year in the surveyed region.

Report	Year of Survey	Regions Surveyed	Estimated Number of Sea Anglers
Drew Associates 2004	2003	England & Wales	1,450,000
Simpson & Mawle 2005	2005	England & Wales	2,035,705
National Rivers Authority 1995	1994	England & Wales	1,104,000
National Angling Survey	1980	England & Wales	1,791,000
National Angling Survey	1970	England & Wales	1,280,000
Radford <i>et al.</i> 2009	2009	Scotland	98,634
Nautilus Consultants 2000		Wales	12,000*
Dunn <i>et al.</i> 1989	1987	England & Wales (except NE England)	490,300**

* Based on the opinion of 2 angling specialists

** Number of bass sea anglers

The Drew (2004) telephone survey of 10,980 households out of 22.2 m households in England and Wales indicated that 5.02% of the households had participated in sea angling in the previous year. Accounting for households with multiple sea anglers resulted in the estimate of 1.45m anglers. The Simpson and Mawle (2005) study based on a much smaller sample of people using face-to-face interviews indicated a similar participation rate (4.6% of the population of England & Wales).

The Radford *et al.*(2009) review of sea angling in Scotland estimated a participation rate of 1.7% of resident Scottish adults (18+) and 4.8% of under-18 year olds. The number of youth anglers was obtained using data on the ratio of adult to youth participants based on a leisure and time use survey in 2000.

The Nautilus Consultants (2000) study produced an estimate of 12,000 sea anglers in Wales, which was not based on any sample of the population but rather through consultation with a local angling journalist and the Chairman of the Welsh Federation of Sea Anglers. This estimate is much lower than given by the regional breakdown of the participation rates in Wales from the omnibus survey in Drew (2004) which estimated that 89,500 households took part in sea angling. Even if each household is assumed to have just one sea angler, then this is still about 7.5 times the estimate by Nautilus Consultants.

Regional Participation

The Drew (2004) study indicated that the highest participation rates in sea angling in England and Wales were for households in Wales and in the NE, SE and SW of England (Table 3). This may be expected due to their proximity to the coast. These estimates do not reflect the locations where anglers actually participate in angling.

Dunn *et al* (1989) quote figures from the 1980 National Angling Survey (NAS) that also show regional variations in participation in sea angling in England and Wales (Table 4), although the regional distribution differs in detail from the more recent data in Drew (2004).

Table 3 – Regional participation and estimated number of households participating at least once in the previous year from Drew (2004) omnibus survey.

Government Region	Participation %	No of Households Fishing in Previous Year	Mean No. of Days Fishing per Year
North East	7.1	78,100	9.56
North West	4.5	129,600	14.86
Yorkshire and Humber	4.1	87,700	14.43
East Midlands	3.1	54,600	4.91

West Midlands	3.2	70,100	2.97
East England	4.1	93,500	16.15
London	4	125,200	4.87
South East	6.1	207,400	10.41
South West	8.7	184,400	13.99
Wales	7.4	89,500	15.98

Table 4 - Regional participation of all types of angling, and the percentage of sea anglers fishing in the previous year, from the 1980 National Angling Survey (from Dunn *et al* 1989)

Region	No. of Anglers Fishing in Previous Year	% of Angling Population who went Sea Angling	No. of Sea Anglers
North	128,000	78%	99,840
Yorkshire and Humberside	321,000	68%	218,280
East Midlands	244,000	22%	53,680
Eastern	379,000	42%	159,180
Greater London and South East	622,000	44%	273,680
Southern	294,000	63%	185,220
South West	312,000	76%	237,120
West Midlands	375,000	30%	112,500
Wales	22,3000	78%	173,940
North West	377,000	43%	162,110
		Total	1,675,550

Participation by angling platform

The Drew (2004) survey in England&Wales and the Cappell and Lawrence (2006) survey in southwest England indicated that the bulk of anglers fish from the shore, with private boats making up the next most popular mode of sea

angling (Table 5). Results from surveys of fishing club members differed from the results from telephone and intercept surveys of the broader population. However the variance around those estimates based on relatively small samples may be large.

Table 5 – Percentage of the sampled population participating on the different platforms.

Platform	Drew Associates 2004		Cappell and Lawrence 2006	
	Omnibus Telephone	Club Postal	Intercept	Club Telephone
Shore	54%	43%	70%	63%
Private Boat	23%	27%	16%	24%
Charter Boat	22%	15%	14%	13%
Multiple Platforms	-	14%	-	-

Fishing effort

A number of the studies have attempted to estimate fishing effort due to its requirement in any economic calculations. The standard unit used amongst the reports has been days per year or trips per year, with the reasonable assumption that 1 trip equates to 1 day. Due to participants being asked to recall the amount of days or trips over the previous year, all the estimates will have suffered from recall error/bias. In some cases the sample sizes are extremely small, and are separated by up to two decades, and only the general consistencies across studies should be considered.

The majority of the reports have estimated effort for three different platforms or types of recreational sea angling, namely shore, private boat and charter boat sea angling. The results show considerable variability depending on survey type and fishing platform (Table 6). The intercept surveys and postal surveys of club members conducted by Drew Associates (2004), Cappell & Lawrence (2006) and Goudge *et al.* (2009) provide generally similar estimates of 42-66 days per year for anglers who predominantly fish from the shore, 51-78 days for private boats, 23-30 days for charter boats and 46-55 days for anglers who spread their activities over multiple platforms. In contrast, the Drew Associates (2004)

telephone survey indicated only 14 days for shore fishing, 12 days for private boats and 5 days for charter boats, averaged over households where angling was recorded. These figures are closer to the avidity-bias weighted results of Dunn *et al.* (1989) and Smith *et al* (draft report) which indicated 18 – 19 days for shore anglers, 4 – 18 for private/charter boats and 25 for mixed platforms. Cappell and Lawrence (2006) state that their estimates are affected by avidity bias and give a method to weight the results for this effect, but do not report a weighted effort estimate.

Goudge *et al* (2009) only reported an estimate for shore anglers due to the limited amount of sampling of boat anglers. They calculated average hours per year for predefined categories of anglers as estimated number of trips per year multiplied by the estimated average trip length. Unfortunately the average number of trips per year was not reported but could be calculated from the given results (see Table 9).

Table 6 – Estimates of the yearly angler effort for platforms predominantly used. Brackets give indication of error or sample size.

	Drew Associates (2004)			Cappell & Lawrence (2006)
	Omnibus Telephone	Intercept	Club Postal	Intercept
Unit	Days Angling a Year per Household	Days Angling a Year per Angler		Days Angling a Year per Angler
Shore	13.62	64 (se ± 3.44)	65.7 (se ± 4.435)	41.6 (sd-29.1)
Private Boat	12.41	78 (se ± 5.52)	45.2 (se ± 5.46)	50.8 (sd-25.5)
Charter Boat	4.96	30.3 (se ± 5.36)	23.3 (se ± 7.34)	27 (sd-26.7)
Multiple Platforms	-	46.4 (se ± 9.46)	52.1 (se ± 7.76)	54.5 (sd-29.9)

	Goudge <i>et al.</i> (2009)	Dunn <i>et al.</i> (1989)	Smith <i>et al.</i> (draft report)
	Intercept	Intercept	Intercept
Unit	Angling Trips a Year per Angler	Avidity Weighted Angling Trips a Year per Angler *	Avidity Weighted Angling Trips a Year per Angler
Shore	56.9 (n = 121)	19 (n=404)	17.8 (n=203)
Private Boat	-	4 (n = 108)	16 (n=47)
Charter Boat	-		11.6 (n=8)
Multiple Platforms	-	-	25.1 (n=20)

*1987 estimate used in table.

The Dunn *et al* (1989) study did not make a distinction between different boat angling platforms and produced an estimate for all boat angling. Their estimates are much smaller than the private boat estimate from the Drew omnibus survey (Table 6) but are almost identical to the charter boat estimate of Drew Associates (2004). The methods adopted in the two studies are however different: Dunn *et al* asked anglers how many trips they made shore fishing and boat fishing during the survey period. In contrast, Drew Associates asked interviewees their main type of fishing, and allocated all the fishing effort of the interviewee to that platform.

The Radford *et al* (2009) omnibus telephone survey in Scotland produced an effort estimate as part of the economic review. The estimates do not distinguish fishing platforms. However the trimmed mean estimate of 16.85 days per year is of similar order of magnitude to the Drew Associates (2004), Dunn *et al* (1989) and Smith (draft report) estimates for England and Wales using a similar telephone survey or avidity-adjusted data from intercept surveys.

These results of the avidity-adjusted and non-adjusted results indicate that effort per angler is highly skewed. Since avid anglers (by definition) spend considerably more time fishing than less avid ones, intercept surveys will over-sample the more avid anglers in relation to the population of anglers as a whole, because the probability of the sampler encountering an avid angler is much higher. Studies which have tried to counteract the avidity bias using weighting statistics (Dunn *et al* 1989; Smith *et al*, draft report) are therefore more likely to provide effort statistics that can be applied to overall population estimates of anglers unless both the population estimates and the samples can be accurately stratified by avidity.

Catch per Unit Effort

Some of the studies under review provide estimates of catch per unit effort (CPUE). The Drew Associates (2004) survey gives numbers of all species caught per trip. Cappell and Lawrence (2006) and Smith *et al* (draft report) estimated catch per trip for cod and bass, and Goudge *et al* (2009) reported a catch per year estimate for cod (Table 7). The latter can be converted to catch per trip using data in the report (Table 8).

The estimates are expected to suffer from recall error when interviewees are asked to recall the number of fish they caught over the last year or to estimate the average number of fish caught per trip. Cappell and Lawrence (2006) found that anglers appeared to overestimate their catch per trip, forgetting the blank

trips and remembering the particularly good trips. Memory recall of average catch per trip over a full year is also likely to be biased if there is a strong seasonality in catch rates, in addition to the difficulties in recalling both catch and effort many months after the event. Recall bias is known to be a serious and often large source of bias in any recreational fishery survey, and measures to reduce it have been developed (such as the use of telephone diary approaches in Australia where the interviewee has been asked to maintain a personal logbook as a “memory jogger” for subsequent telephone interviews) (ICES, 2009).

The estimates of CPUE produced by Cappell and Lawrence (2006) - 2.9 cod and 2.5 bass per trip – are for all types of fishing combined but it is not clear if this applies to all trips or only to trips where the species was targeted or caught. The figures are not corrected for avidity bias. Smith *et al* (2009) produced much lower figures for shore fishing (0.27 cod and 0.4 bass per trip) and private boats (1.68 cod and 0.5 bass per trip) from relatively small samples of anglers, but made adjustments for avidity. The estimates for bass calculated from the data given by Dunn *et al.* (1989) were even lower (Table 7). The derivation of the Dunn *et al* figures are in Table 8. The CPUE will of course respond to changes in abundance which are likely to be marked over the two decades between these studies.

The estimate from Goudge *et al* (2009) of 28.19 cod caught per year by shore anglers in Wales in 2007, recalled by anglers the following year, is high considering that only two cod were caught by the interviewees during the 3 month interview period. The surveyors and participants were recording catches on a per trip basis during this period, which covered the main cod fishing period. Dividing the annual figure by the estimated number of trips per year gives a CPUE of 0.5 per trip in 2007 (Table 9), which is comparable to the figure given by Smith *et al* (draft report) for the three areas of England covered by their study. A much higher figure for cod of 3.03 cod per trip can be derived from Goudge *et al* figures of 5.76 hours per angling trip and 0.53 cod caught per hour. However the catch per hour is likely to be even more susceptible to recall bias than catch per year, and is likely to be an over-estimate.

Table 7. Catch per unit effort estimates for cod and bass. Brackets give indication of error or sample size)

	Drew Associates (2004)	Cappell & Lawrence (2006)	Smith <i>et al.</i>(draft report)
Unit	Number of Fish Caught per Trip	Number per Day	Weighted Catch per Trip
Shore	5.11 (se±0.42)	Cod - 2.9 Bass - 2.5	Cod - 0.27 (n=124) Bass - 0.4 (n=72)

Private Boat	12.94(se±0.61)		Cod - 1.68 (n=36) Bass - 0.5 (n=27)
Charter Boat	12.52 (se±0.68)		-
Multiple Platforms	10.77(se±0.94)		-

	Goudge et al.(2009)		Dunn et al. (1989)
Unit	Number per Year for 2007	Catch per Trip	Calculated "Minimum" ** Number per Trip
Shore	Cod - 28.19 (n=114)	Cod - 0.5* Cod - 3.03*	Bass - 0.09*** (n=327)
Private Boat	-	-	Bass - 0.16*** (n=119)
Charter Boat	-	-	
Multiple Platforms	-	-	-

* Calculated from data published in report see Table 9

** Term minimum used because anglers asked for number of successful trip

***Calculated from data published in report see Table 8

Table 8 – Bass CPUE calculations using reported data from Dunn *et al* (1989)

shore	"Minimum" total bass caught in 1986	1439	0.09	Bass per trip
	total number of trips in 1986	16627		
boat	"Minimum" total bass caught in 1986	179	0.16	Bass per trip
	total number of trips in 1986	1113		

Table 9 – Calculations of cod CPUE by trip using estimates from Goudge *et al* (2009)

Total hours per year*	328.06	56.9	Trips per year
Hours per angling trip*	5.76		
Trips per year	56.9	0.5	Cod per trip
Mean number of cod caught in 2007*	28.19		

* Estimates published in report

Reported estimates of CPUE need to include retained and discarded fish if they are to be used as an index of abundance, but need to be separated into retained and discarded components if the data are to be used for deriving total retained or discard quantities from independent estimates of effort. Survival rates of discards become an issue if total removals are to be estimated. Estimates of percentage of fish retained are quite consistent between studies, and vary around 30-40% in Drew Associates (2004: all species), Dunn *et al* (1989: bass) and Cappell and Lawrence (2006: cod and bass) (Table 10).

Table 10 – Retention rates of catch by recreational sea anglers

	Drew Associates (2004)		Cappell & Lawrence (2005)	Dunn <i>et al.</i> (1989)
Unit	No. of retained fish per trip	% of caught fish retained*	% of catch retained**	% of caught bass retained
Shore	1.62 (se±0.24)	32%	Cod – 40% Bass – 29%	41%
Private	5.07 (se±0.35)	39%		48%
Charter	4.8 (se±0.39)	38%		
Multiple	4.19 (se±0.54)	39%		

* Calculated from the number of fish caught and retained per trip reported by Drew (2004)

** Participants were asked the percentage of their catch that was returned, the reported percentage has been inverted to get a comparable retention rate.

Total Catch

Estimates of total catch are of particular importance for considering the need for, or magnitude of, recreational fishery surveys for particular species. Unfortunately this has not been an objective of most of the studies reviewed. There have been two attempts at quantifying certain parts of the recreational sea angler catch. Dunn *et al* (1989) estimated the bass catch in England and Wales, and Cappell and Lawrence (2005) produced estimates for the most popular species caught in South West England. Both used information on catch collected from recall questions over the previous year and are therefore susceptible to recall bias.

The Dunn *et al* (1989) data were weighted to adjust for avidity bias in effort and catch, and used the average size of fish given by shore anglers and the available logbook data for boat fishermen as the basis of the mean weight of bass caught. Certain groups of participants were only asked for the number of trips on which bass was caught, and therefore had no CPUE data for the successful trips. An assumption that only one bass was caught by this group per successful trip gave a “minimum” estimate of 660 tonnes of bass caught in 1986 by all recreational sea anglers (Table 11). The “maximum” catch of 694 tonnes was obtained by assuming that the group with no catch data had a CPUE on successful trips equivalent to the CPUE for the group with catch data, adjusted by the ratio of the success rates of the two groups.

The Cappell and Lawrence (2006) study uses CPUE figures for cod and bass that may be over-estimates due to recall bias and lack of avidity adjustment. The average weight of caught fish was also based on experts advice rather than sampling. They estimated that resident and non-resident anglers caught 230 tonnes of cod and 250 tonnes of bass in the South-West of England during the study period (Table 12).

Although some of the statistics from the reviewed studies are fairly consistent (e.g. numbers of anglers; breakdown of activities between shore and boat fishing; retention rates) the figures for effort and CPUE are very variable, are often from small sample sizes, suffer recall bias, and are not consistently corrected for avidity bias. It is therefore not possible to determine how representative they are of the population of anglers as a whole and could give a misleading picture if applied to the overall angling population estimated from nationwide telephone surveys.

Table 11 – Dunn *et al.* (1989) estimates of recreational sea anglers' bass catch in England and Wales in 1986

1) Bass Angler Population, based on 1980 National Anglers Survey

	Percentage of bass anglers in survey (%)	Avidity weighted* percentage of bass anglers in survey (%)	Total population of bass anglers
Bass Anglers	41.6	37.6	490300

2) Fishing effort for anglers sampled

	Sample mean no. of trips per year	Population (avidity weighted) mean no. of trips per year
Bass shore anglers	27.1	7.6
Bass boat anglers	11.2	4.6
Non-bass shore anglers	50.8	21.2
Non-bass boat anglers	9.4	3.5

3) Population estimate of bass catch in weight

	Estimated bass catch (tonnes)	
	"Minimum"	"Maximum"
Bass shore anglers	397	
Bass boat anglers	116	
Non-bass shore anglers	143	177
Non-bass boat anglers	4	4
Total	660	694

Table 12 – Cappell and Lawrence (2006) calculations of South West England recreational sea angler catch of bass and cod

	Average Catch per Day	% Released	mean fish wt (kg)	CPUE (kg/trip)*	No. Targeted Trips***	Total catch per year (tonnes)	
						Residents only	All Anglers**
Cod	2.9	60	1	1.5	115,000	172	229
Bass	2.5	71	0.65	0.7	273,000	187	249

* Estimated average catch weight from angling literature and discussion with experts

** Based on a 90% survival rate of returned fish

*** Top 3 targeted species allocated a descending proportion of the total number of trips; assumed fish caught only on targeted trips

**** Assumed visiting anglers catch the same and at the same rate as resident anglers

Recommended sampling approach.

Charter boats and for-hire boats

Sampling should be based on stratified random selection of vessels in a list frame established from vessels registrations or through local knowledge of fishery inspectors. An initial telephone census of vessel owners should be used, together with face-to-face interviews where possible, to establish the activities of the vessels for the purposes of developing a suitably stratified sampling scheme.

Shore and private boat fishermen

The ability to estimate the population numbers of shore and private boat recreational fishermen with acceptable precision using stratified random intercept surveys is likely to be impacted by the length and varied nature of the UK coastline, the patchiness of angling activities, and day-night fishing patterns. In the absence of a licensing or permit scheme that would provide full lists of known anglers by area, the following options are possible:

1. Nation-wide stratified random digit dialling telephone surveys to estimate the overall population of recreational fishermen in the UK. The most accurate procedure is to have several in-year waves of surveys, which act to reduce recall bias and also increase the probability of contacting individual fishermen. Such surveys are conducted in the USA and in France (ICES, 2009). Although a large-scale telephone survey series can establish the population of recreational fishermen and collect information on recent fishing effort and catches, it excludes visiting anglers and is problematic where households have only mobile numbers which are not area-linked.
2. Intercept sampling scheme involving stratified random or systematic/random visits to sites providing access to clusters of recreational fishermen operating along defined stretches of coastline. The primary sampling units would be coastline segment x day. This could be a roving design (the surveyor travels along the coast and interviews all or a representative sample of anglers encountered) or a fixed intercept location design where anglers are intercepted in a location such as a car park beside an angling site or at a landing site for private boats.
3. Collection of data for registered fishing club members. There are many fishing clubs in the UK for which membership lists could be obtained, allowing direct access to a known sector of the angling community. As these are likely to have many of the more avid anglers, they would be a biased sample of the angling community as a whole. However, the club sector could be treated as a separate stratum.

It is likely that the design of intercept surveys would evolve as knowledge is accumulated. A suitable initial approach may be a year of surveying with wide coastal coverage but a minimum sufficient sampling intensity to characterise the fishery participation and catch rates. The results of such a survey would require avidity-bias correction but would be relatively free of recall bias, and would provide data allowing computation of more optimal sampling design to achieve desired precision levels. Such sampling would ideally be carried out by regional operators with accurate knowledge of local recreational fisheries.

Conclusions

The following conclusions can be drawn from the recreational fishery studies reviewed in this report, for designing surveys as required by the DCF and the EU Control regulation:

1. Recreational sea angling is a widespread activity around the UK coastline (1 – 2 million anglers, with regional variations as shown for example in Table 3).
2. The largest participation is shore angling, although average catch rates are smaller than reported for boat fishing.
3. No studies are available that provide information on non-angling recreational fishery catches.
4. Effort and catch rates are skewed, with avid anglers accounting for a disproportionate fraction. All intercept surveys require adjustment for the over-representation of the more avid anglers who fish more often.
5. Recall bias is a major source of error, and any sampling scheme must include elements to minimise the bias. Any dependence on memory recall should be limited to the immediate past.
6. As there are no complete lists of UK recreational fishermen, large-scale telephone surveys remain the only feasible approach to estimating the total population of resident sea anglers who go shore fishing or use private boats. However the “omnibus” type surveys (where a payment is made to add questions to a more general population survey) is probably an inefficient method of collecting data on recreational fishing due to the limited number of questions possible, the possibility of recall bias, and the inability to prescribe stratification schemes appropriate for angling. However it could potentially be used to recruit anglers to a more appropriately stratified “telephone diary” type approach (ICES, 2009) to minimise recall bias, if sufficient funding is available.
7. Intercept surveys for shore and private-boat anglers are a possible alternative to telephone surveys for quantifying overall angling effort and catch, and provide the most accurate data on catch composition and discarding with minimal recall bias. However, such a survey would require a substantial sampling effort to quantify catches by species at the required precision (CV of 20% on annual estimates), and with minimal bias, given the relatively long and varied coastline and the spatio-temporal variability in catch rates and catch composition. The very variable results in the reviewed studies arise partly from small sample sizes and localised sampling. Further work is needed in the present project (Defra MF1203) to predict sampling levels needed to achieve this precision, and optimal allocation of sampling effort.
8. The fleet of vessels available for angling charters can be established with sufficient completeness to allow a sampling scheme based on a suitably stratified list frame.
9. The available data are not sufficient to design a fully optimised sampling scheme for the UK coast. It is recommended that the initial

- year of coast-wide sampling is designed primarily to provide the information on spatio-temporal variability needed to develop more optimal sample design and allocation, and cost-benefit in terms of achievable precision. Lists of angling club membership could be used for defining a separate stratum of anglers who can be subject to a restricted telephone survey.
10. It is likely that several waves of nation-wide stratified random digit dialling telephone surveys would be needed to estimate the overall population of recreational fishermen in the UK.

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Fisheries Science Partnership: 2009/10

Final Report

Whelk Biology

Prepared by:

Andy Lawler and Belinda Vause

Cefas, Lowestoft and Sussex SFC



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December 2009.

Summary

The fishing vessels *Tomkat of Selsey* and *Beachy Head* were chartered in September 2009 to carry out two potting surveys in the whelk fisheries in two areas off the Sussex coast in the eastern English Channel. The main objective was to investigate the population structure of whelks spread throughout the two survey areas, one off Selsey (West Sussex) and the other off Eastbourne (East Sussex). A trial mark-recapture experiment was set up in each area to test the feasibility of using this type of methodology to assess exploitation rates and population sizes in these fisheries. Additionally, samples of whelks were collected and a sampling programme initiated to determine various aspects of whelk reproductive cycle and growth rate.



Volume of whelks caught, numbers measured and gear hauled during each of the two potting surveys.

Dates	Vessel	Area	Stations or fleets	Number of pots hauled	Typical number of pots per fleet	Volume of whelks landed (baskets)	Number of whelks measured
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11 - 19 September 2009	<i>Tomkat of Selsey</i>	Selsey	35	1750	50	81.4	13 662
24 – 30 September 2009	<i>Beachy Head</i>	Eastbourne	56	5600	100	83.3	26 650

Catch rates of whelks on both surveys were generally low and although typical for the time of year in which the surveys were undertaken, are atypical of those that could be expected at the peak of the season.

Catch rates of whelks of commercial size were generally larger in the western survey area off Selsey, especially at sites east of Selsey Bill. The sites yielding the best catch rates from the Eastbourne area were generally just off Sovereign harbour and Pevensey Bay. The size range of the catch was larger from the eastern area, but the mean size of whelks in the catch was higher in the western area.

The standard commercial gear used for these surveys fished very cleanly with only extremely low numbers of by-catch species taken.

Typical whelk traps, as used on the potting



This Fisheries Science Partnership survey was planned to provide data on the variation and distribution of catches of whelks, as well as the size compositions of the catch. The monthly sampling programme initiated during the surveys will provide growth data that can be combined with the size compositions to provide estimates of whelk mortality rates. The trial mark–recapture experiments carried out in both areas suggest that given certain practical considerations, a full-scale application of the methodology in future may provide useful information on population size and exploitation rate.

Introduction

The Fisheries Science Partnership (FSP) was established in 2003 to build relationships between fishermen and scientists, and to involve fishermen in the co-commissioning of science. The FSP is funded by the UK's Department for Environment, Food and Rural Affairs (Defra).

Traditionally, the whelk fisheries in the eastern English Channel have been exploited at modest levels for food and bait. Over the past two decades they have become an increasingly valuable alternative source of income for some crab and lobster fishermen, especially during winter when the other fisheries may yield less. Recently, some fishermen have become more reliant on the whelk as the local crab fisheries suffered from poor catches and prices. In some cases this extended the traditional season for the whelk fishery and increased the level of fishing effort on the whelk stocks. Aspects of whelk biology make the species potentially susceptible to both growth- and recruitment-overfishing, and the perceived increase in fishing effort has led to concern among some industry members about the sustainability of the fisheries. This concern led the industry, via the Sussex Sea Fisheries Committee, to propose that an investigation be undertaken as part of the 2009/2010 FSP programme.

The main objectives of this project were to investigate the population structure of whelks within the inshore static-gear fishery of both the Selsey and Eastbourne areas of the eastern English Channel; to trial a mark-recapture experiment in both areas to ascertain the potential of the methodology to determine the exploitation rate and the population size; and to design and initiate a monthly maturity sampling programme to determine the size at sexual maturity and the seasonality of the reproductive cycle.

This report presents the results of the potting surveys carried out on whelk grounds off the Selsey and Eastbourne coasts between 11 and 30 September 2009 as part of the 2009/10 FSP programme. The whelk fisheries are located in the general vicinity of the mixed fisheries for brown crab and lobsters; although specific gear is used, some of the habitats occupied by each stock may overlap. The project used the commercial fishing vessels *Tomkat of Selsey* (skipper Chris Wilson) for the western area and *Beachy Head* (skipper George Piper) for the eastern area.

The detailed operational plan was discussed at meetings between Cefas and the vessel skippers immediately prior to starting each survey. The detailed operational plans for the programme are given in Appendix 1.

Methods

Vessels and fishing gear



FV *Tomkat of Selsey* (P1010) is a multipurpose, aluminium catamaran, primarily equipped for potting, but also capable of netting. Overall length 9.88 m and breadth 4.66 m, with 420 kW main engine power provided by twin Doosan engines.



FV *Beachy Head* (NN748) is a fibreglass vessel equipped for potting. Overall length 11.83 m and breadth 5.19 m, with 189 kW main engine power provided by twin Gardner engines.

The FV *Tomkat of Selsey* typically fishes fleets of 50 pots approximately 18.3 m apart (~900 m fleets). The traps used were approximately 350 mm in diameter and 330 mm high, weighted with lead in the base. Escape holes were typically 23 mm diameter. FV *Beachy Head* deployed traps in fleets of 100 that are 16 m apart (~1600 m long), 380 mm in diameter and 350 mm high, with iron weights in the base. Escape holes in the sides were 12 mm diameter, and those in the base were 22 mm diameter. Bait for both vessels was various, but generally locally sourced shellfish and fish used in combination.

Survey design

The fishing surveys were designed to provide coverage of the whelk fisheries within the main areas exploited by the potting fleets operating out of Selsey and Eastbourne. The most intensive sampling was carried out in close proximity to these two ports, where much of the gear operated by the two survey vessels is situated during normal fishing operations. During the course of the fishing surveys, fleets of pots were moved farther from port to provide additional spatial coverage of the whelk grounds. The nature of static gear operations and potential conflicts with other fishing activities means that spatial coverage was not unrestricted during the survey period. For logistical reasons, the surveys were carried out outside the main whelk fishing season, and as such it is accepted that the catch rates observed, although representative for the time-period, are not typical of those at the seasonal peak of the fishery.

A truncated fleet of just 6 pots (183 m long) was fished in a locale within easy access of Selsey and another fleet of 20 pots was fished close to Eastbourne. These pots were used as sites for mark-recapture experiments using whelks marked with coloured rubber bands. Trip reports for both these subsurveys are included in Appendix 2.

Data capture and catch processing

Station details, including the skipper's interpretation of ground type (skipper-defined ground type), soak time, bait type and water depth were recorded for each site. At each site the catch was passed over each vessel's onboard sieving device (riddle) and separated into components for landing and to be discarded. The volumes of these two components were recorded and the shell heights of the whelks from a suitable subsample from each were measured to the nearest mm below using a Vernier caliper. Weights were recorded using a spring balance or estimated by a crew member (one basket of whelks weighs approximately 32 kg).



Photograph of a whelk shell showing the height measurement used throughout the survey.

A qualitative assessment of the species present in the bycatch was carried out throughout the survey. A more accurate assessment of the bycatch was also carried out by careful collection of the bycatch content of 5 pots per fleet at selected stations (five samples were taken from the Selsey area and ten from the Eastbourne area). Most of these were analysed at facilities onshore and the species composition quantified.

At the experimental sites, whelks were marked with coloured rubber bands (one colour per day) and released at a point midway between the two anchors of each experimental fleet. Initially, low catch rates at these sites necessitated using pre-marked whelks from an adjacent site to supplement release numbers. These fleets were hauled consecutively on each subsequent day of the survey, and the numbers of recaptures and unmarked animals were recorded.

Analytical methods

Spatial patterns in the variation in catch rates of whelks were examined by compiling maps showing the weight caught per fleet (standardised to 100 pots) for both the total catch (cpue) and landed component (lpue).

Size compositions for the catch were plotted and examined for each fishing operation and for the two potting areas separately. The mean size of the whelks in the catch at each site was determined and collated spatially. Length distributions were combined and raised to provide the size compositions for the total catch for each survey area. Two length-converted catch-curve methodologies were applied to these size compositions, using provisional growth data to provide estimates of total mortality for each area, both the linearized

catch curve method and the cumulative catch curve method of Jones and van Zalinge (Sparre, 1998).

Standardised catch rates of the total catch and the landed component (lpue and cpue) were conditioned using log-transformation and analysed with all available explanatory variables, using a generalized linear modelling technique to determine which factors most likely were influencing the catches. The factors provided by the skippers during the surveys included water depth and temperature, seabed type and soak time, and the extent of the tide as acquired from tide tables. The two survey areas were analysed separately. Initially, all available explanatory variables were used to describe the variability in catch rates, but sequential removal of the least influential factors based on analysis of variance left only those that described catch rates significantly.

A refined Lincoln–Peterson method was used to provide a provisional estimate of the population of whelks in the immediate vicinity of each experimental fleet.

The numbers of whelks in the population (N) is given by

$$N = \frac{(M + 1)(C + 1)}{R + 1} - 1,$$

where M is the number of animals captured and marked, C the number of animals captured on the subsequent operation, and R is the number of marked animals recaptured during the subsequent operation.

Results

Fishing stations

The fleet positions in Figure 1 were obtained by joining the positions of the end anchors taken from the vessels' GPS with a straight line. Owing to the close proximity of some fleets, others may partially obscure their position in the Figure.

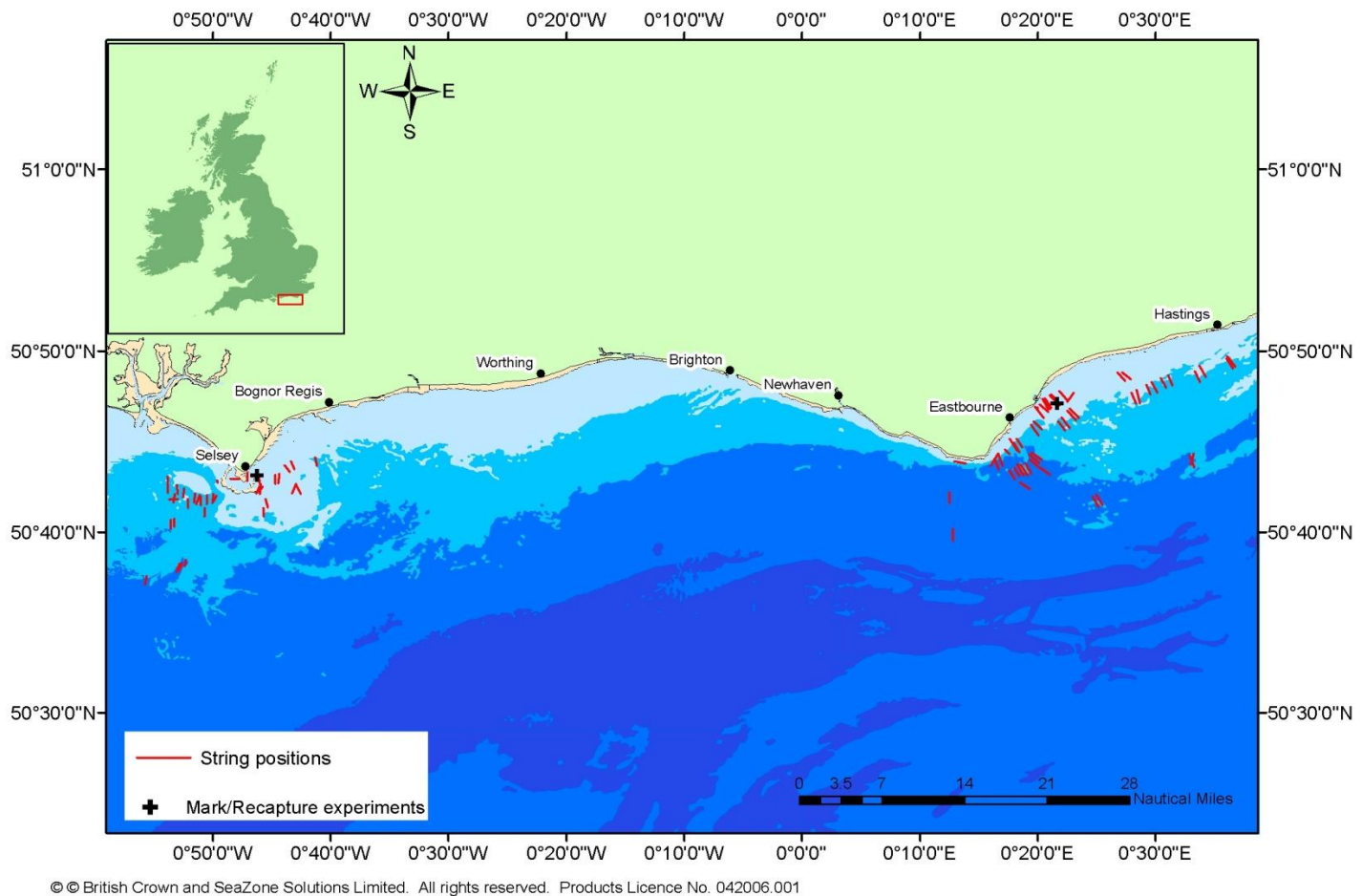


Figure 1. Sussex coast whelk biology. Fishing survey fleet positions in the Selsey and Eastbourne areas.

Distribution patterns

Distribution maps for the total catch standardised to 100 pots (cpue) are given in Figures 2 and 3, and those for the standardised landed component (lpue) are shown in Figures 4 and 5. The size of the symbols is proportional to the weight caught or landed at each station per 100 pots. The proportions of the catch that were landed, the mean catch rates, and the values of lpue by both survey areas, separately and combined, are shown in Figure 6. It is important to realise that the catch rates observed over the course of the surveys help describe whelk activity at that time, but that they do not predict the likely productivity of these sites during the remaining season. Both skippers commented that the timing of the survey was synchronous with the time of year when low catch rates would be expected.

Catch

Catch rates were generally higher from fishing positions in the Selsey area than in those from the Eastbourne area (mean cpue 235.4, cf. 70.4 kg per 100 pots). Of the stations around Selsey, the catch rates at those to the east of Selsey Bill and some positions farther offshore were generally higher than those to the west. The highest catch rates in the Eastbourne area were just off Sovereign harbour and Pevensey Bay. The lowest cpue was just 1.05 kg per 100 pots at a site around 3 nautical miles off Bexhill, and the highest was 452 kg per 100 pots from a fishing position adjacent to Pagham harbour.

Landings

The values of lpue were again generally higher from the Selsey area (mean lpue 147.7, cf. 47.0 kg per 100 pots), with those fishing stations to the east of Selsey Bill being much higher. The lpue from fishing positions close to Sovereign harbour and Pevensey Bay were the highest of those in the Eastbourne area. The lowest and the highest values of lpue observed during both surveys were at the same sites as those where the lowest and highest catches were observed (1 kg per 100 pots off Bexhill and 400 kg per 100 pots off Pagham harbour). Although lpue values were on average higher in the Selsey area, the proportion of the catch landed was higher for the fishing positions in the Eastbourne area (71% cf. 64%).

Population structure

More than 40 000 whelks were measured for the standard fishing survey work alone, allowing good quality length distributions to be constructed for each fishing site. For brevity, only combined size compositions for each area are included here. It is not practical to identify the sex of whelks in the field, so the length data listed are for both sexes combined.

A summary of the numbers and the size of the catch is given in Table 1, and the size distributions combined and raised to the total catch for each survey area are shown in Figure 7. The spatial distributions of the mean size of the catch for each survey area are shown in Figures 8 and 9.

Area	Number raised to catch in thousands	Mean size (mm)	Standard error of the mean	95% confidence interval	Smallest whelk (mm)	Largest whelk (mm)
Both areas	420	49.4	0.015	0.030	8	102
Eastbourne	216	46.8	0.024	0.047	8	102
Selsey	204	52.0	0.017	0.033	17	81

Table 1. Sussex coast whelk biology. Mean size and ranges for catch of whelks by survey area (standard error of the mean with 95% confidence interval included).

The mean size of whelks from both surveys was 49.4 mm, with whelks from the Selsey area being on average larger than those from the Eastbourne area (mean 52.0 mm cf. 46.8 mm). The combined and raised length distribution for both areas shows that the size composition for the Eastbourne area was wider, and with a pronounced positive skew (on the right). Therefore, although the largest whelks came from the Eastbourne sites (102 mm), there was a significant component of the catch <45 mm minimum landing size. This is somewhat in contrast to the proportion of the catch landed, and demonstrates different discarding practices by the two vessels. The smallest whelks, just 8 mm, were also taken in the catches off Eastbourne. The mean sizes of whelks in the landed component of the catch were similar for both areas at 58.3 mm and 56.4 mm for Eastbourne and Selsey, and 57.8 mm for both areas combined (standard errors for the means were 0.097, 0.082 and 0.41).

The two Length Converted Catch Curve methodologies applied to these data provide some insight into the mortality exerted on these populations, and are shown in Figure 10. The values of total mortality (Z) for Selsey estimated by each method are 2.25–2.62, and for Eastbourne 1.72–1.63 for the linearized catch curve method and the Jones and van Zalinge method, respectively.

Bycatch

Both of the types of whelk pots used during the survey fished very cleanly with very low numbers of other species present in the pots. The average by-catch per whelk pot, taken from five samples of five whelk pots from the Selsey area and from five samples of five whelk pots from the Eastbourne area are compared in Table 2. The results show the average weight of bycatch per pot in Eastbourne to be greater than twice the weight of bycatch in Selsey, but in three of the Eastbourne samples, *Maja brachydactyla*, the common spider crab, was present; these are relatively large heavy animals compared with the other bycatch species and this influences the results. In the samples where the common spider crab was not present, there was little difference in bycatch weight. An average of ~6 non-target animals was present per whelk pot in Selsey compared with 4 in Eastbourne. Molluscs were the most common bycatch phylum in Selsey, with the topshell *Gibbula cineraria* the most abundant. In contrast, crustaceans were the most common bycatch phylum off Eastbourne, with the hermit crab *Pagurus bernhardus* the most abundant. A photograph showing typical species present as bycatch is shown in Appendix 4.

Phyla	Selsey	Eastbourne
Crustaceans	1.88	3.12
Molluscs	4.36	0.52
Annelids	0.04	0.20
Echinoderms	0.00	0.24
Mean weight all Phyla per pot (g)	0.94	2.16

Table 2. Sussex coast whelk biology. Mean numbers of individuals per pot by phyla and survey area from five pot samples of bycatch. The bottom line entry is the mean weight of all bycatch per pot.

Mark-recapture experiment

A summary of the results of the mark and recapture experiment carried out off Selsey is presented in Table 3, and those for the Eastbourne area in Appendix 3.

Selsey			Recaptures			
date	Numbers released	band colour	White	Red	Blue	Unmarked
12/09/2009	710	White	0	0	0	0
13/09/2009	521	Red	0	0	0	477
14/09/2009	488	Blue	3	1	0	140
15/09/2009	-	-	16	19	0	81
18/09/2009	-	-	3	1	0	59
19/09/2009	-	-	0	1	1	292
22/09/2009	-	-	0	0	0	24 kg
24/09/2009	-	-	23	25	45	12 kg (est. 388)
26/09/2009	-	-	45	80	52	-
29/09/2009	-	-	6	38	37	-
02/10/2009	-	-	18	39	26	-
07/10/2009	-	-	43	53	35	-
23/12/2009	-	-	32	32	26	-

Table 3. Sussex coast whelk biology. Numbers of whelks marked and recaptured and captures of unmarked whelks by day fished during the mark-recapture experiment off Selsey. Shaded rows were post-survey data kindly provided by the skipper and crew.

Selsey

A total of 1719 whelks were marked with rubber bands over the first three days of the experiment. Owing to the very low catch rates, the natural population in the vicinity of the experiment had to be supplemented by whelks from another area. Recapture rates for the duration of the survey were very low and variable. The skipper kindly offered to monitor the experimental fleet after the survey and recapture rates improved five days later.

The population size in the vicinity of the fleet was estimated to be 4892, based solely on the white-banded animals and recaptures on 15 September. Using the recaptures of that day, but red-banded ones, the estimate becomes 3052. These estimates include the population after it had been increased by releasing animals from another area. Using recapture information from data provided post-survey when both recaptures and captures were higher (24 September) and using all releases combined gives a higher population estimate of 8818.

Eastbourne

In all, 1546 whelks were marked over the first three days, with a different colour on each day of the experiment. Very low catch rates were observed up to the last day of the survey (30 September). Again, the skipper kindly offered to monitor the experimental fleet after the survey. Using recaptures for the last day and the three different colours yielded three estimates of population size, 8080, 10 362 and 18 363. Again these estimates include the numbers of whelks which were added to the area from outside.

Factors influencing catch rates and lpue – linear modelling

Selsey

Sequential removal of the least influential factors until only significant variables remained suggest that the height of the tide and the water depth together describe 41% of the variance in whelk catch rates. Tidal height alone explained 21% of the variance in whelk lpue. The relationships are all positive, suggesting, for example, that higher catch rates are achieved during periods of bigger tides and in deeper water. None of the other factors provided additional explanatory power.

Eastbourne

Substratum type explained 46% of the variation in the catch rates of whelks (cpue). The average catch rate for fleets on soft, mixed and hard ground was 110.9, 59.5 and 30.1 kg per 100 pots. Substratum type alone explained 38% of the variation in lpue, with the average lpue for soft, mixed and hard ground being 68.8, 44.3 and 22.3 kg per 100 pots.

Discussion

Anecdotal information and official fisheries statistics suggest that the whelk fisheries in the eastern English Channel are under increasing fishing pressure. The primary purpose of this project was to initiate research that will eventually lead to a better understanding of the exploitation of whelks in the region. Data collected during the surveys and from the monthly maturity sampling will provide information about the likely affect of any new management measures considered necessary to conserve the stocks.

This FSP project successfully used commercial static gear to help explain the population structure and spatial variations in catch rates of whelks. It proved useful in developing industry contacts and providing local knowledge, as well as discovering sources of additional data not anticipated at the outset.

Length distributions of whelks acquired during this work are also valuable as a prerequisite of any assessments carried out in future on these fisheries in support of advice offered by Cefas or the Sussex SFC. Knowledge of spatial variation in length compositions is important for the design and interpretation of sampling programmes. In addition to the data presented here, the performance of various sizes and formats of riddle grids was evaluated, data that will be useful if current MLS legislation is reviewed.

It should be stressed that the estimates of total mortality of the whelk population using LCCC methods are sensitive to the growth estimates used (currently unpublished and more relevant to other fisheries) and, as part of ongoing work following this FSP project, appropriate growth rates will be estimated and these data rigorously reanalysed. The actual growth parameters used may be more applicable to slower-growing whelks in colder water, so we caution that the mortality results estimated here may be optimistic.

Analysis of both catch rates and l_{pue} using the linear modelling approach was carried out to help determine the factors that best defined the catch rates of the various stocks. The significance of a particular explanatory variable may not necessarily indicate dependence, because it is likely that a given parameter may well act as a proxy for another variable. For example, the catch rates of whelks around Selsey appear to be positively affected by the size of the tide. The size of the tide may well influence catch rates, or alternatively be just a coincidence in tides being large on the days that the survey vessel fished the grounds with the highest density of whelks. Although the catch rates were standardised and log-transformed to condition the data, some assumptions regarding the data that are necessary for the use of such a parametric statistical technique may not hold true. Such techniques may be quite robust to departures from these

assumptions, but caution should be applied to the results. As such, the modelling in this report should be regarded more as an exploratory tool than a formal hypothesis-testing method. Formal testing of specific hypotheses regarding the significance of particular factors and how they relate to the catch rates and lpu of whelks may be better achieved using non-parametric techniques.

Results from the mark–recapture experiment suggest that recapture rates are highly variable, and that there is an initial delay between release and recapture. This may be a consequence of the low mobility rates of whelks or perhaps an indication of a behavioural response to first capture. It will not be possible to derive a value for the density of whelks from population estimates without knowing the effective range of the traps. This will depend on a number of factors, including the attractive range of the bait and the mobility of the whelks. Were this experiment to be scaled up in size or intensity, consideration would have to be given to spatially separating the traps and altering the density of traps on the seabed, as well as the number of animals to be marked and the time-scale over which recaptures were to be expected. Anecdotal information received from one of the skippers three months after this experiment suggested that the rubber bands used were perishing and this would suggest that this marking method is suitable for short-term studies only. More elaborate modelling, for example using Poisson regression techniques, may do more justice to the data, but are earmarked for the future and not in terms of the analysis here.

Acknowledgements

Owners/skippers Chris Wilson, Peter Storey and George Piper and the crews of “*Tomkat of Selsey*” and “*Beachy Head*” are warmly thanked for their help, advice and willing cooperation throughout this project. All Cefas and Sussex Sea Fisheries Committee staff involved in the surveys, data processing and facilitation, and in project administration, are thanked for their valuable contribution to the success of this project, which was funded by Defra.

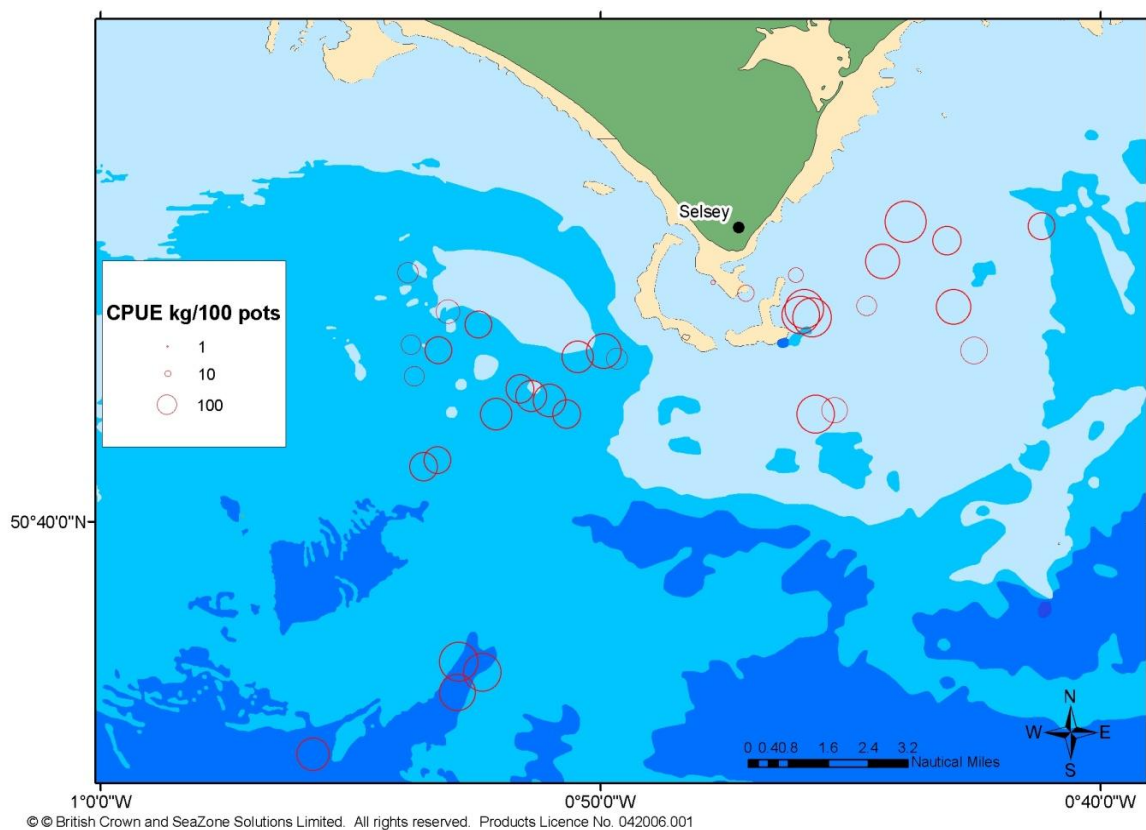


Figure 2. Sussex coast whelk biology. Catch per unit effort by station position off Selsey.

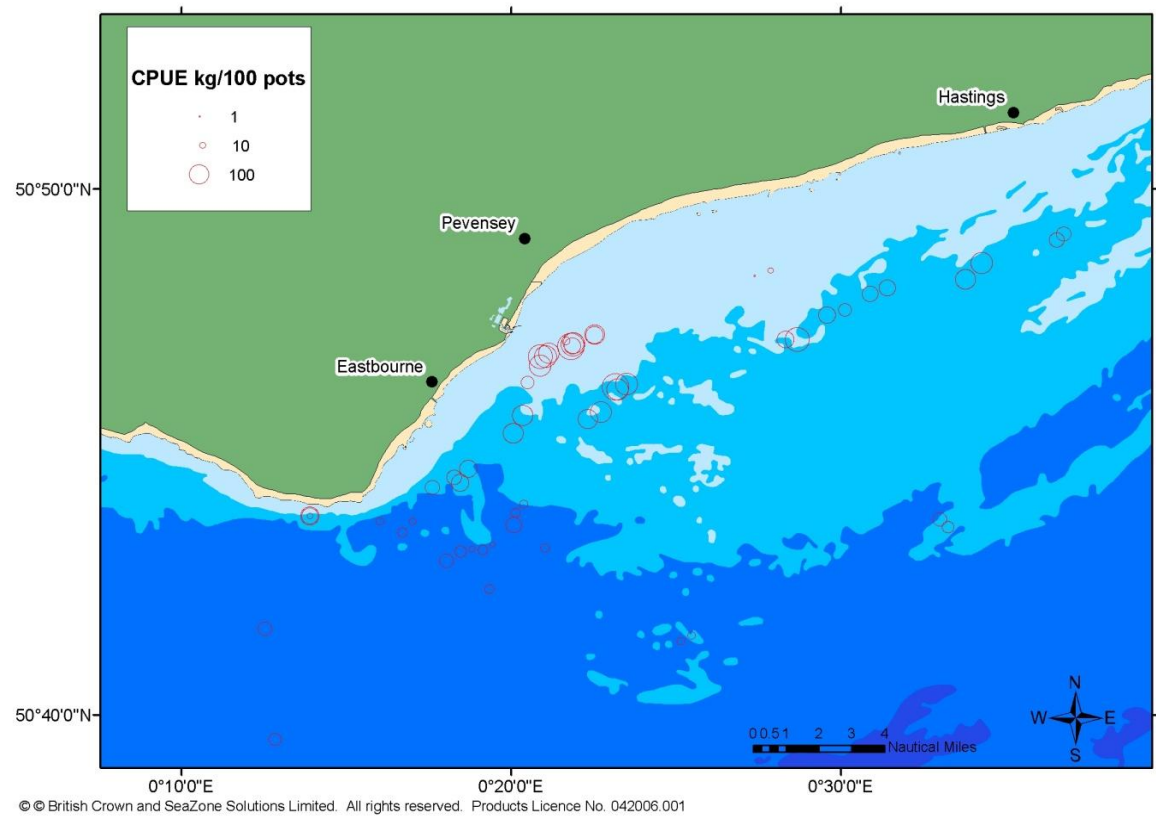


Figure 3. Sussex coast whelk biology. Catch per unit effort by station position off Eastbourne.

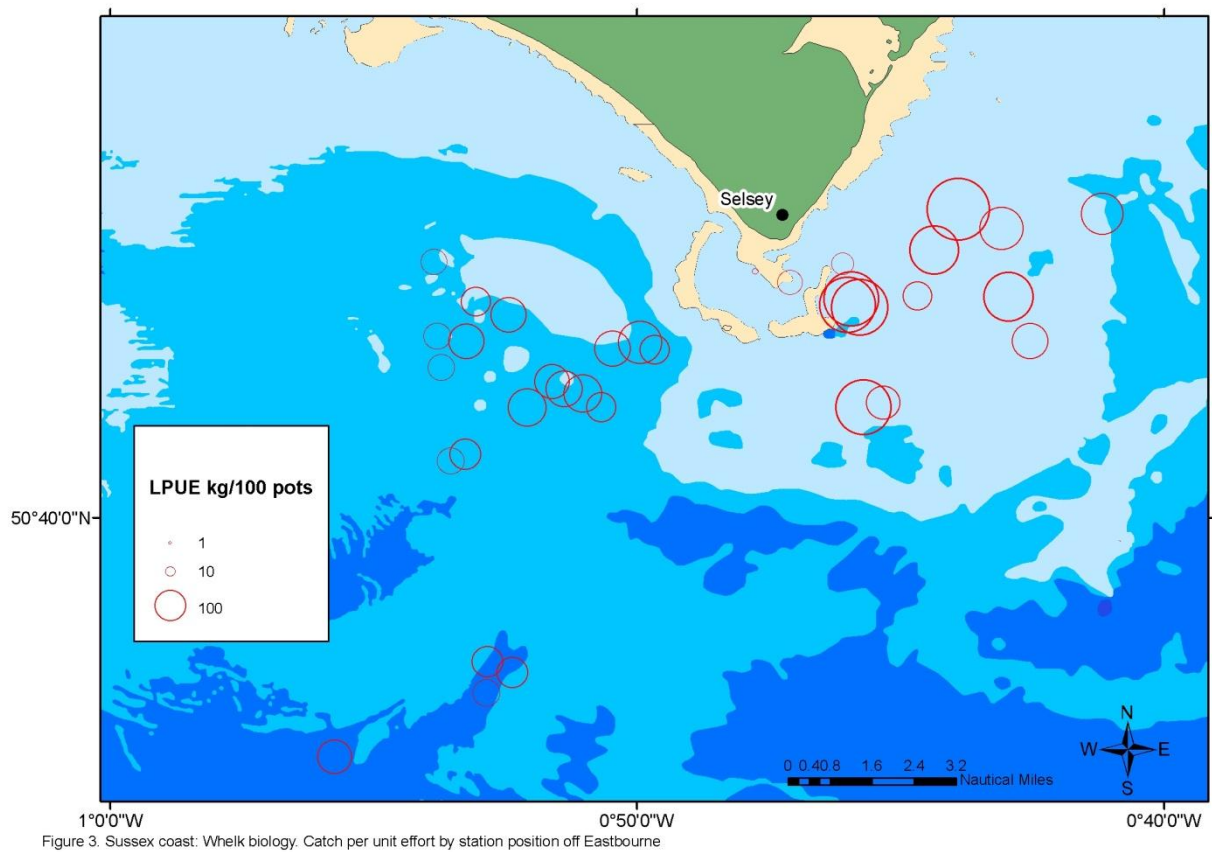


Figure 4. Sussex coast whelk biology. Landings per unit effort by station position off Selsey.

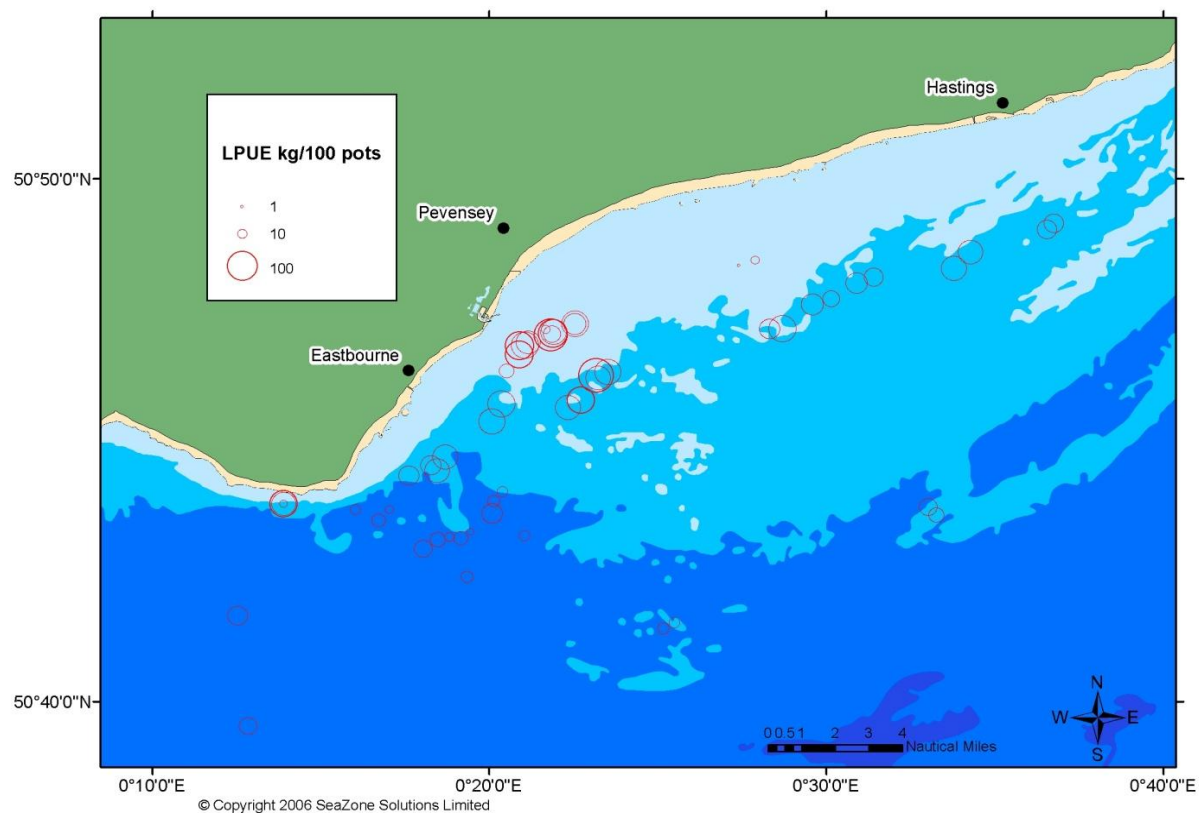


Figure 5. Sussex coast whelk biology. Landings per unit effort by station position off Eastbourne.

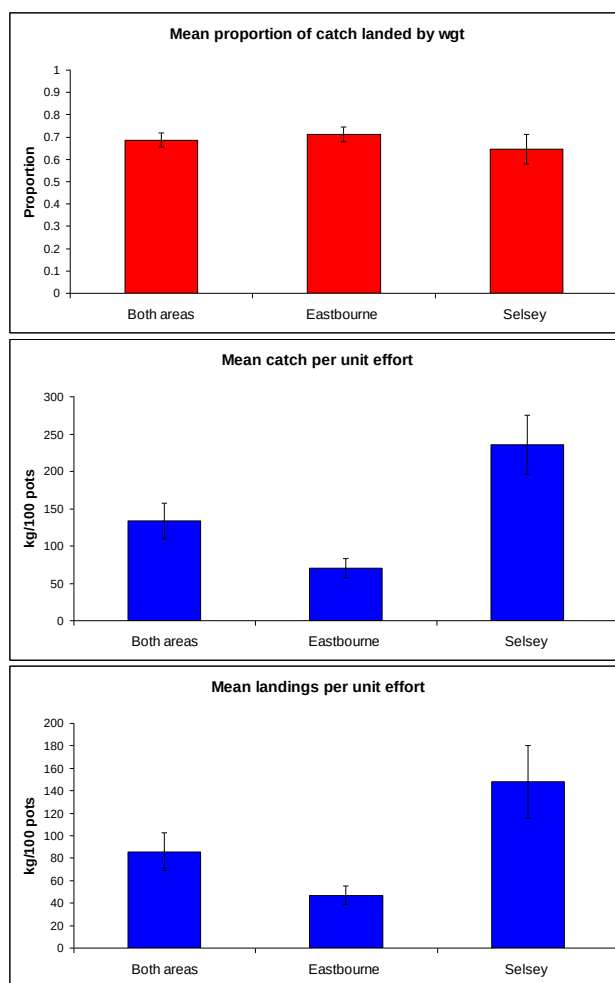


Figure 6. Sussex coast whelk biology. The mean proportion of the catch landed (by weight), mean cpue and lpue by survey area (all with 95% *CI* of the mean).

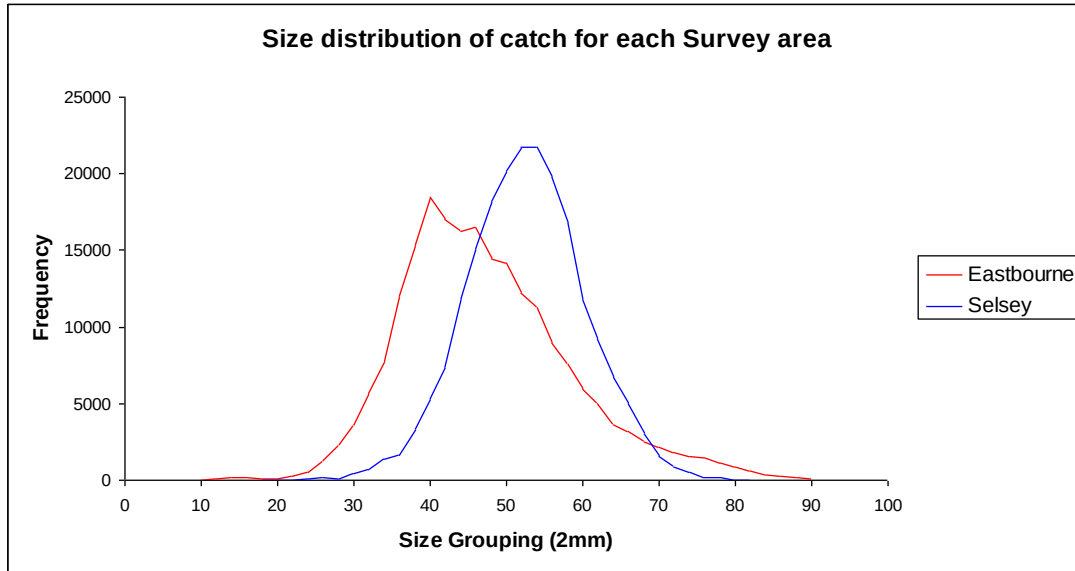


Figure 7. Sussex coast whelk biology. Size distribution of whelks raised to total catch by survey area.

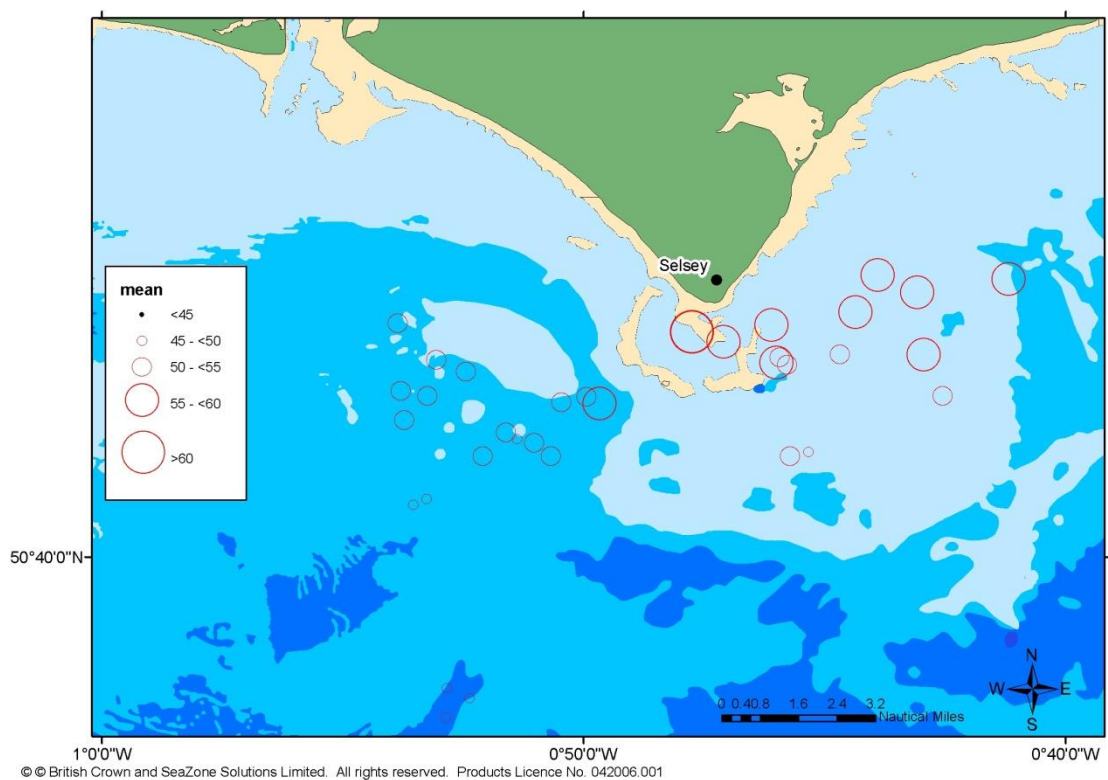
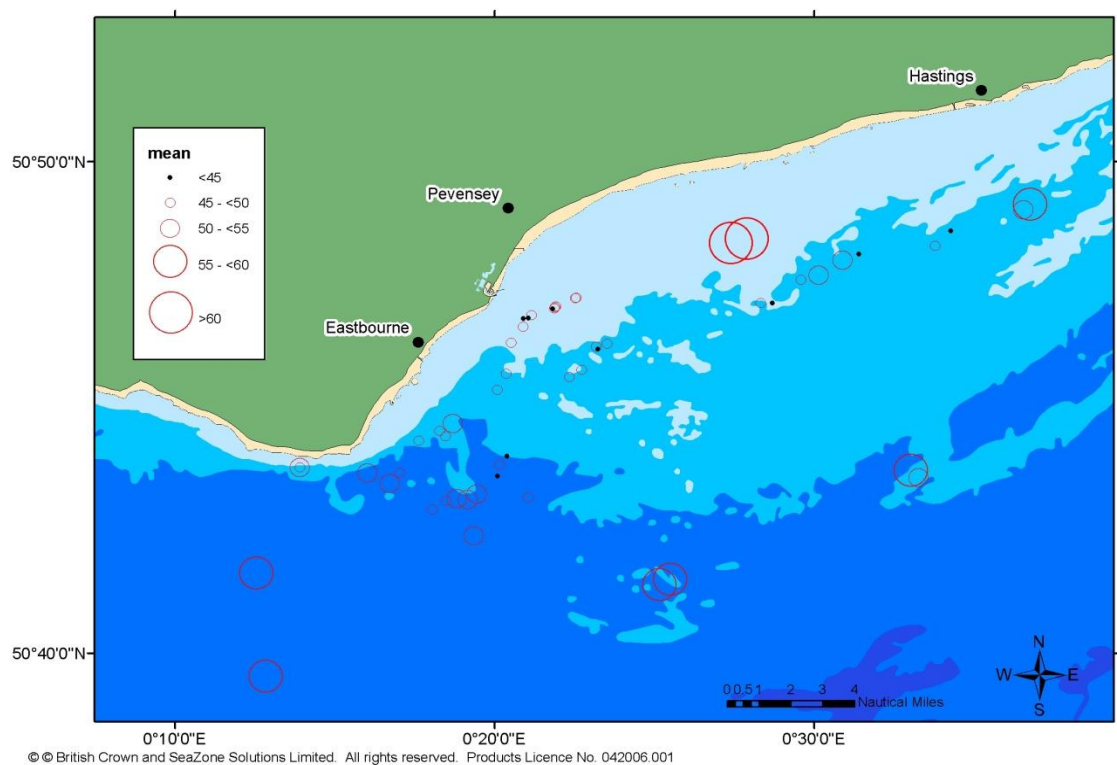
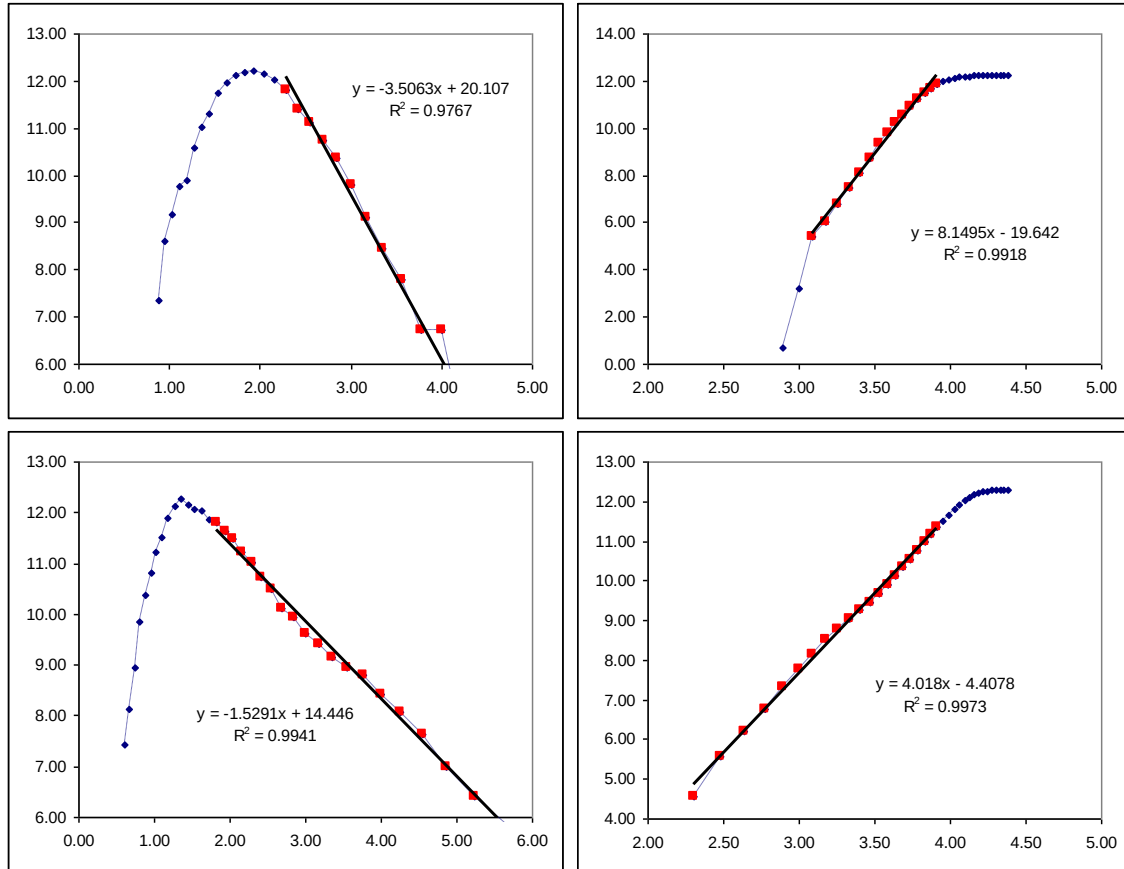


Figure 8. Sussex coast whelk biology. Mean size of whelks in the catches from the Selsey area.



•
Figure 9. Sussex coast whelk biology. Mean size of whelks in the catches from the Eastbourne area.



•
Figure 10. Sussex coast whelk biology. Results of LCCC analysis (RH method of Jones and van Zalinge; top Selsey area, bottom Eastbourne area). Growth parameters provisionally used $L_{inf} = 100$ mm, $K = 0.39$ and $T_0 = 0$.

Appendix 1 Detailed Survey Plans

Channel Whelk MF033: September 2009

Detailed Operation Plan (as agreed 10th September 2009)

VESSEL

FV TomKat of Selsey (P1010)

Skipper: Chris Wilson

- **SCIENTISTS**

1. Andy Lawler Cefas
2. Belinda Vause Sussex SFC

- **OBJECTIVES**

- Describe the population structures and their differences in space of whelk as taken by baited traps.
- Design and initiate a monthly sampling programme to determine size at sexual maturity and the seasonality of the reproductive cycle.
- Carry out a trial mark-recapture experiment to assess the potential of such techniques for determining the population size and exploitation rate for whelk in the Selsey area.

- **FISHING GEAR**

The fishing gear will be typical whelk pots, and will be deployed in fleets of around 50 traps. Traps will be baited with suitable fresh bait when available.

- **AREA OF OPERATION and FISHING POSITIONS**

Fishing operations will be carried out on fishing grounds in the English Channel in the vicinity of Selsey. Operations will be restricted to an area between the shore and 9 nautical miles off the coast. Limitations with the mobility of potting gear and initial pre survey fishing positions will influence the survey-fishing positions. The final decision on where to set gear will be the responsibility of the skipper.

PERIOD OF SURVEYS

The Fishing Survey will commence on the 11th September with two scientists onboard. The duration of the trip will be 7 fishing days but this may not be continuous if fishing conditions are not suitable.

FISHING ACTIVITIES

An average of 5 fleets of 50 pots will be hauled during daily trips from Selsey dependant on adequate steaming time. The catch of whelks will be recorded for each fleet of pots and length distributions will be recorded. A crewmember will assist the scientists by arranging for sub samples of undersized whelks to be retained for measuring. The skipper will record the positions of the ends of each fleet and soak times. Fleets will be repositioned around the fishery on a daily basis. To enable a trial mark-recapture experiment to be carried out a small string of 6 pots will be deployed within easy access of Selsey (to facilitate daily hauling as weather permits).

SORTING AND RECORDING THE CATCH

The crew will be required to assist in sorting the catch as required by the scientists and preparing any fish for sale. The entire catch should be available to

the scientist for sampling, and none discarded without being recorded. The catch will be sorted into the commercial species, which will be further divided into landed or discarded components. Some of the catch will be taken ashore for further analysis.

DATA TO BE RECORDED BY SKIPPER

The scientist will provide recording sheets on which the skipper will record the following details for each tow:

Date

Station number

Shooting and hauling times

Shooting and hauling positions of ends of each fleet (latitude and longitude)

Soak times

Other relevant information e.g. tidal state, weather conditions and seabed type (hard or soft).

The skipper should provide full gear specifications and at the end of the survey an electronic copy of the station positions from the plotter.

DATA TO BE RECORDED BY SCIENTIST

The scientist must ensure that all catch composition, length frequencies and raising factors are fully and correctly entered on the recording sheets, and that all wheelhouse log sheets and biological sampling sheets are collated at the end of each sampling day.

The scientists must ensure that data is secure and on return to the laboratory is processed and analysed in a suitable manner.

CRUISE REPORT

The scientists will maintain a diary of activities, including an electronic copy where possible, and a draft cruise report in standard CEFAS format will be prepared for submission to CEFAS within one week after the cruise. The cruise narrative should be read and agreed by the skipper (report will bear the sentence “seen in draft by skipper”).

Signed:

..... (skipper)

.....(date)

.....(Cefas)

.....(date)

Channel Whelk MF033: September 2009

Detailed Operation Plan (as agreed 23rd September 2009)

VESSEL

FV Beachy Head (NN748)

Skipper: George Piper

SCIENTISTS

3. Chris Firmin and Andy Lawler Cefas
4. Belinda Vause Sussex SFC

OBJECTIVES

- Describe the population structures and their differences in space of whelk as taken by baited traps.
- Design and initiate a monthly sampling programme to determine size at sexual maturity and the seasonality of the reproductive cycle.
- Carry out a trial mark-recapture experiment to assess the potential of such techniques for determining the population size and exploitation rate for whelk in the Eastbourne area.

FISHING GEAR

The fishing gear will be typical whelk pots, and will be deployed in fleets of around 100 traps. Traps will be baited with suitable fresh bait when available.

AREA OF OPERATION and FISHING POSITIONS

Fishing operations will be carried out on fishing grounds in the English Channel in the vicinity of Eastbourne. Operations will be restricted to an area between the shore and 6 nautical miles off the coast. Limitations with the mobility of potting gear and initial pre survey fishing positions will influence the survey-fishing positions. The final decision on where to set gear will be the responsibility of the skipper.

PERIOD OF SURVEYS

The Fishing Survey will commence on the 24th September (provisional) with two scientists onboard. The duration of the trip will be 7 fishing days but this may not be continuous if fishing conditions are not suitable.

FISHING ACTIVITIES

An average of 8 fleets of 100 pots will be hauled during daily trips from Eastbourne dependant on adequate steaming time. The catch of whelks will be recorded for each fleet of pots and length distributions will be recorded. A crewmember will assist the scientists by arranging for sub samples of undersized whelks to be retained for measuring. The skipper will record the positions of the ends of each fleet and soak times. Fleets will be repositioned around the fishery on a daily basis. To enable a trial mark-recapture experiment to be carried out a small string of around 20 pots will be deployed within easy access of Eastbourne (to facilitate daily hauling as weather permits).

SORTING AND RECORDING THE CATCH

The crew will be required to assist in sorting the catch as required by the scientists and preparing any fish for sale. The entire catch should be available to the scientist for sampling, and none discarded without being recorded. The catch will be sorted into the commercial species, which will be further divided into landed or discarded components. Some of the catch will be taken ashore for further analysis.

DATA TO BE RECORDED BY SKIPPER

The scientist will provide recording sheets on which the skipper will record the following details for each tow:

Date

Station number

Shooting and hauling times

Shooting and hauling positions of ends of each fleet (latitude and longitude)

Soak times

Other relevant information e.g. tidal state, weather conditions and seabed type (hard or soft).

The skipper should provide full gear specifications and at the end of the survey an electronic copy of the station positions from the plotter.

DATA TO BE RECORDED BY SCIENTIST

The scientist must ensure that all catch composition, length frequencies and raising factors are fully and correctly entered on the recording sheets, and that all wheelhouse log sheets and biological sampling sheets are collated at the end of each sampling day.

The scientists must ensure that data is secure and on return to the laboratory is processed and analysed in a suitable manner.

CRUISE REPORT

The scientists will maintain a diary of activities, including an electronic copy where possible, and a draft cruise report in standard CEFAS format will be prepared for submission to CEFAS within one week after the cruise. The cruise narrative should be read and agreed by the skipper (report will bear the sentence “seen in draft by skipper”).

Signed:

..... (skipper) (date)

.....(Cefas) (date)

Appendix 2 Cruise reports

CENTRE FOR ENVIRONMENT, FISHERIES AND AQUACULTURE SCIENCE
LOWESTOFT LABORATORY, LOWESTOFT, SUFFOLK NR33 OHT
2009 FISHERIES SCIENCE PARTNERSHIP

FSP Programme MF033: Eastern Channel whelk biology

REPORT: FV *Tomkat* (P1010) cruise 1.

SKIPPER: C Wilson

SCIENTIFIC STAFF: A Lawler Cefas
 B Vause Sussex SFC
 C Trigg Sussex SFC (15th September)

DURATION: 11th- 19th September 2009

LOCATION: West Sussex, Eastern English Channel

AIMS:

1. To describe variations in catch rates and size composition of whelks in the sea area off Selsey using baited commercial traps.
2. To initiate and design a monthly sampling programme to determine the size at sexual maturity and the seasonality of the reproductive cycle in the Selsey area.
3. To carry out a trial mark-recapture experiment to assess the potential of such techniques for determining the population size and exploitation rate for whelk in the Selsey area.

NARRATIVE:

Tomkat sailed from Selsey at 0730 on 11 September and proceeded to gear she had set in the traditional whelk grounds within a few miles off the Selsey coast.

Fishing operations continued on a daily basis from Selsey throughout the survey, moving gear around the ground to get good spatial coverage. On each day a small fleet of 6 pots were fished in the same position to mark and recapture whelks. On 15 and 16 September Tomkat was unable to fish her gear due to a fresh ENE wind. The survey resumed 0615 on 17 September and continued until the survey was completed at 1200 on 19 September.

Results

1. *Tomkat* fished 35 fleets of around 50 pots in the survey area. From 1,750 pot hauls made on the survey a total of 81.4 baskets of whelks were landed (approx. 2.6 t).
2. Over 13 thousand whelks were measured from samples taken from both discarded and landed components of the catch at each of the 35 fishing locations.
3. A total of 1719 whelks were marked with a combination of coloured rubber bands. Over the duration of the survey 45 marked whelks were recaptured.

Andy Lawler 2nd October 2009.

CENTRE FOR ENVIRONMENT, FISHERIES AND AQUACULTURE SCIENCE
LOWESTOFT LABORATORY, LOWESTOFT, SUFFOLK NR33 OHT
2009 FISHERIES SCIENCE PARTNERSHIP

FSP Programme MF033: Eastern Channel whelk biology

REPORT: FV *Beachy Head* (NN748) cruise 2.

SKIPPER: G Piper

SCIENTIFIC STAFF: C Firmin	Cefas (24-28 th)
A Lawler	Cefas (29-30 th)
B Vause	Sussex SFC
A Kavadellas	Sussex SFC (26 th)
C Trigg	Sussex SFC (27 th)

DURATION: 24th- 30th September 2009

LOCATION: East Sussex, Eastern English Channel

AIMS:

4. To describe variations in catch rates and size composition of whelks in the sea area around Eastbourne using baited commercial traps.
5. To initiate and design a monthly sampling programme to determine the size at sexual maturity and the seasonality of the reproductive cycle of whelks in the sea area off Eastbourne.
6. To carry out a trial mark-recapture experiment to assess the potential of such techniques for determining the population size and exploitation rate for whelk off the East Sussex.

NARRATIVE:

Beachy Head sailed from Eastbourne at 0600 on 24 September and preceded to gear she had set in the traditional whelk grounds off the East Sussex coast. Fishing operations continued on a daily basis from Eastbourne throughout the survey, moving gear around the ground to get good spatial coverage. On each day a small fleet of 20 pots were fished in the same position to mark and recapture whelks. The survey continued uninterrupted until the survey was completed at 1830 on 30 September.

Results

4. *Beachy Head* fished 56 fleets of around 100 pots in the survey area. From 5,600 pot hauls made on the survey a total of 83.3 baskets of whelks were landed (approx. 2.6 t).
5. Over 26 thousand whelks were measured from samples of both discarded and landed components of the catch at each of the 56 locations.
6. A total of 1546 whelks were marked with a combination of coloured rubber bands and over the course of the survey 206 were recaptured.

A Lawler 2nd October 2009.

Appendix 3 Summary of a mark-recapture experiment

Eastbourne			Recaptures						
date	Numbers	band	W	R	B	R+W	B+W	Y+W	Unmarked

	released	colour							
24/09/2009	468	R	0	0	0	0	0	0	0
25/09/2009	552	W	0	1	0	0	0	0	545
26/09/2009	526	B	4	2	0	0	0	0	678
27/09/2009	2	Y	2	8	0	0	0	0	632
28/09/2009	26	R	12	5	7	2	0	0	408
29/09/2009	32	G	19	8	5	0	0	0	1013
30/09/2009	-	-	61	40	25	0	2	1	776
02/10/2009	-	-	2	0	0	0	0	0	-

Table 3. Sussex coast: Whelk biology. Numbers of whelks marked and recaptured and captures of unmarked whelks by day fished during mark-recapture experiment off Eastbourne. Shaded row was post survey data kindly provided by skipper. Additional data to be provided. W - white, R - red, B – blue, G - green and Y - yellow.

Appendix 4 Example of species present in typical whelk pot by-catch



Annex 8

Summary Quality Report for Annual Business Inquiry Part 1 (ABI/1)

1 Introduction

This report is part of a rolling programme of quality reports being introduced by the Office for National Statistics (ONS). The full programme of work being carried out on Statistical Quality¹ is available on the National Statistics website. Summary Quality Reports are overview notes which pull together key qualitative information on the various dimensions of quality as well as providing a summary of methods used to compile the output.

This report relates to the Annual Business Inquiry (ABI). The ABI collects information via two surveys. The ABI/1 solely concentrates on business employment details and the ABI/2 collects information relating to the financial information of a business. This report specifically concentrates on the ABI/1 and aims to provide users with guidance to assess the quality and usability of the ABI/1 estimates.

The National Statistics website has a comprehensive online guide to the ABI Methods and Terminology² used in compiling ABI business and economic statistics.

2 Summary of Quality

2.1 Relevance

The degree to which the statistical product meets user needs for both coverage and content.

The Annual Business Inquiry Part 1 (ABI/1) collects comprehensive employment information from businesses representing the majority of the Great Britain economy. The ABI/1 survey collects business information for England, Scotland and Wales. The Department of Enterprise Trade and

Investment (DETINI)³ of Northern Ireland collect the same ABI information (NIABI)⁴ independently. Both data sources are then combined to produce ABI/2 estimates on a UK basis.

The ABI/1 employee estimates are Great Britain based and published on the National On-line Manpower Information Service (NOMIS)⁵ website. NOMIS⁵ is regarded as the definitive source of official Government employee statistics.

In terms of employee data, the ABI/1 sample of approximately 83,000 businesses is used to provide estimates for a total universe of around 2.4 million businesses covering all major industry sectors, such as Production, Construction, Service Trades, Distribution, Public Administration, Health and Education. More detail on ABI/1 industry coverage can be found under the Summary of Methods section at the end of the report.

ABI/1

What it measures

The number of employees in the Great Britain economy on a male/female and full time/part time basis. For the purpose of the ABI/1 survey part-time is classed as 30 hours per week or less.

Frequency	Annual.
Sample Size (achieved)	Approximately 83,000 in 2008.
Periods available	From 1997.
Sample frame	Inter-Departmental Business Register (IDBR).
Sample design	Stratified random sample where the strata are defined by Standard Industrial Classification (SIC), country, and employment size of a business.
Weighting	Each responding business represents a number of similar businesses from the IDBR, based on number of employees and the standard industrial classification (currently SIC 2003). Weights are updated annually. For the 2008 ABI/1 the sample will be derived on a SIC 2007 basis and the published estimates dual coded to both SIC's.
Estimation	Ratio estimation is carried out for all strata with employment less than 250.
Imputation	Automatic imputation using period on period movements is carried out for non-responding businesses with 250+ employment. Manual construction is used in exceptional circumstances. For example an influential responder (such as a business with a significant regional impact on employee estimates) would have a manual construction if it did not respond.
Outliers	Businesses with extreme or atypical variable returns for their business size are treated as outliers. Outlier business information is placed into a separate fully enumerated

The ABI/1 data and estimates are used widely, both within and outside the government and are a vital source of business employee information. The key users and uses of the output include:

- **Eurostat** – The ABI/1 is a source of annual structural statistics for the Structural Business Statistics Regulation (SBSR), used for policy monitoring and formulation by the European Union.
- **The Scottish Executive and the Welsh Assembly** - The ABI/1 provides estimates on employee numbers which are essential in the calculation of Scottish and Welsh employment trends. Estimates on all sectors are incorporated into the Scottish and Welsh figures and may also be utilised in internal briefings.
- **Department of Business, Enterprise and Regulatory Reform (BERR)** - BERR uses ABI/1 estimates to assess the structure and performance of industries.

- **Workforce Jobs** - It is usual for the Workforce Jobs series (WFJ), much of which is initially based on the Short Term Employment Survey's estimate of employee jobs, to be benchmarked on the Annual Business Inquiry (ABI/1) estimate. This benchmarking usually takes place in time for the December Labour Market Statistics Statistical Bulletin⁶ in the following year.
- **ABI/2** - The ABI/2 survey collects financial data which are matched to ABI/1 employment estimates to calculate turnover per head.
- **Local Government** - Local Government planning departments are major users of the ABI/1, using the estimates published on NOMIS⁵ to forecast trends in employment in their specific areas and to claim for Central Government and European funding.

Additional users also include national government departments and bodies, businesses, academics and the general public. User groups are consulted to ensure that ABI/1 data remain relevant to their needs.

2.2 Accuracy

The closeness between an estimated result and the (unknown) true value.

Estimates from this survey are subject to various sources of error. Total error consists of two elements, the sampling error and the non-sampling error.⁷ More detail on estimates and measures of these errors can be found in the ABI Quality Measures.

Sampling error

The ABI is based on a sampled survey estimating the number of employees which gives rise to sampling errors. The actual sampling error for any estimate is unknown but we can estimate, from the sample, a typical error, known as the standard error. This provides a means of assessing the precision of the estimate; the lower the standard error, the more confident we can be that the estimate is close to the true value. The coefficient of variation (CV) can be calculated as the standard error divided by the estimate, and it is used to compare the relative precision across surveys or variables. The CV indicates the quality of a figure, the smaller the CV the higher the quality.

For ABI/1, the CV and standard errors are at local authority/district level. Data are available for 2000 - 2006 and have been calculated on unrounded figures.⁸ The CV and standard errors are calculated based on current Geography ABI estimates. The CV for each current district can be applied to the relevant CAS (Census Area Statistics) geography district estimates to produce standard errors on this basis.

The CVs are calculated excluding agriculture data as these data are supplied externally and not necessarily through a sample. However, it is assumed the agriculture data are of the same quality and will not affect the value of the CV, and can be applied to the total estimate for the region.⁹

Data on ABI/1 Standard Errors⁹ are available on NOMIS⁵.

Non-sampling error

Non-sampling errors are not easy to quantify and include errors of coverage, measurement, processing and non-response. Where there are small differences between responders and non-responders, response rates give an indication of the likely impact of non-response bias on the estimates.

In seeking to maximise accuracy of the survey, the sample selection for ABI/1 is carried out after the annual IDBR update processes are complete. This should minimise the selection of misclassified businesses and inadequate coverage of newly established businesses and defunct reporting units.

Various procedures are in place to ensure that errors are minimised. Year on year comparisons are made at respondent and aggregate level. Disparities are investigated to ensure consistent annual returns. Congruence checks are made against other surveys to ensure consistent values across industries from different surveys.

Another indicator of accuracy is reliability, which can be measured by assessing the difference between the first published estimate and the final revised figure. ABI/1 adheres to a Revisions Policy whereby both current survey estimates together with a revision of the previous year's survey estimates are published. Late returns or information received in the course of the following year's survey may make changes to source data after publication. Such changes are incorporated into the figures when the revised estimates are published the following year. This revisions policy can be seen in the [ABI Statistical Bulletin](#)¹⁰

2.3 Timeliness and Punctuality

Timeliness refers to the lapse of time between publication and the period to which the data refer. Punctuality refers to the time lag between the actual and planned dates of publication.

The [National Statistics Release Calendar](#)¹¹ is available on the National Statistics website and provides twelve months advance notice of releases. ABI/1 has always met the target publication deadlines. In the unlikely event of a change to the pre-announced release schedule, public attention will be drawn to the change and the reasons for the change will be explained fully at the same time, as set out in the [Code of Practice for Official Statistics](#)¹².

The following list shows the time lag between publication and the reference period to which the ABI/1 data refer. These timings are for the publications of the ABI/1 estimates from the 2006 survey period onwards.

Provisional National Results Release: 15 months after the reference period.

Final National Results Release: 27 months after the reference period.

2.4 Accessibility and Clarity

Accessibility is the ease with which users are able to access the data, also reflecting the format(s) in which the data are available and the availability of supporting information. Clarity refers to the quality and sufficiency of the metadata, illustrations and accompanying advice.

ABI/1 employee estimates are published twice for every annual survey, once in December of the following year at the provisional level and then a final revised release the following December.

The ABI/1 publication is available online at [NOMIS](#)⁵ and provides a comprehensive overview of the Great Britain economy at various regional levels. Users of ABI/1 estimates are required to purchase a Chancellors Notice via [NOMIS](#)⁵ in order to access them.

The ABI/1 results team can be contacted by e-mail, annual.employment.figures@ons.gov.uk, to provide advice on additional estimates and alternative data formats.

2.5 Comparability

The degree to which data can be compared over time and domain.

The ABI/1 has been published on a comparable basis since 1997. Whenever methodological changes or other factors, such as changes to the Standard Industrial Classification (SIC), impact on the latest data/estimates, announcements are given and every effort is made to ensure that all previous estimates are amended to make them directly equivalent.

ABI/1 covers all SIC 2003¹³ classifications. Data for 1997 - 2002 have been collected under SIC 92¹⁴ and data from 2003 have been collected under SIC 2003¹³.

For the 2008 ABI/1, figures will be collected and presented at the new SIC 2007¹⁵, in line with Eurostat guidelines.

Three specific improvements were introduced for 2006 publication results onwards:

- Firstly, the reference month has changed from December to September. The change of reference month has resulted in a reduction in figures overall, although the amount varies by industry given the seasonal nature of some activity. This is linked to the use of Business Register Survey (BRS) questionnaires. To enable the BRS to contribute to the ABI/1 sample, the two surveys needed to be brought into line in terms of the reference date. For ABI/1 2006 onwards, the ABI/1 reference month has been brought forwards from December to September to be consistent with the BRS. This action also brings the ABI/1 more in line with other ONS outputs.
- Secondly, from 2006 onward, ABI/1 now uses actual BRS returns within the ABI/1 survey. It has been identified that by moving the reference month from December to September the data collected by the ABI/1 can be directly compared to the data collected by the BRS and the quality of statistics will be improved. An important aspect of this is that the ABI/1 now incorporates actual local unit returns within its results, where these returns are included in the BRS sample. The non sampled element will continue to be estimated as before. This should result in more accurate regional data.
- Thirdly, there has been a change in the methodology regarding minimum domains. Minimum domains group together certain industries and geographical areas in order to provide regional estimates at the lower, more detailed, levels. The change of minimum domain methodology has led to an improvement in the quality of the estimates at the detailed regional level. Overall aggregate estimates were not affected by this change in methodology.

The change in reference date and the use of BRS data is part of the move towards the implementation of the Business Register Employment Survey (BRES)¹⁶ in 2009, which will replace the ABI/1 survey.

The classification of what is an employee has remained consistent for ABI/1 since implementation in 1997, with only minor changes being made to the questionnaires in accordance with customer needs and requirements.¹⁷ More detail of what is classed as an employee can be found in the ABI Technical Report

2.6 Coherence

The degree to which data that are derived from different sources or methods, but which refer to the same phenomenon, are similar.

The users of ABI/1 require ABI/1 aggregate estimates to be coherent with other surveys. ABI/1 estimates, where possible, are coherent with various short term indicators produced from the Monthly Production Inquiry (MPI) and Monthly Inquiry into the Distribution and Services Sector (MIDSS). In addition, ABI/1 aims to be consistent with related annual and quarterly surveys such as the Workforce Jobs Series (WFJ).

The Monthly Wages and Salary Survey (MWSS), Retail Sales Inquiry (RSI), Monthly Inquiry into Distribution Services Sector (MIDSS), Monthly Production Inquiry (MPI) and GAP'S surveys all collect employment information. GAP'S is a quarterly employment survey that fills the gap in industry coverage of the other short term employment surveys. It covers the distribution and service sectors only, and is sent out to businesses that do not receive a turnover inquiry form. MIDSS, MPI, RSI and GAP'S are among the sources used to calculate the WFJ series. Although ABI/1 is less timely, their sample sizes are much smaller than the ABI/1 and as such, this will cause variation in the estimates from these short term surveys and the ABI/1.

The Labour Force Survey (LFS) is regarded by ONS as the best measure of total jobs in the economy. The ABI/1 outputs are regarded as the best estimates at a detailed regional and industrial level.

- The ABI/1 is a point in time survey requesting employee counts on a specific date in the year. The LFS estimates are averages for three month periods.
- The LFS is employment based, the ABI/1 employee based. The LFS definition of employment is anyone (aged 16 or over) who does at least one hour's paid work in the week prior to their LFS interview, or has a job that they are temporarily away from (e.g. on holiday). Whereas the ABI is a point in time estimate of full and part time employees on the payroll. Also, unlike the ABI, the LFS includes people who do unpaid work in a family business, working proprietors, the self employed, Government Supported Trainees and HM Forces.
- The LFS is a household survey while the ABI/1 is a survey of businesses. There is often a conflict between which industry people actually work in, compared to what they think they work in, and the LFS relies on respondents to self-classify to an industry. The answers that employees give in response to the LFS industry question may be influenced by the nature of their own job, which may not reflect the main activity of the organisation for which they work. As a result ABI/1 figures give a more reliable industry breakdown than the LFS.

3 Summary of methods used to compile the output

Coverage

The ABI/1 estimates cover Great Britain businesses registered for Value Added Tax (VAT) and/or Pay As You Earn (PAYE) and are classified to the SIC 2003¹³.

The 2008 estimates, due for publication in December 2009, will be classified to the SIC 2007 with both the 2007 revised and 2008 provisional results being dual coded and published on both basis in December 2009. Further information can be found in the SIC 2007 Implementation¹⁸ guide.

The ABI/1 obtains the required details on these businesses from the IDBR which is then used as the ABI/1 sampling frame.

The ABI/1 sample covers all major industry groups, such as Production, Construction,

Distribution, Service Trades and many more. A complete listing of the SIC 2003¹³ industry groups can be found in the National Statistics publication 'UK Standard Industrial Classification of

Economic Activities 2003'¹⁹. A description of the SIC 2007 Implementation¹⁸ can also be found on the ONS website.

Sample Design

The ABI/1 sample currently covers around 83,000 contributors from across the Great Britain economy. The IDBR is used as the sampling frame from which a stratified random sample is drawn. The strata are defined by SIC at industry level, by country and by employment size, with all employment sizes of businesses being covered.

The sampling scheme is designed to give the best estimates of the population totals for a given sample size, and involves selecting all the largest businesses with a progressively reducing fraction of smaller businesses. This method will ensure that the sample targets those businesses with the largest contribution to an industry. It also ensures that the survey sample size of the smaller businesses minimizes the compliance burden on them.

Weighting and Estimation

As it is not possible to survey every business in the population, to obtain estimates of the population values it is necessary to weight the data. ABI/1 uses two weights, one to represent the effect of stratified sampling and the other to represent the effect of ratio estimation.

The implementation of weights ensures the estimates take into account the characteristics of non-selected businesses. Further detail on the initial Implementation of the Annual Business Inquiry and the estimation process used by the ABI/1 can be found in the [ABI Technical Report](#)¹⁷ written by James Partington (2001).

Statistical Disclosure

The ABI is conducted under the Statistics of Trade Act (STA) 1947. This Act imposes restrictions on the way that data collected during the survey may be used. The provisions of the STA are further regulated by the Employment and Training Act 1973 (ETA) as amended by the Employment Act 1989, which states that local planning authorities may only use confidential data for purposes that relate to development plans.

The main aim of these restrictions is to protect the identity of individual businesses, who have made statistical returns, from being disclosed or otherwise deduced. Some of the ABI outputs have already been subjected to disclosure control and, therefore, the issue of confidentiality does not arise. However, employee information extracted by users of the [NOMIS](#)⁵ database has not been suppressed and contains potentially disclosive cells.

Access to [NOMIS](#)⁵ is restricted, by the provisions of the ETA 4(3) (f), to holders of Chancery of the Exchequer's Notices. From 2007 onwards users are required to agree a Data Access Agreement (DAA) and agree to be bound by the conditions contained within, in order to access the estimates.

Users of ABI/1 estimates on [NOMIS](#)⁵ are personally responsible for ensuring that any information which they publish or pass on to other users does not contain disclosive figures. More information is provided via the [ABI Guide to Use of Potentially Confidential Data](#)²⁰.

Modifications to the Q1 Scottish VIa.IBTS and Q3 Scottish VIb.IBTS

Finlay Burns, Andrzej Jaworski, Ken Coull and Rob Kynoch

burnsf@marlab.ac.uk,jaworskia@marlab.ac.uk,coullka@marlab.ac.uk,kynochr@marlab.ac.uk

Introduction

The Q1 Scottish VIa IBTS survey has been running since 1981 and up until 2010 this was performed using a repeat station format with the GOV survey trawl together with the west coast groundgear rig, 'C'. Similarly the Q4 Scottish VIa IBTS and Q3 Scottish VIb.IBTS (Rockall haddock) have been running in their present form since 1990 and 1999 respectively, once again using the GOV survey trawl with groundgear 'C' and the fixed station format.

2011 heralds the start of modified Scottish bottom trawl surveys in both these areas. The previous repeat station survey format consisting of the same series of survey trawl positions being sampled at approximately the same temporal period every year is considered a biased method for surveying both these subareas and as such a move towards some sort of random stratified survey design was judged necessary. The largest obstacle preventing an earlier move to a more randomised survey design was the lack of confidence in the 'C' rig to tackle the potentially hard substrates that a new randomised survey was likely to encounter. The first step in the process of modifying the survey design was therefore to design a new groundgear that would be capable of tackling such challenging terrain. The modifications made to the trawl configuration are thus summarised below.

Groundgear

All three surveys were undertaken using the standard GOV research trawl but with a modified groundgear more suited to the hard and often undulating topography encountered within ICES subareas VIa and VIb. This gear consisted of 530mm, 450mm and 350mm rubber wheel bobbins with 15m x 150mm rubber leg sections along each wing. Despite the large bobbins present in the 'C' rig it consistently failed to provide adequate protection to the trawl on harder ground – especially in the wing sections - and in 2006 the search began to find a new replacement rockhopper rig for the west coast - groundgear 'D'. The configuration selected was broadly modelled around the rig used by Ireland and consists of 400mm hopper discs in the centre reducing to 350mm discs at the

quarters and then 300mm discs out to the wingends. Instead of being attached to the groundgear using toggle chains – as was the case with ‘C’ - the footrope is lashed directly to the groundgear using a series of steel rings, another feature copied from the Irish rig. This gear has been used during a number of gear trials and has proved robust and reliable throughout. See figure 1.

Wire Sweep Rig

The Rockall survey is conducted exclusively in depths greater than 100m whereas on the Scottish West Coast surveys approximately 80% of tows are made in depths deeper than 80m. Historically, only 60m sweeps were used throughout, during all Scottish western surveys, despite the IBTS recommendation that for trawls conducted in depths deeper than 70m that the 110m sweep rig be used. From 2011, the new configuration - in an effort to maintain net geometry parameters (wingend spread & headline height) and ground gear bottom contact – will utilise both 60m and 110m sweep rigs. Although the IBTS recommends 70m as the cut-off for changing the sweep length the new survey will aim to standardise with the current Irish west coast survey – that also surveys ICES Subarea VIa – and adopt the cut off for deploying the long sweep rig on trawls in depths in excess of 80m in both ICES subareas VIa and VIb.

GOV Trawl

No modifications have been made to the GOV trawl frame ropes or the mesh sizes used in the different netting panel sections. The only alteration from the previous trawl design is the incorporation of tearing strips and guard meshes constructed from 5mm high tenacity double braided polyethylene twine. The mesh sizes of the double netting panels corresponded to the mesh sizes being replaced. To maintain consistency with the old netting the overall dimensions of the double netting panels, tearing strips and guard panels were determined by stretched length and not mesh counts. Double netting has also been inserted into upper/lower wing tips, 6 mesh deep guard inserted into upper/lower 1st wing sections, 1st belly section, 2nd belly section tearing strip and 5 mesh deep headline guard. See figure 1.

This strengthening of the netting in the panels around the fishing line coupled with the other modifications made to both groundgear and sweep rig afford the GOV the best possible chance of being able to complete a comprehensively stratified and random bottom trawl survey that will aim to sample all fishable areas within ICES Subarea VIa/VIb.

Figure 1. GOV lower wingend showing 5mm double PE guard netting and Ground gear D hoppers



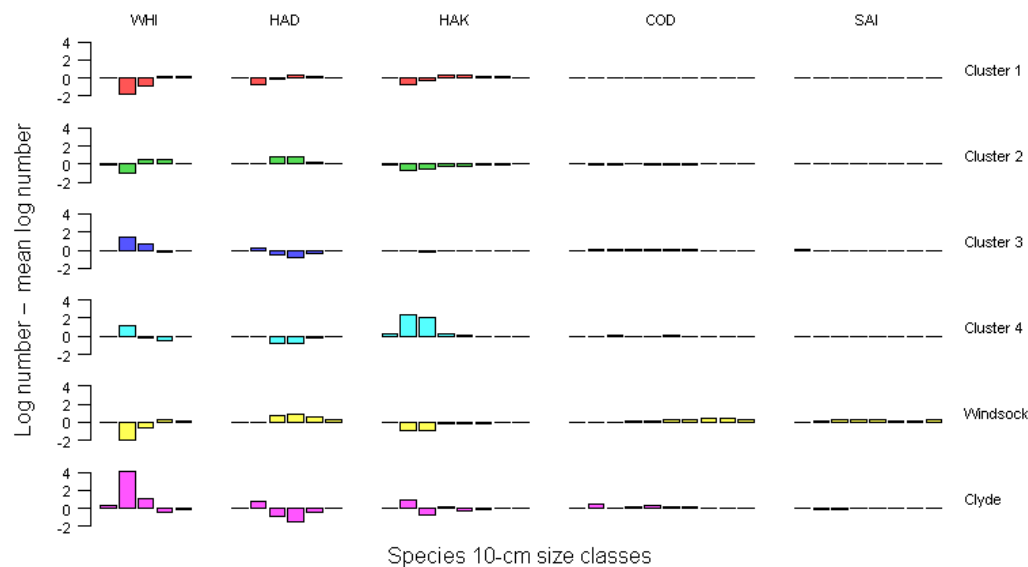
Survey Design – Q1 Scottish VIa. IBTS

The Q1 Scottish VIa. IBTS is primarily a juvenile gadoid survey so when it came to constructing relevant strata for ICES Subarea VIa the focus was on those species for which the survey was principally designed to sample. The target species that were analysed were cod, haddock, whiting, saithe and also hake.

A cluster analysis was performed using aggregated data from the previous quarter 1 SCOGFS data 1999 – 2010 as well as the data collected from the dedicated gadoid survey which took place during quarter 1 of 2010 with all data being standardised to no's/hour. This gadoid survey was completed on charter vessels using a non – standard rockhopper gear and was intended to complement the Q1 SCOGFS carried out by Scotia within the same temporal period and geographical area.

K – means clustering of abundance data for the 5 aforementioned species subdivided into 10cm size categories yielded 4 specific clusters (hierarchical clustering also provided the same results). In addition to the 4 clusters highlighted an additional 2 additional strata were added to the analysis. These were the Clyde area and also the windsock which is an area that has been designated as a recovery zone since 2002 and has therefore experienced no mobile gear exploitation during this time. All densities were standardized and are given in relation to the average density for a specific trip for a given species/size group. Thus the bars show where different species/size groups are likely to be more/less abundant than the average for a given survey. See figure 2.

Figure 2. Barplot displaying the species/size structure of each stratum.



A brief description of the 4 clusters as well as the windsock and Clyde:

- Cluster 1 (red): generally deeper waters, much less small fish (particularly whiting), a bit of medium/big fish.
- Cluster 2 (green): more fish than in red (whiting and haddock), but small fish are still less than the average.
- Cluster 3 (blue): more small fish (particularly whiting), less big fish.
- Cluster 4 (light blue): very similar to Cluster 3, but with much more hake (small/medium) than in other strata.
- Windsock (yellow): less small fish (particularly whiting), and slightly more big fish (haddock and cod)
- Clyde (pink): much more small fish (particularly whiting, but also haddock and hake), less bigger fish (particularly haddock)

A map displaying these effective geographical strata can be found below in figure 3, together with a colour coded description of each of the strata.

Allocation of sampling effort was distributed in the following way. Each individual polygon was treated as a separate substratum, for instance red1, red 2 and red3 rather than just 'red'. The following formula was then applied to each of the substrata.

$$n_i / n = A_i s_i / \sum A_i s_i$$

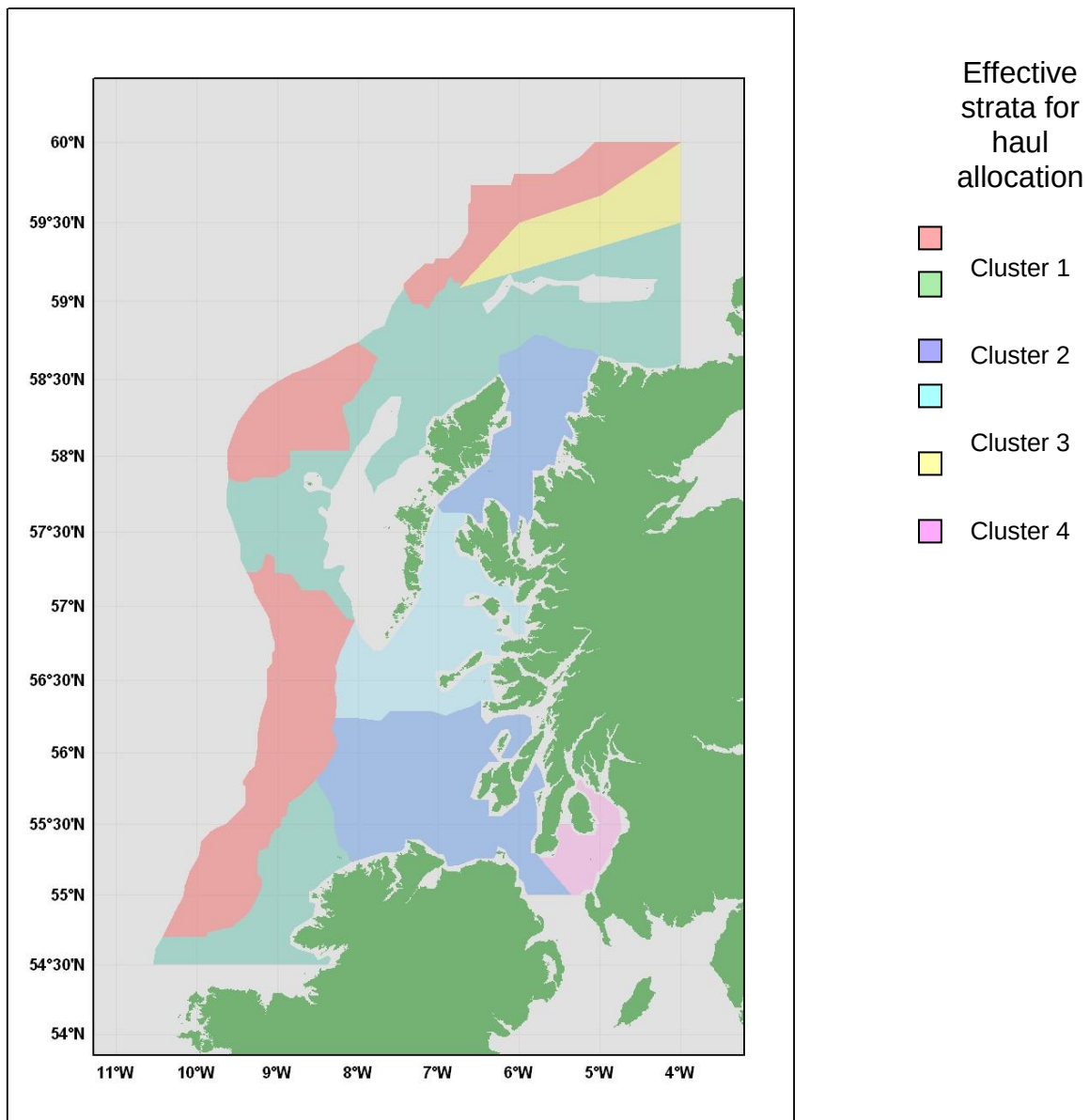
where n_i = number of stations allocated to substratum i , n = total number of stations, A_i = the area of substratum i and s_i = standard deviation of substratum i .

This ensures that more effort is diverted to the substrata that have the largest area and the highest variation. The mean standard deviation across species/size classes was used and the results were translated into a proportion of the total survey effort of 60 hauls. The results are displayed below.

red1	green1	blue1	lightblue	red2	red3	blue2	green2	Clyde	windsock	
2	13	4	6	3	9	10	6	3	4	Total = 60

Within substrata, the samples were chosen at random within strips of equal area. This ensures that (a) each possible sample point has an equal chance of being selected; and (b) that there is an even coverage of samples throughout the strata (avoiding clustering of samples and concomitant large open spaces without samples).

Figure 3.



[Several subsequent pages discussing the Vlb haddock survey are deleted from this annex as they do not reference a DCF-mandated survey]

ANNEX 10 – INFORMATION ON THE PROPOSED SHIFT IN TIMING AND DESIGN OF THE QUARTER 4 WESTERN IBTS.

Background to the alterations in the Cefas survey programme.

The UK contributes substantially to the programme of surveys underpinning the DCF, and commits over 5m Euros (eligible costs) annually to these surveys. The Cefas laboratory carries out eight of these surveys in the North Sea and North Atlantic areas. The UK government introduced stringent spending controls in the public sector leading in 2011 to a requirement for Cefas to identify widespread efficiency savings at relatively short notice. Major surveys contributing substantially to assessments and advice were largely protected, and some national surveys not covered by DCF funding were cut. Major efficiency savings in other areas of DCF work are being introduced, particularly electronic data capture systems. However, the utility and value-for-money of two of the Cefas DCF surveys came under scrutiny – the Demersal Young Fish Survey in the North Sea, and the Quarter 4 western IBTS in the Celtic and Irish Sea. Savings made on these surveys would allow the other DCF funded surveys to maintain their robustness and deliver all primary aims, in particular the requirements of the DCF (indices and other biological data). The decisions regarding the two surveys are explained below.

Western IBTS Quarter 4 survey

Background to Cefas decision to move Q4 survey to Q1 and remove overlap with AFBI Irish Sea survey

Cefas has a long history of groundfish surveys in the Celtic Sea. The UK west coast groundfish survey (UK-WCGFS: 1986-2004) was conducted during the first quarter of the year making it useful for covering populations of cod, haddock, whiting and other species when the mature components are segregated on the different spawning sites in the Celtic Sea. Its performance was variable due to changes in coverage over the years, but has in the past contributed to the XSA estimates of V_{11e-k} cod at older ages (4 and older) where there is otherwise a lack of survey data.

In 2003 a decision was made to bring the Cefas survey into an IBTS coordinated Quarter-4 programme. This required changes to survey timing, design and survey gear (GOV trawl). For several more years, a separate non-DCF funded survey was continued by Cefas in the Celtic Sea in March to collect biological parameters as required by the DCF. The Commission would not fund this through the DCF/DCF as it was not IBTS coordinated, and it was eventually discontinued by Cefas due to the UK government funding cuts.

Between 2003 and 2011, data from the Western IBTS Q4 survey have been collected as part of the IBTS coordinated Q4 surveys of the Irish Sea and Celtic

Sea. However, during this time the data have not been used in assessments by any of the stock assessment Working Groups for the sea areas covered (WGCSE, WGHMM, WGWIDE) although WGEF has presented survey results on species composition, size distribution and spatial distribution of approximately 15 species of elasmobranchs along with biological information for various skates (i.e. data not specific to a particular year).

A number of important limitations have emerged with the Quarter 4 survey:

- The survey scored low in the STECF review of surveys in 2011 (mean score 1.45), in contrast to other surveys in the area (1.05-1.15), with low scores on data access, survey coverage, duplication and history of use (i.e. not used in assessment). It overlaps with three other surveys, including complete overlap with the AFBI Quarter 4 survey in the Irish Sea.
- The first two years of the survey explored the use of different gear configurations to establish the best gears for the different ground type. Hence the most consistent time series is 2005 onwards.
- Poor weather conditions in Quarter 4 have resulted in some years to major disruption of spatial coverage including complete loss of some strata;
- Day length in December is very short, limiting the amount of work possible as the survey is daytime only;
- Catches of adult gadoids are very low compared with surveys in spring, seriously reducing the utility of the survey for the older age classes where relative abundance data from surveys has been lacking. In autumn, many cod for example are located on rougher ground and wrecks/reefs where trawling is not possible;
- The timing of the survey seriously reduces its utility for providing data on maturity of spring spawners such as most gadoids and flatfish. The 2012 ICES Workshop on Maturity Staging of Sole, Plaice, Dab and Flounder (WKMSSPDF) recommended that macroscopic staging for maturity ogives is carried out only from two months before spawning season until the end of spawning. Sampling for other purposes should use histology. This advice is likely to hold for gadoids as well, compounding the problem of very low catch rates of adults in autumn and indicating a need for histology to confirm maturity stages collected in early December except for early spawners such as plaice.

Informal and formal discussions at ICES WGCSE and IBTSWG have for several years highlighted the considerable benefits of Quarter 1 surveys. This includes much better catch rates of adult gadoids which have moved onto spawning grounds; better data on biological parameters; longer day length and often better weather than in autumn in the exposed south-west region. In the Irish Sea, the assessments of cod and haddock are largely dependent on the AFBI Quarter 1 survey, with the AFBI Quarter 4 survey providing mainly recruit information. There is currently a continuous Q1 IBTS coverage from the Irish Sea through the

west of Scotland to the North Sea. The Celtic Sea and English Channel do not have Q1 IBTS coverage. There is continuous Q3/4 IBTS coverage around most of the British Isles even if the Cefas Q4 survey is dropped, as the Irish Sea is covered by Northern Ireland and the Celtic Sea by the French Evhoe survey.

The ICES WGCSE (2010) report on VIIe-k cod provided the following justification for implementing a Quarter 1 survey in the Celtic Sea, and describes an Irish Industry-science cod survey carried out there in spring 2010:

ICES (2009) notes that “given the uncertainty in the landings, the surveys represent the main source of information for estimating the historical trends in the stock.” However, the current IBTS survey is conducted in quarter 4 when the stock is widely dispersed resulting in poor ability to track abundance due to low catch rates. ICES notes that “changing the surveys’ design or programming additional stations are not thought to be relevant solutions, given the implications on other survey objectives” and ICES (2009) conclude that “adding a survey in quarter 1 would be the best solution, in order to monitor both the concentration of fish and the maturity during the spawning period.” In recognition of this advice, the Marine Institute and the Federation of Irish Fishermen, in 2010 initiated an annual Q1 fishery independent survey for Celtic Sea Cod. The survey uses a commercial vessel and a dedicated survey trawl specification, based on a commercial design and in accordance with the criteria laid down in the ICES Study Group on Survey Trawl Standardisation (SGSST, 2009).

[Reference to ICES 2009 is the response of WGCSE (CM2009/09 p495) to comments by WKROUND (2009) on Celtic Sea cod data.]. The Irish Q1 commercial charter survey was not carried out after 2010 due to resource limitations, leaving a continued lack of Q1 surveys in the Celtic Sea.

Details of proposed change to Cefas Q4 survey and its benefits

Cefas intends to provide better value for money and a more robust data set by carrying out the following amendments to the Q4 Western IBTS survey:

- Moving the survey from December to March
- Reducing the IBTS survey component to the Celtic Sea (VIIIfgh) only, removing the existing complete overlap with the AFBI (N.Ireland) survey of the Irish Sea (VIIa).
- Implementing a stratified random design using known tow positions to reduce bias, maximise precision for a given cost; and allow robust estimation of precision;
- Using IBTS standard GOV trawl configurations (as currently used in the Western IBTS survey) in VIIIfgh to provide abundance indices and biological parameters for gadoids and other species suitable for this gear, and a WGBEAM approved beam trawl for conducting a parallel survey of flatfish in the Celtic Sea and western Channel (VIIe).

- Strengthening the collection of additional data on the Celtic Seas ecosystem including oceanographic and habitat data in line with SGRN 10-03 criteria 2b. *“Ecosystem management needs - The survey provides the DCF ecosystem indicators 1-4 and additional ecosystem-level data are available.”*

The main advantages of the planned change are:

- Considerable increase in cost-effectiveness by joining two existing surveys, removing redundancies in the programme (e.g. overlaps with AFBI survey), reducing vessel transit costs and delivering a much wider range of useful data for assessments and MSFD.
- Provision of data on maturity as recommended by the ICES maturity workshops, ensuring data is collected within the correct time period and providing more data on the full length range of the target species as well as ensuring the estimates are based on a proper survey design covering the population;
- Decreased risk of bad weather impacting the survey and taking advantage of longer day length.

Proposed survey design

The design of the new survey will take place during 2012, and will be reported to the Commission when the UK submits amendments to the DCF programme in autumn 2012. Some general design considerations under discussion at present are outlined below.

Spatial coverage

The IBTS component (GOV trawl) of the survey will cover sampling strata in the Celtic Sea (VII f&g and possibly northern part of VII h: Fig. 1). This will cover known cod spawning sites off SE Ireland and SW England (including in and around the Trevose cod closure) as well as important fishing grounds for haddock, whiting and various elasmobranchs.

The beam trawl survey component will cover strata in VII e and VII f covering important spawning sites for VII e and VII f g plaice and sole. Additional beam trawl tows are being considered for providing data on megrim and anglerfish in VII g.

Species coverage

The beam trawl survey component will build on an existing non-DCF funded Quarter-1 survey of VII e conducted by Cefas using a random stratified design to monitor abundance and population structure of flatfish such as sole, plaice, lemon sole, dab, megrim, turbot and brill, other demersal species including anglerfish and skates/rays, and shellfish species such as cuttlefish and crustacea, whilst collecting a wide range of environmental and habitat data of relevance to MFSD. The current design of this survey and the catch rates of some species are shown in Fig. 2.

The existing Q1 beam trawl survey in VII e will be reduced by selecting fewer tows per stratum, and additional stations / strata will be added to VII f&g to cover VII f&g plaice and sole during their spawning period as well as megrim in more offshore waters in VII g.

The otter trawl component of the survey in VII fgh will provide assessment data for cod, haddock, whiting, anglerfish, skates/rays and a wide range of other species from the diverse populations of the Celtic Sea including a number of new species included in the EC-ICES MoU.

Ecosystem data

The Q1 beam trawl survey collects a wide range of ecosystem data which will be extended across the full area of the combined survey. Data currently collected include: habitat mapping including multibeam acoustic data to investigate distribution of fish in relation to their environment; distribution of macrobenthos and anthropogenic debris; surface and bottom temperature and salinity. The combined survey will provide comprehensive data on the Celtic Sea ecosystem and provide a platform for ecosystem studies including diet analysis and stock structure analysis.

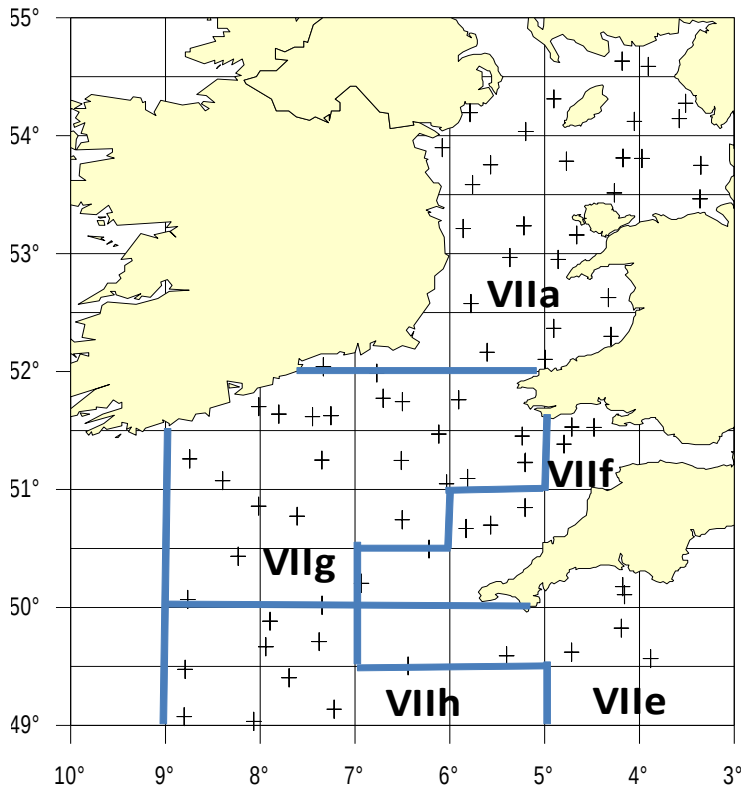


Fig. 1. Existing design of Cefas Quarter 4 Western IBTS survey. The proposed new survey will include bottom trawl stations in VIIb&c and possibly VIId. Some overlap with the AFBI Q1 survey in VIIa may be required to meet IBTSWG requirements for intercalibration.

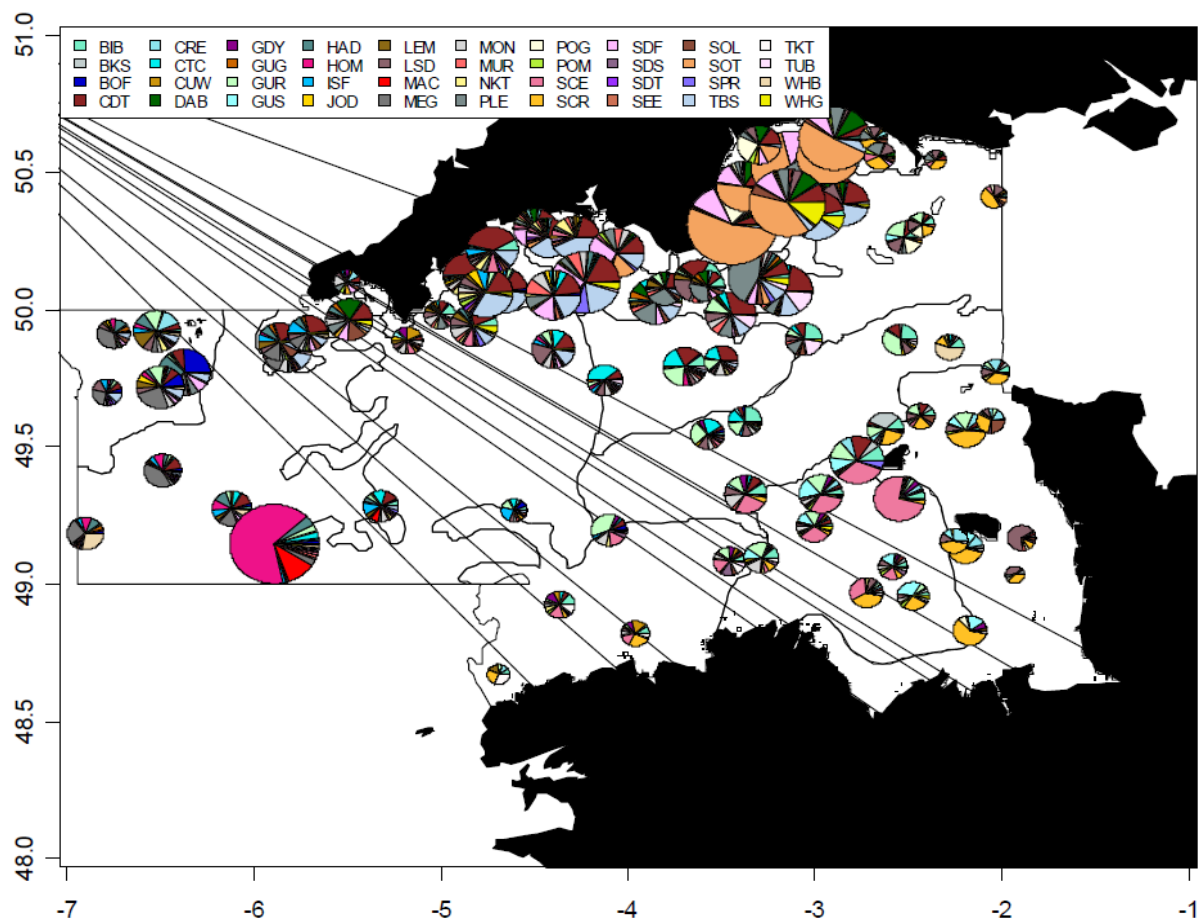


Fig. 2. Survey strata and catch rates for the 2011 non-DCF funded Cefas quarter 1 beam trawl survey of VIIe. The species compositions for the top 40 species are indicated.

ANNEX 11 Working Document on discard rates from dredge fisheries (HMD_MOL_000 and DRB_MOL_000) from UK (E) data for RCM NS&EA 2012 (Ostend, Belgium) and RCM NA 2012 (Galway, Ireland).

Steve Warnes

Cefas

29 August 2012

Summary

HMD MOL 000

Landings of finfish and shellfish represent between 0% - 1% of the total landings by year and fishing ground. Discarding is mainly of undersize targeted G3 molluscs with limited discards of any finfish species. Most fisheries are within 6 miles of the UK coast and highly regulated by the IFCAs (Inshore Fisheries and Conservation Authorities).

Cefas would seek a derogation from sampling at sea

DRB MOL 000 (non-scallop targeted)

Landings of finfish and shellfish represent between 0% - 1% of the total landings by year and fishing ground. Discarding is mainly of undersize targeted G3 molluscs with limited discards of any finfish species. Most fisheries are within 6 miles of the UK coast and highly regulated by the IFCAs (Inshore Fisheries and Conservation Authorities).

Cefas would seek a derogation from sampling at sea

DRB MOL 000 (scallop targeted)

Landings of finfish and shellfish represent between 1% - 3% of the total landings by year and fishing ground. Discarding is mainly of undersize scallops (5%- 35% by area) with limited discards of G1 & G2 finfish and shellfish species (5% - 8% by area).

Cefas would propose to continue sampling at sea the vessels targeting scallops within DRB_MOL_000 in 2013 and review the situation once more data is available.

Background

The métiers DRB_MOL_0_0_0 and HMD_MOL_0_0_0 are important UK fisheries and the landings for UK (E&W) were of over £37m in 2010 and over

£45m in 2011. The métiers for which the UK (E&W) has significant effort and landings are in fishing grounds IV and VIId (under the remit of RCM NS&EA) and in VIIa and VIIe (under the remit of RCM NA), and are all ranked in the top 3 UK métiers for those grounds. Effort in fishing ground VIIfgh has increased in recent years.

These métiers mainly target scallops, mussels, cockles and clams with a majority of the fisheries being coastal in nature. All target species taken within these métiers are classed as G3 in Annex VII of the DCF, with the exception of scallops (*Pecten maximus*) in area VIId which are classed as G2.

Unlike the majority of métiers which deal with a clearly defined gear type, species composition and mesh size both HMD and DRB can be composed of several different gear types, and the types of gears employed may also vary between fishing grounds, dependant on the species targeted. HMD for example includes both hand dredges and powered suction dredges making it difficult to standardise effort data. DRB can include vessels powered by rowing and sails as well as larger engine powered vessels. Many of the vessels involved are less than 10m and reliable effort data is not available. As many of the fisheries are regulated by daily or weekly catch rates, effort data cannot be compared with that of other métiers. It is difficult when allocating landings between HMD and DRB as most vessels are not required to provide logbooks and move between stocks and gears employed due to the regulations in place. This could explain the apparent lack of landings in some métiers and fishing grounds on an annual basis.

Métier HMD_MOL_000

All species prosecuted in this metier are classed as G3 under DCF Appendix VII.

The majority of effort in this métier is within 6 miles of the UK coast and these fisheries are in the main regulated in England by the Inshore Fisheries and Conservation Authorities (see Annex 2 for summary of inshore shellfish management in England). The main species targeted are cockles (*Cerastoderma (cardium) edule*) and limited fishing for mussels (*Mytilus edulis*) using mainly suction dredges at sea and to a lesser extent hand rakes from the shore and sandbanks with whelks (*Buccinum undatum*), Clams (*Veneracea*) also being taken by hand rakes. In the case of mussels the landings also include those of 'seed' mussels which are taken to be re-laid in beds for harvesting at a later date. The majority of landing come from IVc and consist of cockles.

In 2011 Cefas undertook a pilot study (ANNEX 1) on the cockle fishery in the Thames Estuary which forms a major part of HMD_MOL_000 in the fishing ground IV&VIId using powered dredge. Sampling took place in the regulated fishery, which accounts for the majority of the landings, as it is difficult to gain access to the transient vessels working in the offshore areas which tend to arrive when other regulated fisheries (such as in the Wash – also in IVc) are closed. Virtually all landings from the fishery are made by vessels using suction dredges.

The regulations relating to gear design are the same for most regulated fisheries and discards are controlled using the same methods. Most discards in the fishery are of undersize and damaged cockles with virtually no discards of finfish. During the pilot study less than one kilogram of finfish was discarded for the 12 tonnes (daily limit) of cockles landed.

In the case of the hand raking part of the métier there is no method to determine discarding rates for finfish as only large fish are picked up.

All the fisheries within HMD_MOL_000 tend to be species specific with usually no by-catch of other molluscs being taken. The catch of finfish and crustaceans is also negligible (Table 1). The majority of the landed by-catch is as a result of fish being collected after being stranded in sea-water pools when hand raking takes place.

Landings and value by fishing ground are given in Table 1.

Métier DRB_MOL_000

All species prosecuted in this métier are classed as G3 under DCF Appendix VII with the exception of scallops (*Pecten maximus*), which is classified as G2 in VIId only. Effort in this métier can be divided between non-scallop fisheries where the species targeted are mussels (*Mytilus edulis*), Clams (*Veneracea*) and oysters (*Ostrea edulis*) predominately within 6 miles of the UK coast and these fisheries are in the main (as with HMD_MOL_000) regulated by the IFCAs and the mainly offshore targeted scallop fishery.

Cefas first sampled scallop dredging vessels in 2002, where one trip was completed as a pilot trip. Scallop dredging was then incorporated into the sampling plan until 2005. Between 2002-2005, Cefas completed 25 sea trips on a mixture of over and below 12m vessels. No trips occurred on vessels less than 10m registered length due to safety concerns with this class of vessel, at the time (see Table 2). Very little sampling occurred in the North Sea (IV) after the initial trip because the DCR only specified that scallops should be looked at in the English Channel, specifically area VIId. However Cefas found that a lot of dredging effort was also occurring in VIle and so sampling occurred in both areas and on both large and small vessels. Sampling was abandoned half way through 2005 as sampling priority was given to other métiers, due to the low catches of finfish and the perceived high survivability of discarded scallops. It should be noted that no research was done on scallop survival rates at this time.

In 2009 Cefas presented a Working Document based on these data to RCM NS&EA 2009, Boulogne-sur-mer, France in order to obtain a derogation from sampling at sea for this métier. As the RCM felt that more information was required before any derogation could be granted, Cefas started to sample DRB_MOL_000 in VIId from 2010.

Targeting vessels according to ICES Division proved inefficient leading to shortfall from targets for DRB in VIId in 2010 and 2011 due to the fleet operating mainly in VIIe. Changing the area stratification so that vessel trips were selected from a random draw list covering all fishing grounds for DRB_MOL_000 from 2012 resulted in more samples being collected.

Most of the vessels involved in the inshore fisheries are under 10m (the majority are less than 8m) and are regulated by daily or weekly catch rates. Due to safety concerns with this class of vessel (under 10m) it is not possible to place observers on board to undertake sampling in most instances. Most of these fisheries tend to be species specific with no significant by-catch of other finfish.

The number of sampling trips Cefas has undertaken on dredgers, detailing target species, since 2002 are given in Table 2.

As with HMD_MOL_000 many of the vessels involved in the inshore fisheries are under 10m and reliable effort data is not available, and as many of the fisheries are regulated by daily or weekly catch rates they cannot be compared with other métiers or across the gear type within the métier at fishery level. It is difficult to identify the métier that landings should be allocated to between HMD and DRB as most vessels are not required to provide logbooks and move between stocks and gear types. Landings data are given in Table 3.

As stated previously most of the vessels involved in the inshore fisheries are less than 10m (the majority are less than 8m) and are regulated by daily or weekly catch rates, dependant on the fishery. Due to safety concerns with this class of vessel (under 10m) it is not possible to place observers on board to undertake sampling in most instances. In 2012 Cefas managed to sample a 9m vessel targeting Manila clams (*Ruditapes philippinarum*) fishing in VIId. Only clams were taken in the dredge with no other species being caught and only undersize clams were discarded. The proportions retained and discarded by weight and number are given in Table 4.

From Table 3 it can be seen that landings of finfish and shellfish represent less than 5% of the landing from DRB_MOL_000, most of the landed by-catch coming from the targeted scallop fishery. Very few species are retained when caught in the dredges along with scallops, either because the fish are below the minimum landing size, are of low value or are damaged by the scallops and rocks caught. Usually the high value flatfish and some of the hardier rays are retained; this varies between fishing ground and relates directly to the species composition within the area. The discard ratio of scallops also varies between fishing ground due to the size structure of the stocks – up to a third of the scallops caught can be discarded, mainly because they are below the minimum landing size (MLS).

The total numbers and weights of retained finfish/crustacean and scallops for all sampled trips by fishing ground are shown in Table 5. The data are also shown as a proportion of the total catch (including scallops).

The combined total numbers and weights of all species caught from scallop dredges, by fishing ground, on discard observer trips is shown in Table 6.

Survival rates of discarded scallops are thought to be high, however Jenkins and Brand (2001) have stated that the “escape response of scallops that have encountered a dredge are significantly impaired and this could lead to high levels of mortality in undersize discarded scallops”.

References

Jenkins, S.R., and Brand, A.R., 2001. The effect of dredge capture on the escape response of the great scallop, *Pecten maximus* (L.): implications for the survival of undersize discards. *Journal of Experimental Marine Biology and Ecology*, vol. 266, no. 1, pp33-50.

Table 1. Landings and value HMD_MOL_000 by fishing ground and species group

Fishing ground	Species group	Data	Year										
			2001	2002	2003	2004	2005	2006	2007	2008	2009	2010*	2011*
IV, VIId	Finfish	Tonnes	0							0			
		Value	£117							£381			
	Molluscs	Tonnes	17494	15506	16628	14900	11808	9833	10161	13230	1733	1126	4255
		Value	£3,612,479	£3,218,146	£4,954,399	£9,136,331	£6,202,338	£4,298,366	£6,597,929	£6,507,394	£6,609,551	£1,184,895	£567,254
	Total	Tonnes	17494	15506	16628	14900	11808	9833	10161	13230	1733	1126	4255
		Value	£3,612,596	£3,218,146	£4,954,399	£9,136,331	£6,202,338	£4,298,366	£6,597,929	£6,507,775	£6,609,551	£1,184,895	£567,254
VIIa	Molluscs	Tonnes	2300				35	55	62		126		
		Value	£966,000				£38,456	£74,257	£52,766		£24,213		
	Total	Tonnes	2300	0	0	0	35	55	62	0	126	0	0
		Value	£966,000	£0	£0	£0	£38,456	£74,257	£52,766	£0	£24,213	£0	£0
VIIe	Crustaceans	Tonnes											0
		Value											£17
	Finfish	Tonnes								0	0	0	0

		Value								£129	£2,948	£50	£234
	Molluscs	Tonnes		1			0	0	0	3	22	20	29
		Value		£1,315			£224	£228	£228	£3,629	£28,865	£41,274	£65,728
	Total	Tonnes	0	1	0	0	0	0	0	3	23	20	29
		Value	£0	£1,315	£0	£0	£224	£228	£228	£3,758	£31,813	£41,324	£65,979

* Provisional data

Table 2 Number of sampling trips DRB_MOL_000.

Year	ICES Area	Target species	Vessels <12m	Vessels >12m	Total Number Trips
2002	IVb	Scallop	0	1	1
2003	VIIId	Scallop	3	0	3
2003	VIIe	Scallop	3	5	8
2004	VIIId	Scallop	1	1	2
2004	VIIe	Scallop	4	3	7
2005	VIIe	Scallop	1	3	4
2010	VIIId	Scallop	0	1	1
2011	VIIId	Scallop	0	1	1
2011	VIIe	Scallop	0	1	1
2012	VIIId	Scallop	3	0	3
2012	VIIId	Clams	1	0	1
2012	VIIe	Scallop	2	4	6

2012	Vllf	Scallop	0	1	1
	Totals		12	13	25

Table 3.Landings, effort and value DRB_MOL_000 by fishing ground and species group

Fishing ground	Species Group	Data	Year										
			2001	2002	2003	2004	2005	2006	2007	2008	2009	2010*	2011*
IV, VIId	Crustaceans	Tonnes	5	60	7	1	1	1	1	0	4	1	3
		Value	£4,403	£142,816	£10,852	£967	£1,573	£1,255	£1,194	£855	£14,209	£2,426	£6,789
	Finfish	Tonnes	10	14	13	5	8	10	17	16	18	40	61
		Value	£37,382	£39,913	£43,698	£15,816	£44,187	£46,400	£77,266	£61,179	£71,316	£275,790	£220,734
	Molluscs	Tonnes	2032	2083	2453	3805	5964	2852	3021	2567	3428	4118	3275
		Value	£2,495,940	£3,197,288	£3,447,184	£2,872,452	£3,216,915	£2,881,357	£3,550,730	£3,527,952	£4,711,785	£6,207,312	£6,061,567
	Total	Tonnes	2047	2157	2473	3811	5973	2863	3039	2584	3450	4159	3339
		Value	£2,537,725	£3,380,017	£3,501,734	£2,889,235	£3,262,675	£2,929,012	£3,629,190	£3,589,986	£4,797,310	£6,485,528	£6,289,090
		Days Fishing	3276	3835	4169	2737	3336	4051	3965	4371	4265	5136	4800
VIIa	Crustaceans	Tonnes	5	5				5	1	1	0	1	0
		Value	£6,744	£7,180				£5,554	£2,791	£1,044	£547	£1,367	£3,362
	Finfish	Tonnes	5	0	0	1	0	1	0	0	1	2	1
		Value	£19,042	£458	£30	£4,475	£54	£3,038	£1,048	£172	£2,911	£2,809	£1,372
	Molluscs	Tonnes	7584	9359	1519	3425	839	6831	1444	6359	3433	6847	11878
		Value	£3,599,374	£3,792,134	£1,882,932	£1,243,248	£767,812	£1,637,857	£1,563,412	£3,112,782	£2,644,917	£3,746,654	£7,190,397
	Total	Tonnes	7594	9364	1519	3426	839	6836	1445	6360	3434	6849	11879
		Value	£3,625,160	£3,799,772	£1,882,962	£1,247,723	£767,866	£1,646,449	£1,567,251	£3,113,998	£2,648,375	£3,750,830	£7,195,131

		Days Fishing	700	656	597	449	455	812	761	1220	1241	1474	3671
VIIe	Crustaceans	Tonnes	1	216	1	1	0	2	2	1	6	3	2
		Value	£1,981	£279,304	£1,218	£1,472	£599	£1,697	£1,714	£1,045	£3,560	£4,993	£5,036
	Finfish	Tonnes	89	78	49	69	88	103	96	62	91	132	204
		Value	£317,274	£285,358	£155,317	£207,973	£366,158	£380,070	£414,720	£287,034	£361,247	£663,440	£944,922
	Molluscs	Tonnes	5224	6449	4392	6806	9797	6262	5836	4529	5186	6305	6471
		Value	£4,980,048	£5,400,640	£4,541,600	£5,421,061	£7,326,170	£7,127,996	£6,683,249	£4,711,832	£6,081,591	£7,531,885	£10,555,144
	Total	Tonnes	5314	6742	4442	6876	9886	6367	5934	4592	5283	6440	6677
		Value	£5,299,303	£5,965,302	£4,698,135	£5,630,506	£7,692,927	£7,509,763	£7,099,683	£4,999,911	£6,446,398	£8,200,318	£11,505,102
		Days Fishing	5772	5302	4328	4623	4690	5843	5685	4190	4559	4596	5451
VIIIfgh	Crustaceans	Tonnes		36	0				0	0	0		0
		Value		£44,160	£79				£90	£16	£410		£6
	Finfish	Tonnes	16	33	5	3	4	12	4	2	1	6	8
		Value	£38,546	£56,924	£9,292	£7,760	£12,866	£31,229	£8,409	£2,615	£4,026	£15,030	£20,980
	Molluscs	Tonnes	890	549	198	255	1059	460	120	194	36	207	274
		Value	£451,851	£714,216	£238,491	£409,522	£193,590	£620,828	£160,388	£246,187	£72,849	£305,397	£452,507
	Total	Tonnes	906	618	203	258	1064	472	124	196	37	213	282
		Value	£490,397	£815,300	£247,862	£417,282	£206,456	£652,057	£168,887	£248,818	£77,285	£320,427	£473,493
		Days Fishing	203	236	186	140	100	288	141	217	146	198	284

* Provisional Data

Table 4. Proportions of clams retained and discarded from targeted DRB_MOL_000 discard trip.

Fishing Ground IV, VIId			Retained		Discarded	
Common name	Latin name	Species Group	Number	Weight(kg)	Number	Weight(kg)
Manila Clam	<i>Ruditapes philippinarum</i>	G3	8091	142	19240	193
			29.6%	42.3%	70.4%	57.7%

Table 5. Summed numbers and weights (and proportions) of retained finfish/crustacean and scallops for all sampled scallop dredge trips by fishing ground.

		Retained		Discarded	
Fishing ground	Species	Number	Weight	Number	Weight
IV, VIId	Scallops	117532	14366	18724	1162
		82.0%	81.5%	13.1%	6.6%
	Finfish/Shellfish By-catch	666	414	6476	1676
		0.5%	2.4%	4.5%	9.5%
	Total	118197	14781	25200	2837
VIIe	Scallops	343048	32008	175617	11184
		65.3%	68.1%	33.4%	23.8%

	Finfish/Shellfish By-catch	504	1003	6215	2805
		0.1%	2.1%	1.2%	6.0%
	Total	343552	33011	181832	13989
VII fgh	Scallops	17258	1697	718	40
		93.2%	85.0%	3.9%	2.0%
	Finfish/Shellfish By-catch	11	5	538	253
		0.1%	0.3%	2.9%	12.7%
	Total	17270	1702	1256	293

Table 6. Combined numbers and weights of all species caught from scallop dredges, by fishing ground, on discard observer trips.

Fishing Ground IV, VIId			Retained		Discarded	
Common name	Latin name	Species Group	Number	Weight(kg)	Number	Weight(kg)
ANGLERFISH (MONK)	<i>Lophius piscatorius</i>	G1	23	29	3	1
BRILL	<i>Scophthalmus rhombus</i>	G2	41	35		
BULLROUT	<i>Myoxocephalus scorpius</i>	G3			4	0
COD	<i>Gadus morhua</i>	G1	11	22		
COMMON CUTTLEFISH	<i>Sepia officinalis</i>	G3			2959	449

COMMON DRAGONET	<i>Callionymus lyra</i>	G3			65	1
CUCKOO RAY	<i>Raja naevus</i>	G1			4	3
DAB	<i>Limanda limanda</i>	G2	2	0	153	16
EDIBLE CRAB	<i>Cancer pagurus</i>	G2	5	5	145	96
ESCALLOP	<i>Pecten maximus</i>	G2	117532	14366	18724	1162
EUROPEAN FLAT OYSTER	<i>Ostrea edulis</i>	G3			1	0
EUROPEAN LOBSTER	<i>Homarus gammarus</i>	G2	1	3	1	1
EUROPEAN PLAICE	<i>Pleuronectes platessa</i>	G1	236	107	1481	507
GREY GURNARD	<i>Eutrigla gurnardus</i>	G2			3	0
LEMON SOLE	<i>Microstomus kitt</i>	G2	159	51	365	96
LESSER SPOTTED DOGFISH	<i>Scyliorhinus canicula</i>	G1			7	4
POOR COD	<i>Trisopterus minutus</i>	G3			64	1
SANDEELS	<i>Ammodytes spp</i>	G2			64	3
SOLE (DOVER SOLE)	<i>Solea solea</i>	G1	124	56	65	14
SPINY SPIDER CRAB	<i>Maja squinado</i>	G3	1	1	607	333
SPOTTED RAY	<i>Raja montagui</i>	G1			3	2
STARRY SMOOTH HOUND	<i>Mustelus asterias</i>	G1			1	0
THICKBACK SOLE	<i>Microchirus variegatus</i>	G3			193	7
THORNBACK RAY (ROKER)	<i>Raja clavata</i>	G1	1	2	9	5
TOPKNOT	<i>Zeugopterus punctatus</i>	G3			3	0
TUB GURNARD	<i>Chelidonichthys lucerna</i>	G2			64	37

TURBOT	<i>Psetta maxima</i>	G2	60	103	65	61
UNDULATE RAY	<i>Raja undulata</i>	G1			67	20
VELVET SWIMMING CRAB	<i>Necora puber</i>	G3			3	0
WHITING	<i>Merlangius merlangus</i>	G1			1	0
WHITING-POUT (BIB)	<i>Trisopterus luscus</i>	G3			73	19
Grand Total			118197	14781	25200	2837
Fishing Ground VIIe			Retained		Discarded	
Common name	Latin name	Species Group	Number	Weight(kg)	Number	Weight(kg)
ANGLERFISH (MONK)	<i>Lophius piscatorius</i>	G1	362	850	1436	712
BLONDE RAY	<i>Raja brachyura</i>	G1	2	2	4	6
BRILL	<i>Scophthalmus rhombus</i>	G2	25	40		
BUTTERFLY BLENNY	<i>Blennius ocellaris</i>	G3			2	0
COD	<i>Gadus morhua</i>	G1			2	3
COMMON CUTTLEFISH	<i>Sepia officinalis</i>	G2			1209	270
COMMON DRAGONET	<i>Callionymus lyra</i>	G3			197	7
EDIBLE CRAB	<i>Cancer pagurus</i>	G2	1	2	1814	1214
ESCALLOP	<i>Pecten maximus</i>	G3	343048	32008	175617	11184
EUROPEAN LOBSTER	<i>Homarus gammarus</i>	G2			6	6
EUROPEAN PLAICE	<i>Pleuronectes platessa</i>	G1	37	16	73	24
LEMON SOLE	<i>Microstomus kitt</i>	G2	13	5		

MARbled ELECTRIC RAY	<i>Torpedo marmorata</i>	G1			6	23
POOR COD	<i>Trisopterus minutus</i>	G2			59	0
RED GURNARD	<i>Aspitrigla cuculus</i>	G2			123	25
RED MULLET	<i>Mullus surmuletus</i>	G2			2	0
SOLE (DOVER SOLE)	<i>Solea solea</i>	G1	48	31	2	1
SPINY SPIDER CRAB	<i>Maja squinado</i>	G3			1023	367
SPOTTED RAY	<i>Raja montagui</i>	G1	2	4		
STREAKED GURNARD	<i>Chelidonichthys lastoviza</i>	G3			14	0
THICKBACK SOLE	<i>Microchirus variegatus</i>	G3			101	1
THORNBACk RAY (ROKER)	<i>Raja clavata</i>	G1			73	94
TURBOT	<i>Psetta maxima</i>	G2	10	39		
WHITE-ANGLERFISH	<i>Lophius budegassa</i>	G1	4	14		
WHITING-POUT (BIB)	<i>Trisopterus luscus</i>	G2			69	49
Grand Total			343552	33011	181832	13989
Fishing Ground VII fgh			Retained		Discarded	
Common name	Latin name	Species Group	Number	Weight(kg)	Number	Weight(kg)
ANGLERFISH (MONK)	<i>Lophius piscatorius</i>	G1	8	2		
EDIBLE CRAB	<i>Cancer pagurus</i>	G2			31	12
ESCALLOP	<i>Pecten maximus</i>	G3	17258	1697	718	40
LEMON SOLE	<i>Microstomus kitt</i>	G2	3	1		

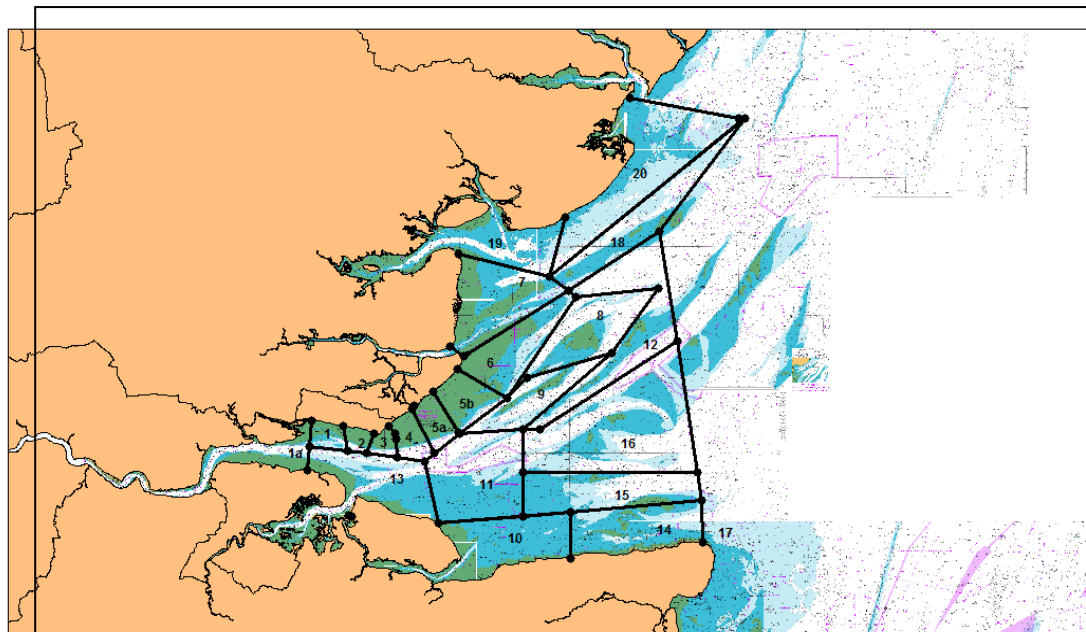
LESSER SPOTTED DOGFISH	<i>Scyliorhinus canicula</i>	G1			1	2
SOLE (DOVER SOLE)	<i>Solea solea</i>	G1			1	1
SPINY SPIDER CRAB	<i>Maja squinado</i>	G3			504	238
SPOTTED RAY	<i>Raja montagui</i>	G1	1	2	1	1
Grand Total			17270	1702	1256	293

ANNEX 1

Pilot study on discard rates from the Thames cockle fishery in IVc (HMD_MOL_000)

The fishery

The Thames estuary supports an important cockle fishery (fishing ground IV, VIId). Up until the late 1960's, all cockles were collected by hand raking, however hand raking has steadily declined and virtually all cockle harvesting is now carried out using suction dredges. In 1994, the Thames Estuary Cockle fishery regulation order came into operation, it covers a large section of the fishery with only 14 vessels licensed to harvest cockles in this area (see Annex Figure 1). As well as the 14 local vessels, vessels from the wash and west coast ports work the outer areas not covered by the regulating order.



Grounds within the area covered by the Thames estuary cockle fishery order 1994.

1. Marsh End and Chapman Sands
2. East of Pier
3. West of Shoebury Boom
4. East of Shoebury Boom
- 5a. South Maplin
- 5b. Mid Maplin
6. North Maplin and Foulness Sand
8. East Barrow and Maplin Spit
9. West Barrow
11. East Cant, Middle and Red Sand

Grounds outside the area covered by the Thames estuary cockle fishery order 1994.

- 1a. Inner Estuary
7. Buxey and Dengie Sands
10. Pollard, Columbine and Whitstable
14. South Margate Sands
17. South Kent Coast and Dungeness
18. Gunfleet Sand
19. Blackwater Estuary
20. Wallet and North Essex Coast

Annex Figure 1: Kent and Essex IFCA cockle harvesting areas in the Thames Estuary

All vessels fishing in the district are subject to bylaws limiting the size of the fishing vessel and dredge, the construction of the fishing gear and closure of beds including closed seasons. In addition to this there is a minimum cockle size, a maximum smash rate and restricted fishing times, with no more than 12 bags (1 tonne/bag) landed during a 24 hour period.

The commercial harvesting of cockles in the Thames estuary is controlled by Kent and Essex IFCA. In addition to enforcing local bylaws and restrictions, they also carry out spawning stock assessments bi-annually in autumn and spring, to ensure the sustainable management of the fishery. The surveys examine the distribution and density of cockles and the results are used to produce estimated values of population size. Annual total allowable catch (TAC) limits are set following completion of the spring survey at a maximum level of 33% of the adult stock.

The fishery is only open for a short period, this year it opened on June 20th and is scheduled to close on 7th October, though this is subject to change depending upon the continual assessment of the stocks.

Fin-fish by catch pilot study

In order to determine the amount of finfish by-catch in the fishery, a Pilot trip was completed on FV Lewis Andrew on 31st August 2011.

The retained catch comes on board through a single shoot and is funnelled directly into tonne bags. Discarded finfish which came on board with the retained cockles were monitored throughout the trip.

The discarded proportion of the catch (small cockles, benthos and small fish) is rinsed out through the 16mm riddle and is dispelled through a single shoot on the side of the vessel. To get a sample of the discards, a 10mm mesh ring net was hung over the side of the vessel for a set length of time (between 10 and 30 seconds), then brought back on board and sorted. Any fish in the sample were identified and measured. See pictures



below.



On the first deployment of the dredge, at 00:45hrs, Area 3 West of Shoebury boom, Area 4 East of Shoebury boom and Area 5a South Maplin were worked for 4 hours and 55 minutes. Samples were taken with the net for a total of 1 minute 30 seconds. Only one fish was caught in the discard proportion, and none in the retained proportion of the catch.

Fishing stopped at 05:40hrs and the vessel laid to, to wait for more tide. At 10:40hrs, fishing recommenced and we continued fishing for 2 hours 15 minutes until the maximum 12 tonne bags had been filled. Area 4 and Area 5a were again fished. During this second fishing period, samples were taken every 30 minutes for 30 seconds to give a total sample time of 2 minutes 30 seconds. In this sample event, 7 fish were caught in the discard sample and 1 fish was caught in the retained shoot. No fish were landed for the trip and the total weight of finfish discards was less than 1 kilo.

The combined raised numbers and weights of all fish species caught in the cockle dredge for this trip are shown in Annex Table 1 below.

Annex Table 1. Raised numbers and weight of fish discarded from sampled trip

Common Name	Species Group	Latin Name	Number Discarded	Weight (Kg) Discarded
Flounder	G2	<i>Platichthys flesus</i>	1	0.165
Nilssons Pipefish	G3	<i>Sygnathus rostellatus</i>	54	0.040
Sandeels	G2	<i>Ammodytes spp</i>	108	.0140
Sand Goby	G3	<i>Pomatoschistus minutus</i>	413	0.335

The skipper noted that the day before, seven flounders (*Platichthys flesus*) came through the retained shoot and that this was an unusually high number of fish to see. It is unusual to see finfish as a by-catch in this fishery, however if dredging moves to new ground, softer ground or deeper water i.e. in Areas 8 and 9, East/West Barrows, there is a potential for fish to appear in the catch. This year the fleet has stayed local on their main fishing grounds.

The improvements to the dredging gear have also led to a decrease in fish by-catch, mainly because the suction pipe is covered.

Sampling on these vessels poses some risk to the observer, in particular in obtaining a sample of the discarded proportion of the catch. This is because the observer would need to hang over the side of the vessel if the crew were not willing or able to help. However discussion with the local IFCA has led to the possibility of them incorporating some discard sampling with their surveys. From season start, all licensed vessels undergo a damage rate assessment and are sampled by Kent&Essex IFCA officers to ensure that smash rates of cockles are below 10% of the catch. The methodology and equipment used to perform these assessments are very similar to those adopted here.

ANNEX 2

Inshore Shellfish fishery management in England

The Marine and Coastal Access Act 2009 has modernised the way that inshore sea fisheries resources are managed in England by replacing Sea Fisheries Committees in England with Inshore Fisheries and Conservation Authorities (IFCAs) from April 2011. IFCAs are either committees or joint committees of the local authorities that fall within an IFC district. They are tasked with the sustainable management of inshore sea fisheries resources in their local area. The Marine Management Organisation, Environment Agency and Natural England also each have a statutory seat on the IFCA.

Each IFCA manages a district that covers part of the English coast that goes out to six nautical miles and its inland boundaries align with those of its constituent local authorities. IFCAs also manage sea fisheries resources in estuaries that fall within their districts. The devolved government of Wales now has responsibility for management of inshore sea fisheries around the coast of Wales.

The Sea Fisheries (Shellfish) Act 1967 provides for the establishment and improvement of commercial shellfisheries through a Several Order. It also allows the preservation and improvement of existing wild shellfisheries that may be at risk of over-exploitation through a Regulating Order. In the future Defra will only grant Regulating Orders to Inshore Fisheries and Conservation Authorities (IFCAs), or other public bodies that regulate fishing activity in certain areas (such as the Environment Agency).

In addition to enforcing local bylaws and restrictions, IFCAs also carry out stock assessments to ensure the sustainable management of the major stocks and fisheries. Surveys examine the distribution and density the stocks and the results are used to produce estimated values of population size. Some minor species/stocks may be subject to regulation but not assessed. Annual total allowable catch (TAC) limits are set for cockle fisheries within Regulating Orders, most others are managed through technical bylaws.

The types of order are detailed below.

Several orders: - Section 2 of the Act gives the Grantee of an Order exclusive rights, exercisable within a defined area of the sea shore, to fish, dredge for or take the shellfish species to which the Several Order applies. The right of Several fishery bestows ownership of the shellfish on the Grantee and is a property right that may be leased or transferred. In exercising this right the Grantee may create and maintain shellfish beds and may collect, move or deposit shellfish as it sees fit within the defined area. The Order which confers this right will set out the extent of such powers and any conditions to which they are subject.

Whilst an Order only applies to named species, it can place restrictions on other activities (including fishing for other species) which may take place within the area of an Order, if these activities would damage or place at risk the shellfish stock for which an Order has been given. Unauthorised disturbance of or injury to a shellfish bed within the designated area of a Several Order may give rise to criminal sanctions and entitle the Grantee to compensation. Regulating Orders grant the right to regulate the exploitation of a shellfishery. They are designed to improve the management of natural shellfisheries.

Regulating orders: - Grantees of a Regulating Order have powers of management to carry into effect and enforce regulations and restrictions relative to the fishing for, dredging or taking of specified shellfish species within a designated area. These Orders provide licensing provisions under which Grantees may issue licences authorising the fishing, dredging for or taking of shellfish at a time, in a manner and to a (geographical) extent determined by the Grantees. Unlicensed persons are excluded from the Regulated fishery. The Grantees of Regulating Orders, who do not themselves exercise fishing rights under it, are not treated as receiving financial benefit directly from the rights granted to them.

Hybrid orders:-The Act also allows for the creation of Hybrid Orders. These Orders combine Several and Regulating provisions. Where such an order is made, it sets up a regulated fishery that has within its boundaries one or more areas designated as Several fisheries. The rights of the Grantee in respect of each of those parts of the fishery will be as described above. As with Regulating Orders, these Defra will only grant these to IFCAs.

In England, Several and Regulating Orders are granted by the Secretary of State under the terms of the Sea Fisheries (Shellfish) Act 1967.

ANNEX 12

CATCH-QUOTA MANAGEMENT SYSTEM WITH REMOTE ELECTRONIC MONITORING (REM)

TERMS & CONDITIONS 2012

Overview

1. This is a voluntary scheme. It is based on catch-quota management, not on traditional landing quotas. The catch-quota management system (CQMS) will operate in the 2012 quota management year and will be applicable to CQMS stocks that fishermen have agreed to participate for.
2. The purpose of this management system is to assess the capability of the CQMS to reduce discards, reduce fishing mortality and to encourage fishermen to fish more selectively. At the same time, it is aimed at delivering higher revenue for participating vessels compared to those not participating.
3. The main features for vessels participating in the CQMS are that:
 - a) all caught fish are recorded
 - b) all CQMS species caught shall count against quota;
 - c) all CQMS species caught shall be retained on board and landed; and,
 - d) fishermen will have to account for all fish caught through documentation.
4. The main objectives of the scheme are to:
 - Reduce discard levels.
 - Reduce fishing mortality rates for demersal stocks.
 - Provide evidence and experience from the scheme for the reform of the Common Fisheries Policy (CFP).
 - Provide further detailed evaluation of using catch-quotas as a fishery management and discard reduction tool in a multi-species context.
 - Seek to ensure improved science and advice on the basis of precise fisheries data. In effect, it is hoped that participants in the scheme will significantly enhance our data collection and improve fisheries science and advice e.g. the effect of management initiatives such as a discard ban.
 - Improve the effect and tuning of regulations e.g. real-time closures, grading bans and effort restrictions by providing precise data on catch rates and discards from reference vessels having full catch documentation.

Eligibility

5. To allow for effective management, monitoring and communication, eligibility shall be limited to English vessels only. For the purposes of the CQMS an English vessel shall be defined as English registered and administered at a Marine Management Organisation (MMO) coastal office.

6. In order to be eligible a vessel must be a member of a Producer Organisation (PO).
7. A vessel must be suitable for the installation of the Remote Electronic Monitoring equipment.
8. Pair Trawl vessels shall only be eligible if both vessels are signed up to the scheme.

Additional quota and days at sea

9. Each vessel will receive additional quota for the CQMS stocks it is participating for. Additional quota will be based on:
 - A vessel's track record of annual landings in 2011 (fish landed under scientific dispensation schemes and additional quota from previous catch quota schemes will not be included in this track record);
 - The bid made in its application form; and,
 - A maximum allocation of up to 75% of the discard rate for each stock, according to gear type.
10. Once a vessel has reached its total quota allocation for a CQMS stock it will be required to cease **all** fishing operations in all ICES areas to which the allocation relates. Vessels are therefore strongly encouraged to consider the use of highly selective gears and continue avoidance behaviours to ensure this scenario does not arise. Whilst additional quota can be leased in during the year, this additional quota will not qualify for the *pro rata* increase in quota given at the start of the management year.
11. Vessels fishing in Norwegian waters with gear capable of catching CQMS stocks must ensure that they have sufficient quota to account for any bycatch and so comply with Norwegian discarding rules. If such quota is exhausted then fishing operations must be stopped.
12. Participating vessels will be subject to the days at sea regime, and may be offered additional days at sea to encourage cod-avoidance behaviour. The amount of additional days made available will depend upon the overall constraints of the 2012 days at sea regime. Participating vessels cannot transfer out any additional days at sea awarded.
13. Participating vessels can buy-in and lease additional quota from other sources outside the CQMS. Bought in and leased quota will also be subject to the rules of the scheme. Participating vessels must not sell or lease out quota to vessels either within or outside the scheme.

Discards and undersize fish

14. Vessels must not discard any catches of CQMS stocks.

15. Slipping the whole, or part, of the catch is considered to be a form of discarding and is not permitted.
16. Discarding of species other than CQMS stocks will be allowed providing it adheres to the requirements of the High Grading Ban. Non CQMS fish can only be discarded once they have passed under the view of ALL CCTV cameras placed above the catch sorting/discard area. Discarded fish can only be discarded via the traditional discard chute.
17. Catches of undersized CQMS species must not be sold or offered for human consumption but should be disposed of either by sending for processing into fishmeal or offering as bait to static gear operators.
18. Catches of undersized CQMS species must be kept in separate containers and not be mixed with fish above the minimum landing size. Boxes of undersize fish should be stowed separately. A document setting out the weight of species of undersize fish and its disposal method must be submitted to the MMO for quota uptake purposes.

Remote Electronic Monitoring (REM) system

19. Positioning of cameras for the duration of the scheme will be decided in co-operation with the fishing vessel master so as to ensure that observers can monitor the process to obtain a good assessment of the catch. Cameras must not be moved or altered without approval from the MMO. Only personnel authorised by the MMO will be able to carry out repairs and maintenance.
20. Due to the need to cross-verify the effectiveness of electronic monitoring, observers will be required onboard participating vessels from time to time.
21. The sorting and handling of all catches must be carried out in full view of the cameras. Defra reserves the right to place additional cameras onboard participating vessels as required and request alterations to sorting operations in agreement with the master, to allow for effective quantification of catches.
22. The systems must remain switched on at all times regardless of the sea area in which the vessel is operating.
23. In the event of equipment failure the Master must notify the MMO as soon as they become aware of the failure. The trip may be completed before return to port but the vessel will not be allowed to return to sea until the equipment is fully functioning. Early communication of any equipment problems will allow the MMO to take steps to ensure that the problem can be corrected as soon as possible on the vessel's return to port.
24. In relation to the equipment installed there shall be a duty of care placed on the master as laid out in the **duty of care code**. It is the responsibility of the

Master to ensure that crew are aware of, and compliant with, the terms and conditions of the CQMS.

25. Skippers and crews must:

- Allow observers onboard and make suitable provision for their comfort;
- Not tamper **or interfere with** the work of observers;
- Not tamper or interfere with the on-board REM equipment;
- Not deliberately block the view from REM equipment to the vessel's catch-handling areas;
- Not deliberately attempt to handle or discard catch out of the view of REM equipment; and,
- Not carry out trans-shipment operations (either receiving or donating catch) with other vessels.

26. The MMO will provide regular feedback to vessel masters on their catch handling procedures to ensure that catches can be monitored easily.

27. The REM system is the property of Defra. The master of the fishing vessel must make himself and the vessel available prior to the start of the scheme for a period of up to 3 days to allow installation of the monitoring systems and for one day after completion of the trial for the equipment to be removed.

Control and enforcement

28. It is important that vessels are inspected to ensure accuracy of data and that the rules of the project are being adhered to. Vessels will therefore be subject to ongoing monitoring and evaluation to confirm this. The master of the fishing vessel must facilitate vessels' inspections whenever requested by a Marine Officer.

29. The MMO will inspect vessels in port and at sea as part of their risk-based control regime.

30. Breaches of the scheme will be investigated by a disciplinary board consisting of the relevant Defra policy lead, the CQMS Trial Manager and a Senior MMO Official. The board will be responsible for establishing whether a vessel is deemed to have been non-compliant with the requirements of the scheme. The disciplinary board's decision shall be final.

31. Any breach of the scheme that potentially indicates an offence in law will be handed to the relevant authorities for further investigation. Vessels prosecuted for a fishery offence that occurs within the duration of the scheme will be referred to the disciplinary board. The board will review the vessel's continued participation in the scheme in relation to the offence.

Conditions placed on the participating vessel and the participant

32. If a participating vessel is sold or exchanged, that vessel will be removed from the scheme. All remaining quota made available under the CQMS will be removed from the vessel's allocation.

33. In the instance of sudden unforeseen circumstances, such as sinking or disablement of a vessel, a replacement vessel may take part in the scheme providing the replacement is agreed by MMO prior to any commitment being made, and meets the requirements as set out above. REM equipment must be provided by the project participant.
34. Loss or damage caused by the negligent acts of the master or crew in relation to the REM system will not be the responsibility of Defra or the MMO.
35. Project participants must have sufficient insurance to cover the loss or damage of all parts of the REM system.
36. Defra or the MMO must be compensated for any repair or replacement to the REM system where damage or loss has occurred as above. The Master will be responsible for notifying the MMO of maintenance and repair required to the REM system. Only engineers authorised by MMO will be able to carry out repairs.
37. Project participants may be able to change vessel and remain on the project once in the project term. Any potential change should receive prior confirmation in writing from the MMO so that the owner can be sure that the replacement vessel will remain in the scheme before they make any commitment. The remaining catch quota and terms of the scheme will transfer to the replacement vessel.
38. If a participating vessel is removed from the scheme, or leaves the scheme voluntarily, then the additional quota and days granted under the terms of the scheme will be deducted from current and/or future allocations. MMO will thereafter consider the level and terms of any new allocation of days at sea. MMO will not be able to guarantee an allocation of days at sea to vessels removed from the scheme, particularly where removal takes place later in the effort management year.

Data control and handling

39. MMO and Defra will appoint Data Controllers. Data Controllers will determine dissemination of the recorded data.
40. Footage and data gathered may be used in an aggregated and anonymous form in publications and reports produced by, for and on behalf of MMO and Defra. All data will be treated as commercially sensitive. The data will be owned by Defra.
41. Enquiries made under Freedom of Information (FOI) legislation will be answered following normal FOI guidelines. Personal data (which includes CCTV footage and data) will be protected in accordance with the Data Protection Act (1998).
42. System hard drives from vessels will be collected at regular intervals following liaison with the master of the fishing vessel. Data will be transferred to a secure

server for processing and a replacement hard drive will be fitted to allow the vessel to continue fishing operations.

43. The data/footage will be erased 6 months after the date recorded, unless required for ongoing enforcement action. Some data may be temporarily retained for up to an additional 6 months to allow scientific analysis to be conducted and papers to be written.
44. Information obtained by the REM system and by observers will be retained and used for the purposes of the project only, except that such information may be released to other bodies if it is necessary for the investigation or prosecution of persons, or for any other purpose required by law.
45. Data may be retained for longer periods or for uses other than those listed above only with the express written consent of the vessel owners.

General conditions

46. All vessels operating in the scheme **must** complete an EU logbook. All catches of CQMS stocks must be recorded in the logbook.
47. Vessels must also complete additional trip details as required by the MMO.
48. Project participants are required to comply with the Real Time Closure schemes.

Penalties

49. Vessels found to have breached the above conditions will be subject to a range of penalties depending on the seriousness of the breach. This will include removal from the scheme and deduction from current or future allocations of the additional quota and/or days received.
50. Vessels removed from the scheme will be required to make available to their Producer Organisation (for them to transfer to MMO) the quota tonnage awarded to them through their participation in the CQMS. If a vessel is not able, during the relevant management year, to provide this, the vessel will be invited to make a transfer in the following year. Where the vessel is unable to make the transfer in the following year, MMO will make a deduction from the days at sea allocation of the vessel, at a level to be determined by MMO.
51. Vessels removed will not be permitted to join any CQMS in the following year.