ICES PGCCDBS REPORT 2012

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Report of the Planning Group on Commercial Catches, Discards and Biological Sampling (PGCCDBS 2012)

30 January–3 February 2012

Rome, Italy

ICES International Council for the Exploration of the Sea

CIEM Conseil International pour l'Exploration de la Mer

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Contents

Executive summary

The Planning Group on Commercial Catches, Discards and Biological Sampling [PGCCDBS] (Chairs: Mike Armstrong, UK, and Gráinne Ní Chonchúir, Ireland) met in Rome, Italy, 30th January–3rd February 2012, in parallel with the Mediterranean Planning Group for Methodological Development (PGMed).

The PGCCDBS was established in 2002 in response to the EC-ICES Memorandum of Understanding (MoU) requesting ICES to provide support for the EU Data Collection Framework (DCF). It implements the ICES Quality Assurance Framework to ensure that datasets and parameters supporting assessments and advice for the ICES area are based on i) statistically-sound sampling schemes; ii) correct and consistent interpretation of biological material such as otoliths and gonads; iii) technology that improves accuracy and cost-effectiveness of data collection; iv) comprehensive and easily sourced documentation, and v) efficient collaboration between PGCCDBS, expert groups and other bodies in relation to data collection.

The 2012 meeting of PGCCDBS focused on work completed since last year, and planned work for 2012 and 2013, in the following topics which formed the basis of the Terms of Reference:

- Stock-based biological parameters from sampling of fishery and survey catches (age, growth, maturity, fecundity, sex ratio);
- Fleet/métier related variables (discards estimates and length/age compositions of landings and discards) and statistical design of sampling schemes;
- Data collection technology (hardware, and software such as WebGR and the Regional Data bases);
- Implementation of the ICES Quality Assurance Framework;
- Addressing recommendations and requests for advice from ICES expert groups (including through PGCCDBS data contact persons), and RCMs.

In addition, the PGCCDBS provided views on the revision of the Data Collection Framework, focusing on the need for statistically-sound, regional sampling programmes and task-sharing to improve cost effectiveness.

The PGCCDBS met in plenary with PGMed to review the outcomes of a wide range of workshops and age exchanges conducted since PGCCDBS 2011 and the workplan for 2012. On the basis of this review and the PGCCDBS long-term planning process, the following workshops and exchanges were proposed for 2013–2014:

- Age workshops: WKARBLUE - Workshop on Age Reading of Blue whiting (June 2013); WKNARC2 - Workshop of National Age Readings Coordinators (May 2013); WKSABCAL - Workshop on the Statistical Analysis of Biological Calibration Studies [postponed until 2014]; WKAVSG - Workshop on Age Validation Studies for Gadoids (April 2013); WKMIAS - Workshop on Micro increment Daily Growth in European Anchovy and Sardine (October 2013).
- Sampling design workshops: WKPICS3 - Workshop on the Practical Implementation of Statically Sound Catch Sampling programmes (Nov. 2013).
- Age exchanges (Sprat - full exchange North sea only; Mackerel - small exchange; Herring (Norwegian spring spawner) - small exchange; Saithe -full exchange using only images; Dab - 2012 exchange postponed until 2013; Sea Bass - full exchange).

- Proposals for study contracts on i) anglerfish ageing (*Lophius piscatorius*); ii) stock- and component related issues for the herring in the West of Scotland, West of Ireland, Irish Sea and North Sea; iii) Supporting design based regional data collection programmes.
- Proposal for a series of training courses covering the design of statistically sound catch sampling for fisheries monitoring programmes, and for a theme session at the 2013 ICES Annual Science Conference – "Improving statistical survey methods for monitoring commercial catches."

The PGCCDBS report also contains a full and updated list of national age readers and co-ordinators, and recommendations on ways of streamlining and improving the effectiveness of the system of recommendations passed between ICES expert groups, planning groups, RCMs and DCF Liaison Meeting.

The ToRs for PGCCDBS 2013 were also discussed and agreed, see Annex 15, and it was also agreed that the PGCCDBS 2013 meeting will be held in Belfast, Northern Ireland.

1 Introduction

1.1 Terms of Reference

2010/2/ACOM41 The **Planning Group on Commercial Catches, Discards and Biological Sampling** [PGCCDBS], chaired by Mike Armstrong, Germany UK, and Gráinne Ní Chonchúir, Ireland, will meet in Rome, Italy, 30th January–3rd February 2012, to:

a) Review last year's PGCCDBS recommendations and responsive actions taken.

b) Review the outcomes of workshops, study groups, exchange schemes and other intersession work related to sampling design, collection, interpretation and quality assurance of data on stock-related biological variables (age and growth; maturity and fecundity; sex ratio).

c) Review the outcomes of workshops, study groups and other intersession work related to sampling design, collection, interpretation and quality assurance of data on fleet/métier related variables (discards estimates and length/age compositions of landings and discards).

d) Respond to data issues reported by Assessment Working Group contact persons by providing advice on suitable actions and responsibilities for those actions.

e) Report on the implementation of the Quality Assurance Framework (QAF) by ICES Expert Groups, and make recommendations for further development of the QAF and procedures for ensuring its full implementation in stock assessments and associated advice.

f) Review and present practical examples of progress in developing enabling technologies and equipment for data collection from fisheries.

PGCCDBS will report by 9 March 2012 for the attention of ACOM.

PGCCDBS and PGMed met in parallel and the ToRs and Participants list for PGMed are included in this report in Annex 1.

1.2 Participants

The list of participants for PGCCDBS is given in Annex 2.

1.3 Purpose and scope of PGCCDBS

The PGCCDBS was established in 2002 in response to the EC-ICES Memorandum of Understanding (MoU) requesting ICES to provide support for the EU Data Collection Framework (DCF; EC Reg. 199/2008, 665/2008; Decisions 2008/949/EC and 2010/93/EU).

The PG implements the ICES Quality Assurance Framework to ensure that datasets and parameters supporting assessments and advice for the ICES area are based on i) statistically-sound sampling schemes; ii) correct and consistent interpretation of biological material such as otoliths and gonads; iii) technology that improves accuracy and cost-effectiveness of data collection; iv) comprehensive and easily sourced documentation, and v) efficient collaboration between PGCCDBS, expert groups and other bodies in relation to data collection.

The work of the PG is structured around developing standards and guidelines for the types of data required by the DCF, principally:

- Stock-based biological parameters from sampling of fishery and survey catches (age, growth, maturity, fecundity, sex ratio);
- Fleet/métier related variables (discards estimates and length/age compositions of landings and discards) and statistical design of sampling schemes.

The general approaches adopted by PGCCDBS to fulfil its remit include:

- Establishing and implementing a longer-term plan for inter-calibration studies that include age reading and maturity staging and deal with promoting agreement among scientists classifying calcified age structure (e.g. otoliths) and gonads of specific species or groups of species.
- Proposing methodological workshops and study groups to establish the basis for interpretation of biological material, sampling survey design, statistical analysis of data and development of data quality indicators. These workshops are generally applicable to most areas, species and fisheries.
- Development of proposals for EU-funded Studies Contracts to allow more in-depth methodological studies addressing key issues within the scope of PGCCDBS and PGMed.
- Responding to data quality issues highlighted by ICES Expert Groups and Regional Coordination Meetings (RCMs) and identifying additional work needed to address these.
- Development of new technologies to improve the cost-effectiveness and accuracy of data collection.

The success of calibration exercises and workshops requires a substantial amount of preparatory work in the laboratories. This preparatory work is the responsibility of the national laboratories. ICES has been informed that this work is included in the DCF National Programmes.

All workshops are carried out as official ICES workshops and the reports stored on the "PGCCDBS Documents Repository", in PDF format and available to the public (http://www.ices.dk/reports/acfm/pgccdbs/PGCCDBSdocrepository.asp), maintained by the ICES Secretariat.

As many of the activities of PGCCDBS are closely linked to the activities of the DCF, DG MARE is a member of the PG to ensure coordination with the DCF activities. Stock assessment requires data covering the total removal from the fish stocks and the PG serves as a forum for coordination with non-EU member countries where appropriate.

There are five Regional Co-ordination Meetings (RCMs) relevant to the PGCCDBS or PGMed: 1) North Sea and Eastern Arctic, 2) Baltic Sea, 3) North Atlantic, 4) Mediterranean, 5) Long-Distance Fisheries. These RCMs provide a forum for EU Member States to discuss how best to implement their National Programmes.

1.4 Cooperation and links with PGMED

The main role of the PGCCDBS is to plan and coordinate the collection of data for stock assessment purposes and thus, to provide support to the Data Collection Framework. Following the proposal of the 2006 3rd Liaison Meeting, a specific planning group for the Mediterranean was created (PGMed) and met for the first time jointly with the 2007 PGCCDBS meeting in Malta. Although organised as an

autonomous group, it was agreed among all scientists that the contact and cooperation between the Mediterranean area and the ICES area (PGCCBDS) should be promoted and maintained.

It was agreed previously that the link between the two planning groups (PGs) should be maintained through:

i) the inclusion of each group's report as an annex of the other;

ii) the organisation of parallel meetings;

iii) the organisation of joint plenary sessions for generic issues;

iv) the organisation of joint workshops.

Although points (ii) and (iii) have been fulfilled since the beginning, each group's report is not usually included as annex of the other, mainly due to practical issues, so both reports are published independently. The organisation of joint workshops has been done, although the participation of experts both from ICES and Mediterranean is not always as common as expected, when the subject of the workshop concerns both areas.

Another issue to add is the lack of time for addressing specific topics for PGMed: on one hand, PGMed participates in the common presentations with PGCCDBS but also has to deal with a long list of ToRs, most of them practical issues that are developed during the meeting. The work of PGMed has been more similar to that of an RCM in dealing with actual sampling levels by fleet métier, etc. This differs from PGCCDBS which has been directed more at development of methods and guidelines for data collection, and quality assurance of data.

Therefore four main issues have been identified: (i) PGCCDBS and PGMed reports have become too independent; (ii) the active participation of experts from both the Mediterranean and Atlantic in the workshops proposed during any PG is not as frequent as it could be; (iii) PGMed lacks time to deal with all the ToR and (iv) the two PGs have been diverging during the last years.

The divergence of the PGs is not a real problem, as they both work under different umbrellas (ICES in the case of PGCCDBS and RCMMed and BS in the case of PGMed). However, the rest of the problems should be solved. For that reason, PGMed proposed the following points to be taken into account in future PG meetings and reports in order to increase and improve the links between the groups. These points were agreed in plenary with PGCCDBS:

- For the meetings: (i) when possible, join all presentations of potential interests for the Mediterranean together, so that PGMed can have more time to work on their specific ToRs; (ii) presentation of PGMed main results and discussions in plenary on the last day.
- For the report: (i) include a summary of relevant issues discussed in plenary in the PGMed report; (ii) include the list of ToRs of each group in the other's report; (iii) include the list of participants of each group in the other's report; (iv) add a link to the online report; (v) include the list of workshops of potential interest of each PG.

1.5 Work plan for 2012 PGCCDBS meeting

The meeting was structured as a mixture of plenary sessions involving PGCCDBS and PGMed, plenaries involving PGCCDBS only, and three subgroups working separately to address ToRs dealing with stock based biological variables, fleet-based bio-

logical data, and new technologies. The new technologies subgroup also dealt with the ICES assessment working groups data contact persons recommendations and the issue of recommendations in general.

The plenary sessions mainly included presentations of the outcomes of exchanges and workshops that took place since the previous PG meeting, presentations on other relevant topics (such as by the EC representative on the revision of the DCF), periodic updates of subgroup progress, review of proposals for exchanges, workshops and studies, and review of key pieces of text for the report.

The subgroups were tasked with:

- Reviewing outcomes of the exchanges, study groups and workshops in 2011;
- Reviewing the programme of exchanges study groups and workshops in 2012;
- Proposing new exchanges, study groups, workshops and studies contracts for 2013 onwards, and drafting the ToRs and supporting information;
- Responding to Expert Group (EG) and RCM recommendations relevant to the subgroup;
- Other specific tasks such as review of progress on regional data bases, development of WebGR, views on future role of PGCCDBS under a changing DCF, updating age readers contact lists, etc.

An important outcome of the PG meeting is clear statement of actions, responsibilities and schedules to fulfil the tasks proposed.

The use of online tools to deal with our tasks and support the meeting organisation was extended. The SharePoint site was used to store background information and presentations, and to revise subgroup results and report sections. These tools supported the development of our work and created conditions to continue our tasks intersessionally.

This year PGCCDBS looked at how to streamline the system of recommendations between Expert Groups, RCMs, PGCCDBS and Liaison Meeting to make the process simpler, more effective and easier to track the outcomes (see Section 5). ICES has created a very useful recommendations database for recommendations from ICES EGs, but the number of recommendations moving around the different groups has increased and has become unmanageable.

1.6 Publication of PGCCDBS outputs

The PG continues to promote the idea that the work done in (a group of) certain workshops should be published under the ICES Cooperative Research Report series (CRR) when ready for synopsis. Such a publication should constitute a major contribution to the literature by reporting the state of the art of scientific knowledge regarding a species or a group of species, or a development of methods. It is our view that this process will promote quality of this work and will constitute an important recognition of the scientists involved. This year's PGCCDBS has developed a proposal for an ICES cooperative research report (CRR) on protocols on the ageing of different fish species in the ICES area, following from a suggestion by the ICES Publications Committee. The draft resolution for this CRR can be found in Annex 7.

PGCCDBS has been a major driver in promoting the application of statistically-sound sampling schemes for collection of biological and fishery data, through workshops

including WKACCU, WKPRECISE, WKSMRF, WKMERGE and WKPICS. A proposed output of the WKPICS1-3 series is a reference book on catch sampling with contemporary methodology and examples, which is presently missing from the fisheries literature. This is discussed further in Section 4.

1.7 Organisation of the report

The PG report has been restructured this year by moving many of the long recommendations tables into Annexes, and focusing more clearly on the key outcomes, actions and recommendations from the group.

This report is organised by Terms of Reference (ToR), starting with Section 2 for ToR a) to Section 7 for ToR f). A set of annexes was added including the list of participants, agenda, ToR for 2012, the WK proposals and recommendations, as well as other information that is too spacious for the main part of the report.

1.8 PGCCDBS views on the revision of the EU Data Collection Framework i.e. The New Multi Annual Programme 2014–2020

PGCCDBS was established in 2002 to develop methods, sampling standards and guidelines to ensure that (primarily) biological data collected under the EU Data Collection Regulation/Framework are of sufficient quality to support the implementation of the Common Fisheries Policy in Europe.

The PGCCDBS recognises that the reform of the CFP will include greater regionalisation of fisheries management and a move towards multi-annual management plans with greater emphasis on fleet-based management, and along with the MSFD will result in more focus on ecosystem impacts of fishing. The role of ICES as advisors to the European Commission will change accordingly, and this must be reflected in the work of ICES Expert Groups including PGCCDBS.

The PGCCDBS considers that a revised Data Collection Framework must adopt a results-based approach to deliver international data sets and parameters at the scale of **regions and stocks** for input to assessments and advice, and at finer scales where needed. It should require fully collaborative and coordinated **regional programmes** of data collection based on fully documented statistically-sound sampling design, to deliver international data and estimates for fisheries and stocks meeting required quality standards. For collection of data from fisheries, national fleets could be considered as strata within an overall regional sampling scheme, and national work plans and sampling intensities developed to best achieve the regional goals whilst optimising the use of DCF resources. Care should be taken to ensure that the objectives of the regional sampling programmes are realistic and achievable within available resources. This requires strong linkages between the main end-users and the groups involved in design of regional data collection programmes. A results-based DCF will require more focus on sampling design issues including different quality indicators relating to regional and national programmes as well as outputs. The PGCCDBS could play an important role for quality assurance of designs including establishment of methods for representative sampling, requirements for documentation and development of quality indicators.

The PGCCDBS considers that the regional database will be a vital tool for development of regional data collection programmes and analysis of data to provide outputs for end-users, and recommends that the development and ongoing support of the RDB are included in the revision of the DCF.

Revision of the DCF should be done in a way that encourages and facilitates stronger and more effective linkages between the RCMs, RACs, ICES Expert Working Groups, ICES Planning Groups such as PGCCDBS and STECF Expert Groups and clarifies their relative roles (Figure 1.8.1). The work of ICES Planning Groups such as PGCCDBS, and the RCMs, should in particular be more closely aligned; the PGs developing the detailed methods and approaches for regional sampling programmes and quality assurance of data, and the RCMs developing collaborative regional sampling plans adopting the recommended methods. Within the 7-year multiannual programmes, there must be a clear possibility for national annual work plans to adapt to the needs for regional data collection following changes to stocks, fisheries and management goals.

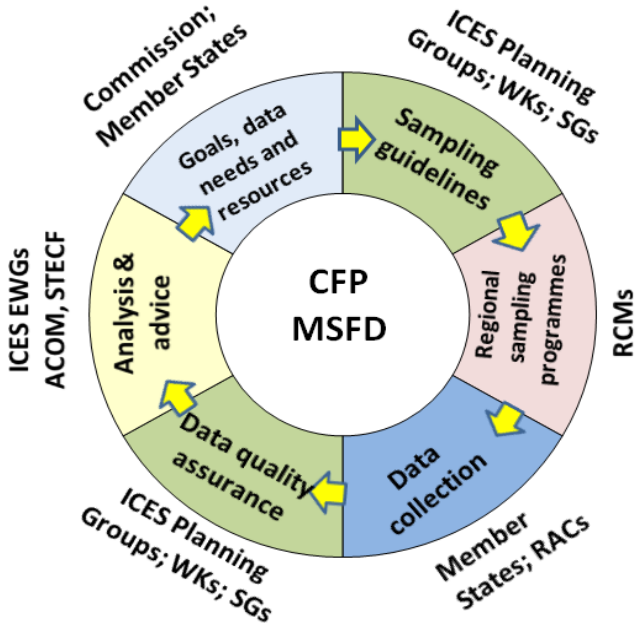

Figure 1.8.1. The cycle of data collection, analysis and advice in the ICES area, and the linkages between the responsible bodies.

The PGCCDBS recommends a clear distinction in the revised DCF between stocks requiring data to support full analytical, age-based assessments, and so-called "data-poor" stocks for which management will be based on relative abundance trends and life-history parameters. The PGs will retain an important role for quality assurance of age, maturity and other stock-related biological parameters, and for establishing the sampling and analysis methodology for representative collection of such data and estimation of biological parameters for individual fish stocks.

The PGCCDBS considers that the revision of the DCF should recognise the increasing need for regional cooperation and task sharing to provide quality assured data on age compositions and life-history parameters (growth, maturity, fecundity) for a growing number of species and stocks to be included in single and multispecies management advice. National laboratories have only a limited pool of experts and it is becoming essential to optimise the use of resources and expertise and eliminate duplication of efforts.

PGCCDBS recognises the risks in concentrating the expertise on individual fish species amongst fewer people and laboratories, and will retain a key role in developing standards, guidelines and statistical and methodological procedures to monitor and

ensure consistency in age and maturity determination. The revised DCF will need to support the additional work in identifying and agreeing task sharing through expert review of scientific and technical expertise, equipment and financial capability of institutes to ensure continuity as a centre of excellence for individual species. The process of establishing task sharing should involve close cooperation between PGCCDBS, RCMs and ICES EGs, and establishment of formal agreements with the Member States involved. The questionnaire to national institutes produced by ICES WKNARC (2011) provides a valuable first step in identifying possibilities for task sharing.

More detailed discussion on these topics can be found in the PGCCDBS 2012 report Sections 3 and 4 dealing with ToRs (b) and (c).

2 Review last year's PGCCDBS recommendations and responsive actions taken (TOR a)

The PGCCDBS 2011 recommendations were reviewed and responsive actions are highlighted where applicable in (Annex 3). The vast majority of PGCCDBS recommendations were actioned; however some were quite vague and could not be followed through. PGCCDBS recommendations from the 2012 meeting will be kept succinct and clear.

3 Review the outcomes of workshops, study groups, exchange schemes and other intersession work related to sampling design, collection, interpretation and quality assurance of data on stock-related biological variables (age and growth; maturity and fecundity; sex ratio). (TOR b)

Reports on workshops and exchanges completed in 2011 can be found at the following link, (http://www.ices.dk/reports/acfm/pgccdbs/PGCCDBSdocrepository.asp) and are also presented in summary in Sections 3.1 and 3.2 respectively. Eight otolith exchanges were carried out in 2011, three were postponed until 2012. Furthermore, four otolith ageing workshops and three maturity staging workshops were conducted in 2011. Recommendations from each of the completed workshops were reviewed by PGCCDBS 2012.

3.1 PGCCDBS age workshops

3.1.1 Age workshop outcomes 2011 and PGCCDBS response

The following are summaries of the age reading workshops carried out in 2011.

3.1.1.1 Workshop on Age Reading of Eel [WKAREA]

The workshop was held in CEMAGREF, Bordeaux, France, 22–24 March 2011. The meeting was chaired by Francoise Daverat, France.

The workshop commenced with the analysis of the results of the experienced reader intercalibration exercise that had been carried out several months previous the meeting. This intercalibration exercise was based on image exchange for both the European and the American eel.

A collection of 117 European eel and 44 American eel otolith pictures were used for the exchange. Ten of the otoliths were cracked and burned; others were prepared by polishing and staining. The overall agreement rate of the readings with the modal age ranged from 66.2% to 13.2%. There were two samples of eels with known ages available for the readers. For those samples, the readers tended to underestimate the age.

The eel age reading manual was updated with more precisions included for the different preparation protocols. A reference collection composed of 38 *A. Anguilla* and 19 *A. rostrata* known age otolith pictures was set up, with one blind file and one fully annotated file. A protocol for age reading and training age reading and routine age reading was proposed, including the use of the reference collection.

The workshop recommended that a new intercalibration should be arranged where the metadata for the otoliths is available, the ageing rules are followed and the software does not put misleading guides on the images. More burned and cracked otoliths and a more wide variety of ages should be included in that intercalibration.

PGCCDBS agrees with this recommendation

3.1.1.2 Workshop on Age Reading of European Atlantic Sardine [WKARAS]

The Workshop on Age reading of European Atlantic Sardine (WKARAS) was held in Lisbon, Portugal, from 14 to 18 February 2011, chaired by Alexandra Silva, Eduardo Soares (IPIMAR, Lisbon, Portugal) and Isabel Riveiro (IEO, Vigo, Spain). There were

eleven participants (seven with >4 years of experience in sardine age reading and contributing to stock assessment of sardine in ICES Divisions VIIIc and IXa) from five institutes (France, Spain, Portugal).

The otolith exchange included a total of 300 otoliths. The relative accuracy of sardine age determination after otolith exchange was generally good: the average percentage of agreement with modal age was 77.0% and 75.2% for the Iberian Stock and the Bay of Biscay, respectively; average bias was ca. 0.03 years. Precision was higher in the Bay of Biscay (CV=14.1%) than that in the Iberian stock area (CV=32.8%), although the latter was strongly influenced by high CVs at age 0 in the Gulf of Cadiz.

Compared to the previous workshop, the relative accuracy of sardine age determination within the Iberian Stock area (Cantabrian Sea and South Iberian Peninsula areas ICES Divisions VIIIc and IXa) has improved (by ca. 20% agreement increase) with minor improvement in precision. Identification of the otolith edge and of the first annual ring was the main between-reader discrepancy in sardine age determination.

A reference collection of 139 annotated digital otolith images was assembled during the workshop (catch area, date, fish length, location of modal rings), covering the northern Gulf of Biscay to the Gulf of Cadiz and Age groups 0–8 years (http://groupnet.ices.dk/WKARAS2011/default.aspx).

The Workshop recommends that i) sardine age reading workshops take place regularly at 4–5 years intervals, ii) procedures to calculate CV's by age groups are revised (given problems with the 0 age group), and iii) a workshop on daily ring methodology and interpretation is set up (like WKARAS 2009).

PGCCDBS agrees with these recommendations

3.1.1.3 Workshop on Age Reading of Greenland Halibut [WKARGH]

The workshop was held in Vigo, Spain, 14–17 February 2011. The meeting was chaired by Ole Thomas Albert, Norway and Margaret Treble, Canada.

The workshop focused on validation of otolith readings, and discussed possible validation methods for aging of Greenland halibut otoliths. Several age reading methods for Greenland Halibut were described and evaluated together with available validation and corroboration results. The different methods can be classified into two groups: A) Those that produce age–length relationships that broadly compare with the traditional methods described by the joint NAFO-ICES workshop in 1996 (ICES, 1997), typically indicating age around 10–12 years for 70 cm fish; and B) Several recently developed techniques that provide much higher longevity and approximately half the growth rate from 40–50 cm onwards compared to the traditional method. These typically produce age estimates around 20 years or more for 70 cm fish.

All available validation and corroboration results were in favour of group B methods. There are still validation works needed to be done in order to fully appreciate the full range of variability in the formation of annuli in otoliths from different stocks within different environmental regimes. There is also a need for improved precision, especially for the group B methods. Based on the review in this report, the relevant assessment working groups are advised to seriously consider how to proceed with age reading of their stocks.

The majority of the participants of the workshop agreed on the general conclusions, however more validation is needed on the newer methods and Russian participant consider the traditional method to be the most appropriate to use until more valida-

tion studies has been conducted. Due to the different methods used, stock assessments should note the likelihood that catch-at-age matrices based on the traditional ages are likely to be in error (too low ages).

Studies conducted so far indicate that the traditional method is no longer sufficient and PGCCDBS agrees that the new methods should be taken into consideration and used. However, further validation is needed and an agreement on method should be compiled

3.1.1.4 Workshop on Age Reading of Salmon [WKADS]

The workshop was held in Galway, Ireland, 18–20 January 2011 and chaired by Jonathan White, Ireland.

The objectives of the meeting were to review, assess, document and make recommendations on current methods of ageing salmon, *Salmo salar*. The workshop primarily focused on digital scale reading to measure age and growth, with a view to standardization. Notable variation was found in the approaches taken by different laboratories. The most prevalent issues were presented and discussed in working sessions to reach consensus on how they should be addressed and what are the necessary steps to provide further information about them. The ICES report "No. 188 Atlantic Salmon Scale Reading Guidelines" (Shearer, 1992) was found to still be a primary reference point. As such its definitions were adopted, though technology has moved forward enabling greater detailing in measurements and image storage. Most of the laboratories use digitalized scale images and suitable software in ageing process.

The workshop discussed characteristics of scale spawning marks and erosion marks, which commonly are found to be difficult to recognize. Informative marks on scales useful in identifying fish origins (wild or hatchery) were listed. Fish morphology was considered to be an important supportive data when identifying fish origin. Approaches to data analyses being used on the more detailed datasets from digital scale reading were presented and discussed. Means of determining changes in growth and life histories from scales were addressed and recommendations for the necessary data collection to determine these were made.

A digital image reference collection was compiled to include recognized scale features and age groups. The group made several recommendations on how to process and analyze salmon scales and how to continue the groups work. The group recommended that the progress made in the meeting should be continued with following meetings to further enhance the exchange of information, detailing of procedures and follow up on recommendations.

PGCCDBS agrees with these recommendations

3.1.2 Work plan 2012

The following age reading workshops will take place in 2012.

Acronym	Dates	Chairs	Venue
WKARHOM Workshop on Age Reading of horse mackerel (*Trachurus trachurus*), Mediterranean horse mackerel (*Trachurus mediterraneus*) and blue jack mackerel (*Trachurus picturatus*)	23–27 April 2012	Alberto Murta (Portugal) and Pablo Ablaunza (Spain)	Lisbon, Portugal
WKADS-2 Workshop on Age Determination of Salmon	June 2012	Jonathan White, Ireland	Londonderry, N.Ireland
WKACM2 Workshop on Age reading red mullet (*Mullus barbatus*) and striped red mullet (*Mullus surmuletus*)	2–6 July 2012	Kelig Mahé, France	Boulogne-sur-Mer, France
WKAMDEEP Workshop on Age Estimation Methods of Deep-water Species	22–26 October 2012	Ole Thomas Albert, Norway, and Beatriz Morales Nin, Spain	Esporles, Spain

3.1.3 Proposals for 2013 and beyond

Below is a list of proposed workshops scheduled for 2013 and beyond. The workshops proposals including the ToRs' scientifc justification, chairs and locations can be found in Annex 4.

- WKARBLUE; Workshop on age reading of Blue whiting, Chaired by M. Meixide, Spain and J. Amtoft Godiksen, Norway will meet in Bergen from 10–14 June 2013.
- WKNARC2; The Workshop of National Age Readings Coordinators, Chaired by Ângela Canha, Portugal and Lotte Worsøe Clausen, Denmark, will meet in Horta (Portugal), 13–17 May 2013.
- WKSABCAL; Workshop on the Statistical Analysis of Biological Calibration Studies has been postponed until 2014, the ToRs for this WK are available in the PGCCDBS 2011 report.
- WKAVSG; Workshop on Age Validation Studies for Gadoids, Appointed Chairs Karin Hussi (DTU aqua) and Beatriz Morales-Nin (Spain), will meet in Imedea, Mallorca, from the 22nd–26th April 2013.
- WKMIAS; Workshop on Micro increment daily growth in European Anchovy and Sardine, will meet in Mazara del Vallo, Sicily, from 21–25 October 2013. Appointed chairs, G. Basilone, Italy, B. Villamor, Spain and M. La Mesa, Italy.

3.2 PGCCDBS Age Exchanges

3.2.1 Age Exchange outcomes 2011 and PGCCDBS response

3.2.1.1 White anglerfish illicia and otoliths exchange

The exchange was coordinated by Jorge Landa (Spain). Modifications in the methodology of illicia preparation and in the traditional standardized age estimation criterion have allowed a new age estimation criterion on illicia. Using it, the catches-at-age have been able to be more successfully tracked (Landa *et al*., in prep.).

White anglerfish exchange of 200 images (100 illicia and 100 otoliths of the same specimen) took place during the third quarter of 2011. Age estimation analyses were

performed within each calcified structures: illicia (i) and otoliths (ii). A comparison of illicia and otoliths age readings (iii) was also performed. For both analyses, the between reader agreement was higher in illicia compared to otoliths. The illicia readings had lower relative bias than otolith readings, although were slightly less precise.

i) **Illicia**. The first annulus was well located by most of readers between 300 and 350 μm. Analysing only the illicia readers contributing to the stock assessment, the agreement, precision and specially the relative accuracy increased.

ii) **Otoliths**. As in the last anglerfish illicia and otoliths ageing workshop in 2004, two different otolith analyses had to be performed due to the low agreement between the experienced otolith readers. There were discrepancies among the readers in the location of the first annulus.

iii) **Illicia vs. otoliths**. Results indicated strong discrepancies between illicia and otoliths readings, as was concluded in the last anglerfish exchange and workshop in 2004 (Duarte *et al*., 2005). 86% and 71% of specimens were aged older using otoliths than using illicia when the readings of the experienced illicia readers and experienced otoliths readers R8 and R9 were compared.

Conclusions

Length-structured assessment models, that also enable using growth parameters as an additional input, will be used for white anglerfish in the next 2012 benchmark and assessment. The use of the overall growth parameters based on validated growth evidences (Landa *et al*., 2008) seems most appropriate at the current state of the art.

i) **Illicia vs. otoliths**. Considering the low levels of agreement between calcified structures (5–16%) it is not possible to use the age estimates of both illicia and otoliths together for stock assessment purposes.

ii) **Illicia**. Although the relative bias values among the assessment readers can be considered good, the agreement values and precision suggest that they are not still sufficiently acceptable for building valid ALK for the stock assessment. If the new age estimation criterion is validated in several areas allowing the cohorts tracking, and the agreement among readers is increased, then the illicia could be used for stock assessment in the future.

iii) **Otoliths**. The age estimation of white anglerfish, based on otoliths, is difficult mainly due to the occurrence of confusing false annuli and to the increasing opacity with age. The location of the first annulus is also a problem, even among expert readers. But there have been advances in daily growth studies that can help locate the first annulus more precisely. It is not possible to use otoliths of white anglerfish for stock assessment without a validated growth pattern and further research in that issue is needed.

3.2.1.2 Bay of Biscay sole

After an exchange and a workshop in 2002, an exchange of 120 sole (*Solea solea*) otoliths from the Bay of Biscay (caught in June 2011) was carried out in summer 2011 among five participants from Belgium, France, and UK England.

The mean precision of age estimation for individual fish had a Coefficient of Variation (CV) of 4.7% and percent agreement to modal age of 88.6%. 67 out of 120 otoliths were read with 100% agreement (56%), i.e. a CV of 0%. There were only little variations in precision on age estimates between individual fish, with CVs ranging from 0 to 27% and percent agreement range from 50 to 100%. There was no bias between readers from the three countries using otoliths prepared with the staining technique. All readers produced the same age estimates (i.e. no bias) of otoliths with or without staining.

3.2.1.3 Black spot sea bream

The designated exchange of Black spot sea bream otoliths was postponed to 2012 and will be incorporated into WKAMDEEP (Workshop on Age Estimation Methods of Deep-water Species) in Esporles, Spain, 22–26 October 2012.

3.2.1.4 Blue whiting

After a blue whiting otolith ageing workshop in 2005, an otolith exchange of 189 fish caught in ICES Divisions IVa, IVb, IIa, and Va was carried out between twelve countries (21 age readers) from January 2010 to February 2011 (organized by IMR, Norway). An agreement level with the modal age between age readers of 90% is considered desirable for some species, especially for readers supplying ages to an assessment working group. The overall percentage agreement for this exchange was only 46.4% and the overall precision CV was 17.1%, which is not satisfactory, even if all readers are included and interpreting age of blue whiting is considered relatively difficult. Underestimation of older ages seems to be one of the problems when interpreting ages of blue whiting. There is also a high level of bias between readers from many institutes.

The results were poorer than those obtained during the previous ageing workshop. This may partly be due to a higher number of inexperienced participants and a more complex otolith material with a higher proportion of older fish. However, the result suggests that a new workshop is needed to standardize the age reading between laboratories and to ensure the implementation of the ageing protocol/guidelines.

3.2.1.5 Brill

The Brill otolith exchange has been postponed till 2012, and four countries (Belgium, France, Netherland and Northern Ireland) will participate. Images and slides of stained sectioned otoliths from ICES Divisions IV, VII, VIII will be provided as well as images of whole otoliths.

3.2.1.6 Hake

The hake otolith exchange was initiated during the last Hake Age estimation Workshop conducted in November 2009 (WKAEH 2009; ICES 2010), and coordinated by Carmen Piñeiro and María Saínza (Spain). Readers from eight research institutes participated in the exchange, where all except two readers had been involved in the previous workshop (WKAEH 2009).

The exchange collection consisted of calibrated digital images of otolith sections from 237 fish collected during all seasons of 2006. Addition information on date, area of capture, total length and sex of respective specimens, were also provided to the readers. The length range of fish selected was between 20 cm and 80 cm TL from ICES Divisions VIIIc–IXa. The interpretation of the otoliths was based on the new guide-

lines agreed in the last Workshop (WKAEH 2009, ICES 2010) in order to improve the precision of age estimation.

The objectives of this exchange were to check the precision and bias of readers when using the new guidelines described at the last workshop (WKAEH 2009), and to test WebGR as an otolith exchange tool for hake otoliths.

The overall percentage agreement for this exchange was 62.3% (27–100%) and the overall CV was 33.1% (0–100%), which is not satisfactory. The high variability in the results was induced by the variable degree of participant experience in age determination of hake otoliths. Furthermore, due to the lack of a validated method to confirm the frequency of growth rings, the new guidelines are not sufficient to rule out individual subjectivity of interpretation of hake otoliths.

The use of the WebGR was very useful for calibration exercises; however, some improvements are needed for efficient running of the application in order to encourage general use of the tool.

3.2.1.7 Red mullet and stripped mullet

After a Workshop in 2009 (WKACM, Workshop on Age reading of Red mullet and Striped mullet), an exchange of 540 images with 377 otoliths and 163 scales from the two species both the Atlantic and the Mediterranean Sea was carried out in 2011 among four participants from Cyprus, Italy, and France. Differences were detected between the otoliths from the Atlantic and the Mediterranean Sea. Percent agreement among readers was relatively low and CVs were relatively high. Consequently, a Workshop on Age reading red mullet (*Mullus barbatus*) and striped red mullet (*Mullus surmuletus*) [WKACM] will take place in Boulogne-sur-Mer (IFREMER) in France, 2–6 July 2012.

3.2.1.8 Redfish

The otolith exchange of redfish (*Sebastes mentella*) conducted during 2011 was a follow-up of the 2006 workshop held in Vigo, Spain and the 2008 workshop held in Nanaimo, Canada. The exchange was classified as a small scale exchange, which is the first step in the PGCCDBS five-step approach for planning age calibration exchanges and workshops.

A total of 64 otoliths and images of ten of these were circulated to five different institutes. The length range of the fish was between 6 and 50 cm, but only information about where and when the fish were captured was given to the readers. One reader was classified as a beginner in redfish otolith readings, while the rest had from four to more than 13 years of experience. The overall percentage agreement for this exchange was 33.9% (0–100%) and the overall CV was 19.7% (0–35%), with only one fish for which all readers agreed on the age. Exclusion of the non-experienced reader increased the average percentage agreement to 38.4% and reduced the CV to 15.5%.

The exchange showed good agreement in age determination between readers compared with previous exchange and workshop results. The agreement was better for the younger individuals (<20 years) than for individuals older than 20 years. Given this good result of the exchange, the need for an otolith workshop of redfish is not pressing. A small scale otolith exchange should be planned every 3–5 years, and considering the fact that the readers disagreed most in age determination for individuals older than 20 years, next exchange should pay particular attention to these age groups.

3.2.1.9 Roundnose grenadier

The roundnose grenadier (*Coryphaenoides rupestris*) Otolith Exchange 2011 was the second one after the exchange of 2007. It was composed by two sets of otoliths, one from VIa (n=64, the same as the exchange 2007) and the other from IIIa (n=63). Six readers participated in the exchange, and only images of otolith sections were used. The set of otoliths from VIa showed Coefficient of Variation of 14.9% and percent agreement to modal age of 29.3%. The set of otoliths from IIIa showed Coefficient of Variation of 22.6% and percent agreement to modal age of 30.7%. These results from both areas were very close to those from 2006. There was bias both between the readers and between readings against the modal age. The sample from the Skagerrak was composed by younger fish than those of the sample from western Scotland but the results showed the same bias. Sections of these otoliths remain definitively very difficult to interpret.

3.2.1.10 Sea bass scale and otolith exchange

This was the first exchange of seabass otoliths and scales. A total of 155 fish from the Eastern English Channel (ICES Division VIId) was used to compare the age estimation between both calcified pieces. There were four participants from two countries (UK England, France).

There was a low mean precision of age estimate for individual fish with CVs of 13.1% and 54.1% agreement to modal age; only two fish were read with 100% agreement (1.3%). Similar precisions of age estimation were achieved for otoliths and scales. However, this exchange showed that the age estimation differed between otoliths and scales. A large exchange is planned for 2013.

3.2.1.11 Turbot

The Turbot otolith exchange was been postponed until 2012, and nine countries (Belgium, France, Netherland, Northern Ireland, Estonia, Poland, Rumania, Sweden and Germany) will participate.

3.2.2 Work plan 2012

The following exchanges are due to take place in 2012.

SPECIES	COORDINATOR
Turbot- Full scale exchange	Annemie Zenner, Belgium
Brill- Small scale exchange	Annemie Zenner,Belgium
Megrim – Small scale exchange	Mark Etherton
North Sea Sole – Small scale exchange	Mark Etherton

3.2.3 Proposals for 2013 and beyond (including recommendations for small scale exchanges from long-term planning table)

The following are proposals for small-scale and full-scale age exchanges in 2013.

- Sprat: Full scale exchange North Sea only. Appointed coordinator: Lotte W. Clausen, Denmark.
- Mackerel: Small scale exchange. Appointed coordinator: Jen Ulleweit, Germany.
- Herring (Norwegian spring spawner): Small-scale exchange. Appointed coordinator: Jane Amtoft Godiksen, Norway.

- Saithe: The last saithe exchange was 2008. A full exchange using only images for all ICES areas, should take place in 2013. Appointed coordinator: Kélig Mahe, France.
- Capelin: A small exchange was scheduled between Iceland and Norway in 2013 but is no longer necessary as a non-ICES exchange took place between Norway, Iceland, Russia and Canada in 2010-11. The results will be reported to PGCCDBS in 2013.
- Dab: The proposed 2012 dab exchange (ICES, 2011) was postponed until 2013.
- Sea Bass: A full scale exchange is proposed for 2013. Coordinator Kélig Mahe, France.

3.3 PGCCDBS maturity workshops

3.3.1 Maturity workshop outcomes 2011 and PGCCDBS response

The following are the outcomes of the Maturity workshops which took place in 2011.

3.3.1.1 Workshop on maturity staging of Herring and Sprat [WKMSHS]

The ICES Workshop on Sexual Maturity Staging of Herring and Sprat (WKMSHS) was held 20 to 23 June 2011 at DTU Aqua in Copenhagen, Denmark. A total of 40 participants from 15 countries participated in the workshop chaired by Jonna Tomkiewicz, Denmark and Rikke Hagstrøm Bucholtz, Denmark.

The purpose of the workshop was to elaborate standardised maturity scales for herring and sprat for common use among laboratories and evaluate sampling strategies and timing for accurate classification of maturity. The establishment of standardised maturity scales included identification of reliable maturity determination criteria for females and males and comparison of interpretation of stages according to existing scales.

During the workshop standardised maturity scales for herring and sprat were established using the macroscopic and microscopic photos of the sampled female and male fish to agree on classification and criteria including both a macroscopic and histological stage description. The established maturity classification scales for both species and sexes are compatible with the existing maturity scales of any of the participating countries, however, the interpretation of stages in relation to sexual maturity changed in many cases. Illustrated manuals were elaborated for both species on a preliminary basis including the available stages, and a preliminary manual for interpretation of histologically processed frozen gonad tissues was developed.

WKMSHS concludes that a general separation among immature specimens and adult reproducing specimens is problematic to apply in a mixed stock, and estimation of the spawning proportion in relation to stock and season is recommended. Similarly, optimal sampling strategies and sampling times for accurate classification of maturity can be established, but are difficult to apply as sampling relates to specific surveys and dataseries that require consistency. Therefore, revising and focusing the sampling strategy to enhance data for specific purposes is recommended.

PGCCDBS agrees with these recommendations

3.3.1.2 Workshop on maturity staging of Redfish and Greenland Halibut [WKSMREGH]

This workshop was held in Vigo November 28th–December 1st 2011. The meeting was chaired by Fran Saborido-Rey, Spain, and Agnes Gundersen, Norway.

The workshop compared existing maturity scales for both species and came up with standardized scales that convert to the scales used at present. For redfish six stages were described. Sampling should be conducted after copulation in maturity stage 3 and/or 4, which means 2–3 months prior to spawning which corresponds to late winter–spring. With respect to Greenland Halibut it was agreed on a 7-stage scale. All ICES reports on maturity should use the 7-stage scale in future. However, in the future one should consider the actual need of stage 7. Sampling should be conducted 2–5 months prior to spawning but the actual time of the year may vary due to geographical differences in life cycle.

For both species more knowledge is needed with respect to the male maturity cycle. For Greenland Halibut it is recommended that separate sex maturity oogives are used due to sexual dimorphism. The case of geographical area should also be considered. Furthermore, the stock perception is not clear, and more work is needed on the stock perception on Greenland Halibut. A reference collection for both species will be organised in IEO, Spain. For Greenland Halibut it was suggested that DFO, Møreforsking, and IEO should be reference labs in future. For redfish IEO, Vigo was suggested as reference lab. This should be discussed further on the workshop of Chairs in June.

For the future it was decided to prepare a sampling protocol for both species including detailed descriptions and a wide selection of photos for all maturity stages of both species.

PGCCDBS agrees with this recommendation

3.3.1.3 Workshop on maturity staging of Sole, Plaice, Dab and Flounder [WKMSSPDF]

WKMSSPDF met 9–13 January 2012 in Oostende, Belgium to validate the maturity stages for sole, plaice, dab and flounder as proposed by WKMSSPDF in 2010. 24 participants from eight institutes and countries joined the meeting.

Three staging exercises were carried out, one using fresh fish and two using pictures. In all exercises, for all species, the percentage agreement was higher than in 2010. As expected, the percentage agreement in the fresh staging was higher than the percentage agreement in the staging exercises from pictures since (a) touching is one of the components in maturity staging and (b) one hyaline egg is easier to identify in fresh samples than from pictures. It was easier to stage female than male fishes. There was also significantly higher agreement on the sexual maturity stage of fishes within the spawning season (October–April) compared to outside the spawning season. The macroscopic maturity stage was validated with the histological analysis after the calibration exercises.

The following changes in the maturity scale descriptions were done: Male stage 5 was removed from the male staging diagram. Female stage 5 changed from resting/skipped spawners to skipped spawners. Distinguishing stage 2 and 3 (maturing to spawning): it was decided that the presence of one hyaline egg will put fish in maturity stage 3, as spawning will happen within due time. The % agreement in relation

to modal stage did not always reflect correct staging (as the modal stage might be wrong).

The workshop 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.

WKMSSPDF 2012 recommended that (i) all the Baltic institutes keep their own national staging, (ii) the national scales are translated to the DATRAS stages, from a certain date onwards, (iii) old data should not be changed, (iv) the BITS manual should describe the change in DATRAS thoroughly. It was highlighted that when countries move to the new maturity keys, a change in the number of spawning fish might occur as the definitions of the various stages might differ between the old national stages and the internationally agreed stage. The next workshop should take place in 3–5 years, requiring prior collection of pictures and histology samples by the participating institutes.

PGCCDBS agrees with the WK recommendations although notes that assessment WGs should consider on a stock by stock basis if the distribution and behaviour of mature and immature stock components at spawning time are sufficiently different to induce biases in estimates of proportion mature–at–age or length if fish are sampled only at that time

3.3.2 Work plan 2012

The following is a summary of the workshops taking place this year:

Acronym	Dates	Chairs	Venue
WKMSTB Workshop on Sexual Maturity Staging of Turbot and Brill	5–9 March 2012	Ingeborg de Boois and Cindy van Damme, The Netherlands	Ijmuiden, The Netherlands
WKMATCH Workshop for maturity staging chairs	11–15 June 2012	Fran Saborido-Rey, Spain	Split, Croatia
WKMSGAD Workshop on Sexual Maturity Staging of Cod, Whiting, Haddock, Saithe and Hake	12–16 November 2012	Francesca Vitale, Sweden, and Maria Korta, Spain	San Sebastian, Spain
WKMSEL-2 Workshop on sexual maturity staging of elasmobranchs	19–23 November 2012	Fabrizio Serena, Italy and Barbara Pereira, Portugal	Lisbon, Portugal

3.3.3 Proposals for 2013 and beyond

A Recommendation was received from WGCEPH to PGCCDBS to set up a workshop to investigate the maturity of cephalopods. The concept of proposing WKMSCEPH (Maturity Workshop for Cephalopods) was discussed for 2013, however several issues were raised and so it was agreed that the workshop proposal is to be sent to the RCM Med and BS who will decide on the necessity and utility of such a workshop. PGCCDBS has requested that the chair of WGCEPH provide a set of ToRs and a scientific justification for such a workshop to the RCM Med for their consideration.

3.4 Respond to stock related biological variables data issues raised by ICES Expert groups and Regional Coordination Meetings

Recommendations from ICES expert groups on age and maturity related issues were reviewed and a number of small exchanges, full (pre-workshop) exchanges and workshops are proposed in accordance with the current PGCCDBS cycle for these calibration exercises. Terms of reference, chairs meeting times and locations are iden-

tified as far as possible. The 22 recommendations of the Workshop of the National Age Readings Coordinators were also reviewed [WKNARC] and actions, persons responsible and deadlines are identified. See Annex 12 for all recommendations forwarded to the PGCCDBS in 2011 by the AWG data contact persons. All expert group and working group recommendations addressed to the PGCCDBS in 2011 and the PG responses are housed in the ICES recommendations database. For RCM recommendations to the PGCCDBS in 2011 and the PGCCDBS responsive actions please refer to Annex 5.

3.5 Intersessional work: update on interactive age and maturity planning table

The Interactive table of age calibration reports by ICES species–stocks will be uploaded to the PGCCDBS docs repository, with a link to this table on the European Age Readers Forum, and all age calibration reports will be moved to the PGCCDBS docs repository, with links back to the original ICES database locations (e.g. the European Age Readers Forum SharePoint site (Cristina Morgado). Missing age calibration reports located by PGCCDBS scientists and colleagues will be sent to Jane Godiksen (jane.godiksen@imr.no) who will coordinate with the ICES Secretariat to keep the table updated. Francesca Vitale will coordinate with the ICES Secretariat to keep the Interactive table of maturity calibration reports by ICES species–stocks updated. The Interactive Table has already been uploaded onto the PGCCDBS docs repository.

3.6 European Age Readers Forum (EARF) and WebGR updates

PGCCDBS established the EARF in response to feedback received from those engaged in age reading across Europe. The objective was to establish a "One Stop Shop" for all those involved in age reading. It was thought that the forum would provide an important resource for training of new age readers, as well as providing opportunities for sharing and discussing existing age reading manuals, establishing standard operating procedures, and standardising preparation and interpretation methods. The forum was initially established as a Google Group, but was subsequently migrated to a more secure SharePoint site. At the moment the forum includes the following information:

- The contact details and a mailing list of age reading coordinators as well as those engaged in age reading of fish species in the various European laboratories.
- A calendar of upcoming workshops and also the PGCCDBS meeting details.
- A link to the PGCCDBS documents repository.
- A link to WebGR.
- The EFAN Reports.
- PGCCDBS guidelines for otolith exchanges and workshops.
- A discussion board.

In 2011 a concerted effort was made to promote the usefulness of the EARF, and to encourage "buy in" from the age reading community. The EARF was presented to the meeting of age reading coordinators (WKNARC) which took place in June 2011. The utility of the forum was discussed and it was agreed by all that the forum is a useful tool and should be used by all institutes and age readers.

Also in 2011, several exchanges and workshops were successfully organised through the EARF. This proved very effective in streamlining communications between the chairs of the exchanges and the participants, and has also promoted on line sub forums (image J users forum) and discussions within the age readers forum, which are then visible to the wider age reading community. According to the users, the EARF seems to be working well and no further development was desired at the moment.

New users have also been identified for the age reader's forum, i.e. the eel and salmon community, and the chairs of PGCCDBS have highlighted the EARF and the benefits of using the forum to the chairs of both the eel and salmon workshops, in the hope that they will encourage their members to use the forum in the future.

The results of the most recent eel age reading workshop (WKAREA-2) are currently not widely available and the participants of this workshop have requested a home for their results, age reading manual and the resulting reference collection. PGCCDBS suggests that the EARF is an ideal location for the age reading manual, with a link also to the report. It is also recommended that information be uploaded to the forum detailing the existence of a reference collection of agreed age images. The image collection could be stored in the WebGR tool, and the link to this could be highlighted on the EARF.

The same points also apply to the Workshop on Age Determination of Salmon (WKADS) which was held in January 2011. A digital image reference collection was compiled to include recognised scale features and age groups. It would be extremely useful to have a link to this collection on the EARF. It was also suggested in 2011 to include a literature section, with titles for relevant books on age reading topics, as well as references to historic methodological reports which would also be of interest. A good example of this is the recent e-mail discussions on re-ageing of whiting, where one person involved in the discussion highlighted that the information required already exists and the "New" method had already been tested 20 years ago. In this way the age readers forum will help preserve the "Institutional Memory" of the age reading community and ensure that this information is not lost when an individual leaves/retires, etc. However this has not been done yet, but could be encouraged amongst users of the EARF in 2012.

All members of the SharePoint should be informed that they can be alerted to updates on the site by activating the e-mail notification system.

Details of the location and ownership of reference collections of both annotated agreed age images and calcified structures should be housed on the forum.

WebGR implementation

During 2010, 2011 and early 2012 several workshops and exchanges have used WebGR (http://webgr.azti.es), with varying success, depending on the training that members of these expert groups and lab staff had in using this software and its tools. The tool has not been developed since 2010 but bug fixing is being supported by a small budget allocated in the German DCF National Programme.

From recommendations of WebGR users some short-term needed developments has been identified:

- Develop installation packages in order to allow an easy set-up of the tool in servers different from the one provided by the WebGR consortium and in Windows and Linux environments.

- System needs to provide better information about errors encountered during the batch upload of images, since it has been identified as the major problem by coordinators when setting up a new workshop.
- Since the average user is not an IT professional, a better user manual needs to be written and an FAQ system would be desirable in WebGR's wiki page.
- A tool allowing calibrating a set of images from the pixel to real distance ratio for having a calibration bar in the annotation screen is expected to be a great help for readers.
- An R package (RWebGR) on statistical methodologies that will be developed during WKSABCAL 2014 for analysis of results of maturity and ageing workshops needs to be developed and its direct link to WebGR.
- Develop a tool that allows performing daily rings study.
- In the medium term and considering that WebGR has an Adobe Flash based interface that is likely to be discontinued by Adobe, it would be advisable to start migrating the interface to other standards like HTML5.

3.7 Updated age readers' contact list

The list of age readers' contacts was updated during the 2012 PGCCDBS Meeting in Rome. The list is now available on the European Age Readers Forum: http://groupnet.ices.dk/AgeForum/Age%20Readers%20Contact/Forms/AllItems.aspx

3.8 Update the list from PGCCDBS 2011 comparing the species in the MoU to those species included under the DCF

The requirements of the EU Data Collection Framework (DCF) changed in 2009 (Council Reg. 199/2008, COM Decision 2008/949/EC) and slight changes occurred in 2010 (COM Decision 2010/93/EU: List of sharks for stock-based sampling). The PGCCDBS comments from 2010 remain valid and Member States should document changes to national sampling programmes resulting from the new DCF and evaluate their effects on the dataseries used in stock assessments.

The basis for ICES advice on fish stocks is evolving towards the MSY framework since 2010. PGCCDBS does not expect this change to alter data collection requirements in the short term but over time it may be a further driver to improve knowledge for so-called data-poor stocks.

A list of species for which advice is requested is specified in the draft 2012 Memorandum of Understanding (MoU) between ICES and the European Commission. The list is given in Annex 6 along with an indication if any species or stock is not currently included in the Commission Decision for the current DCF. For example, boarfish in the Celtic Sea is not included in the DCF, but advice is requested from ICES.

3.9 Proposals for collaborative studies contracts

PGCCDBS 2012 makes two proposals for study contracts related to stock-based biological variables. These are (i) a collaborative study on anglerfish (*Lophius piscatorius*), and (ii) a study on stock- and component related issues for the herring in the West of Scotland, West of Ireland, Irish Sea and North Sea. The anglerfish study is considered to have the highest priority of the two proposals.

3.9.1 Recommendation for a collaborative study in anglerfish (*Lophius piscatorius*) (priority 1)

The age estimation of white anglerfish (*Lophius piscatorius*) in the ICES area for stock assessment has been traditionally based on two different calcified structures (CS), the *illicium* (used by the majority of the European countries) and the *sagitta* otolith (used only by two countries). Growth studies alternative to the age estimates on CS of white anglerfish, such as tagging-recapture (Laurenson *et al*., 2005; Landa *et al*., 2008a), daily growth (Wright *et al*., 2002) and length frequency distributions of catches (Dupouy *et al*., 1986; Thangstad *et al*., 2002; Jónsson, 2007), showed that the growth pattern estimated using the traditional standardized age estimation criterion based on illicia (Duarte *et al*., 2002) was underestimated and that criterion was not accurate, although it was standardized and used in several age estimation anglerfish workshops (Anon 1991, 1997, 1999; Landa *et al*., 2002; Duarte *et al*, 2005). The age estimation using illicia of a decadal time-series was performed for the southern stock assessment of white anglerfish using the traditional standardized age estimation criterion (Duarte *et al*., 2002). A catch-at-age by year matrix was built, but inconsistencies in cohort tracking were found (Azevedo *et al*., 2008).

Modifications in the methodology of illicia preparation and in the traditional standardized age estimation criterion have allowed obtaining a new age estimation criterion on illicia (Landa, pers. com.). Using it, the catches-at-age have been able to be more successfully tracked. Therefore this new criterion was judged to be more accurate and it was used for the age estimation in the "Anglerfish (*Lophius piscatorius*) illicia and otoliths exchange 2011" (a working document presented to the 2012 PGCCDBS Meeting). The results of this exchange have showed similar results to those from the 2004 workshop (Duarte *et al*., 2005):

i) **Illicia and otoliths age readings comparison.** Strong discrepancies between illicia and otoliths readings were found. It is not possible to use the age estimates of both CS together, *illicia* and otoliths, for stock assessment purposes.

ii) **Illicia.** Although the relative bias values among the assessment readers can be considered good, the agreement values and precision suggest that they are not still sufficiently acceptable for building a valid ALK. The research for a reliable criterion for age estimation of white anglerfish based on CS is more advanced in *illicia* than for otoliths. There is an illicia age estimation criterion that allows cohort tracking (indirect age validation) but only in the Porcupine Bank of the Atlantic.

iii) **Otoliths.** The age estimation of white anglerfish, based on otoliths, is difficult mainly due to the occurrence of confusing false annuli and to the increase of opacity with age. The location of the first annulus is also a problem, even among expert readers, in the last and present exchanges. There have also been advances in daily growth studies (Wright *et al*., 2002; Woodroffe *et al*., 2003) that can help locate the first annulus more precisely.

Further research should enhance our knowledge of the true growth of white anglerfish by developing and using methodologies that allow validation, before the attempt to standardize reading criteria. It is unproductive to go further in estimating white anglerfish growth patterns and age without progress being made in age validation (Duarte *et al*., 2005). Improving the precision in the absence of accuracy cannot, under any account, guarantee data quality (de Pontual *et al*., 2006).

A collaborative study among several European countries could be based on the following issues:

i) **Indirect growth validation** using the new *illicia* ageing criterion for testing if cohort tracking is possible in other areas (after the age estimation a time-series of illicia, similar to what has been done in the Porcupine Bank).

ii) **Direct growth validation** studies. The tagging–recapture of specimens of white anglerfish could be very useful to a further advance on growth validation, especially on that of the large specimens, were validated information is very scarce. Tagging is a direct method of validating the growth of a fish during its time at liberty. Two tagging programs have been undertaken for white anglerfish, one on the Atlantic northern shelf stock (Laurenson *et al*., 2005) and another on the two stocks of the Atlantic southern shelf (Landa *et al*., 2008b). Acceptable recovery rates were obtained in both studies (3.8–4.5%). Given the difficulty of tagging a large number of specimens of this species, it was not possible to obtain information from specimens which had spent much time at liberty. Most of the available information from those tagging-recapture programs corresponded to information from small and medium specimens, but not from large specimens. Despite this, invaluable information was obtained to advance on the validation of the growth pattern of white anglerfish, and to obtain more information on the movements and interaction between stocks (Laurenson *et al*., 2005; Landa *et al*., 2008b).

3.9.2 Suggested study on stock- and component related issues for the herring in the west of Scotland, west of Ireland, Irish Sea and North Sea. (priority 2)

The effect of possible changes of autumn, winter and spring spawning components in those areas will potentially influence the catch-at-age data and survey numbers-at-age. Mixing of autumn, winter and spring spawners takes place in those areas which may lead to ageing difficulties regarding counting of winter rings.

The stock identity of herring west of the British Isles was reviewed by the EU-funded project WESTHER. This identified West of Scotland as an area where catches comprise a mixture of fish from adjacent areas and previously studies have validated the North Sea and Skagerrak as areas of stock mixing (Bekkevold, Ruzzante, Clausen, Bierman). Concerning the management for such areas with a mixture of stock components, those should be managed separately to afford maximum protection. Thus, to increase the knowledge of the magnitude and implication of the stock component mixing, it is advisable to incorporate splitting methodology of stock components in both catch and survey in all areas, where herring stocks mix. In some areas (parts of the North Sea and Skagerrak, Kattegat) this is already implemented (HAWG report, WKWATSUP report), however, the areas West of Scotland, West of Ireland and the Irish Sea has not yet started such procedures.

A study investigating the potential effect of the uncertainty in relation to the mixing of herring stock components and the related difficulties in estimating accurate biological parameters for those mixed stocks is highly warranted. The text for such a study will be drafted intersessionally with Lotte Worsøe Clausen (DTU Aqua, Denmark) taking the lead.

3.10 Proposal for ICES cooperative research report (CRR). Protocols on the ageing of different fish species in the ICES area (identify editors/content/contributors/species)

PGCCDBS was approached by the ICES Publications Committee with a suggestion of combining the existing protocols on the ageing of fish species within the ICES area, and publishing them as an ICES cooperative research report (CRR).

This idea was positively received by PGCCDBS. It is important to summarise the state of knowledge for key species and to scrutinize by peer review, the work done during the many calibration exercises and by doing so promote an increase in quality. The CRR will provide a comprehensive manual on the methodology of age reading and validation. Having a collation of all hitherto validated and effectuated methodologies facilitates a fast and quality assured development of a method suitable for a new species given the power of example.

The proposed CRR represents a collation of the state-of-the-art scientific work on the methods and validated age estimation of commercially exploited fish species across Europe. Improving precision in age reading is extremely important for many species and the information included in existing protocols should be more widely available. Given the wide span of validated methods already existing within the ICES community, the collation of these protocols would provide a useful resource to the ICES community and will potentially facilitate the production of validated protocols for species new to sampling for biological parameters.

The CRR will consist of a general introduction to age estimation based on calcified structures and possible validation techniques followed by a series of chapters holding the protocols for a group of species (e.g. gadoids, deep-sea fish, widely migrating species, small pelagic species, etc.). Each chapter will contain an introduction describing the general methodology specified for the group of species and then exemplifying through the protocols. The suggested collation of age reading protocols in a CRR will be produced in several steps prior to submission:

1) Authors of chapters are invited by the editors and asked to produce draft text prior to the WKNARC in 2013.
2) During the WKNARC 2013 the chapters are reviewed and adjusted where necessary.
3) Authors submit their chapters to the editors by October 2013.
4) Editors circulate final draft in November 2013.
5) Submission of final draft by January 2014.

The draft resolution for this CRR can be found in Annex 7. The proposed authors are: Lotte Worsøe Clausen (Denmark) and Gráinne Ní Chonchúir (Ireland).

3.11 Supporting end-user needs for stock-related biological parameters

PGCCDBS 2012 considered how the work of its subgroups on age and growth, reproductive parameters and other stock-related biological variables should evolve to ensure we address end–user needs in the most effective way. For example, what additional skills sets are required in PGCCDBS to address these needs?

One of the main aims of PGCCDBS is to develop standards and guidelines for the collection and interpretation of data on biological variables, so that the advisory process can be supported by the best possible science and most cost-effective use of

DCF and national resources. In order to meet these rather ambitious aims, the group needs to possess all the required skills for answering such issues by its membership.

In relation to the subgroup on age and growth, reproductive parameters and other stock-related biological variables, experts in assessment, statistics and biology would make up a highly efficient and capable team. This would enable PGCCDBS to outline exactly what data and quality statistics should be provided for use in assessment models; to review and suggest user-friendly ways of evaluating workshop results in order that they can be applied in the assessment process, and to convey information on the species in question, the nature of growth of calcified structures/maturation processes, etc. Many of the skills are already represented in the group; however, there is a need for a more direct link between the actual stock-assessors and managers and the PGCCDBS.

3.12 Perspectives for the new EU multi-annual programme 2014-2020 in relation to stock related biological variables

The new EU multi-annual programme opens a wide range of possibilities for regional cooperation and task sharing in relation to the production of stock related biological variables.

The improvement of regional focused sampling should be a priority and an independent analysis should be implemented to optimise best use of resources and eliminate duplication of efforts in relation to stock related biological variables. This will require in depth data analysis to ensure that the sampling programme is fit for purpose and will require a dedicated research programme. Sufficient consultations with the appropriate experts should take place to enable the allocation of tasks across expert laboratories in relevant MS. Task sharing between Members States should facilitate more focus on regional sampling where appropriate.

In relation to the envisaged regionalisation, the PGCCDBS was approached by the RCM NA to initiate a discussion of statistical and methodological procedures which would enable sharing international information on biological parameters. The general opinion in the PGCCDBS is that task sharing is beneficial and should be encouraged where deemed appropriate. For institutes collecting small volumes of age samples for certain species and when new species are to be sampled, task sharing of the production of biological parameters such as ALK and maturity ogives are highly warranted in order to optimise the use of the existing expertise among the national laboratories.

There are, however, some concerns in relation to the formation of regional expert laboratories in relation to quality assurance of the age- and maturity estimations. A keystone in maintaining quality assurance and control is to ensure the avoidance of drift, and 'unification' of the estimations made by the laboratories treating the various stocks. Moving beyond precision based on individual assignments of age and maturity is in its beginning. This should be further encouraged and supported (also financially) to the regional expert laboratories. This will potentially facilitate a decrease in bias and improve the precision of the determinations despite the fewer readers and thus the risk of drift. The PGCCDBS encourages the task sharing and regionalisation, however, underlines the necessity for accompanying studies validating the age and maturity estimations and quality assurance made by the regional expert laboratories.

If all Nations agree to start up the formation of regional centres that are experienced, capable, and willing to perform the relevant analysis on assigned species; the alloca-

tion of species should be based on a review of the capability (in terms of expertise, equipment, financial possibilities, etc.) of each institute. The sampling, processing and exchange of samples between the suppliers ('customers') and the regional centres of expertise should be agreed and reviewed by a specified group consisting of experts on the particular stock in relation to its biology (growth, migration, stock components, maturation), the assessment needs and the options for sampling (both catches and scientific samples) for the species. Ideally those specific groups could be nominated by the relevant assessment working groups and then discussed, agreed and decided by the relevant RCMs/National correspondents so the first agreements could be established formally.

4 Review the outcomes of workshops, study groups and other intersession work related to sampling design, collection, interpretation and quality assurance of data on fleet/métier related variables (discards estimates and length/age compositions of landings and discards) (TORc)

4.1 Review key outcomes of the 2011 fleet based sampling workshops (WKPICS1; SGPIDS)

4.1.1 Workshop on practical implementation of statistical sound catch sampling programmes (WKPICS1)

This workshop, chaired by Jon-Helge Vølstad (Norway) and Mike Armstrong (UK) was held in Bilbao, Spain, from 8–10 November 2011. The report for WKPICS1 is still in preparation. This following text is a preliminary summary of the outcomes of the workshop. Twenty-eight participants representing eleven countries including Iceland and the United States were present. Alan Lowther, United States, an external contributor, provided a particular reference and expertise in sampling small scale fisheries.

Prior to the workshop participants from each Member State were provided with a questionnaire to collect standard descriptions of each onshore and offshore sampling programme. These were collated at the workshop. The objectives, descriptions and the practical issues relating to setting up national programmes were detailed in the presentations of a diverse range of case studies covering:

- Analyses of the Danish offshore observer programme;
- At-sea sampling-the Norwegian reference fleet;
- Maltese fisheries sampling programme;
- Sampling programme of artisanal fisheries (Basque Country);
- Sampling of commercial catches in Iceland (On-shore sampling);
- Scottish port-sampling case-study;
- UK England On-shore sampling programme;
- Swedish sea-sampling programme-case study Skagerak.

The ideal sampling procedures are probability-based, carried out according to a statistical plan such that samples can easily be extrapolated to the target population using weights based on inclusion-probabilities.

The problems encountered in trying to adopt a probability based sampling scheme for onshore sampling programmes and offshore sampling programmes are quite different and a subgroup for each of these fields reviewed the experiences and the practical implementation of such a scheme.

In each case the ideal sampling frame, the primary sampling units and secondary units were defined. For onshore sampling the spatiotemporal sampling frames consist of sites-days (sites being the port of sampling or access point). For offshore sampling the frame is effectively based on a nation's vessel registry. Stratifying these sampling frames to improve on sampling efficiency, to limit cost or to focus sampling at key areas or domains of interest, were discussed and demonstrated with reference to the various case studies.

The key advantages of adopting a probability-based proportional sampling scheme is that the sampling of trips ashore or the fishing operations at sea within their respective domains will occur in their right proportions. Important métiers will achieve reasonable coverage, those that account for a minimal portion of the catch or effort will be sampled less.

Currently most sampling schemes are driven by a requirement to meet a minimum number of samples or a minimum level of precision. This can lead to quota sampling, where chasing a target for a particular métier, when sampling trips in a port, for example, will result in bias. In these instances métiers will not be sampled in their right proportion. The inclusion probabilities are unknown and the overall precision may be reduced.

Other key aspects that came from the workshop was the importance of recording non-events, such as documenting failed sampling attempts where procedures were followed but fishermen or merchants barred access to landings or a trip. These events could create bias so need to be accounted for in raised estimates. Documenting their occurrence and their impact on the raised estimates, when presented to stake holders, has improved access to trips and landings in a couple of the case studies.

The post-stratification and the raising samples to catch estimates were only touched on briefly and these processes will be reviewed in detail using these case studies in WKPICS2 (see Section 4.2).

4.1.2 The Study Group on Practical Implementation of Discard Sampling Plans

SGPIDS, chaired by Edwin van Helmond (The Netherlands), met from 27 June–1 July 2011 in Copenhagen, Denmark. Seventeen participants representing eleven countries were present at the meeting, including the outgoing chair, Simon Northridge, of ICES WGBYC (Working Group on Bycatch of Protected Species). SGPIDS was proposed by ICES PGCCDBS (2010) in response to a request from the Regional Coordination Meeting for the North Sea and Eastern Arctic (RCM NS and EA; 2010) to foster an exchange of experience and expertise between experts on discard sampling, planning and implementation of PGCCDBS recommendations and ultimately synchronize coordination and data collection procedures of discard sampling between countries.

To handle the exhaustive list of terms of reference the group split up into subgroups. These dealt with one term of reference each. Wherever necessary, the subgroups collected information about the existing discard sampling programmes by represented member state. This information was used to create an extensive overview of techniques and protocols used to sample discards onboard commercial vessels. Throughout the meeting plenary sessions were used to keep all subgroups up to date with each other.

The study group identified 21 different discard sampling programmes among the countries present, which were divided into two main types of discard sampling techniques: observer and self sampling (including self sampling with a reference fleet). Among observer programmes, differences in the procedures of selecting vessels and allocating sampling effort were identified. For example, nine out of 15 observer programmes use a quasi-random vessel selection method, based on a combination of opportunistic and co-operative criteria. The remaining six programmes use a fully random or otherwise systematic approach to select the vessels for monitoring. It was noted that only 25% of the programmes routinely record refusal rates. Six countries at SGPIDS conduct dedicated self-sampling schemes. Of these, 66% are validated (e.g.

comparing biological data with matched or unmated observed trips and/or other independent sources). Vessel selection was a key source of potential bias for both sampling techniques. Sampling effort allocation was another major source of bias. Further, it was noted that legal conditions under which discard sampling is taking place, potentially harm the cooperation between industry and scientist in discard sampling programmes and, eventually jeopardize the quality of sampling programmes.

SGPIDS recognised the potential for more standardisation in sampling designs and this should start with a complete description (in English) of sampling designs of all current sampling programmes. SGPIDS created a detailed description, at all levels (i.e. sampling protocols, data processing, data storage procedures, co-operation with industry, observer training and safety procedures) for the 21 programmes. With the aim to standardize discard sampling across countries, it is important that bias and variability associated with their respective sampling programmes are investigated.

The Data Collection Framework (DCF) set out precision levels but did not include any requirements about bias. Bias is introduced to sampling schemes when samples are not representative of the population. In accordance with previous working and study groups (e.g. ICES WKEID, WKACCU), SGPIDS identified a number of potential sources of bias in discard data. There was a general agreement that improving the data quality by reducing bias should be prioritised over increasing precision levels.

4.2 Work plan 2012

The following workshops and study groups will take place in 2012.

Acronym	Dates	Chairs	Venue
WKPICS2 Workshop on practical implementation of statistical sound catch sampling programmes	6–9 November 2012	Jon Helge Vølstad (Norway) and Mike Armstrong(UK)	ICES HQ
SGPIDS2 Study Group on Practical Implementation of Discard Sampling Plans	25–29 June 2012	Edwin van Helmond, (the Netherlands)	ICES HQ

PGCCDBS reviewed the original ToRs for these meetings and proposed some changes (see ANNEX 8 and 9 respectively for the amended ToRs with full resolutions for WKPICS2 and SGPIDS).

4.2.1 Review of ToRs for WKPICS2

The PGCCDBS proposed the following change:

- Inclusion of an additional ToR to provide Quality Indicators that can be incorporated into the WKACCU score cards in reference to the two types of schemes for sampling at sea and on shore.

4.2.2 Review of ToRs and work plan for SGPIDS2

The PGCCDBS proposed the following changes to ToRs:

- A change to ToR1 to define quality indicators in a score card format, which ultimately can be used to identify areas of improvements of the protocols used for on board sampling by the different member states.
- Combining ToR 3 and 4, since they both deal with general fleet level procedures.

Concerning the workplan for the meeting, the PG advises that within-trip on-board procedures (i.e., the specifics of observer work on board and the precision and accuracy associated with that) are approached separately from more general fleet level procedures (vessel and trip selection, refusal rate recording, discard raising to fleet level and the precision and accuracy associated with that. The combination of ToRs 2 and 3 helps to emphasize this distinction.

In relation to ToR (2), the PG also advises that SGPIDS2 should evaluate differences, and possible data deviations caused by these differences, to on-board sampling protocols on a regional fleet level (ToR2). Specific cases where member states overlap in sampling the same fleet should be defined before the start of the meeting. This will enable member states to prepare in advance and ultimately result in improved and synchronized on-board sampling protocols (concrete output).

4.3 Proposals for 2013 and beyond

4.3.1 Proposals for workshops

Because of the diversity in the existing programmes and potential complexity in the raising procedures to calculate catch estimates and their precision, the **PG recommends an additional workshop (WKPICS3) in 2013.** WKPICS3 will summarise the findings of the WKPICS1 and 2 workshops; will provide standard procedures and clear guidelines on best practice and will use the case studies to demonstrate the practical problems and to map ways of optimizing schemes. See Annex 10 for draft proposal and ToRs.

4.3.2 Proposal for ICES training course

A statistically robust sampling scheme should be a prerequisite for collecting any data for any form of assessment. The practical problems in sampling fisheries and implementing these schemes are being documented by WKPICS. Expertise in designing sampling schemes is growing with experience within the MS but there is little formal training available that concentrates on sampling design. Such courses will not only help those setting up schemes and implementing them but will also help inform end users on how this data can and should be used. Documenting schemes is forming part of the current process but it is important for the end user to understand this documentation, how that data was derived and why, and how it can be used.

PGCCDBS recommends that ICES provide a series of training courses covering the design of statistically sound catch sampling for fisheries monitoring programmes.

There should be three levels: an introductory level, an intermediate, and an advanced level. At the introductory level the candidates should already have grounding in basic statistics and experience of biological sampling in the field and/or experience of using catch estimates from sampling programmes, in stock or fisheries assessments. The higher level courses may extend to the analysis of complex surveys using design-based and model-based estimators for raising the sample estimates of catch characteristics (e.g. numbers-at-age) to the total catch estimates, with associated precision estimates. See Annex 11 for the draft training proposal.

4.3.3 Proposal for a theme session at ICES Annual Science Conference

Within the ICES community there is growing experience in setting up statistically sound sampling schemes. The difficulties and costs of getting access to all fisheries, catches and vessels and the way the industry works, create what may appear to be

fairly unique problems in applying theory to practice. Workshops and Study groups are ideal for focusing on particular national and regional issues and exchanging ideas on solutions to these problems but there is scope to trawl a larger worldwide pool of experience. The ICES Annual Science Conference would provide a forum for reviewing this and world wide experience, and exchanging further ideas in this field. **PGCCDBS proposes a theme session at the 2013 ICES Annual Science Conference – "Improving statistical survey methods for monitoring commercial catches" –** A template will be submitted by ICES' deadlines for consideration of new Theme Session proposals.

4.3.4 Proposal for collaborative study contract on "Support design based regional data collection programmes"

Objective of proposed study

The Study will develop an operational framework for establishing and coordinating design-based sampling programmes at a regional scale for the most cost-effective delivery of fishery and biological data required by the revised DCF and any specific additional needs to support assessment and fishery management.

Duration of project

It is anticipated that the project would run for two years, and cover two periods of RCM and Liaison meetings to allow consultation and discussion of proposals.

The need for the proposed study

A design based sampling strategy is a prerequisite for transparency in the data collection-assessment-advice process since it allows for straightforward estimation processes, assessment of bias as well as variance associated with different estimates. In particular, it supports estimators that do not depend on complex models and assumptions about the underlying stochastic process of the catching operations of the fleet. It also enables the use of DCF data in the wider scientific/management community since data are collected in a transparent way following sound statistical procedures including documentation of sampling protocols and sampling designs.

Due to severe logistical constrains in sampling of fisheries, many national sampling programmes may in reality be more or less *ad hoc* based. Recent ICES workshops including WKPICS and WKMERGE have started to examine how sampling schemes can be adapted to deal with different types of logistical constrains without compromising the basic requirements of statistical design. Within these workshops it has become evident that countries need support to design and implement such statistically-sound sampling schemes.

Currently, the DCF Regional Coordination Meetings (RCMs) focus heavily on "task sharing" for metier and stock based sampling. It is foreseeable that in the new DCF, the role of RCMs may evolve more towards establishing and coordinating statistically-sound programmes of data collection to deliver the estimates for stocks and fleets required at the regional scale. This could include agreement of sampling frames, allocation of sampling effort amongst Member States, documentation of sampling schemes, and review of achievements and data quality. To adopt this role, RCMs would require guidance and a system of support because the sampling problems already encountered by individual countries will remain at the regional scale. If true progress should be made towards regional data collection programmes, it is cru-

cial that sufficient resources and expertise are available for Member States and RCMs to carry out the necessary tasks.

Study specifications

The study will require setting up a core project team to work out principles for regional sampling designs, and to work closely with RCMs, ICES PGs, European Commission and Liaison meeting to review how the structure and operation of RCMs should be adapted to best serve the needs of the revised DCF. The project team will focus particularly on:

- Understanding the fleet-based and stock-based estimates that are required to support assessments and advice at a regional scale.
- Defining an operational framework for RCMs to coordinate annual or multi-annual regional sampling programmes to deliver the estimates.
- Identifying logistical constraints to national sampling schemes within a region, and proposing solutions for how these could be handled in regional sampling plans and within the component national strata (ref: WKMERGE; WKPICS1–3).
- Establishing procedures for optimising sampling schemes and allocation of sampling amongst Member States in relation to regional objectives and available resources.
- Identifying the procedures for estimation and sample raising at the regional scale.
- Developing Quality Indicators for regional datasets.
- Identifying developments needed in the Regional Databases to support regional sampling programmes.
- Propose future support systems to help RCMs implement and evaluate regional sampling programmes.

RCM areas to be covered

The project will initially scope out the problem across all DCF regions in consultation with RCMs, European Commission and PGs, but depending on resources may then focus on one or two regions as case studies.

Project tasks

Subject to discussion with the European Commission, it is anticipated that a two-year Study would involve the following tasks:

- Initial workshops and WebEx meetings with key RCM, ICES Planning Group and European Commission representatives, and invited external experts, to agree the basic principles of implementing and optimising a regional programme of sampling to deliver the required estimates.
- Identification of the structure of a regional sampling programme allowing a fully coordinated international approach to delivering the required data and estimates, including documenting the characteristics of the fisheries and stocks to be sampled in each country, development of sampling frames, stratification schemes, sample selection procedures, optimal allocation of sampling effort amongst countries, estimation procedures and production of quality indicators.

- Presentation of proposals to RCMs, ICES PGs, European Commission and Liaison Meeting, for discussion and further development.
- Development of final proposals and report.

4.4 PGCCDBS responses to fleet based sampling issues raised by ICES expert groups and Regional Coordination Meetings

The Expert Group recommendations forwarded for the attention of the PGCCDBS in 2011 can be found in Annex 12, along with all responsive actions. Responses to RCM recommendations are given in Annex 5.

A more detailed response to a specific request from SGPIDS (2011) is given below.

4.4.1 Bias associated to the use of fully discard age–length key, mixed discard/retained age–length key or survey age–length key when estimating the age composition of discards (SGPIDS)

SGPIDS (2011) included the following recommendation to PGCCDBS: "The issue of bias associated to the use of fully discard age–length key, mixed discard/retained age–length key or survey age–length key when estimating the age composition of discards was unresolved by SGPIDS. We suggest this subject should be discussed by experts at the next PGCCDBS meeting". The PG response is given below.

The SGPIDS detected MS are using different ways to obtain age data for discards (Table 5.1, p. 46 of SGPIDS report). As an example, some MS derive discard specific ALKs for each fleet, while others use landing derived and survey/derived ALKs to obtain age estimates of discards. Similarly, some MS collect weight data directly in on-board surveys that they use to estimate total discards and others use weight–length relationships to convert lengths to weights at different levels (trip, stratum, etc.). Ideally, age–length keys and weight–length relationships should be developed and updated at a regular time basis, derived separately for each gear type and variable of interest (landings and discards). However, this subgroup recognizes such objectives will be hard to implement at national level. Furthermore, it is likely that the amount of bias caused by departures from this ideal situation is species specific and could at instances be reduced compared to other sources of bias (e.g. those directly related to the sampling design).

As a first step towards characterizing this situation, PGCCDBS recommends that a full account of all procedures used to generate age and weight data from discards at national level is carried out by the national stock coordinators for stocks where age-based assessments are conducted. These reports should be made available to EWGs of STECF, data compilation workshops, benchmark and stock assessment working groups so that the full extent of the differences in the sampling and compilation procedures amongst MS is left clear.

Templates for such reports are available in Table 4.4.1.1. and include aspects known to determine the accuracy and precision of ALKs such as the number of samples used to derive each ALK/weight–length relationship, the origin of the samples (survey, landings, discards), the sampling design used to select the samples, the temporal, spatial and fleet resolution of the samples as well as details on the level at which the ALKs are applied (trip, stratum, etc) and their frequency of update.

4.5 PGCCDBS views on data collection changes under the revised DCF

The data collected under the EU data collection framework (DCF) have the primary function of supporting stock assessments and informing the fleet based management decisions upon which the common fisheries policy is based. It also provides for the routine monitoring of the catch and discards of data poor fisheries and data poor stocks. To that end the overall aim of the DCF should be for a design based sampling strategy that:

1) Collects data in a way that quality (bias and precision) can be reliably assessed at national and regional level.

2) Ensures that sampling intensity is allocated in a way that will maximize precision at the level where it matters most, the region, in the context of assessment of stocks and fisheries.

The use of statistically sound survey sampling designs for field data collection schemes that are fully documented is a prerequisite for transparency in the data collection-assessment-advice process. Only with the use of such schemes can selection bias be controlled for and assessed and the variance, associated with different estimates, be correctly calculated. It also enables the usage of DCF data in a wider scientific/management community since the applicability of such data is readily apparent.

Rationale for catch sampling to be designed at the regional level

The data collection to support assessment under the DCF is derived ultimately from sampling the catch of the fishing fleets operating within regions. In the sampling sense the fishing vessels are the study population. Stock assessments estimate the effect of commercial fishing on the fish populations and it is the fishers that operate these vessels that are subject to the fleet based management measures put in place to manage stocks.

These fishing fleets operate in the regional seas, (Baltic, North Sea, Eastern Atlantic, Mediterranean) and while some vessels confine their activities to fishing areas and landing ports within the scope of a single nation or member state, others vessels operate in a more international way, fishing in a range of locations and landing their catch in a number of different member states. In order to sample these fisheries it therefore makes intuitive sense that sampling programmes are organised primarily at the regional level. These programmes will still need to account for the necessary national contributions to baseline monitoring of unshared small scale fisheries and data poor stocks.

Table 4.4.1.1. Templates for reporting derivation of age–length keys and weight–length data for at-sea sampling.

		ALK construction									ALK application			
MS	Stock	Calcified Structure used in ALK	Métier (or Grouped Métier) where Calcified Structures are sampled	Origin of Calcified Structures	Sampling method used to select fish	Target number of fish per length class in ALK	Sex specific ALK? (if yes detail target number per length*sex)	Temporal resolution of ALK	Spatial Resolution of ALK	Frequency of update of ALK	Métier (or Grouped Métier) to which ALKs are applied	Origin of length data where ALK is applied	Temporal scale of length data where ALK is applied	Spatial scale of length data where ALK is applied
PT		Otolith	Demersal	Discards	random	10	es (5 per sex; 10 in immature	Quarter	ICES Div	every trip	Demersal	Discards	Quarter	ICES Div
NO		Scales	OTB_CRU	Landings	stratified by size	ad-hoc	no	Trip	ICES Area	every year	OTB_CRU	Landings	Trip	ICES Area
SP		Otoliths and Scales	All métiers	Discards and Landings	other (detail)	other (detail)	other (detail)	Year	other (detail)	every quarter	All métiers	Discards and Landings	Year	other (detail)
		Trawl survey	other (detail)	Surveys				other (detail)		every month	other (detail)	Surveys	other (detail)	
		other (detail)		other (detail)						never (date of last construction)		other (detail)		
										other (detail)				

		Weight length								relationship application			
MS	Stock	Métier (or Grouped Métier) where fish are sampled	Origin of fish	Sampling method used to select fish	is there a target number of fish per length class? If yes state number	Sex specific relationship?	Temporal resolution of relationship	Spatial Resolution of relationship	Frequency of update	Métier (or Grouped Métier) to which relationships are applied	length data where relationship is applied	Temporal scale of length data where relationship is applied	Spatial scale of length data where relationship is applied
PT		Demersal	Discards	random	no	yes	Quarter	ICES Div	every trip	Demersal	Discards	Quarter	ICES Div
NO		OTB_CRU	Landings	stratified by size	10	no	Trip	ICES Area	every year	OTB_CRU	Discards	Trip	ICES Area
SP		All métiers	Discards and Landings	census	no		Year	other (detail)	every quarter	All métiers	Discards	Year	other (detail)
		Trawl survey	other (detail)	other (detail)			Month		every month	other (detail)	other (detail)	other (detail)	
		other (detail)					other (detail)		never (date of last construction)				
									other (detail)				

Rationale for the use of statistically sound design based sampling schemes

Sampling is the process whereby the statistics of a small sample can be extrapolated to make inference about the attributes of a far larger population. To ensure that this process produces data that supports unbiased estimates, with reliable measures of precision, it is essential that the selection of the sample does not involve any subjective decision making by the data collector; rather the selection process is based on probability, the simplest form of which would, for example, be a purely random sample. It is this probability based control of the selection of samples that distinguishes design based estimates from other sampling techniques such as quota sampling. Quota sampling is characterised by the collector of the data choosing the sample based on its attributes (or on their own convenience or judgment) rather than on pure probability.

Probability-based sampling has three overriding advantages over other sampling techniques.

1) It ensures that (all other things being equal) the sample is unbiased.

2) It enables the estimation of variance in estimates of catch characteristics based on the sample (i.e. design-based estimates), without any assumptions about the underlying population.

3) It ensures that given some auxiliary information about the population, and knowledge of the sampling design, it is possible for a range of reliable data quality indicators to be calculated, e.g. non-response rates, non-compliance rates, coverage rates. These quality indicators can be used to make quite legitimate inferences about sections of the population that it is not possible to sample. They can also be used to optimise the sampling design to enable the most cost effective use of resources.

Other sampling practices, such as quota sampling, *ad hoc* sampling, or opportunistic unplanned sampling have none of these attributes and thus run the risk of producing biased results for which no meaningful measures of variation can be calculated and which can be financially wasteful.

Recent reviews of sampling schemes in operation across regions suggest there is considerable scope to improve the existing national sampling designs. Best practice statistically sound sampling design principles need to propagate through scientific institutions across member states. Moreover it needs to be recognised that the data collection process involves the implementation of standard methodologies, adequate staff training, suitable data storage formats, and the physical housing of data within databases. These practices and physical infrastructure that supports these data collection has historically been operated at the national level, and so that the process of harmonisation will thus take time. The establishment and population of regional databases is a key step in this process.

Attributes of a statistically sound design based regional sampling schemes

Vessels that make up the fleets operating at the regional level present two basic sampling opportunities where catch can be accessed and the required data on fish in the catch gathered.

1) On-shore sampling at access points (ports, harbours, markets and processors).

2) At sea sampling on vessels (e.g. stratified by size, predominate gear...).

Catch is composed of a retained fraction (that is landed at ports and sold to market) and a discarded fraction (that is not landed at ports and is generally thrown back to the sea). The recent series of catch sampling workshops focusing on promoting statistically sound methodology (WKPRECISE, WKMERGE WKPICS I) have outlined the two basic models for sampling design; one for the sampling of the landed (retained) fraction of the catch another for sampling the discarded fraction of the catch.

On-shore sampling is, by definition, directed at the landed (retained) fraction of the catch. On-shore sampling designs should be based on sampling frames consisting of lists of access points (ports, markets or processors) where landed fish or shellfish can be sampled. These are typically stratified by such criteria as small/large port or as area frames based on geographic location. Sampling visits are allocated to a particular day or week using, preferably using a random or systematic random allocation over the time period desired (say a quarter). The primary sampling unit (PSU) in most instances is likely to be port and day; the secondary sampling unit (SSU) the vessel.

At-sea sampling is often directed at the discarded fraction of the catch because discards can with few exceptions be sampled (or collected) only at-sea. At-sea sampling is also necessary to obtain samples for age (e.g. otholits) from fisheries where catches are processed at sea prior to being landed. At-sea sampling designs should be based on vessel lists. Generally a vessel will be chosen using probability based selection from all vessels in the list, and a trip sampled from that vessel. In most instances it is not possible, for practical reasons, to select from the population of all trips as they are not known in advance. For most at-sea sampling programmes the PSU is therefore the vessel and the SSU the trip. Typically sampling frames can, and would, be stratified according to vessel length class, type of catch processing (on-board processors could be a stratum), temporal operation of a fleet, geographic location of home ports and so on.

The logical extension of national sampling designs to regional sampling designs is to recognise that the strata in these national designs are in fact strata of a larger regional design. The regional sampling frame would consist of the combined sampling frames that exist at the national level.

The main task in establishing regional sampling designs would therefore be to ensure that the national schemes provide estimates for strata that can be combined across nations to obtain unbiased regional estimates. These should be based on sampling frames of access points for on-shore sampling, and sampling frames based on vessel lists for at-sea sampling. Sampling designs within nations can be flexible with respect to stratification and sample selection as long as they are based on sound statistical principles, and ensure that estimates can support regional estimates when required. However, National institutions need to share a common understanding of the statistical principles involved in the sampling design and have a harmonised approach to the collection of data and the generation of data quality indices.

Data collected under regional programmes can of course be utilised for national purposes, and indeed national sampling programmes can augment regional requirements where there are particular national desires for data e.g. when the sampling of more localized, smaller scale, fisheries and data-poor stocks becomes an important objective for economical or ecological reasons.

Sampling frames and the role of metier under the revised DCF

An important requirement within the revision of the DCF is to make a clear distinction between the design based sampling based on sampling frames (as outlined

above), and the metier based sampling approach which has prevailed in the DCR and existing DCF up till now.

The métier concept is a very useful one in that it allows for a common description of fishing trips *after* they have occurred. This enables the routine monitoring of fleet activity, changes in target species, changes in discarding practices, etc. The métier is not however a useful concept for defining sampling stratum. For the reasoning set out in WKPRECISE and WKMERGE, sampling strata have to be defined in advance, have to be stable over time, have to be non-overlapping and have to include attributes of the sampling unit that can be used to inform the allocation of effort between strata.

Métiers do not generally fulfil these criteria, and the attempt to sample to métier defined targets has resulted in the widespread adoption of quota sampling, with the likely consequence that the collection of data may actually have become more biased, and certainly less cost effective to collect. The resolution at which métiers are defined may also be detrimental to the cost effective use of limited resources. As an example, a case-study on the precision levels required to attain a 20% CV in quarterly total discard volume of two Portuguese bottom otter trawl fisheries indicated that an unmanageable three-fold increase in current annual at-sea sampling levels would be required to achieve such precision for both métiers (Prista and Jardim, 2012).

It is clear from discussions within the subgroup and WKPICS we are still some way away from regional 'best practice' and there are a number of steps that need to be taken before we approach the ideal both at the national and the coordinating regional level. PGCCDBS has developed the following roadmap for developing statistically-sound sampling schemes at a regional level, and proposes that this be followed by countries represented at the RCMs:

PGCCDBS roadmap for development of regional fishery sampling programmes

1) National laboratories should evaluate the statistical design of their fishery sampling schemes and identify the potential for bias, following the guidelines in the ICES WKPICS reports. Of particular concern are schemes using quota sampling to meet target numbers for fish measured and otoliths collected based on métier definitions of trips. This can lead to bias and inefficient use of resources, and such schemes should be replaced with ones with a sound statistical basis.

2) PGCCDBS proposes that countries move toward statistically-sound, probability-based sampling schemes based on sampling frames and a regional sampling design. These schemes should be fully documented and generate common measures of data quality. Resource allocation to improve sampling effort within specified sampling strata is to be the mechanism by which unbiased sampling is achieved with the desired levels of precision.

3) Data quality indicators, especially those based on attributes of sampling designs, need to be further developed. This process can build on the WKACCU scorecard approach and would be greatly facilitated by standardised metadata production formats, and by populating the regional databases with sampling data, landings data, effort data and VMS data at an appropriate resolution and suitable format.

4) The SGRN role of reviewing national programmes needs to be augmented by a review group with the statistical knowledge sufficient for the task. This review process will draw heavily on the standardised data quality indicators.

5) PGCCDBS and the RCMs, in communication with end-users, agree on primary objectives for regional sampling programmes, and to actively support the work of member states in the promotion of best practice (as set out in WKPRECISE WKMERGE). Countries supplying fishery sampling data should compile and fully document the following information:

5.1) *For sampling of landings on shore*: i) Lists of all access points (e.g. ports) upon which sampling frames can be based. ii) Landed tonnages and number of landings for all access points specified in i) above. iii) Descriptions of existing sampling frames, sampling stratification and primary and lower sampling units iv) Descriptions of existing sampling effort by number of visits to access points, number of samples per visit, numbers of fish measures and otoliths taken.

5.2) *For at-sea sampling*: i) Lists of all nationally registered vessels upon which sampling frames can be based. iii) Landed tonnages and number of trips by vessel specified in i) above. iii) Descriptions of existing sampling frames, sampling stratification, and primary and lower sampling units iv) Description of existing sampling effort by number of observer trips undertaken, vessels sampled, and numbers of fish measured and otoliths taken.

6) The process of incorporating national schemes as strata into wider regional sampling designs needs to be established and actively promoted. To that end data gathered under 5 above should be pooled at RCMs.

7) The establishment of regional databases adequate to the task of housing sampling data, landing data, effort data and VMS data needed to inform the design of regional and national sampling schemes needs to be promoted. Necessary adjustments to format, levels of aggregation, data housing and data availability should be addressed.

4.6 Evolving role of PGCCDBS

PGCCDBS 2012 considered how the work of PGCCDBS subgroups on fleet-based biological variables should evolve to ensure we address end-user needs in the most effective way. For example, what additional skills sets are required in PGCCDBS to address these needs? The subgroup discussed this in relation to the possible revisions to the DCF (see Section 4.5) and changes in the way that regional data collection could best be coordinated ensuring the practical implementation of statistically-sound sampling schemes at both the regional and national level.

In line with the road map provided in Section 4.5, the role of PGCCDBS will evolve with the adoption of best sampling practice by MS and more robust Regional Sampling Schemes. The PGCCDBS will continue to provide advice on best practice and will need to continue to provide support to end-users and RCMs.

Monitoring and advice

PG will monitor and advise on progress in establishing statistically robust sampling and monitoring schemes and the progress in following the road map, provided in Section 4.5.

In the short term, PG will monitor, through the RCMs, WKPICS and SGPIDS, the progress in establishing these schemes and will need assurance that MS adopt raising processes from data to catch estimates that are appropriate, clear and unambiguous.

But as stated before, MS will need to provide sufficient data, uploaded to RDBs, and documentation for the national and regional schemes to be properly assessed.

In relation to the roadmap PG will need to support clear incentives and offer encouragement for MS to adopt these schemes. PG will need to ensure communication between data gatherers, coordinators and end-users improve.

The PG will continue to review proposals that come from RCMs and EGs in relation to the evolving systems and will oversee progress as monitoring systems and evaluation systems evolve.

Standard evaluation processes

PGCCDBS will need to monitor the development of these schemes and provide advice on standard evaluation processes at the national and regional level. These standards come from the PG but the PG will also need to advise on how the results of these evaluation can be used. If there is insufficient time within the meetings and or skills amongst the attendees then the PG will continue to propose workshops, and studies to focus on resolving particular sampling and or analytical issues, and improving on best practice using relevant experience within MS and further skills from outside. The PG will continue to provide advise on quality indicators and their implementation and will continue to promote Data Compilation workshops; it is crucial that all measures of bias and precision levels are correctly calculated and that they can be interpreted correctly by end-users.

The EWG evaluating DCF Annual Reports and National Programmes needs to draw on statistical knowledge they may not currently have to properly evaluate national and regional schemes. This will become more apparent as WKPICS, SGPIDS and PG provide more quality indicators on data collection and sampling schemes. Training may be required and formal ICES training courses (see Section 4.3.2) should provide the skills for coordinators and reviewers to properly evaluate the full range of sampling schemes. The end users will also benefit from these training courses as they will gain the skills to appreciate the limits of the data provided.

Quality Indicators (QI) and their implementation

As more statistically robust schemes are adopted nationally and quality indicators are more readily available, the focus of PG will need to move to how these quality indicators can be used. The QIs will lead to confidence limits around population indices from assessments and PG will need to review how these will or can help improve on sampling nationally and regionally.

As the quality of the data collected going into assessments becomes more apparent then Regional Advisory Councils and industry may start to question the results of assessments which could lead to management decisions being challenged. The whole evaluation process will become tighter and these schemes may become less self-evaluated, and may need to be evaluated externally. The PG could become more involved with the industry as a consequence.

The roadmap and the background to it provided in the introduction to this section offer a clear process. RCMs, MS, ICES EGs, STECF and its EWG's, and the EU and other end-users all have roles to play. But through this process the PG should provide a system through the DCF that guarantees clarity on how data is collected and guarantees catch estimates of a clear quality that should provide measurable levels of confidence that end-users can take forward into their assessments.

5 Respond to data issues reported by Assessment Working Group data contact persons by providing advice on suitable actions and responsibilities for those actions. (TORd)

Sections 5.1–5.3 deal with the responses to issues raised by AWG data contact persons, the performance of the AWG data contact persons system, and an update of the contact persons list. Section 5.4 is a review of the way recommendations are handled within and between ICES and the RCMs and proposes a more efficient process. Finally, Section 5.5 reviews the relationship between PGCCDBS and the Regional Advisory Council data task forces.

5.1 Data problems reported by the AWG contact persons

Annex 12 tabulates the data issues reported to PGCCDBS in 2011 by the AWG data contact persons, and gives a PGCCDBS response. The majority of recommendations relate to concerns around sampling intensity, data quality, age, growth and maturity parameters, discards and surveys. There are also some proposals for tagging studies and studies on survival rates of certain discarded species.

5.2 Performance of the AWG contact person system

Following PGCCDBS (2009) the role of the data contact person was defined as somebody who should be (ideally):

- An attendee of the relevant assessment group;
- A participant of PGCCDBS or close contact with an attendee of that group;
- A participant of relevant RCM or close contact with attendee of that group.

In order for the contact person to function effectively, PGCCDBS envisage that the role should include the following tasks;

- Contact all stock coordinators (and assessors) that the AWG represents in order to identify issues relevant to PGCCDBS;
- Ensure that all issues relevant to PGCCDBS and RCM's are entered in the table "Stock Data Problems Related to Data Collection" (see Annex 12 for format) and that this is included in the report of the AWG;
- In completing the form, the contact person should, where possible, indicate the course of action that they feel is required in order to address the issues identified;
- Provide feedback from PGCCDBS and RCM's to AWG or Benchmark WK;
- Work in cooperation with ICES secretariat.

In most cases, AWGs and PGCCDBS were in a position to nominate a contact person. Where this has not been done or on working groups which are meeting the first time in 2012 (e.g. IBP NEW), the contact person should be identified, no later than the first day of the AWG meeting.

The empty table "Stock Data Problems Related to Data Collection" is sent by the ICES Secretariat to the chair and the data contact person before the actual meetings. After the meetings the ICES Secretariat also compiles the relevant comments from AWGs and forwards these to RCMs, PGCCDBS, and all ACOM members. During the RCMs the raised issues are considered and answered if they are relevant to the RCM. The

RCMs advise also PGCCDBS of their actions in addressing relevant issues and indicate where further action is required from PGCCDBS.

So far the system of data contact persons serves as a feedback system from ICES to PGCCDBS and RCMS and vice versa. In view of the PGCCDBS this system is a positive development but there is room for improvement. It is especially important that the contact person is aware of the objectives of the DCF or non-EU sampling programmes, which will limit the number of unachievable comments and suggestions put forward. The expected actions must be clearly stated and not be expressed as general statements.

There should be effective coordination between the AWG contact person and the stock coordinators. The stock coordinators should be aware of who the designated data contact person is for the AWG and inform the contact person about the identified data deficiencies. The contact person is responsible for ensuring that the necessary information on data deficiencies is entered in the standard table "Stock Data Problems Related to Data Collection" which can be found in Annex 12. For convenience purposes it would be recommended that this table is inserted in a separate section of the AWG Report.

The stock coordinator is usually the person who compiles national data for the stock assessment and who has the knowledge of deficiencies in these data. However, often stock coordinators are not aware of the changes that have taken place in the data collection and/or preparation in the national laboratories, e.g. changes in data collection design, changes of age readers, etc., but which could have a significant impact on data quality. Therefore it would be important when submitting the national data to the stock coordinator, that the national laboratories inform the stock coordinators on issues that could have influenced the quality or the consistency of the submitted data. This could be included in the data submission procedure when national laboratories submit their data to the relevant stock coordinator. In turn, the stock coordinator would decide either it could have influence on stock assessment or should be sent forward for discussion at AWG. This could be highlighted in the table "Stock Data Problems Related to Data Collection".

With the implementation of the regional data bases there will, in future, be a tool which could be used to easily identify stock data problems on a regional level. This will hopefully ease the work of the stock-coordinators and data contact persons.

5.3 Updated list of AWG data contact persons

An updated list of the assessment working group data contact persons 2012 can be found in Annex 13 of this report.

5.4 Review of the ICES-RCM recommendations process

PGCCDBS is presented with four sets of recommendations or issues to deal with: i) from PGCCDBS to itself; ii) from other ICES Expert Groups; iii) from AWG data contact persons; iv) from RCMs (via Liaison Meeting). The development of an ICES Expert Group recommendations database by the secretariat has been a major improvement, and PGCCDBS has added its responses to the database from where the relevant EGs can easily pick them up without paging through the PGCCDBS report.

In the process of checking the outcome of the recommendations the PGCCDBS has realized that this list is increasing and is far too long. It also became clear that a recommendation could either be a pure recommendation or in fact only a suggestion or

a strategic comment. Therefore PGCCDBS advises that the recommendations directed to PGCCDBS should be categorized as follows, and that the ICES recommendations database should be altered to allow this categorization:

R=Recommendation

SCS=Strategic Comment or Suggestion

PGCCDBS advises that the categorization should be applied immediately within the working groups to ease the follow up and outcome of those recommendations and strategic comments/suggestions.

The number of recommendations directed to PGCCDBS is too large, so PG insists that Expert Groups must, in future:

- Make a distinction between recommendations (R) and strategic comments or suggestions (SCS);
- Clearly describe the recommendation and indicate precisely who it is aimed at;
- Consider if the EG can resolve the data issue itself, if it has the necessary expertise;
- Some WG put forward an INORDINATELY large number of recommendations and some of these are repeated year after year. PGCCDBS struggles to understand what the recurring problems are and the reason they cannot be resolved. PGCCDBS suggests that the WG should step back and look at the stock and data requirements and re-assess what the problem is, consider methodologies employed, link them to the appropriate DCF or non-EU programme, and 'look outside the box' for achievable solutions.

The flow of recommendations within and between ICES and RCMs

The comments above can also be applied to the number of recommendations being sent to any receiving body from any sender. All receiver bodies consider that the number of recommendations is too large and that the follow up of recommendations is a chaotic situation. Too often the recommendations are sent back and forth from sender to receiver without any action taken.

All groups should reflect when recommendations are defined. They need to be distinguished into real recommendations (R) and strategic comments and suggestions (SCS). Of the recommendations, the sending body should carefully list **only five key recommendations**. This is in line with the advice from the October 2011 Liaison Meeting. Reducing to this number will be the first step in making the tracking and outcomes of recommendations more transparent. The recommendations should be given a priority number as well.

It is suggested that there should be a recommendations database set up by the ICES secretariat on the RCM Share Point for all areas. It will be accessible by all RCM members in read-only format and the RCM chairs will have read/write access. All recommendations, as well all strategic comments and suggestion, should be available in the recommendations database, given the possibility of tracking all. An example of the information held in the recommendation database is given in Annex 14. The history of the recommendations is also kept in the database allowing the RCMs to keep track of the history of as well recommendations as strategic comments and suggestions.

An efficient process for managing the flow of recommendations and responses within and between ICES and RCMs is shown in Figure 5.4.1.

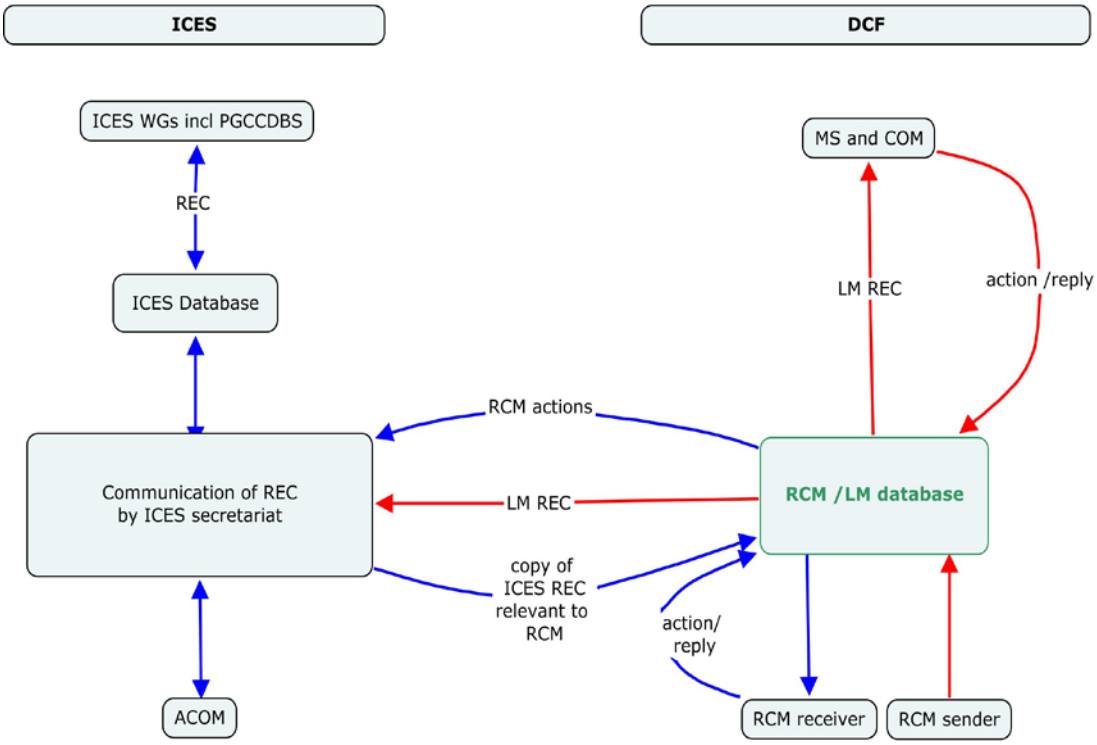

Figure 5.4.1. The flow of recommendation within the ICES and RCM system and the link between the two systems.

The process involves the following steps:

- ICES recommendations (incl. PGCCDBS) sent out to RCMs are kept in the ICES recommendations database.
- A copy of the recommendations addressed to the RCMs is uploaded to the RCM recommendations database from where they are forwarded to the relevant individual RCMs.
- These recommendations are considered, discussed and accepted or rejected and the result/actions are resent to the RCM recommendations database. ICES Secretariat picks up the actions and communicates this further to the relevant ICES groups.
- When the RCM is the 'sender', the recommendations of all RCMs are centralized in the RCM database.
- From there they are sent to the Liaison meeting where they are endorsed and forwarded to bodies such as ICES Groups, PGCCDBS, MS, STECF, etc.
- The considered replies and suggested actions are then sent back to the RCM database, from where they can be picked up by the individual RCM.

PG recommends the Recommendations Database should be set up by the ICES secretariat on the RCM SharePoint for all areas in an attempt to improve the capture, tracking and actioning of all recommendations currently being generated within the system.

5.5 Relationship between RAC Data Taskforces and the PGCCDBS

The fishing industry has been actively engaged in trying to find ways of providing better data to support the assessment and advice for stocks considered to be data-deficient. In January 2011 representatives from the RACs had a meeting with ICES. At this meeting it was agreed that collaboration be ICES and RACs was important to address the data deficiencies that currently undermine the quantity and quality of assessments (ICES, 2011). This first meeting defined the problem and types of data deficiencies and data needs, identified existing initiatives, discussed the need to involve key stakeholders, and explored the range of possible remedial measures. Other issues touched upon at the first meeting included dealing with uncertainty and simpler assessment methods.

The January meeting was follow up by a second meeting held in the ICES headquarters in April with the participation of interested participants from the North Sea and North Western Waters RACs, the chairs of ICES EG of these areas, key stock coordinators from stocks that were planned to be benchmarked this year and of which data quality and quantity was an issue. RCMs chairs and PGCCDBS chairs were also invited, but due to an overlap with other commitments couldn't attend the meeting.

Some of the conclusions from the meeting that may have an impact of the data collection were:

- Strong communications between scientists, fisheries managers and fisheries stakeholders at every level is required to address the data deficiencies described above;
- There is an urgency to address stocks with upcoming benchmarks and the pedigree matrix tool can be a useful focal point for dialog between stock co-ordinators and industry;
- There is a need to avoid duplication and learn from previous collaborative experiences. The revision of the DCF may provide an opportunity to develop collaborative data collection initiatives. Improved data management (e.g. Connolly and Caffrey, 2011) within MS and the DCF is a critical next step in addressing some data deficiencies;
- Accurate recording of landings provides the backbone for most stock assessments and in many cases is perceived as a key uncertainty by scientists;
- Dialogue between scientists and industry on changing fishing patterns will improve understanding of fishing effort, targeting and other fishing behaviours and strategies;
- Well designed and applied self-sampling programmes can be developed and sustained;
- Industry cooperation with the requirements of the Data Collection Framework is critical;
- An increasing number of incentivised fully documented fisheries, "reference fleets" and where appropriate sentinel fisheries should be developed.

The PGCCDBS 2012 welcome any industry involvement in improving better a more quality insured data collection. It should though be mentioned that there are still

room for improvement as e.g. the refusal rate for not taking observers onboard for carrying out at sea sampling programmes are high, the accuracy of catch statistic is still an issue and active participation in self sampling programmes could improve cost efficient data collection.

6 Report on the implementation of the Quality Assurance Framework (QAF) by ICES Expert Groups, and make recommendations for further development of the QAF and procedures for ensuring its full implementation in stock assessments and associated advice. (TORe)

6.1 Review developments in setting up regional databases

The potential benefits of regional databases holding sampling data on a detailed level and transversal data (e.g. landings, effort) on a low aggregated level have been discussed over the years in the PGCCDBS and in the RCMs. Regional databases have the potential to increase transparency on how international datasets are compiled enabling a full assessment of the overall quality. Storage of all relevant data in a central depository give further the possibility for different end-users to assess the overall availability of data and decrease problems with data deficiencies through more centralised transmission processes. But benefits are of course dependent on countries uploading data to the database.

In 2010 a workshop ""Regional scenarios and roadmap on Regional Database" was organised by the European Commission. During this workshop the needs and perceived benefits of a regional database for different regions and for different modules in the DCF were examined. Participants from the Baltic (where a regional database is already used) and North Sea regions expressed a particular need for a regional database. For the North Atlantic region the opinions were divided. Some MS saw the possibility of improving the quality of data and data management through a regional database while others considered the present situation with national databases satisfactory and saw a risk of an increase in workload.

The outcome of the workshop was discussed in the different RCMs which, through the Liaison Meeting (LM) 2010, recommended the formation of a steering committee for regional databases. As a response, a more informal interim steering group met in February 2011, to work out a proposal for how the regional databases could be managed and to suggest a road map for actions and data uploads the forthcoming years.

The proposal covered regions (RCM Baltic, RCM NS and EA and RCM NA) and Member States (RCM reports 2010) that have expressed a need and support for a regional database. It does however by no means exclude other Member States, non EU countries or regions that perceive a regional database beneficial.

The proposal included identification of the RCMs as the bodies governing content in the database and responsible for development of data processing features within the database from a user perspective, establishment of a formal steering committee responsible for technical governance, operational and strategic issues, composition of the steering committee (host, 3 persons appointed by each participating RCM, non EU countries), ICES as the database host, and selection of the existing database FishFrame as platform.

The proposal intrinsically implied that there will be one supra-regional database from a technical point of view but that the regional databases will be kept separate from a content point of view as the RCMs may have different priorities. The interim steering group was also informed that ICES was willing to host the regional database as long as costs and practical issues could be resolved.

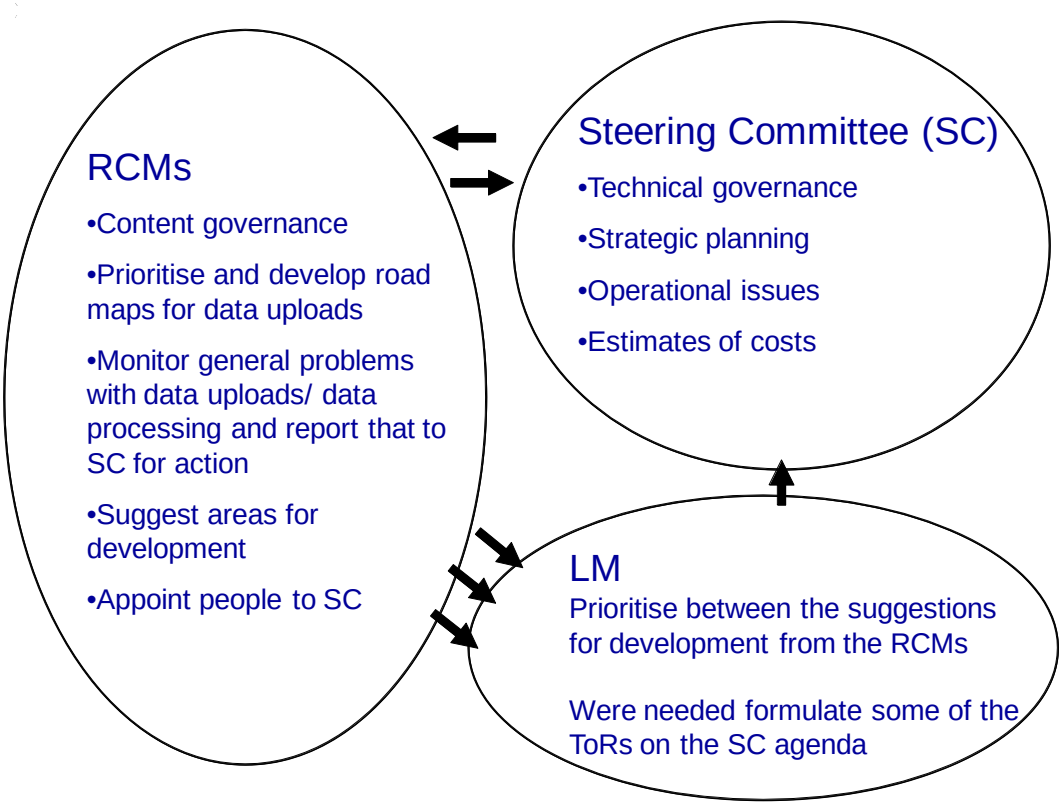

Figure 6.1.1. Showing responsibilities of different bodies in the management of the regional database.

The meeting of the Interim steering group for regional databases further developed roadmaps on how to put the management system in place during 2011, how to initiate and enable upload of data into the database during 2011 and also agreed on a medium term (2012–2013) goal. This goal is that the datasets prioritised by the RCMs, are uploaded to the RDB by all participating MS in order to enable better regional planning of sampling and provide input to the DCF reform process.

This proposal was accepted by the RCM/LM meetings in 2011 and members of the regional database steering committee (SC-RDB) were appointed. The Steering Committee of the Regional Database (SC-RDB) had their first meeting in December 2011. At the meeting the SC-RDB summarised the status of the regional database and formulated a workplan for 2012.

The work in 2012 includes three workshops. The overall aim of the workshops is to increase the awareness of the potential in the RDB; and facilitate countries in the uploading of data to the database as well as the use of the database for raising data for stock assessment. Different regions have different levels of experience of FishFrame implying that the different workshops to some extent will have a regional approach. However all workshops are open for participants from all countries. The workshops planned in 2012 are:

- 29 February–2 March – Objective: use FishFrame to raise data for stock assessment - primarily Baltic region.
- 29 May–1 June – Objective: uploading of data into FishFrame (also to facilitate for countries to reply to RCM data calls) – primarily North Sea and Atlantic regions.

- 20–23 November – Objective: to increase experience on what can be done with data in FishFrame and which outputs that can be received – primarily North Sea and Atlantic regions.

As a response to the RCMs/LM the SC-RDB also discussed a data policy document dealing with data confidentiality and data ownership issues. A subgroup within the SC-RDB has been appointed to produce a draft of such a document. The draft will be discussed at the next SC meeting (March 2012).

The SC-RDB also discussed how future needs for development of the database should be handled. Development needs ought to be split into type of users (data providers, end-users (e.g. AWGs and RCMs)) and these needs prioritized in a transparent way.

It will be the role of the steering committee to gather expressed needs as well as providing cost and time estimates for the development. The RCMs will have a significant role in prioritising these needs.

Information needed from the databases to produce reports on quality indicators

These databases could be the primary source for key quality indicators for the catch estimates over time. Steps 5, 6 and 7 on the road to sampling nirvana (Section 4.5) highlight the process required. The evaluation of regional and national sampling schemes will depend on each MS providing the data on the sampling frames used for their national schemes and uploading to the RDB the data relating to the activity of their fleets whether sampled or not. This will allow a proper evaluation of national and regional schemes as well as provide indices on the quality of regional raised catch estimates. Whether the database is used to hold the documentation of each sampling scheme has yet to be discussed but it will, with the data provided, allow regional coordinators to structure baseline sampling schemes that should meet regional objectives on precision. Once established, updating these databases with current data will allow coordinators to monitor and analyse how well these precisions are being met. These data will also allow coordinators to see how National Schemes are performing and contributing to these estimates and whether standards are being met. The regional schemes will effectively provide the National coordinators with the bones on which to hang the meat of their schemes.

Either the contents of the database can furnish the documentation on national schemes with quality indicators or the national documentation could populate the database with metadata that will add to an overall report on quality linked to the estimate. Both may exist with the first feeding back to the national coordinator suggesting a course of action or information that may help with improving a scheme. The latter would help with qualifying the estimates used in the pre-benchmark Data Compilation workshops.

The report on quality indicators will include those relating to the sampling scheme and will range from simply presence or absence e.g.

- Sampling frame;
- Documented procedures and protocols;
- Vessels/Port/Access points lists;
- Lists of access and refusals;
- Fleet activity data available at the appropriate level;
- Secondary sampling units trip selection/ hauls selection, etc.;

- Raising done to the sampling design (standard design based estimate);
- Bias estimation – WKACCU;
- Quality indicators for procedures (SGPIDS, WKPICS);
- To performance indicators.

Precision of the catch estimates should be measured at the regional level rather than at the disaggregated level.

Others may follow the PG 2011 templates or examples of templates for quality indicators provided for the ICES WGCHAIRS (See PGCCDBS, 2011). These may simply be provided as output from the RDBs and should be available for the pre benchmark Data Compilation Workshops. Vessels\Trips by strata versus the activity; comparative matrices, GIS maps.

How these indicators are to be scored, prioritised, or used is to be subject to further analysis and discussion at and following SGPIDS, WKPICS, WKNARC and WKBASCAL (See Section 6.3 and 6.4).

PG recommends the RDBSC should consider how these indicators should be reported and made available to EGs, SGRN and endusers

6.2 Evaluation on the impact of any recent changes in data collection on the continuity of dataseries

PG is currently not in a position to evaluate this we can only speculate. We have a clear idea where we need to go in improving on current sampling schemes. In some instances schemes were non-existent and sampling was *ad hoc*. Funding through the DCF has provided a greater coverage of sampling but has to some extent encouraged the persistence of quota sampling and chasing sampling targets. Although sampling has increased and improved, assessment scientists are often still expecting data to be provided in the same format or raised to the same historic fleet assemblages. SGPIDS and WKPICS are providing the focus and the pattern for MS to improve on current sampling practices and raising procedures. These groups will be considering raising procedures and importance of following the sampling design and analyses of case studies may provide an indication of the impact of this issue.

6.3 Recommendation on a suitable format for reporting information from age workshops and exchanges on likely errors in age composition data to the Assessment Working Groups

There was insufficient time in this PG to cover this issue, this needs proper consideration and should be considered in relation to the development of the WKACCU score cards.

APEs, PAs and CVs are available from a number of exchanges but how these are used as a measure of quality has yet to be formerly addressed. At what point is it acceptable to carry out an age based assessment despite low agreement between age readers? How do you deal with borderline cases? How do you present this information in a format that assessment scientist can use without them loosing complete confidence in the age data?

At PGCCDBS in 2011 a process of creating an age bias matrix which could be incorporated into an assessment as known uncertainties in a catch matrix for the period covered by the cohorts in the exchange was suggested. This should be done every

time a workshop or exchange occurs. A case study was presented then but the process could be more widely adopted.

PG recommends that WKNARC should review what experience there may be, world-wide, of incorporating age based uncertainties into age based assessments.

Drawing on this experience any practice should be reviewed. WKQF should provide support with this process and this should feed in to the work proposed for WKSABCAL meeting in 2014.

6.4 Further development of the WKACCU scorecard (to include weightings allowing identification of the key sources of bias affecting the quality of stock assessments and advice)

Both SGPIDS 2012 and WKPICS 2012 have amended ToRs to review quality indicators for catch sampling programmes. These quality indicators should be incorporated into the data review programme, may form part of a revision to the WKACCU score cards which should ultimately feed into pre-benchmark Data Workshops and will form part of the evaluation of national and regional sampling schemes. **PG recommends that SGPIDS forward their review to WKPICS who will coordinate responses relating to both onshore and offshore sampling schemes and make recommendations on the development of the WKACCU score cards. This may lead to a more focussed workshop on the development of these score cards in 2013–2014**. These recommendations will qualify and prioritise the quality indicators and provide advice on how these scores may be used in any assessments and type of assessment. They will cover both quality which could be simply presence or absence to performance which would include levels of potential bias or calculations of precision indices. As national and regional schemes evolve with the changes to the DCF and the focus falls on probability based sampling, other quality indicators and performance measures for regional and national schemes may become more apparent.

One criticism of the current WKACCU scorecards is that they can be difficult to use as they are fairly subjective. The bias in most national catch sampling schemes are currently unquantifiable and the results of these cards may be misleading for example - those schemes where no information is available score better than those where it is known there is bias.

Ideally a record of bias needs to be available and quantifiable. The current score cards need to develop to incorporate any of the quality indicators and performance indicators identified in the workshops and study groups highlighted above but the scores need to be quantifiable and informative. They need to provide a positive course of action.

Using the model schemes described in the introduction, these score cards need to incorporate reference to sampling schemes and raising procedures and should describe a number of levels.

- Assessment of the scheme at a regional level. Quality indicators may simply be presence or absence indicators. These should indicate that it meets the requirements of a reasonable scheme.
- The performance of the regional scheme – main source of this data will likely be the Regional DBs and should be quantifiable (See Section 6.2).
- Assessment of the national schemes. This level may form the basis of compliance to the DCF and may cover the performance of the national scheme

and whether it meets the baseline requirements of the regional scheme. It should still be quantitative and will need to be representative.

- Assessment of national procedures, protocols and processing. This again may be qualitative in terms of meeting DCF or PG guidelines on ageing or data collection and whether the metadata is available and fully documented; whether and sampling protocols and internal training plans e.g. for age reading, are available. Nations cannot afford to hide inadequate schemes or procedures.

It is important to develop score cards that are used. They need to be well defined; relevant and useable and all scores need to be evidence based. The precisions estimates may feed directly into the assessments but should also feed back to the coordinators and inform on how regionally sampling schemes may improve or nationally how sampling may need to be prioritised.

It is clear these need to be available for end-users in relation to the data and information available but there is scope for their being completed or populated at number of different levels including by the end-users themselves. The different levels of aggregation dictate a scoring system at the national level which will feed into the overall scores at the regional level. The complexities of sampling different components of the catch within national boundaries mean that there ought to be an independent or at the very least a collective evaluation of the national schemes contributing to the regional estimates. Who else will contribute to evaluating and scoring the catch sampling? At the very least output from the regional databases once developed should provide clear indication of 'compliance' and quality, but do these schemes need to be audited externally?

National catch sampling schemes will be designed following guidelines and adopting best practice and will evolve through the WKPICS and SGPIDS series. These workshops and study groups will help to inform on appropriate assessments of quality. A regular review process monitoring these schemes at a regional level will need to check the quality of the sampling design and the ability to deliver to national and regional objectives.

PG recommends PG 2013 review progress by SGPIDS and WKPICS in identifying quality indicators and how they may be best used to inform national sampling coordinators that they may need to revisit their sampling designs and or improve on their sampling frequency and inform end users whether or how the data can be used for the assessment they are attempting.

7 Review and present practical examples of progress in developing enabling technologies and equipment for data collection from fisheries. (TOR f)

7.1 Review any developments in the area of data collection technologies since the PGCCDBS 2011

In general, measuring fish and shellfish is still done by using a measuring board and the length is recorded by using a pen and paper as it was 100 years ago. Therefore, there is an urgent need to further develop systems, hardware and software, which would make data collection easier and more automated to achieve high quality information and reduce the cost of sampling. Furthermore, a more automated method would also minimize manual data entry into data bases, improve the data quality assurance and reduce time spent on data cross-checking as well as ease the workload onboard vessels.

Even though all fisheries research institutes would benefit from a coordinated initiative for developing a common solution in order to reduce the development and production costs only few initiatives have been made since the PG meeting last year and these initiatives were not coordinated internationally.

Therefore, the PGCCDBS would like to encourage and stimulate any initiative to develop electronic facilities for collecting data e.g. length and weight measurements. To speed up the process, there is a need to get more people aware of the existing technologies as well as getting a broader involvement of other expertise. As a first step in disseminating this information the following action was agreed:

- An Article on Enabling Technologies will be written for ICES InsideOut and other fisheries magazine, if possible by Els Torreele, and Jørgen Dalskov.

In order to get an up-to-date status of methodologies and electronic facilities used for collecting information on length and weight in the different countries an overview was produced in PGCCDBS 2010 (ICES 2010a). This overview has been updated in 2011 and again at the PGCCBDS 2012 and the overview of methods is presented in Table 7.1 below. There were no major changes as compared to the 2011 status, with only few updates and/or amendments. But PGCCDBS 2012 regards it worth continuing to update this table each year as reference for those laboratories that plan some development in this area.

Semi-automatic/automatic methods are used in some countries, mainly on research vessels, but the technology spreads to auction sampling as well. These methods include electronic measuring boards, electronic caliper for crustaceans, digital image analyzer for length measurement of shrimps and electronic data capture system.

The latest known initiatives for developing portable semi-automatic methods for registering some of the fisheries data have been:

The Netherlands

An electronic registration form for length sampling in the auction has been finalized and implemented 2011 (PGCCDBS 2011). For further information contact: Sieto Verver [Sieto.Verver@wur.nl].

Sweden

The Swedish system is similar to the Dutch system including small scale at sea sampling and is finalized and implemented in 2011. For further information contact: Maria Hansson [Maria.Hansson@slu.se].

Denmark

Electronic caliper for crustaceans where the caliper via Bluetooth technology is transmitting data to a programmed cell phone. The system is implemented in 2011. For further information contact: Jørgen Dalskov [jd@aqua.dtu.dk].

Portugal

A system called Fishmetrics was successfully tested at Horta auction house in Faial Island (Azores) showing superior results compared to the traditional length frequency manual sampling. Despite of all the advantages this system presents (all species archive depositary, sampling representativeness, etc.) further development was temporarily suspended due to financial difficulties and lack of opportunities to extend the system to other auction houses.

At present further development is not stopped as interest of producing the system commercially has increased. If any institute is interested in testing the Fishmetrics system, either at auction houses or ships, it can be arranged by contacting Gui Menezes [gui@uac.pt].

Finland

Data recording measuring board and scale unit

In Finland, a data recording measuring board/scale unit is used by all persons working with DCF sampling. It has been developed in cooperation with staff of FGFRI and a commercial data engineering manufacturer.

It consists of three separate connectable parts: a measuring board with 1 mm resolution, a scale with 1 g resolution (Figure 7.1.1) and a data recorder/controller unit (Figure 7.1.2) with cable connections.

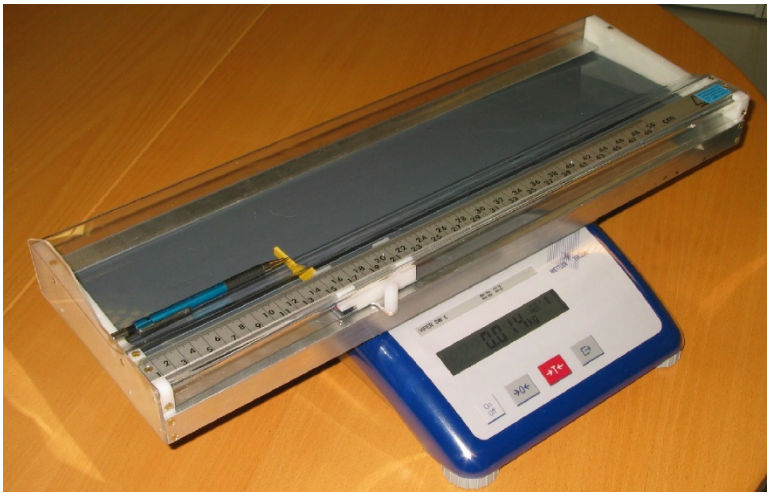

Figure 7.1.1. Measuring board and scale.

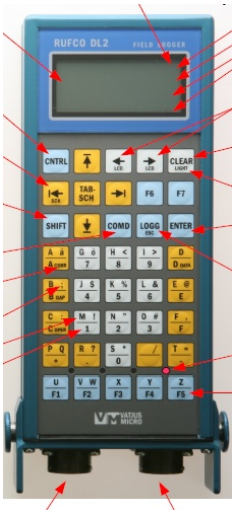

Figure 7.1.2. Data. Recorder/control unit.

Operation

Once all species in a particular sample have been defined to be sampled, there is an option to have only total weight of species, length distribution and total weight for a species or individual lengths and weights of the sampled specimen, with an option of having sex, maturity and e.g. possible disease- or damage-information for the measured fish. The lengths and weights are recorded simultaneously automatically (by pushing one button), but in case of bigger fish than the used scales allow (550 mm and 5000 g), the information can be recorded also manually.

The recorded data files are then uploaded via USB-cable to computer and via internet to the national database.

One of the many good features of this unit is that it allows samplers to work alone. One downside is that the recently used scale cannot be used onboard research vessels. The unit can be, however, updated later to fit to any scale, including those used in research vessels.

For further information contact: Jukka Pönni [jukka.ponni@rktl.fi].

New Zealand

A New Zealand company Lat 37 has developed measuring board for quick and efficient measurements for length frequency sampling for either finfish or shellfish. These Lat 37 wFMBs (Figure 7.1.3) are made with a marine-grade stainless steel platform and include an aluminium rule and adjustable shuttle. Data collected by the measuring board can be wireless transmitted to field PC (Figure 7.1.4 and 7.1.5) that can be hold submersion in water.

For further information contact: Simon Anderson, Lat 37 [simon@lat37.co.nz] or [www.lat37.co.nz].

Figure 7.1.3. Lat37 wFMB measuring board field PC.

Figure 7.1.4. Allegro field PC.

Figure 7.1.5. Archer field PC.

The overview of existing devices shows that there are several systems in use to ease the process of collecting fisheries data and is now a matter of passing on the information to all, to avoid duplication of effort by laboratories in researching and sourcing enabling technologies. The available technology, along with contact details are presented in Table 7.1.2. At the PGCCDBS 2011 meeting some minimum requirements for automatic electronic equipment for recording fisheries data were listed. As the progress of development of new electronic hard/software has been limited the PGCCDBS 2012 would like to encourage and promote any good ideas for development of new technology.

Therefore, in order to take the development of automatic electronic equipment for recording fisheries data at ports and on board vessels to a higher level, there is a need to involve new expertise from other businesses, and also to establish a forum, participated by field sampling staff and IT-developers, engineers, in which new ideas and new techniques can be discussed and suggested. In conclusion, there was no clear suggestion on how such a forum could be set up. In the meantime, a list of general requirements was set up in order to be able to approach companies, universities to start the process of involving other expertise.

Requirements

- The equipment must be capable of recording a variety of parameters such as catch data and biological data (species, length, weight, maturity, etc);

- Light weight;
- Portable;
- Robust;
- Waterproof;
- Be capable of working in unstable conditions;
- Must work on both AC and DC power;
- Easily mountable;
- Must have a touch screen;*
- Must be capable of solo or multi person use;
- Capability to download data directly to PC;
- Be able to be used by right or left-handed staff.

* alternative equipment would be acceptable. The touch screen system is mentioned as this is the technology being pursued by institutes at the moment.

Notes on additional requirements

- The system should be relatively inexpensive;
- A wireless facility would be preferred. For example, the system should have the capacity to receive a GPS signal which would automatically record the vessels' position (the GPS would be bought separately 'off the shelf');
- The system would be easier to maintain if the different parts of the system were separate. For example, the touchpad would not be integrated into the board and the power pack would be detachable;
- The battery pack should have the capacity to stay powered for around twelve hours, if possible, with a recharge time of 2–4 hours;
- Wires connecting the 'parts' may not be required; the French system tested in 2009–2010 worked via bluetooth and mobile phone.

The system should be developed using Open Source Code.

In order to summarise the use of these enabling technologies two tables were created. Table 7.1.1 outlines the methods used by Member State for recording length, weight etc. of fish, and Table 7.1.2 summarises the innovative methods and technologies for the collection of biological data and monitoring of fisheries, presented in conferences and workgroups since 2010 by institute/company, country and fishery.

Table 7.1.1. Review of methods in use for length measurement, weighing of fish (RV= Research vessel, SS= Sea sampling; M/H = Market / Harbour sampling).

Country	Traditional length measurement using pen and paper (Y/N)			Semi automatic /automatic method (Y/N)			Short explaination of the semi / automatic method (i.e electronic measuring board)			Data transported directly to the database		
	RV	SS	M / H	RV	SS	M / H	RV	SS	M / H	RV	SS	M / H
Belgium	Y	Y	N	Y	y	Y	Electronic measuring board (Scantrol) Digital analyse image for shrimps - Length measuring	Electronic measuring board (Scantrol) for the catch and partially for discards	Electronic measuring board (Scantrol)	Y	N	Y
Bulgaria	Y	Y	Y	N	N	N	NA	NA	NA	N	N	N
Cyprus	Y	Y	Y	N	N	N	NA	NA	NA	N	N	N
Denmark	Y	Y	Y	N	Y	N	NA	Electronic caliper stored in portable media and exported to the National Database	NA	N	Y	N
Estonia	Y	Y	Y	N	N	N	NA	NA	NA	N	N	N
Finland	Y	NA	N	N	NA	Y	NA	NA	Length and weight data recording electronic measuring boards connected to scale	N	NA	Y
France	Y	Y	Y	Y	Y	Y	Electronic measuring board (NKE) and electronic caliper for crustaceans	Electronic measuring board (NKE) and electronic caliper for crustaceans	Electronic measuring board (NKE) and electronic caliper for crustaceans	Y	Y	Y
Germany	Y	Y	Y	Y*	N	Y*	Electronic measuring board - tested on some Baltic sea surveys	NA	Electronic measuring board - tested on some Baltic sea surveys	N	N	N
Greece	Y	Y	Y	Y	Y	Y	Electronic caliper for crustaceans	Electronic caliper for crustaceans	Electronic caliper for crustaceans	N	N	N
Ireland	N	Y	Y	Y	Y	Y	Electronic Data Capture (EDC) System Electronic measuring boards uploading L/W, sex, maturity data directly to central database	Digital calipers for Nephrops. Electronic measuring boards.	Digital calipers for Nephrops. Electronic measuring boards.	Y	Y	Y
Italy	Y	Y	Y	N	Y	Y	NA	Tape recorder	Tape recorder	N	N	N
Latvia	Y	Y	Y	N	N	N	NA	NA	NA	N	N	N
Lithuania	Y	Y	Y	N	N	N	NA	NA	NA	N	N	N
Malta	Y	Y	Y	Y	Y	N	Electronic caliper for crustaceans	Electronic caliper for crustaceans	NA	N	N	N

Country	Traditional length measurement using pen and paper (Y/N)			Semi automatic /automatic method (Y/N)			Short explaination of the semi / automatic method (i.e electronic measuring board)			Data transported directly to the database		
Norway	N	Y	Y	Y	Y	N	Electronic measuring board (Scantrol and Marel scales) in a network	Electronic measuring board (Scantrol Fishmeter) for reference fleet and inspectors	NA	N	N	N
Poland	Y	Y	Y	N	N	N	NA	NA	NA	Y	N	N
Portugal	Y	Y	Y	Y	Y	Y	Electronic caliper for crustaceans Electronic measuring board (only DOP/Uac)	Digital/Tape Recorder Electronic caliper for crustaceans	Digital/Tape Recorder Electronic caliper for crustaceans FishMetrics(experimental, only DOP/Uac)	N	N	N
Romania	Y	Y	Y	N	N	N	NA	NA	NA	N	N	N
Spain	Y	Y	Y	N	Y	Y	NA	MP3 Recorders	MP3 Recorders	N	N	N
Sweden	Y /N1)	Y	Y	Y 1)	N	Y2)	1) Coastal surveys, electronic registration form is used	NA	2) Some samples worked up using electronic measured board. *Nephrops* and shrimp measurement using electronic caliper	Y	N	N
The Netherlands	Y	Y	Y	N	Y	Y		Digital voice recorder	Electronic Registration Form	N#	N#	N#
UK England	Y	Y	Y	Y	N	Y	Cefas Electronic Measuring Board (CEMB)	CEMB (under development)	CEMB (under development) Elec. data recording for *Nephrops* catch Elec. Data capture for scallop (size, weight, image)	Y	Y	Y
UK Scotland	Y	Y	Y	Y	N	Y	Cefas Electronic Measuring Board (CEMB); Electronic calipers only for sampling Nephrops	Electronic calipers only for sampling Nephrops	For sampling of *Nephrops*, length measurements, and sex are also recorded on PDP's linked to electronic calipers	y	N	Y
UK N Ireland	Y	Y	Y	Y	Y	Y	Electronic measuring board (Scantrol)	Electronic measuring board (Scantrol)	Electronic Measuring Board (Scantrol)	N	N	N

Table 7.1.2. Innovative methods and technologies for the collection of biological data and monitoring of fisheries presented in conferences and workgroups in 2010 and onwards by institute/company, country and fishery.

COUNTRY	INSTITUTE/COMPANY	CONTACT PERSON	METHODS	INFORMATION
Canada	Archipelago Marine Research (ARM)	Howard McElderry (howardm@archipelago.ca)	Electronic Monitoring; CCTV image, GPS. Catch Quota Management (CQM).	www.archipelago.ca
Denmark	DTU Aqua	Jørgen Dalskov (jd@aqua.dtu.dk)	Electronic Monitoring; CCTV image, GPS. Catch Quota Management (CQM). Electronic caliper system.	www.aqua.dtu.dk
Denmark	DTU Aqua	Jørgen Dalskov (jd@aqua.dtu.dk)	Electronic calliper system.	www.aqua.dtu.dk
EU	JRC EC	Eoin Mac Aoidh (eoin.mac-aoidh@jrc.ec.europa.eu)	FishPopTrace; genetic tools to support control & enforcement.	https://fishproptrace.jrc.ec.europa.eu
Finland	RKTL	Jukka Pönni [jukka.ponni@rktl.fi]	Electronic fish length and weight measurement tool.	
France	IRD	Francios Gerlotto (francios.gerlotto@ird.fr)	Commercial acoustic data	
Germany	Johan Heinrich von Thünen Institute	Christopher Zimmermann (christopherzimmermann@vti.bund.de)	Electronic Monitoring; CCTV image, GPS. Catch Quota Management (CQM).	
Netherlands	IMARES	Sieto Verver (sieto.verver@wur.nl)	LIBBIE; electronic registration form, data recording	
Netherlands	VisNed / IMARES	Conny Loonstra (c.loonstra@visned.nl), Edwin van Helmond (Edwin.vanhelmond@wur.nl)	Electronic Monitoring; CCTV image, GPS. Catch Quota Management (CQM).	
New Zealand	Lat37	Simon Anderson simon@lat37.co.nz	Electronic measuring board and field PC.	www.lat37.co.nz
Norway	Scantrol	Darren Hammersland-White (darrenwhite12@gmail.com)	FishMeter; electronic fish length measurement tool.	www.scantrol.no
Scotland	MarineScotland/SWFPA	Rui Catarino (R.Catarino@MARLAB.AC.UK), Mike Park (mikeswfpa@aol.com)	Electronic Monitoring; cctv image, GPS. Conservation Credits.	www.marlab.co.uk
South Africa	OLfish – OLRAC	Amos Barkai (olfish@olrac.com)	On board data logging and management tool. Touch-pad and software.	www.olfish.com
Sweden	Swedish Board of Fishery	Anders Svensson (anders.svensson@slu.se)	Electronic Registration Form, data recording	
Sweden	Swedish Board of Fishery	Hans Nilsson (hans.nilsson@fiskeriverket.se)	Electronic Monitoring; cctv image, GPS. Catch Quota Management (CQM).	

COUNTRY	INSTITUTE/COMPANY	CONTACT PERSON	METHODS	INFORMATION
UK	CEFAS	Richard Ayers (richard.ayers@cefas.co.uk)	Electronic Data Capture (EDC) system; electronic fish length measurement tool.	
USA	NOAA	James Nance (james.m.nance@noaa.gov)	Electronic logbook, GPS.	
USA	NOAA	Steve Barbeaux (steve.barbeaux@noaa.gov)	Commercial acoustic data.	

7.2 Availability of real time VMS and logbook data and *status quo* of national databases

Table 7.2.1 provides an overview of national fisheries research institutes' real-time accessibility to VMS and logbook data. Of 22 countries, only five have real-time access to VMS data and six have real-time access to logbook data. However, all countries have access to both VMS and logbook data but with a time delay between half a week up to one year.

The advantage of having real time access to the VMS data is to get the real-time information on where the fishery is taking place and which vessels are fishing to plan the sampling in an efficient way. If direct landings information from the vessels are missing or wrong, the real-time access to logbook can be used to check or get the appropriate landings information.

As real time access to logbook and VMS data is crucial for carrying out cost efficient data collection and ensuring quality of the sampling process the PGCCDBS would like to stress the importance for the national authorities holding this data to find solutions for the national institutes to get on line access to the data.

An overview of the national databases storing biological data was made and is reported in Table 7.2.2. This shows that all countries have databases for registration of biological data sampled at surveys, at-sea and on-shore. Most of the countries have one central database but some countries have set up two or more databases for different regions within the country. The most common platforms are Oracle, SQL and Access but there are some databases that are held in Excel. In half of the countries there is an ongoing process of developing a new database or an update of the existing database. PGCCDBS encourage cooperation and exchange of expertise between countries that are in the process of database development.

Table 7.2.1. Review of real time access to VMS and Logbook data by country

Country	Access to VMS data real time (Y/N)	Access to Logbook data real time (Y/N)	If no online access - what time delay ? (weeks, months, years)
Belgium	N	N	between 3 months and 1 year
Bulgaria	N	N	upon request
Cyprus	N	N	on paper without delay, files with delay
Denmark	Y	Y	
Estonia	N	N	months
Finland	N	N	months
France	N	Y	
Germany	N	N	weeks to months; single requests sometimes access online
Greece (HCMR)	N	N	upon request (1 week)
Ireland	N	N	3 months
Italy	N	N	only on request to MIPAAF (Ministry of Fishery & Aquaculture)
Latvia	Y	N	months
Lithuania	N	N	months
Malta	N	N	VMS data - upon request, lobook data - 3-6 months
Norway	Y	Y	
Poland	Y	Y	
Portugal	N	N	months
Romania	N	N	upon request (1/2 week)
Spain	N	N	no for VMS data, 6 months for logbook data
Sweden	N	N	weeks or months
The Netherlands	N	N	3 months
UK England	N	Y	1 week
UK Scotland	Y	Y	
UK Northern Ireland	?	?	

Table 7.2.2. Review of current national central databases for biological data

Country	Do you have a national central DB for biological data (Y/N)	Do you register biological data in a DB ? (Y/N)			Database platform e.g Oracle, Microsoft SQL, Access ?	Are you in the process of developing a new database ? If yes - what platform?	Year of completion of development
		surveys	at sea sampling	on shore sampling			
Belgium	Y	Y	Y	Y	Access	Y - DB not fully compliant with DCF requirements, not efficient, not user friendly	
Bulgaria	Y	Y	Y	Y	SQL		
Cyprus	Y	Y	Y	Y	SQL	N	continued updated
Denmark	Y	Y	Y	Y	SQL	N	2011
Estonia	Y	y	Y	Y	Excel	N	NA
Finland	Y	N	Y	Y	Oracle	ongoing development of the present DB	NA
France	Y	Y	Y	Y	Oracle	Y	
Germany	Y (2 institutes)	Y	Y	Y	My SQL/Access	Y - PostGres	2013?
Greece	Y (HCMR+FRI)	Y	Y	Y	Oracle	N	continued updated
Ireland	Y	Y	Y	Y	Access; Access for discards	migrating discards DB to SQL	2012
Italy	Y	Y	Y	Y	SQL	N	continued updated
Latvia	Y	Y	Y	Y	SQL	ongoing development of the present DB	NA
Lithuania	Y	Y	Y	Y	Excel; Oracle	N - modifications & upgrades	2012
Malta	N	Y	Y	Y	Access	Y	2012
Norway	Y	Y	Y	Y	SQL/JAVA	Y - A major project is going on to develop a new database ...	2012
Poland	Y	Y	Y	Y	My SQL	N	
Portugal	N	Y	Y	Y	My SQL (Azores); Oracle (IPIMAR)	Y - Oracle	2012
Romania	Y	Y	Y	Y	Access	Y	continued updated
Spain	Y	Y	Y	Y	Oracle	N	
Sweden	Y	Y	Y	Y	Oracle	Y - Oracle	2012
The Netherlands	Y	Y	Y	Y	Oracle & SQL	N - upgrading	
UK England	N	Y	Y	Y	SQL	Y - SQL system to process all DB	2013
UK Scotland	N	Y	Y	Y	Oracle	Y - Oracle	?
UK Northern Ireland	N	Y	Y	Y	SQL	Y	2012

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Annex 1a: PGMed List of Participants

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Annex 1b: PGMed ToRs

Terms of Reference PGMed 2012

Rome (Italy), 30th January–3rd February

1) Ranking system for the whole Mediterranean and for the Black Sea;

2) Reviewing and update of the landing template with 2009 and 2010 data (i.e. landing for species and countries) for the Mediterranean and for the Black Sea;

3) For the métier which are exploiting a shared stock and selected by the ranking system the number of sampling trips by metier at the GSA level can be determined. MS should bring the data on catches, effort, value for metier related variables by GSA of the shared stocks;

4) Assess the CV for shared stocks both for the Mediterranean (GSA 7, GSA 15–16 and GSA 17) and Black Sea;

5) Update the work conducted in the PGMed 2011 for large pelagic species on sampling of length and stock related variables by using 2010 data;

6) Assess the CV of large pelagic for length;

7) Review the methodology used in the sampling of large species and harmonization with ICCAT requirements;

8) Common understanding of Ecosystem Indicators (App. XIII EU Decision 93/2010) collection of methodologies used in the different countries;

9) Compatibility and harmonisations of the DCF with GFCM task I requirements;

10) Preparing a common understanding and methodology (e.g. type of data) to set up a Regional Database with "Biological data" and "Transversal data" (i.e. landing and effort) collected under the DCF (see "Regional scenarios and roadmap on Regional Database" report. Brussels, 22–24 February 2010);

11) Proposal of workshops or studies;

12) AOB.

Annex 2: PGCCDBS List of participants

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Annex 3: PGCCDBS 2011 Recommendations with follow-up actions

The following table summarises the status of PGCCDBS 2011 recommendations as at the time of the PGCCDBS 2012 meeting.

Report section	Recommendation	For follow up by	Timeframe	Status at PGCCDBS 2012
2	PGCCDBS recommends that WGDEEP prepares illustrated definitions on length measurement procedures for roundnose grenadier and distribute these through RCMs Not followed up by WGDEEP 2010, so PGCCDBS repeats the 2010 recommendation	WGDEEP, RCMs	April/May 2011	Not followed up by WGDEEP 2011, so PGCCDBS repeats the 2011 recommendation
2	PGCCDBS recommends to follow the WGCHAIRS 2011 suggestion that Assessment WG Chairs could be invited to Age reading WKs to establish this link.	Age reading WK chairs, Assessment WG chairs	From now on	On – Going and included in PGCCDBS WK guidelines and checklist.
2	PGCCDBS recommends to further develop the reporting of age reading error (e.g. based on "EFAN-Eltink" spreadsheet) and inclusion of age reading variance in stock assessments	WKNARC	Sep. 2011	Discussed at WKNARC, but will be actioned during the WKSABCAL in 2014.
3.1	PGCCDBS recommends RCMs should compile an overview of the cephalopod catch data available and WGCEPH participants should approach the relevant national laboratories. The issue relating to the survey data should be forwarded to IBTSWG.	RCMs, WGCEPH	Sep-Oct 2011	RCMs referred this recommendation back to WGCEPH. Requests for cephalopod data sent out by WGCEPH in 2012.
3.1	PGCCDBS recommends that issues relating to the minimum sampling requirements for cephalopod biological data in the DCF should be considered at SGRN. PGCCDBS recommend this to be forwarded and resolved by SGRN in light of DCF requirements.	STECF-EWG on DCF	STECF EWG 11-02, March 2011	This item was not addressed at SGRN in 2011. PGCCDBS will highlight the need to consider cephalopod data needs in the context of the New DCF.
3.1	PGCCDBS recommends that the WGCRAN request to increase and standardise sampling effort for by catches (improve seasonal and spatial coverage) of brown shrimp fisheries should be taken up by SGRN to prioritise the allocation of sampling effort in the general context of the DCF. RCMs should look into the outcomes of SGRN.	STECF-EWG on DCF, RCMs	STECF EWG 11-02, March 2011; RCMs Sep-Oct 2011	RCM NS & EA will adress the evaluation of sampling intensity, and SGPIDS will take up the standardisation.
3.1	PGCCDBS recommends to make better use of discard sampling in recording protected species bycatch occurrence in a range of other fisheries.	STECF-EWG on DCF, RCMs	STECF EWG 11-02, March 2011; RCMs Sep-Oct 2011	Addressed by RCM's.
3.1	PGCCDBS recommends that reporting of Baltic salmon catch estimates from recreational fisheries on a yearly basis, and for commercial on half year basis, is sufficient (ref. WGBAST 2010 requesting a revision of the DCF Decision 2010/93/EU).	STECF-EWG on DCF	STECF EWG 11-02, March 2011	Considered at the RCM Baltic.

Report section	Recommendation	For follow up by	Timeframe	Status at PGCCDBS 2012
3.1	PGCCDBS recommends that the proportion of adipose fin clipped salmon and sea trout in Baltic fisheries should be monitored in conjunction with DCF or other data collection programmes (ref. WGBAST 2010) and that RCM Baltic should implement this sampling.	RCM Baltic	Oct 2011	Considered at the RCM Baltic.
3.1	PGCCDBS recommends that catches (i.e. landings & discards) of deep-sea species should be fully recorded and reported, if possible, by haul-by-haul data for all trawl and longline fisheries (ref. WKDEEP 2010).	STECF-EWG on DCF	STECF EWG 11-02, March 2011	PGCCDBS refers this to the RCM's to consider.
3.1	PGCCDBS recommends that roundnose grenadier effort data should be provided by all involved countries (ref. WKDEEP 2010).	RCMs	Sep-Oct 2011	Considered at RCM's and referred back to National Correspondants.
3.1	PGCCDBS recommends that some exercises should be made to evaluate between observers (or for the same person) the quality of pre-anal fin length measurements for roundnose grenadier (ref. WKDEEP 2010).	RCMs	Sep-Oct 2011	RCM's Referred back to PGCCDBS to initiate an exchange exercise However PGCCDBS considers that an exchange is not practical, and that MS should look to action this recommendation on a local level.
3.1	PGCCDBS recommends that MS should ensure that, when collecting roundnose grenadier samples, hauling duration and fishing depth is recorded with all samples. Sampling should be spread across a number of trips rather than relying on large samples from fewer trips (ref. WKDEEP 2010).	RCMs	Sep-Oct 2011	RCM NS referred this to the individual MS.
3.1	PGCCDBS recommends an increase of the number of discard samples (% of trips covered by observers) on commercial vessels fishing fishing on greater forkbeard (ref. WKDEEP 2010).	STECF-EWG on DCF, RCMs	STECF EWG 11-02, March 2011; RCMs Sep-Oct 2011	RCM's considered and agreed with this recommendation, and referred back to individual MS.
3.1	PGCCDBS recommends to examine the possibility of a longline survey for large pelagic sharks. (in the absence of any fisheries-independent data) (ref. WGEF 2010).	RCMs	Sep-Oct 2011	RCM's referred to WGEF for clarification on methodology.
3.1	PGCCDBS recommends that national laboratories should have a data compilation workshop to consider stock separation and assessment data quality for herring in Division IIIa and Subdivisions 22-24 (ref. WKWATSUP 2010).	National laboratories	From now on.	PGCCDBS notes that this was not followed up. Should be addressed by HAWG.
3.1	PGCCDBS recommends intensified sampling of flounder in ICES Sub-area IV for age and biological parameters, especially of the landings (ref. WGNEW 2010).	STECF-EWG on DCF, RCM NS&EA	STECF EWG 11-02, March 2011; RCM NS&EA Sep. 2011	RCM NS&EA noted this recommendation, and that advise can be non age based. RCM referred this back to ICES

Report section	Recommendation	For follow up by	Timeframe	Status at PGCCDBS 2012
3.1	PGCCDBS recommends that RCM NA considers an increase of sampling levels of the fish and Nephrops fisheries in the Celtic Seas Ecoregion through: a) Self-sampling of catches (both landings and discards), b) Development and promote enhanced catch sampling through reference fleets and or fully documented fisheries (ref. WGCSE 2010).	RCM NA	Oct 2011	RCM NA stated it cannot address this type of non specific recommendation as it is not within DCF requirements.
3.1	PGCCDBS recommends that WGCSE should use the discard sampling level information from RCM NA and review discard raising procedures in accordance with WKDRP 2007 in order to assess bias in discard estimates (quality and quantification of discard data) (ref. WGCSE 2010).	WGCSE	May 2011	See WGCSE report for data used.
3.1	PGCCDBS recommends that RCM NA should develop a Study Proposal for tagging in the light of uncertainties in unaccounted mortality and in stock structure of several WGCSE stocks in the assessment (ref. WGCSE 2010).	RCM NA	Oct 2011	RCM NA stated that they cannot adress this kind of recommendation as tagging is not eligible under DCF.
3.1	PGCCDBS recommends that research on hake growth should continue. Otoliths should continue to be collected, as age reading methods could soon be available (ref. WGHMM 2010).	RCMs	Sep-Oct 2011	RCM NA agreed with this recommendation and referred back to the MS.
3.1	PGCCDSB recommends that RCM NA considers ensuring adequate numbers of small and large (i.e. young and old) fish from deep-water stocks to be sampled, which will improve definition of both ends of the age–length relationship. Age sampling should cover the entire length range of the species (ref. WKDEEP 2010).	RCM NA	Oct 2011	RCM NA stated it cannot address this type of non specific recommendation, and referred back to EWG to be clear and specific in their recommendations.
3.1	PGCCDBS recommends that the systematic differences in weight at age of NEA haddock (when comparing Russian surveys in late autumn and Norwegian surveys in winter) should be followed up bilaterally (IMR Norway, PINRO Russia) and reported to PGCCDBS and AFWG. First, the actual differences should be investigated further, e.g. by region, to exclude other possible sources of error. Second, age reading comparisons should be intensified to investigate and possibly remedy between-reader bias (ref. AFWG 2010).	IMR Norway, PINRO Russia	From now on.	PGCCDBS was unable to track the outcome of this recommendation.
3.1	PGCCDBS recommends that Norwegian and Russian age readings of NEA Sebastes mentella are harmonized for mature fish, especially above age 15. Frequent otolith exchanges between Norway, Russia and others for comparative age readings should be conducted and reported to PGCCDBS and AFWG (ref. AFWG 2010).	IMR Norway, PINRO Russia	From now on.	PGCCDBS was unable to track the outcome of this recommendation.
3.1	PGCCDBS recommends that parallel age reading of young Western Baltic cod should be followed up bilaterally (Denmark – Germany) and reported to WGBFAS and PGCCDBS (ref. WKBFAS 2010).	DTU-Aqua Denmark, vTI-OSF Germany	From now on.	PGCCDBS was unable to track the outcome of this recommendation.

Report section	Recommendation	For follow up by	Timeframe	Status at PGCCDBS 2012
3.1	PGCCDBS recommends that an otolith exchange for Bay of Biscay sole should be conducted bilaterally (France, Belgium) and reported to WGHMM and PGCCDBS (ref. WGHMM 2010).	IFREMER France, ILVO Belgium	From now on.	Completed in 2011.
4.1	PGCCDBS recommends that the list of stocks in the DCF (Appendix VII of Decision 2010/93/EU) is expanded by the additional stocks listed in the new Memorandum of Understanding between ICES and the EU (see Table 4.1 of the PGCCDBS 2011 report).	STECF-EWG on DCF	STECF EWG 11-02, March 2011, or later	Should be considered in the context of the revision of DCF. See section 3.8 of the PGCCDBS 2012 report.
4.2.1.1	PGCCDBS recommends that a new plaice age reading workshop should only be carried out when validation studies have been conducted. PGCCDBS strongly recommends that these studies will be carried out. France has data on the validation of the first annulus by the use of daily increments in the Eastern Channel (ref. WKARP 2010).	Countries involved in age reading of plaice in ICES Sub-area IV and Div. IIIa	From now on.	Validation studies are on – going.

Report section	Recommendation	For follow up by	Timeframe	Status at PGCCDBS 2012
4.2.1.3	PGCCDBS recommends the use of a standard grading system by the mackerel age reader of his/her own readings (e.g. high, medium, low) be considered during the WKNARC as a standard that could be applied in all age calibration exchanges and/or WKs (ref. WKARMAC 2010).	WKNARC	Sep. 2011	Agreed and implemented.
4.2.2.1	The PGCCDBS recommends that all otolith exchange coordinators adhere to the guidelines of exchanges and workshops. In particular, it should be ensured that all interested countries are able to participate. The guidelines have been updated at PGCCDBS 2011 (see Annexes 9 and 10) and will be made available on the European Age Readers Forum (see section 4.2.4).	Co-ordinators of otolith exchanges and age reading WK chairs	From now on.	On – Going. Guidelines followed up in 2011 exchanges and WK's
4.2.2.2	PGCCDBS recommends that the North Sea cod otolith exchange coordinator re-analyses the exchange results according the PGCCDBS guidelines 2011 and restricts the data to those age readers contributing data to the stock assessments, and then from these results evaluate the need for a workshop. In the mean time, the coordinator might like to circulate the agreed age reading criteria again, and request that all age readers adhere to these criteria. PGCCDBS suggests that a small scale exchange could be circulated to cement the age reading criteria in the minds of the age readers, as was very effectively done in the WKARMAC 2010.	Sigbjørn Mehl and Hildegunn Mjanger (Norway)	From now on.	Done and analysis resubmitted.
4.2.2.5	PGCCDBS recommends that the results of the blue whiting otolith exchange are reported according to the updated Guidelines for Otolith Exchanges (Annex 9).	Norway	From now on.	Done and analysis resubmitted.
4.2.2.6	PGCCDBS recommends a follow-up full-scale megrim otolith exchange, including both the calcified structures and corresponding images.	IFREMER (France), CEFAS (UK-England).	From now on.	Will commence in 2012. Mark Etherton coordinating.
5.1	PGCCDBS recommends that Assessment WGs use the procedures and templates in section 5.1 of the PGCCDBS 2011 report to report on data quality.	ACOM, Assessment EGs	2012, after approval by ACOM	On – Going.
5.2	PGCCDBS recommends that ACOM and the European Commission consider the proposals to improve data transmission and implementation of the ICES Quality Assurance Framework for ICES assessment working groups in section 5.2 of the PGCCDBS 2011 report.	ACOM, European Commission	As soon as possible.	On - Going

Report section	Recommendation	For follow up by	Timeframe	Status at PGCCDBS 2012
6.1.2	PGCCDBS recommends that the information about existing data sampling devices will be passed on to the staff at the different fisheries institutes, and should be presented and demonstrated in working groups attended by persons involved in sampling,	PGCCDBS Intersession work	From now on	Electronic data capture systems demonstrated at PGCCDBS 2012. On – going for future meeting.

Report section	Recommendation	For follow up by	Timeframe	Status at PGCCDBS 2012
6.1.2	PGCCDBS recommends to establish a forum, participated by field sampling staff and IT-developers, engineers, in which new ideas and new data sampling techniques can be discussed and suggested	PGCCDBS and RCMs Intersession work	From now on	PGCCDBS has agreed to produce a two page article in the ICES inside – Out publication, and is also suggesting a Theme Session on new Technologies for the ASC 2014.
7.1	PGCCDBS recommends a Second Workshop on practical implementation of statistical sound catch sampling programmes (WKPICS2)	ICES Secretariat, ACOM	Before ICES ASC 2011 (Sep 2011)	Scheduled for November 2012
7.1	PGCCDBS recommends a Workshop on Statistical Analysis of Biological Calibration Studies (WKSABCAL)	ICES Secretariat, ACOM	Before ICES ASC 2011 (Sep 2011)	Scheduled for 2014
7.2.1.3.1	PGCCDBS recommends a small otolith exchange on Bay of Biscay sole (Solea solea).	Kélig Mahé (France)	2011	Completed
7.2.1.3.2	PGCCDBS recommends a small otolith exchange on Redfish (Sebastes mentella).	Lise Heggebakken (Norway)	2011	Completed
7.2.1.3.3	PGCCDBS recommends a small otolith exchange on Hake (Merluccius merluccius).	Carmen Piñeiro and Maria Sainza (IEO, Spain)	April-May 2011	Completed
7.2.2.2.1	PGCCDBS recommends a Workshop on Age Estimation Methods of Deep Water Species (WKAMDEEP)	ICES Secretariat, ACOM	Before ICES ASC 2011 (Sep 2011)	Scheduled October 2012
7.2.2.2.2	PGCCDBS recommends a Workshop on Age Reading of horse mackerel (Trachurus trachurus), Mediterranean horse mackerel (Trachurus mediterraneus) and blue jack mackerel (Trachurus picturatus) (WKARHOM)	ICES Secretariat, ACOM	Before ICES ASC 2011 (Sep 2011)	Scheduled April 2012
7.3.2.1	PGCCDBS recommends a Workshop for maturity staging chairs (WKMATCH).	ICES Secretariat, ACOM	Before ICES ASC 2011 (Sep 2011)	Scheduled June 2012
7.4.1	Prepare a table like Annex 7 with information by ICES stock and prepare a similar table for maturity calibration exercises.	William McCurdy (UK) and Cristina Morgado (ICES Secretariat)	Final draft: November 2011 Final: before WGCHAIRS 2012 (January 2012)	Completed
7.4.2	Compile the percentage agreement all age readings workshops and exchanges.	Annemie Zenner (Belgium)	Final draft: August 2011 Final: before WGCHAIRS 2012 (January 2012)	all results available before august 2011, were compiled. Several issues were identified that need clarification to determine the usefullness of this recommendation in 2012.

Annex 4: Age determination workshop proposals 2013 and beyond

WKARBLUE

2013/X/ACOMXX The **Workshop on the Age Reading of Blue whiting [WKARBLUE]** (Chairs: M. Meixide, Spain and Jane Amtoft Godiksen, Norway) will be established and take place in Bergen, Norway, from 10–14 June 2013, to:

a) Review information on age estimations, otolith exchanges, workshops and validation work done so far.

b) Finalize the report of the otolith exchange carried out in 2010-2011.

c) To make recommendations and produce feedback on the age estimation criteria to increase age estimation precision and accuracy and improve the inter reader agreement.

d) To identify the causes of age determination errors and standardize the age reading between laboratories and to ensure the implementation of the ageing protocol/guidelines.

e) To explore the possibilities to use supplementary information for validating estimated age structures.

f) Address the generic ToRs adopted for workshops on age calibration (see 'PGCCDBS Guidelines for Workshops on Age Calibration').

WKARBLUE will report by 1st of August, 2013 for attention of ACOM.

Supporting information

Priority:	Essential. Age determination is an essential feature in fish stock assessment to estimate the rates of mortalities and growth. Assessment of blue whiting using age structured models has proved useful in establishing a diagnosis on stock status. Age data is provided by different countries and are estimated using international ageing criteria which have not been validated. Therefore, an appropriate otolith exchange programme was carried in 2011 for the purpose of inter-calibration between ageing labs. Results of this otolith exchange highlighted a really low agreement between laboratories and thus the need of a WK.
Scientific justification:	The aim of the workshop is to identify the current ageing problems between readers and standardize the age reading procedures in order to improve the accuracy and precision in the age reading of this species.
Resource requirements :	No specific resource requirement beyond the need for members to prepare for and participate in the meeting.
Participants:	In view of its relevance to the DCR, and ICES WG, the Workshop try to join international experts on growth, age estimation and scientists involved in assessment in order to progress towards a solution. Participants should announce their intention to participate in the WK no later than two months before the meeting.
Secretariat facilities:	
Financial:	
Linkages to advisory committee:	ACOM
Linkages to other committees or groups:	WGWIDE and PGCCDBS
Linkages to other organizations cost:	There is a direct link with the EU DCF.
Secretariat marginal cost share:	

WKNARC2

2013/X/ACOMXX The Workshop of National Age Readings Coordinators [WKNARC] (Chair: Ângela Canha and Lotte Worsøe Clausen) will meet in Horta (Portugal), 13–17 May 2013 to:

a) Review and follow up of last WKNARC's recommendations and intersession work;

b) Review progress in preparation methods and material and techniques development;

c) Review progress in tools for the exchanges and workshops (WebGR, other statistical tools, age readers forum);

d) Review progress in the validation methods and to analyse questionnaires from Assessment WG on the needs for validation studies;

e) Review progress in the Internal and External Quality Control into institutes;

f) Review the available protocols for a CRR (with reference to the PGCCDBS 2012);

g) Report on the implementation of central labs for processing age reading; under this, review the success of existing bilateral agreements and the prospects for task-sharing;

h) Review the means of dealing with uncertainty in relation to age data in assessments (e.g. in assessments performed in the Pacific, etc.) as a pre-task for the WKSABCAL.

The workshop will be preceded by a questionnaire to obtain information on the status of ToRs b, c, d, e at MS institutes.

WKNARC will report by the 30th of June 2013 to the attention of the ACOM and PGCCDBS.

Supporting Information

Priority:	The current activities of this Group will lead ICES into issues related to the ecosystem affects of fisheries, especially with regard to the application of the Precautionary Approach. Consequently, these activities are considered to have a very high priority.
Scientific justification and relation to action plan:	Age determination is an essential feature in fish stock assessment to estimate the rates of mortalities and growth. Assessment of species/stocks using age structured models has proved useful in establishing a diagnosis on stock status. However, the approach has several limitations and shortcomings such as stock structure, natural mortality and growth. Age data is provided by different countries and are estimated using international ageing criteria which have not been validated. For the purpose of inter-calibration between ageing labs WKNARC will review preparation methods by species and areas, material and techniques development, methods in images processing, and the validation methods. WKNARC will review tools for the exchanges and workshops (WebGR, PGCCDBS Guidelines for Otolith Exchanges) and will take into account, the recommendations of the EFAN, TACADAR final reports and the report of the EFARO meeting Brest, 2-4 December 2004 (How can otolith research contribute at improving fisheries sciences?), with the purpose of inter-calibration age readers involved in stock assessment. WKNARC will collate information on the quality status of age reading at MS institutes. The aim of the workshop is to identify the current ageing problems between institutes.
Resource requirements:	The workshop will be preceded by a questionnaire to obtain information on the status of Essential.
Participants:	The Group is normally attended by some 30–35 members (National age reading co-ordinators of MS and experts in assessment).
Secretariat facilities:	None.
Financial:	
Linkages to advisory committees:	ACOM
Linkages to other committees or groups:	PGCCDBS, ACOM, RCM, all WKACs (Age Calibration Workshops)
Linkages to other organisations:	There is a direct link with the EU DCF There is a link to PGMED

WKSABCAL

2014/X/ACOMXX A Workshop on Statistical Analysis of Biological Calibration Studies [WKSABCAL] will be established L. Worsøe Clausen, Denmark and Ernesto Jardim, Portugal) and will meet in Lisbon, late May, 2014 to:

a) compile statistical methods for analysing reader agreement;

b) identify the strengths and weaknesses of each method for fisheries calibration studies;

c) review existing software for analysing calibration workshop data;

d) define data summaries and analysis outputs required by calibration workshop participants and as stock assessment input;

e) Draft a review paper based on workshop presentations, discussions and results.

WKSABCAL will report by August 2014 for the attention of ACOM and PGCCDBS.

Supporting Information

Priority:	High. Age and maturity data are fundamental parts of the stock assessment process and a great deal of effort is put into ensuring the data are of high quality. Therefore it is important that the analytical tools used at age, maturity and other calibration workshops are fit for purpose, delivering informative outputs for the workshop participants and the stock assessment process.
Scientific justification and relation to action plan:	This work relates to quality assurance of biological measurements as part of ICES' goal to advise on the sustainable use of living marine resources. Calibration workshops dealing with age and maturity estimation are funded and held under the auspices of the PGCCDBS. The main objectives of these important workshops are to decrease bias and improve the precision of age/maturity determinations between scientists from different laboratories. The end results are published in extensive ICES reports. However, there is a question of whether the right audience is reached by these reports. Moving beyond precision is increasingly common in calibration workshops and creating outputs better tailored to input for stock assessment models would greatly improve the application of the results. PGCCBDS (2010) also recognized that there is a need to review current methods of analysing data from calibration studies and consider issues such as agreement measures for the age of long-lived species and the best way to incorporate histologically validated samples for maturity staging comparisons. Finally, at a broader level, there is a large body of research on agreement statistics and methodology available from the field of medical statistics so it would be beneficial to transfer this knowledge into the fisheries arena.
Resource requirements:	No specific resource requirements beyond the need for members to prepare for and participate in the meeting.
Participants:	Participants should include a mixture of scientists with expertise in statistical methods, stock assessment, age reading and maturity staging.
Secretariat facilities:	None.

Financial:	Funding for external experts on the statistical methods may be required. The chairs seek to collaborate with NAFO to ease the invitation of experts outside the ICES system
Linkages to advisory committees:	The workshop will link to ACOM through PGCCDBS and PGMED.
Linkages to other committees or groups:	The outputs will be directly relevant to all age reading and maturity staging workshops.
Linkages to other organizations:	This topic links to the EU DCF, the COST (European Cooperation in the field of Scientific and Technical Research) Action FA0601 "Fish Reproduction and Fisheries" (FRESH) and the WebGR project (http://webgr.azti.es).

WKAVSG

2013/X/ACOMXX A Workshop on age validation studies of Gadoids chaired by Karin Hüssy (Denmark) and Beatriz Morales-Nin (Spain), will meet in Imedea, Mallorca, from the 22nd–26th April 2013 to:

a) Review information on age estimations, otolith exchanges, workshops, and validation works done so far on the following species: European hake, cod, pollock, saithe, haddock, whiting and blue whiting;

b) Assemble and compare the results of different validation methods (i.e. marking and recapture, marking the calcified structure, marginal increment analysis, marginal analysis, modal progression analysis, length back-calculation, etc.);

c) Discuss and propose the most appropriate validation methods of age and growth pattern of calcified structures (CS), for each species and stock;

d) Propose the appropriate validation methods to recognise the growth check as well as the spawning ring, demersal ring, migration ring, etc.;

e) Propose an ICES Cooperative Research Report on: Age Validation Studies for ICES and GCFM Gadoid Stocks, to ICES PGCCDBS, using previous studies and the outcome this workshop;

f) Based on results, conclusions and recommendations from this workshop to initiate and design an international cooperation project on validation methods (such as on the validation of checks and spawning rings) to commence after the workshop;

WKAVSG will report by November 2013 for the attention of ACOM and PGCCDBS.

Supporting Information

Priority:	Age validation is a fundamental need in fish age determination to provide accurate mortality and growth rates estimations for stock-assessment. The model of fish stocks-assessment using age structure population models has proved useful in establishing a diagnosis on stock status. However, the approach has several limitations and shortcomings such as stock structure, natural mortality and growth. Age data is provided by different countries and are estimated using international ageing criteria, many of which have not been validated. Therefore, a WK should be carried out in order to make a general methodological review, evaluate available information on validation of CS (calcified structures) growth pattern, age determination issues and ultimately pave the way for solid input data to age-based assessments which has been subject of concern of EC DCF, PGCCDBS and WKNARC, and make progress towards a solution.
Scientific justification:	The provision of age validation studies for gadoid species is crucial. The stock-assessment is severely hampered by the lack of valid age structured data and the fact that the agreement in the age data supplied to the assessment is very low (as seen in previous exchanges), affected the precision of the diagnosis on stock status. In particular the validation of the annual deposition of seasonal zones (opaque and translucent) and the check (i.e. the spawning ring, demersal ring, migration ring) in the CS represent the focal point to the improve the precision in the fish age determination by the CS. Tagging programs with marking and recapture in order to validate seasonal zones in otoliths (i.e. marking with OTC), cannot easily be applied to all species and stocks. In addition techniques such as marginal increment analysis, marginal analysis, length back-calculation may be appropriate to clarify the periodicity of CS growth and the correct interpretation of rings. The aim of the workshop is to identify the state of art of age validation studies conducted so far and to propose appropriate methods for species and stocks and ultimately to promote international cooperation projects on the age validation and CS growth pattern.
Resource requirements:	No specific resource requirements beyond the need for members to prepare for and participate in the meeting.
Participants:	Participants should include a mixture of scientists with expertise in age determination, biology and stock assessment of fish.
Secretariat facilities:	
Financial:	
Linkages to advisory committees:	ACOM
Linkages to other committees or groups:	PGCCDBS, ACOM, RCM, WKNARC
Linkages to other organizations:	There is a direct link with the EU DCF There is a link to PGMED

WKMIAS

2013/X/ACOMXX The **Workshop on Micro increment daily growth in European Anchovy and Sardine [WKMIAS]** (Chair: G. Basilone, Italy, B. Villamor, Spain and M. La Mesa, Italy) will meet in Mazara del Vallo, Sicily from 21–25 October 2013 to:

a) Review literature and consider recent research to define daily increment patterns in anchovy and sardine;

b) Standardize materials and methods for preparation of otolith thin sections;

c) Define and standardize the daily age reading criteria among areas;

d) Validate the first annulus in young of the year anchovy and sardine;

e) Determine growth rate pattern of juvenile anchovy in different areas/environments;

f) Estimate precision and accuracy of age estimates by micro-increment counts;

g) Create a reference collection of otoliths and start the development of a database of otolith images.

WKMIA will report by 15/01/2014 to the attention of ACOM, PGMED and PGCCDBS.

Supporting information

Priority:	The current activities of this Group will lead ICES into issues related to the ecosystem affects of fisheries, especially with regard to the application of the Precautionary Approach. Consequently, these activities are considered to have a very high priority.
Scientific justification and relation to action plan:	Action Plan No: 1. Term of Reference a) Several countries are conducting or have recently completed significant studies in this area and the subject would benefit from a review of progress and an evaluation of the results obtained. The last review of significant studies occurred in 1996 by the ICES Study Group on Unaccounted Mortalities. A review of more recent work will determine the need for revision and update on planning and methodology for studying this subject. Term of Reference b) All fishing activities have influences that extend beyond removing target species. The approach recommended by FAO is that responsible fisheries technology should achieve management objectives with a minimum of side effects and that they should be subject to ongoing review. WGFTFB members and others are currently undertaking a range of research programmes to provide the means to minimize side effects.
Resource requirements:	The research programmes which provide the main input to this group are already underway, and resources are already committed. The additional resource required to undertake additional activities in the framework of this group is negligible.
Participants:	The Group is normally attended by some 20–25 members and guests.
Secretariat facilities:	None.
Financial:	
Linkages to advisory committee:	ACOM
Linkages to other committees or groups:	WGFTFB, PGMED and PGCCDBS
Linkages to other organizations cost:	There is a direct link with the EU DCF
Secretariat marginal cost share:	

Annex 5: RCM 2011 Recommendations and PGCCDBS follow-up

The following RCM 2011 recommendations were directed at PGCCDBS and reviewed by the Liaison Meeting 2011.

SAMPLING OF MÉTIER RELATED VARIABLES: MAKING USE OF THE OUTCOME OF THE LOT 2 PROJECT ON VMS AND LOGBOOK DATA	
RCM Baltic 2011 Recommendation	In order for all MS to gain the knowledge concluded in the Lot 2 project on VMS and logbook data, the RCM recommends a training workshop on how the different appropriate tools can be used.
Follow-up actions needed	Organisation of workshop
Responsible persons for follow-up actions	ICES PGCCDBS
Time frame (Deadline)	2012
PGCCDBS Response	This workshop will be discussed and proposed at the PGCCDBS meeting February 2013.

LM 13 - STOCK RELATED VARIABLES: TASK SHARING OF AGE READING OF FLATFISH SPECIES CAUGHT IN BITS SURVEY, EEL, AND SALMON.	
RCM Baltic 2011 Recommendation	For institutes collecting small volumes of age samples for certain species and when new species are to be sampled, task sharing of age reading is necessary in order to optimise the use of age reading expertise. The RCM Baltic recommends the following MS to investigate their capability to read relevant age samples of interested MS: (1) Germany: plaice (2) Denmark: plaice, dab and sole (3) Poland: flounder and turbot (4) Sweden: eel and salmon (5) Finland: salmon The suggested coordination should be discussed, agreed and decided by the National Correspondents so the first agreements could be established before December 2011.
Follow-up actions needed	Discussion and agreements to be taken place among National Correspondents
Responsible persons for follow-up actions	Participants of RCM Baltic 2011 from the MS listed above to report back the Chair of RCM Baltic. EFARO
Time frame (Deadline)	October 1st 2011
LM 2011 comments	LM strongly supports this approach and recommends that ICES PGCCDBS provides guidedance on harmonisation and documentation of the sampling, storage and age reading methods used. LM encourages other RCMs to use a similar approach.
PGCCDBS response	PGCCDBS encourages cooperation between MS in the area of task sharing for age and maturity, indeed this process is already on – going between many MS. The PGCCDBS promotes harmonisation of storage,preparation and interpretation methods by species during calibration exercises on age and maturity on an on – going basis, and has developed guidelines which can be found in the PGCCDBS documents repository.

LM 19 - DCF REQUIREMENTS	
RCM NA 2011 recommendation	RCM NA recommends that the collection of otoliths of John Dory is continued but not proceed with age readings until an agreed standardized method is developed.
Follow-up actions needed	All MS having catches of John Dory to collect otoliths
Responsible persons for follow-up actions	All MS
Time frame (Deadline)	None
LM 2011 comments	LM supports this recommendation and regards it relevant for the NS&EA region as well. LM recommends that PGCCDBS provides guidance on this issue
PGCCDBS Response	Although a G2 species in DCF for North Atlantic, John Dory is currently not included in the draft 2012 EC-ICES MoU and therefore not subject to development of assessment methods that might require age and growth estimates to provide advice. PGCCDBS guidelines contain protocols for otolith preparation and reading, which MS may wish to consult in support of national research studies on John Dory age and growth. The PG can provide advice on specific issues arising.

LM 36 - Stock variables : Sampling intensities	
RCM NA 2011 Recommendation	In view of the large bandwidth of sampling intensities between the stocks (from very low to extremely high), RCM NA recommends ICES PGCCDBS to reflect on statistical issues related to optimal numbers to sample and minimal requirement under which sampling may only be a waste of time and resource.
Follow-up actions needed	ICES PGCCDBS
Responsible persons for follow-up actions	ICES PGCCDBS
Time frame (Deadline)	2012
PGCCDBS Response	PGCCDBS strongly supports the primary focus on statistically-sound sampling schemes for stock-based biological variables, rather than target fish numbers that can lead to non-representative quota sampling. This is considered in previous workshops particularly WKPRECISE, WKACCU, WKPICS, WKMOG etc. Assuming sound sampling, the effective sample size needed within sampling strata depends on the overall precision required to support assessements and advice.

LM 37 - Stock variables : Task-sharing for ageing	
RCM NA 2011 Recommendation	RCM NA recommends ICES PGCCDBS to discuss the statistical and methodological procedures which would enable sharing international information on biological parameters.
Follow-up actions needed	ICES PGCCDBS
Responsible persons for follow-up actions	ICES PGCCDBS
Time frame (Deadline)	2012
PGCCDBS Response	The design of statistically sound sampling schemes, which are coordinated at the regional level is the first step towards effective task sharing. Once sampling designs adhere to best practice and are fully documented, then task sharing becomes more realistic.

LM 39 - Quality issues : data collection protocols	
RCM NA 2011 Recommendation	RCM NA recommends PGCCDBS to reflect on standard ways of drafting sampling protocols, in order to improve the description by MS in their NP proposals and to enable RCM to compare and compile international procedures.
Follow-up actions needed	ICES PGCCDBS for guidance and STECF for drafting future NP proposal guidelines
Responsible persons for follow-up actions	ICES PGCCDBS, STECF
Time frame (Deadline)	2012
LM 2011 comments	LM notes that this work is linked with the outcome of ICES WKPICS1.
PGCCDBS Response	See WKPICS1 report when available

LM 50 - Stock Variables: Studies on shared international age–length keys	
RCM NS & EA 2011 Recommendation	Sampling for ages and the construction of ALK should follow sound statistical sampling practices set out according to WKPRECISE. Greater emphasis should be placed on the collection of age samples for species subject to age based stock assessments as the collection of length frequency data not linked to age samples may be of limited benefit in improving bias and precision estimates for numbers at age. Databases structures should allow storage of linked age and length samples. Collection regulations should not encourage the collection of length only data at the expense of age sampling for species subject to age based assessments.
Follow-up actions needed	MS to review their sampling for ages and construction of ALKs (if used). Commission to frame collection regulations so as to encourage best statistical practice.
Responsible persons for follow-up actions	MS, Commission
Time frame (Deadline)	To be considered for the new DCF
LM 2011 comments	LM notes that this issue will be discussed further in the light of a revised DCF.
PGCCDBS Response	PGCCDBS strongly recommends that the outcomes of WKPRECISE/WKACCU/WKPICS/SGPIDS are all considered in the light of the revision of the DCF and that their recommendations are taken into account in the redesign of sampling requirements and targets.

Annex 6: Draft MoU species list 2012

List of species in the draft 2012 MoU between EU and ICES.

Species	Eco-Regions / ICES areas	Advice occurrence	Time frame	Included in DCF (Decision 2010/93/EU), species group (G1, G2)
Anchovy	Bay of Biscay and Iberian coast	Yearly	Mid July NB: preliminary information on the stock size will be delivered by End of June	G1
Anglerfish *Lophius piscatorius* and *L. budegassa*	Greater North Sea	Yearly	End of June	G1
	Celtic Seas	Yearly	End of June	G1
	Bay of Biscay and Iberian coast	Yearly	End of June	G1
Blue whiting	Greater North Sea	Yearly	October Widely distributed stocks	G1
	Celtic Seas			
	Bay of Biscay and Iberian coast			
	Macaronesian region			
Boarfish	Celtic Sea	Yearly	October	No
Brill	Baltic Sea	Yearly	Early June	G2
	Greater North Sea	Biennial	End of June	G2
Cod	Baltic Sea	Yearly	Early June	G1
	Greater North Sea	Yearly	End of June	G1
	Celtic Seas	Yearly	End of June	G1
Dab	Baltic Sea	Yearly	Early June	G2
	Greater North Sea	Biennial	End of June	G2
European eel	Baltic Sea	Yearly	October	G1
	Greater North Sea			
	Celtic Seas			
	Bay of Biscay and Iberian coast			
	Macaronesian region			
Flounder	Baltic Sea	Yearly	Early June	G2
	Greater North Sea	Biennial	End of June	G2
Greenland halibut	Celtic Seas	Yearly	End of June	No
Grey gurnard	Greater North Sea	Yearly	To be determined	G2
	Celtic Seas	Yearly	To be determined	No (only Div. VIIe)
	Bay of Biscay and Iberian coast	Yearly	To be determined	No
	Macaronesian region	Yearly	To be determined	No
Haddock	Greater North Sea	Yearly	End of June	G1
	Celtic Seas	Yearly	End of June	G1
Hake	Greater North Sea	Yearly	End of June	G1
	Celtic Seas	Yearly	End of June	G1
	Bay of Biscay and Iberian coast	Yearly	End of June	G1

Species	Eco-Regions / ICES areas	Advice occurrence	Time frame	Included in DCF (Decision 2010/93/EU), species group (G1, G2)
Herring	Baltic Sea	Yearly	Early June	G1
	Greater North Sea	Yearly	Early June	G1
	Celtic Seas	Yearly	End of June October Widely distributed stocks	G1
Horse mackerel *Trachurus* sp.	Greater North Sea	Yearly	October	G2
	Celtic Seas		Widely distributed stocks	G2
	Bay of Biscay and Iberian coast			No (Div. XIa missing)
	Macaronesian region		NB: mid July for the Iberian coast and Macaronesian region	No
Lemon sole	Greater North Sea	Biennial	End of June	G2
Mackerel	Greater North Sea	Yearly	October	G1
	Celtic Seas		Widely distributed stocks	
	Bay of Biscay and Iberian coast			
	Macaronesian region			
Megrim	Greater North Sea	Yearly	End of June	G2
	Celtic Seas	Yearly	End of June	G1
	Bay of Biscay and Iberian coast	Yearly	End of June	G1
Nephrops	Greater North Sea	Yearly or Biennial	End of June	G1
	Celtic Seas	NB: depending on stocks, where surveys are available yearly assessment, when not yearly advice based on biennial assessments	End of June	G1
	Bay of Biscay and Iberian coast		End of June	G1
Norway pout	Greater North Sea	Biannual	End of June, October	G2
	Celtic Seas	Yearly	End of June	G2
Northern shrimp *Pandalus borealis*	Greater North Sea	Yearly	November	G1
Plaice	Baltic Sea	Yearly	Early June	G2
	Greater North Sea	Yearly	End of June	G1
	Celtic Seas	Yearly	End of June	G1
	Bay of Biscay and Iberian coast	Yearly	End of June	G1
Pollack	Greater North Sea	Yearly	End of June	No
	Celtic Seas	Yearly	End of June	G2
	Bay of Biscay and Iberian coast	Yearly	End of June	G2
Red gurnard	Greater North Sea	Yearly	To be determined	G2
	Celtic Seas	Yearly	To be determined	G2
	Bay of Biscay and Iberian coast	Yearly	To be determined	G2
	Macaronesian region	Yearly	To be determined	G2

Species	Eco-Regions / ICES areas	Advice occurrence	Time frame	Included in DCF (Decision 2010/93/EU), species group (G1, G2)
Red mullet	Greater North Sea	Yearly	To be determined	G2
	Celtic Seas	Yearly	To be determined	G2
	Bay of Biscay and Iberian coast	Yearly	To be determined	G2
	Macaronesian region	Yearly	To be determined	G2
Redfish *Sebastes mentella* and *S. marinus*	Celtic Seas	Yearly	October	No
Saithe	Greater North Sea	Yearly	End of June	G1
	Celtic Seas	Yearly	End of June	G2
Salmon	Baltic Sea	Yearly	Early June	G1
Sandeel	Greater North Sea	Biannual	Early march October NB: preliminary advice in October, in-year forecast in March the year after	G2
	Celtic Seas	Yearly	End of June October	No (only Div. VIa: G2)
Sardine	Bay of Biscay and Iberian coast	Yearly	Mid July	G1
Sea Bass	Greater North Sea	Yearly	To be determined	G2
	Celtic Seas	Yearly	To be determined	G2
	Bay of Biscay and Iberian coast	Yearly	To be determined	G2
Sea trout	Baltic Sea	Yearly	Early June	G2
Sharks Including spurdog, lesser spotted dogfish, catsharks, nursehounds, basking shark, blues hark, threser shark, tope, porbeagle, Portuguese dogfish, leafscale gulper shark and kitefine shark	Greater North Sea	Biennial	October	G1
	Celtic Seas	Biennial	October	G1
	Bay of Biscay and Iberian coast	Biennial	October	G1
	Macaronesian region	Biennial	October	G1
Skates and rays	Greater North Sea	Biennial	October	G1
	Celtic Seas	Biennial	October	G1
	Bay of Biscay and Iberian coast	Biennial	October	G1
	Macaronesian region	Biennial	October	G1
Sole	Greater North Sea	Yearly	End of June	G1
	Celtic Seas	Yearly	End of June	G1
	Bay of Biscay and Iberian coast	Yearly	End of June	G1
Sprat	Baltic Sea	Yearly	Early June	G1
	Greater North Sea	Yearly	End of June	G1
	Celtic Seas	Yearly	End of June	No

Species	Eco-Regions / ICES areas	Advice occurrence	Time frame	Included in DCF (Decision 2010/93/EU), species group (G1, G2)
Turbot	Baltic Sea	Yearly	Early June	G2
	Greater North Sea	Biennial	End of June	G2
Whiting	Greater North Sea	Yearly	End of June	G1
	Celtic Seas	Yearly	End of June	G1
	Bay of Biscay and Iberian coast	Yearly	End of June	G2
Witch	Greater North Sea	Biennial	End of June	G2
Deep sea species Including ling, blue ling, tusk, greater silver smelt, greater forkbeard, orange roughy, roundnose grenadier, black scabbardfish, red(blackspot) seabream, greater forkbeard, alfonsinos / golden eye perch.	Greater North Sea	Biennial	October	G1/G2
	Celtic Seas			G1/G2
	Bay of Biscay and Iberian coast			G1/G2
	Macaronesian region			G1/G2

Annex 7: Draft Resolution for an ICES Internal Publication (Category 1)

The collation of age-estimation protocols by the **Planning Group for Commercial Catch and Discard Biological Sampling**, edited by Lotte Worsøe Clausen (Denmark) and Gráinne Ní Chonchúir (Ireland) as reviewed and approved by the Chair of the SCICOM Committee, will be published in the ICES Cooperative Research Report series. The estimated number of pages is indefinite.

The PGCCDBS agrees to submit the final draft of the proposed publication by January 2014.[1]

Supporting information

Priority:	Very high. It is important to summarise the state of knowledge for key species and to scrutinize by peer review the work done during these exercises and promote an increase in quality. The CRRs will provide a comprehensive manual on the methodologies of age reading and validations hereof where available. Having a collation of all hitherto validated and effectuated methodologies facilitates a fast and quality assured development of a method suitable for a new species given the power of example.
Scientific justification:	The forthcoming ICES Cooperative Research Report represents a collation of the state-of-the-art scientific work on the methodologies and validated age estimation of commercially exploited fish species across Europe. Improving precision in age reading is extremely important for many species and the information in existing protocols should be more widely available. Given the wide span of validated methodologies already existing within the ICES community, the collation of these protocols would provide a useful resource to the ICES community and will potentially facilitate the production of validated protocols for species new to sampling for biological parameters.
Resource requirements:	The material in the report is fairly straightforward as all protocols already exist, and therefore no specific additional costs are necessary.
Participants:	Approximately six months work is required by the editor to finalise this draft. The editorial work will be carried out under PGCCDBS
Secretariat facilities:	About two months of the services of Secretariat Professional and General Staff will be required.
Financial:	Cost of production and publication of a XX-page CRR/TIMES.
Linkages to advisory committees:	This product has been endorsed by PUBCOM.
Linkages to other committees or groups:	PGMED
Linkages to other organizations:	None

[1] Extension of this deadline can be requested up to one month before the deadline's expiration. If an extension of the deadline is not agreed upon or if the final draft is not forthcoming, the ICES Secretariat will have the option of cancelling the resolution.

Annex 8: Revised WKPICS2 ToRs

WKPICS2; Second Workshop on practical implementation of statistical sound catch sampling programmes.

2011/2/ACOM53. The **Second Workshop on practical implementation of statistical sound catch sampling programmes** (WKPICS2), chaired by Jon Helge Vølstad, Norway, and Mike Armstrong, UK, will meet in ICES HQ, Copenhagen, in 6–9 November 2012, to:

a) On the basis of case studies, examine how national catch sampling programs can be designed and coordinated between countries to meet DCF or other objectives at a regional scale in the most cost-effective way. Develop operational quality assurance indicators for evaluating sampling surveys that can be incorporated in and enhance the WKACCU bias scorecard.

b) Develop guidelines for design-based and model-based data raising and precision estimation, taking account of multi-stage survey design and cluster sampling effects and the need to combine estimates over different sampling programmes within and between countries at a regional or stock level. Consider how national and regional sampling databases could be designed to raise data following best practice.

c) Develop and define quality indicators and levels for onshore and offshore sampling schemes and advise on revisions to the WKACCU score cards to accommodate them.

WKPICS2 will report by 7 December 2012 for the attention of PGCCDBS, RCMs, STECF/SGRN, and ACOM.

Supporting information

Priority:	Essential
Scientific justification:	This Workshop is an essential follow-on to WKACCU, WKPRECISE, WKMERGE, and WKPICS1 to establish a methodological support system to facilitate the design and practical implementation of regional fishery catch sampling schemes. This workshop is a continuation of the work started by WKPICS1 in 2011, and the main aim of the workshop is to provide countries with enough support to design and implement statistically sound and transparent sampling programmes to supply data that can be combined to give regional or stock based estimates meeting the requirements for precision and minimal bias. The current DCF legislation allows for countries to collaborate in biological data collection, in which case it is the combined rather than the national estimates that are evaluated against DCF precision targets. However there is a need for guidelines on how a regional sampling scheme should be designed to meet regional goals, and how the component national schemes should be designed and implemented to ensure that the data can be combined in a statistically valid way. Guidelines are also needed on how to allocate national sampling effort to meet the desired precision in the most cost-effective manner. The appropriate documentation of proper sampling designs and estimation procedures that supports regional estimates, and enable quality assessment of estimates used for stock assessment, will therefore have priority in WKPICS2. This sequential second workshop should facilitate the design and implementation of sampling schemes that are internationally coordinated to meet objectives at the regional or stock level whilst making the most cost-effective use of national and DCF funds. This second workshop may then replace the planned WKDRASS (Workshop on the Design of Regional Age Sampling Schemes), which was scheduled for 2010, as the PG found it appropriate to first go for general methodology (WKPICS-1) and then go regional. The workshop will be based on a small number of representative case studies allowing for a more thorough discussion on the details of design and implementation of catch sampling schemes at a regional level, and how the component national schemes can be designed and coordinated to allow aggregation at the regional or stock level with unbiased estimates of precision. The workshop should also consider how a regional sampling database could be designed to facilitate this. The case studies should from a methodological point of view be of general interest, covering different types of sampling schemes common in European fisheries, and should be well prepared prior to the workshop. Recommendations for type of case studies to be included in the WKPICS2 will be based on results and discussions in WKPICS1. Based on representative case studes, the WKPICS2 should come up with suggestions for a robust regional design that takes the logistic problems into account, and that can serve as a guideline for countries to set up national programs that are coordinated. It is considered beneficial that the case-studies included for the workshop be of general interest, with sufficient documentation to serve as examples in a planned text-book on design and analysis of catch-sampling programs. The goal is to collate the findings of the WKPICS1 and WKPICS2 workshops (and previous workshops such as WKMERGE) into a reference book, as such a book with contemporary methodology and examples is presently missing from the fisheries literature. This book should describe how sampling schemes and associated estimators can be developed and implemented in practice for a wide range of typical fishery sampling scenarios. A book would help attract experts to the workshop which is crucial for a good outcome. To ensure an efficient and successful meeting, a number of participants will be asked to prepare detailed case studies as Working Documents.
Resource requirements:	In addition to scientists with in-depth knowledge of national and regional sampling programs, the participation of leading expertise in the field of sampling survey methods applied to fisheries is crucial for guaranteeing a best possible outcome of the workshop.
Participants:	Participants will include the national and regional experts involved in the case studies, invited experts on sampling statistics and design, and a cross section of end-users including stock assessment scientists and statisticians. Participants should announce their intention to participate on the workshop no later than 2 months before the meeting. More detailed information about data requirements will be given by the chairs.
Secretariat facilities:	
Financial:	Funding for external experts on the statistical methods may be required. The chairs seek to collaborate with NAFO to ease the invitation of experts outside the ICES system
Linkages to advisory committees:	ACOM
Linkages to other committees or groups:	Assessment working groups
Linkages to other organizations:	There is a direct link with the EU DCF.

Annex 9: Revised ToRs SGPIDS2

SGPIDS2; Study Group on Practical Implementation of Discard Sampling Plans

2011/2/ACOM52 The **Study Group on Practical n of Discard Sampling Plans** (SGPIDS), chaired by Edwin van Helmond, the Netherlands, will meet 25–29 June 2012 in Copenhagen, Denmark to:

a) Define standards and quality indicators e.g. recorded refusal rates, sampling coverage (spatial and temporal distribution), self-sampling validation procedures, and develop a score card format for discard sampling programmes to help identify areas of improvement and inform end users;

b) Identify appropriate on board sampling techniques; evaluate the effect of different on-board sampling protocols (e.g. different usage of age–length keys, sampling unsorted catch vs landings and discard separately, sample size and raising procedures to haul level, usage of length–weight-relations, systematic sampling vs. census sampling, etc.);

c) Identify practical improvements to define sampling frames (i.e. based on effort/landings, etc.) and develop statistically sound and practical tools to implement vessel selection procedures (including registration of refusal rates);

d) Develop standardize reporting of results of sampling designs (case studies: reports of discard results on a national level).

SGPIDS will report by 15 July 2012 to the attention of the ACOM, and PGCCDBS.

Supporting Information

Priority	The quality of the discard data as well as uniformity of the data between countries plays a vital role in the usability of this data in research and stock assessment studies. The Study Group on Practical Implementation of Discard Sampling plans (SGPIDS) is essential to allow standardisation and harmonisation of discard sampling plans and to provide a platform for the exchange of expertise on discard sampling practices for the next three years. Consequently, these activities are considered to have a very high priority.
Scientific justification	Currently all Member States collect data of discard pratices under the Data Colletion Framework (DCF) of the European Commision. This DCF sets out precision levels by metier which need to be met by the different members states. Generally resources available and other practical constraints limit the number of samples and, conseqently, precision leversl are not met. SGPIDS notes that in order to meet the precision level requirements members states unwillingly bias their sampling programmes, i.e. to collect data ot the higest possible numbers of trips, institutes only collaborate with skippers who are willing to take observers on board. To examine whether the precision requirements of the programme are met, SGPIDS suggest a different approach. An approach with focus on the quality of the sampling programmes itself (representative sampling), rather then excessively increasing sampling levels just to meet (unrealistic) presision levels. In pursuit of standardized discard sampling between counties it is important that practical differences between programmes and possible improvements are identified. At within-trip level, it is important that bias and variability associated to different sampling protocols is investigated. Comparison of results of different methods used eventually lead to the most appropriated sampling protocols in discard sampling on board commercial vessels of various fisheries. Potential sources of bias within sampling programmes were identified during the first meeting of the study group. Bias in vessel selection and sampling effort allocation are reported to be common to all national sampling programmes. Providing the practical tools to define appropriate sampling frames, vessel selection procedures and reporting programme outputs will contribute to reduction of bias and ultimately standardize discard sampling programmes between Member States.
Resource requirements	Participants should bring descriptions of sampling procedures to the meeting. Reports of discard results on a national level. Additional resources required to undertake additional investigations regarding on board sampling techniques (i.e. age-length-keys, lengt-weight relations, discard data at haul level, etc.)
Participants	Scientists managing discard sampling schemes or projects, either under or outside DCF, within European waters.
Secretariat facilities	Meeting facilities incl sharepoint and secretarial support.
Financial	No financial implications.
Linkages to advisory committees	ACOM
Linkages to other committees or groups	PGCCDBS, RCMs, WGBYC, WKPICS1.
Linkages to other organizations	None.

Annex 10: Draft ToRs for WKPICS3

WKPICS3; Third Workshop on practical implementation of statistical sound catch sampling programmes

2011/2/ACOM53 The **third Workshop on practical implementation of statistical sound catch sampling programmes** (WKPICS3), chaired by Jon Helge Vølstad, Norway, and Mike Armstrong, UK, will meet in ICES HQ, Copenhagen, in November 2013, to:

a) On the basis of the series of workshops on statistical catch sampling from WKACCU to WKPRECISE2 develop concise guidelines that can serve as a reference on the best-practice design of national catch sampling programmes to meet DCF or other objectives at a regional scale in the most cost-effective way. Develop operational quality assurance indicators for evaluating sampling surveys that can enhance the WKACCU bias scorecard.

b) Identify case-studies to be used as examples of current best-practice programmes for the main categories of catch sampling programmes at-sea and from access-points on-shore. Identify guidelines for design-based data raising and precision estimation based on the case-studies that can serve as examples in a reference book on the design and analysis of statistical catch sampling programmes.

WKPICS3 will report by 20 December 2013 for the attention of PGCCDBS, RCMs, STECF/SGRN, and ACOM.

Supporting information

Priority:	Essential
Scientific justification:	This Workshop will summarize guidelines on best-practice for designing statistical catch sampling programs based on WKACCU, WKPRECISE, WKMERGE, WKPICS1 and WKPICS2 to establish concise methodological reference material that will facilitate the design and practical implementation of regional fishery catch sampling schemes. This will finalize the work started by WKPICS1 in 2011 with the main aim of the workshop to provide countries with guidelines to support the design and implement of statistically sound and transparent sampling programmes. The current DCF legislation allows for countries to collaborate in biological data collection, in which case it is the combined rather than the national estimates that are evaluated against DCF precision targets. However there is a need for guidelines on how a regional sampling scheme should be designed to meet regional goals, and how the component national schemes should be designed and implemented to ensure that the data can be combined in a statistically valid way. Guidelines are also needed on how to allocate national sampling effort to meet the desired precision in the most cost-effective manner. The appropriate documentation of proper sampling designs and estimation procedures that supports regional estimates, and enable quality assessment of estimates used for stock assessment, will therefore have priority in WKPICS2. This sequential second workshop should facilitate the design and implementation of sampling schemes that are internationally coordinated to meet objectives at the regional or stock level whilst making the most cost-effective use of national and DCF funds. This second workshop may then replace the planned WKDRASS (Workshop on the Design of Regional Age Sampling Schemes), which was scheduled for 2010, as the PG found it appropriate to first go for general methodology (WKPICS-1) and then go regional. The workshop will be based on a small number of representative case studies allowing for a more thorough discussion on the details of design and implementation of catch sampling schemes at a regional level, and how the component national schemes can be designed and coordinated to allow aggregation at the regional or stock level with unbiased estimates of precision. The workshop should also consider how a regional sampling database could be designed to facilitate this. The case studies should from a methodological point of view be of general interest, covering different types of sampling schemes common in European fisheries, and should be well prepared prior to the workshop. Recommendations for type of case studies to be included in the WKPICS2 will be based on results and discussions in WKPICS1. Based on representative case studes, the WKPICS2 should come up with suggestions for a robust regional design that takes the logistic problems into account, and that can serve as a guideline for countries to set up national programs that are coordinated. It is considered beneficial that the case-studies included for the workshop be of general interest, with sufficient documentation to serve as examples in a planned text-book on design and analysis of catch-sampling programs. The goal is to collate the findings of the WKPICS1 and WKPICS2 workshops (and previous workshops such as WKMERGE) into a reference book, as such a book with contemporary methodology and examples is presently missing from the fisheries literature. This book should describe how sampling schemes and associated estimators can be developed and implemented in practice for a wide range of typical fishery sampling scenarios. A book would help attract experts to the workshop which is crucial for a good outcome. To ensure an efficient and successful meeting, a number of participants will be asked to prepare detailed case studies as Working Documents.
Resource requirements:	In addition to scientists with in-depth knowledge of national and regional sampling programs, the participation of leading expertise in the field of sampling survey methods applied to fisheries is crucial for guaranteeing a best possible outcome of the workshop.
Participants:	Participants will include the national and regional experts involved in the case studies, invited experts on sampling statistics and design, and a cross section of end-users including stock assessment scientists and statisticians. Participants should announce their intention to participate on the workshop no later than 2 months before the meeting. More detailed information about data requirements will be given by the chairs.
Secretariat facilities:	
Financial:	Travel and accommodation expenses need to be covered for these experts. It is advised that travel costs will be eligible for participants from Member States of the European Union through the EU Data Collection Framework. The outcome of this series of workshops is meant to establish a scientific sound basis for an improved and coordinated catch sampling design within the ICES area. Since this will have an influence on the current catch sampling programs, i.e., the EU-DCF and non-EU national sampling programs, extra funding to bring invited experts to the meeting should be sought through the EU and national institutes/programs. Application for financial support should also be sent to EFARO (The European Fisheries and Aquaculture Research Organisation; an association composed of the Directors of the main European Research Institutes involved in Fisheries and Aquaculture research; www.efaro.eu).
Linkages to advisory committees:	ACOM

Linkages to other committees or groups:	Assessment working groups
Linkages to other organizations:	There is a direct link with the EU DCF.

Annex 11: ICES training proposal

Template for ICES training courses

Course title

The Design of Statistically Sound Catch Sampling for Fisheries Monitoring Programmes

Context, objective and level

So far, the ICES training programme has included modules on:

- the analysis of stock data in analytical assessments (e.g. the modules Introduction / Advanced / AD Model Builder and Stock Assessment);
- other types of analyses and statistics (e.g. Management Strategy Evaluation / Bayesian Inference / Analysis of VMS and EU logbook data);
- sampling for and analysis of fishery independent survey data (Trawl Survey Design and Evaluation);
- communication with stakeholders and end-users (Opening the box to stakeholders, NGOs and policy makers / Communicating Science and Advice – under development); and
- the study of different fundamental and fisheries-related ecosystem-aspects (Integrated assessment of status and trends in marine ecosystems / Fishery Management to meet biodiversity conservation needs / Ecosystem modelling for fishery management / Climate impacts on marine ecosystems – under development).

Most of the data being processed in these courses, and form an important part of the daily routine of fisheries scientists, were initially not collected at the population level, but originate from samples that represent a subset of the population and were raised at a later stage to estimate characteristics of the whole population. Important advantages of sampling (compared to a census survey) are a lower cost, a faster data collection, and a smaller dataset that makes it easier to ensure homogeneity and to improve the accuracy and quality of the data.

In the fisheries world, most data collection is done through sampling of the target populations. All later procedures (raising, analysis, interpretation, and ultimately the resulting advice) are situated at the population level, and are heavily influenced by the initial sampling design. Therefore, a thorough knowledge of sampling theory is indispensable for everybody designing sampling strategies, and a dedicated course on the principals of sampling would be a valuable addition to the ICES training programme.

There should be three levels; an introductory level, an intermediate level, and an advanced level. At the introductory level the candidates should already have grounding in basic statistics and experience of biological sampling in the field and or experience of using catch estimates from sampling programmes, in stock or fisheries assessments. The higher level courses may extend to raising procedures for catch estimates and using bias statistics and precision estimates to qualify these assessments.

Dates and venue

ICES HQ, Copenhagen.

Organisation

Tba.

Admission and registration

Tba.

Fee

Tba.

Programme (If long attached in separate file)

The course on: The Design of Statistically Sound Catch Sampling For Fisheries Monitoring Programmes should include information on the following topics:

- Definitions (population, sample, sampling frame, stratum, …)
- Why sampling? why sampling design?
- Sampling frames.
- Probability versus non-probability sampling.
- Types of sampling/sampling methods.
- Stratification (what? why? when?)
- Sample sizes.
- Sampling versus data collection (sampling involves more than data collection, also data storage, noting comments, documenting refusals, … are parts of the sampling process).
- Errors in sampling surveys (sampling errors, bias, precision, non-sampling errors).
- Weighting.

Lecturers

Tba.

Annex 12: AWG data contact persons recommendations 2011

Stock Data Problems Relevant to Data Collection.

ID	Stock	Data Problem	How to be addressed in	By who	Additional Comments from ICES secretariat	Action proposed by PGCCDBS
AFWG11_01	All stocks	The current FishStat software does not operate in the Windows 7 environment.	Please note, however, a new completely reengineered version of the application, called FishStatJ, which will support all the major operating systems (Windows, Linux and Mac). A beta version of the application has been demonstrated in occasion of the past Committee on Fishery (COFI, Jan 31 - Feb 04, 2011). The operational release is scheduled right after the official publication of the updated FAO global fishery and aquaculture production statistical collections.	FAO	ICES Secretariat is aware and will work on this issue	No action from PGCCDBS

ID	Stock	Data Problem	How to be addressed in	By who	Additional Comments from ICES secretariat	Action proposed by PGCCDBS
AFWG11_02	NeA- cod	In contrast to previous years, the age-length distributions in the catches were not updated for 2010 for gadget-model. This is because the ECA program used for data extraction gave unreliable results when run in 2011. Some files were not produced at all, and others had age-length tables that were not compatible with previous years, despite using the same settings. Work will be undertaken before the next AFWG to investigate and rectify this problem. However for this meeting the most recent years in the Gadget model is lacking in fleet data, and may thus be overly sensitive to variations in the most recent surveys.	Work will be undertaken before the next AFWG to investigate and rectify this problem. First, the actual differences should be investigated further, e.g. by region, gear-group and season to exclude other possible sources of error.	IMR		No action from PGCCDBS

ID	Stock	Data Problem	How to be addressed in	By who	Additional Comments from ICES secretariat	Action proposed by PGCCDBS
AFWG11_03	*Sebastes mentella*	It becomes a problem for the *Sebastes mentella* assessment that some countries fishing *S. mentella* in international waters of the Norwegian Sea do not report their catches to NEAFC and ICES. EU-reported catches are, for example, not split by individual countries. Lack of consistency between daily reports from the sea to NEAFC and later official reports by delegates to NEAFC is also worrying.			Data delivery to ICES' expert groups (EG) is a national responsibility. This recommendation was already sent to ICES delegates of: Norway, Portugal, Spain, Russia, Germany, UK, Poland, Lithuania, and Latvia.	No action from PGCCDBS

ID	Stock	Data Problem	How to be addressed in	By who	Additional Comments from ICES secretariat	Action proposed by PGCCDBS
WGNAS11_01	North Atlantic Salmon	The DCF provisions seem to have been designed with marine stocks in mind. While they have explicitly been extended to salmon (and eel), a number of the data collection requirements relating to these species currently appear inconsistent, inappropriate and/or impractical. It is thus unclear how, in their current form, they will add value to existing well established, internationally agreed salmon assessment procedures. The data collection requirements have not been planned with any view to how they would be used in the ICES assessments, and some of the information (e.g. on maturity ogives) is clearly inappropriate for salmon and eel.			WKESDCF, will propose improvement on salmon data collection.	PGCCBS will consider outcomes and recommendations of WKESDCF.

ID	Stock	Data Problem	How to be addressed in	By who	Additional Comments from ICES secretariat	Action proposed by PGCCDBS
WGNAS11_02	North Atlantic Salmon	There are examples of inconsistencies in the collection requirements with regard to the commercial fishing gears covered (e.g. data do not appear to be required from salmon caught by set gillnets or driftnets, or from other set nets such as stake and bag nets), the vessels covered (i.e. the definition of commercial vessels does not cover non-registered vessels which would include most vessels used for salmon netting), and the areas covered (i.e. data are required from recreational salmon fisheries in the North Atlantic, but not from those in North Sea regions).			WKESDCF, will propose improvement on salmon data collection.	PGCCBS will consider outcomes and recommendations of WKESDCF.

ID	Stock	Data Problem	How to be addressed in	By who	Additional Comments from ICES secretariat	Action proposed by PGCCDBS
WGNAS11-03	North Atlantic Salmon	The impracticalities of the DCF relating to salmon arise principally because fisheries for salmon are often very small and widely dispersed; this particularly applies to recreational fisheries. Individual salmon also have a high value and are landed whole. There are therefore concerns about the practicality, value and cost of organising detailed sampling of catches throughout all fisheries. Further, sampling procedures (e.g. assessing sex ratios) that would require internal examination of fish may be problematic to implement.			WKESDCF, will propose improvement on salmon data collection.	PGCCBS will consider outcomes and recommendations of WKESDCF.

ID	Stock	Data Problem	How to be addressed in	By who	Additional Comments from ICES secretariat	Action proposed by PGCCDBS
WGNAS11_04	North Atlantic Salmon	Some of the terminology is not in general use for salmon fisheries (e.g. metier) and is therefore open to misinterpretation. These terms, if used, need to be clearly defined for salmon in order to ensure consistent approaches by MS and to ensure that standard sampling approaches are adopted in different salmon-producing regions (e.g. the North Sea and North Atlantic).			WKESDCF, will propose improvement on salmon data collection.	PGCCBS will consider outcomes and recommendations of WKESDCF.

ID	Stock	Data Problem	How to be addressed in	By who	Additional Comments from ICES secretariat	Action proposed by PGCCDBS
WGNAS11_05	North Atlantic Salmon	The DCF covers a range of research vessel surveys for marine species, but such surveys are inappropriate for salmon (or eel). However, there is a need to conduct more detailed monitoring on a small sample of salmon rivers in order to obtain information on trends in marine survival and other production parameters ('indicator' rivers). Such monitoring programmes are covered within the Baltic Region, but need to be added for the regions relevant to WGNAS (i.e. Atlantic and North Sea).			WKESDCF, will propose improvement on salmon data collection.	PGCCBS will consider outcomes and recommendations of WKESDCF.

ID	Stock	Data Problem	How to be addressed in	By who	Additional Comments from ICES secretariat	Action proposed by PGCCDBS
WGNAS11_06	North Atlantic Salmon	Some MS have not developed a programme for providing all the data for salmon required under the Regulation because the data requested is not the information that is considered necessary/appropriate, and because collecting the data would be extremely difficult, costly and potentially damaging to stocks. For the past two years various MSs have therefore applied 'pilot' programmes, under which data are collected which are considered appropriate for national assessments. Such arrangements need to be made consistent between MSs and formalised.			WKESDCF, will propose improvement on salmon data collection.	PGCCBS will consider outcomes and recommendations of WKESDCF.

ID	Stock	Data Problem	How to be addressed in	By who	Additional Comments from ICES secretariat	Action proposed by PGCCDBS
WGEF11_01	Spurdog	Age and growth	The WGEF assessment method converts length-based information to age. There is uncertainty in the growth parameters of spurdog, and updated studies could usefully be undertaken	National laboratories	AGE	PGCCDBS redirects this back to the WGEF to propose a study.
WGEF11_02	Spurdog	Migratory patterns (e.g. in relation to the environment, and how changes could affect survey indices)	Improved studies of earlier tagging information (that may be available in Norway and England), analyses of the spatial temporal dynamics of spurdog	National laboratories		No action by PGCCDBS. Tagging of this species is however an expensive exercise and will not give the necessary long term spatial temporal dynamics of spurdog.
WGEF11_03	Deepwater Sharks	No monitoring of the effectiveness of management measures (TAC = 0) of deep water sharks	Implementation of deep water long line surveys	National responsible of surveys		No action from PGCCDBS
WGEF11_04	Demersal skates and rays (general issues)	Stock structure of various species	Various methods could be applied (e.g. genetics, internal parasites, tagging studies)	National laboratories; DCF surveys (e.g. IBTS and BTS) could be asked to tag and release selected species to better understand mixing.		No action by PGCCDBS. WGEF should discuss aim and set up of possibilities of tagging experiment with IBTSWG and WGBEAM

ID	Stock	Data Problem	How to be addressed in	By who	Additional Comments from ICES secretariat	Action proposed by PGCCDBS
WGEF11_05	Demersal skates and rays (general issues)	Reproductive biology	Need better information on fecundity, which could be done through oocyte counts of preserved ovaries, and through examination of egg-laying rates in captive-held specimens	If resource were available, ovaries could be collected under the DCF.	Maturity WKMSEL2 will take place in 2012	PGCCDBS will not take any actions until the WKMSEL2 has taken place and the data needs are specified.
WGEF11_06	Demersal skates and rays (general issues)	Discard survival	Some elasmobranchs are very hardy and can survive capture and subsequent release. A better understanding of the factors that affect survival and how to mitigate this are required	Discard survival studies, potentially to be EU funded	Discards	No action by PGCCDBS. WGEF should discuss aims and methods and set up a possible study.
WGEF11_-7	Demersal elasmobranchs in the North Sea/eastern Channel	Blonde rays	Little known in the North Sea, but locally abundant	Collaborative initiatives between fisheries scientists and fishermen could help increase our knowledge of the stock	Collaborration with RACs	No actions by PGCCDBS

ID	Stock	Data Problem	How to be addressed in	By who	Additional Comments from ICES secretariat	Action proposed by PGCCDBS
WGEF11_08	Demersal elasmobranchs in the North Sea/eastern Channel	Skates on offshore fishing grounds	Consider an increase in survey effort on offshore banks etc. on existing surveys	DCF-funded surveys such as IBTS	Surveys	No actions by PGCCDBS
WGEF11_09	Demersal elasmobranchs in the North Sea/eastern Channel	Thornback ray in the Wash	Consider a slight increase in survey effort on existing surveys to increase our knowledge of *Raja clavata* in The Wash area	DCF-funded surveys such as IBTS	Surveys	No action by PGCCDBS
WGEF11_10	Demersal elasmobranchs in the Celtic Seas	Studies on species with patchy distributions (blonde and undulate ray in the English Channel, angel shark in Cardigan Bay, blonde ray off SE Ireland)	Need some area-specific surveys with appropriate gears and local fisher knowledge to better understand the biology and small-scale distribution of skates species with patchy distributions (i.e. those where existing surveys are inappropriate for informing on stock status)	Collaborative initiatives between fisheries scientists and commercial fishermen could help increase our knowledge of the stock	Collaborration with RACs	No action by PGCCDBS

ID	Stock	Data Problem	How to be addressed in	By who	Additional Comments from ICES secretariat	Action proposed by PGCCDBS
WGEF11_11	Demersal elasmobranchs in the Bay of Biscay and Iberian Waters	No data available on maturity	Improve the biological collection of data. Countries involved in fishery provide data on maturity and natural mortality	National responsibility under the DCF		No action by PGCCDBS
WGEF11_12	Demersal elasmobranchs in the Bay of Biscay and Iberian Waters	Species –specific identification of the landings (rays and smooth hounds)	Reinforce the samplers and observers training.	National responsible of sampling in ports or/and on board	Sampling intensity	To be forwarded to RCM NEA.
WGEF11_13	Demersal elasmobranchs in the Bay of Biscay and Iberian Waters	few commercial length frequencies	Reinforce the samplers and observers effort in taking data. Countries involved in fishery provide data on length frequencies	National responsible of sampling in ports or/and on board	Sampling intensity	To be forwarded to RCM NEA
WGEF11_14	Demersal elasmobranchs in the Bay of Biscay and Iberian Waters	Scarce data on discards	Countries involved in fishery provide data on discards. Reinforce the observers on board effort.	National responsibility under the DCF	Sampling intensity	To be forwarded to RCM NEA

ID	Stock	Data Problem	How to be addressed in	By who	Additional Comments from ICES secretariat	Action proposed by PGCCDBS
WGEF11_15	Demersal elasmobranchs in the Bay of Biscay and Iberian Waters	No data on age composition	Reinforce the collection and analysis of age-structures like vertebrae and spines otoliths (elasmobranchs have no otoliths). Countries involved in fishery provide data age	National responsibility under the DCF	Sampling intensity	PGCCDBS notes that no standard methodology for ageing elasmobranchs is available yet. Methods are still under development; see the table in the WKNARC 2012 report Annex 10 for identifying MS institutes currently involved in studies on elasmobranch ageing. Bilateral agreements with these MS institutes could be set up for the ageing of elasmobranchs.
WGEF11_16	Demersal elasmobranchs in the Bay of Biscay and Iberian Waters	Scarce commercial effort and cpue data	Countries involved in fishery provide data of standardized effort and cpue	National responsibility under the DCF	Sampling intensity	To be forwarded to RCM NEA
WGEF11_17	Demersal elasmobranchs in the Bay of Biscay and Iberian Waters	No survey sin deep Water fishing grounds. DW Fishing grounds not suitable for trawling	Implementation of deep-water longline surveys.	National responsible of surveys	ICES give advice on the needs of deep water survey to EC in 2011 (http://www.ices.dk/committe/acom/comwork/report/2011/Special%20Requests/EC%20Scientific%20surveys%20for%20deep%20water%20fisheries.pdf)	No action by PGCCDBS
WGEF11_18	Demersal elasmobranchs in the Bay of Biscay and Iberian Waters	No data available on maturity	Improve the biological collection of data. Countries involved in fishery provide data on maturity and natural mortality	National responsibility under the DCF	Sampling intensity	A workshop on maturity of elasmobranchs WKMSEL will take place in 2012. PGCCDBS encourages countries involved to participate

ID	Stock	Data Problem	How to be addressed in	By who	Additional Comments from ICES secretariat	Action proposed by PGCCDBS
WGEF11_19	Pelagic sharks	No fishery-independent sources of information for porbeagle, thresher etc.	Funding for a fishery-independent longline survey is required. Such a survey could help inform on the status of the pelagic ecosystem, and although expensive could be undertaken every x years (i.e. such a survey does not need to be annual)	Joint survey by those countries with these fisheries. Should be DCF funded as impacts several EU members, and will also relate to MSFD.	Survey This recommendation is not ICES advice	No action by PGCCDBS
WGHMM11_01	Mgw-78	Ireland: Revised tuning fleet catches not provided since 2007	LPUE data series stopped in 2006 because of patterns in different areas and major changes in the fleet structure over time.	Ireland and ICES delegate & PGCCDBS	Data deliver	PGCCDBS notes that whilst it is a DCF requirement for MS to supply catch and effort data as specified in DCF Decision Annex VIII, it is not a requirement to supply LPUE series which is the product of a statistical analysis of the data. This is the task of the end users and to be evaluated through benchmark data compilation and evaluation process as recommended by PGCCDBS 2011.
WGHMM11_02	Mgw-78	France: No update of CPUEs data series are provided to the group.	STRONG request for providing these data to Member State.	France and ICES delegate & PGCCDBS	Data deliver	See PGCCDBS comment under WGHMM 11_01
WGHMM11_03	Mgw-78	France: No discard data (biomass, length distributions and age composition) is delivered to the WGHMM since 1998.	STRONG request for providing these data to Member State.	France and ICES delegate & PGCCDBS	Data deliver	PGCCDBS supports

ID	Stock	Data Problem	How to be addressed in	By who	Additional Comments from ICES secretariat	Action proposed by PGCCDBS
WGHMM11_04	Mgw-78	France: No ALK and consequently age composition of landing sand weight at age is provided to the WGHMM routinely.	STRONG request for providing these data to Member State.	France and ICES delegate & PGCCDBS	Data deliver	PGCCDBS supports
WGHMM11_05	Mgw-78	United Kingdom: Discards provided to WGHMM but not used because of bad quality of the data (data is not raised).	Application of recommendations of WS Discards (Charlotte Lund, 2003) and future WS on discards (2009)	UK and PGCCDBS	Data deliver	PGCCDBS supports
WGHMM11_06	Ang-78	United Kingdom, Spain and Ireland: Discards provided to WGHMM but not used because of bad quality of the data. (Doubts about the adequacy of raising methodology used).	The standard "ICES methodology" for discards estimation is unlikely to be appropriate for species that may have important discards but are not caught very often (eg. anglerfish or megrims) and that additional methodology and guidelines should be developed (e.g. via specific workshops) to deal with those cases.	UK, IRL, SP and PGCCDBS	Discards	Should be discussed at WKPICS2

ID	Stock	Data Problem	How to be addressed in	By who	Additional Comments from ICES secretariat	Action proposed by PGCCDBS
WGHMM11_07	Ang-78	France: preliminary landings and length distribution data is delivered to the WGHMM.	Request for providing final data to Member State.	France and Ices delegate & PGCCDBS	Data deliver	PGCCDBS supports
WGHMM11_08	Ang-78	France: No discard data is delivered to the WGHMM.	Strong request for providing these data to Member State.	France and Ices delegate & PGCCDBS	Data deliver	PGCCDBS supports
WGHMM11_09	Ang-78	The precise methodology used for splitting catches between both Lophius species is not available to the WGHMM and no precision estimates are delivered	Strong request for providing these data to Member States except for Spain that has presented a WD to the Working Group.	PGCCDBS	This request was already forwarded to the ICES delegates: Ireland, France, Belgium, UK,	No action by PGCCDBS
WGHMM11_10	Ang-78	Available maturity data recorded under DCF is not being delivered to WGHMM	Strong request for providing these data to Member States.	PGCCDBS	Data deliver	PGCCDBS supports
WGHMM11_11	Ang-78	Sex-ratio data recorded under DCF is not being delivered to WGHMM	Strong request for providing these data to Member States.	PGCCDBS	Data deliver	PGCCDBS supports
WGHMM11_12	Hke-89	France landings are unknown in recent years, except 2010.	Request to member state	France and ICES Delegate	Data deliver	PGCCDBS supports
WGHMM11_13	Sol-bisc	Discards (obsmer) not used because of poor spatial representation	Improve spatial representation in sampling.	PGCCDBS	Sampling intensity	To be forwarded to RCMNEA

ID	Stock	Data Problem	How to be addressed in	By who	Additional Comments from ICES secretariat	Action proposed by PGCCDBS
WGHMM11_14	General	Doubts about reliability of discards estimates	The standard "ICES methodology" for discards estimation is unlikely to be appropriate for species that may have important discards but are not caught very often (eg. anglerfish or megrims) and that additional methodology and guidelines should be developed (e.g. via specific workshops) to deal with those cases.	PGCCDBS and ACOM	Discards	To be discussed at WKPICS2

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WGNSSK11_01	Ple-nsea, sol-nsea	An increasing number of beam trawlers (in the Dutch fleet) are using 'Pulse trawl' gear. There is no recognised gear code for this gear and catches etc. are still registered as TBB, grouping them with the traditional twin beam trawl fleet.	It is felt that this gear is likely to have different selectivity (for discards and landings) as well as different catch per unit effort as the traditional beam trawl gears. This has implication for the assessment of sole and plaice. In the first case, for the raising of discards and landings data. In the second case for the determination of the CPUE index used in the sole assessment. It is necessary to create a separate gear code / gear type category for pulse trawls. This would allow for improved raising of data and prevent a discontinuity in the CPUE index used for sole.	National data submitters, PGCCDBS, DCF, WKPULSE?	Methodology	To be forwarded and discussed at RCMNS&EA

ID	Stock	Data Problem	How to be addressed in	By who	Additional Comments from ICES secretariat	Action proposed by PGCCDBS
WGNSSK11_02	Saithe in Subarea IV, VI and Division IIIa	No index for older year-classes in scientific surveys, assessment heavily dependent on commercial cpue	Increase cover of NORACU (below 200 m) and establish an identical acoustic survey in IBTS Q1 to cover spawning aggregations.	Norwegian delegation	Survey	No action by PGCCDBS. Appropriateness and methods for acoustic surveys of saithe to be discussed in the relevant survey planning group.
WGNSSK11_03	Saithe in Subarea IV, VI and Division IIIa	Only a short recruitment index time series	Establish ASSRI as standard survey	Norwegian delegation	Survey	No action by PGCCDBS
WGNSSK11_04	Saithe in Subarea IV, VI and Division IIIa	Age sampling from commercial fleets	Possible cluster sampling due to few vessels in the reference fleet (Norway), needs review / redesign	Norwegian delegation	Methodology	No action from PGCCDBS. The Norwegian reference fleet programme was peer-reviewed in 2011.
WGNSSK11_05	Saithe in Subarea IV, VI and Division IIIa	No discard data used in assessment	Quality control of available data sources, including Norwegian reference fleet data	Norwegian delegation, German, French, and Scottish delegates, PGCCDBS	Discards This recommendations was already forward to ICES delegates: Norway, France, Germany	No action by PGCCDBS

ID	Stock	Data Problem	How to be addressed in	By who	Additional Comments from ICES secretariat	Action proposed by PGCCDBS
WGNSSK11_06	Plaice in IIIa	No survey coverage where the fisheries are	The Western Skagerrak represents by far the huge majority of the catches but there is no survey there, while there is 4 surveys in Kattegat which represent <5% of catches. There is an urgent need to a better coverage through survey or reference fleet	PGCCDBS, DTU-Aqua. Or possibility to extend IBTS or BTS to the Western Skagerrak?	Survey	No action by PGCCDBS. To be discussed in appropiate survey planning group.
WGNSSK11_07	Plaice in IIIa, IV and VIId	Small plaice of stocks cannot be easily assessed because of potentially large migrations in and out the large area IV	Most knowledge about stocks connectivity is based on old and limited tagging experiments. New tagging studies would be necessary to improve the understanding of migratory patterns	PGCCDBS, DTU-Aqua, IMARES, IMR, CEFAS, IFREMER	Study	PGCCDBS recommends to pass this on to SIMWG.
WGNSSK11_08	Plaice in VIId	Discard time series too short to be included in the assessment	Sampling levels have increased in the recent years and more work needs to be done to raise the samples to the population and get reliable estimates of the discards levels	PGCCDBS, French, UK and Belgiam delegations.	Survey	Need to be forwarded and discussed at RCMNS&EA 2012. Intersessional work advisable

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WGNSSK11_09	Sol-eche	The French Young Fish survey as conducted now is probably not providing the correct recruitment estimates as it only covers part of VIId	The UK component of the YFS index is not available since 2007, resulting in the unavailability of the combined YFS-index. This combined index has been estimating the incoming year class strength very consistently, hereby providing reliable estimates to the forecasts. Although results of using the YFS indices separately (FR-YFS for 1987-present and UK-YFS for 1987-2006) did not show apparent changes in retrospective patterns, it was noted that the lack of information from the UK YFS will affect the quality of the recruitment estimates and therefore the forecast. The Working Group suggests that the assessment could benefit if the French Young Fish survey could be extended to include some of the sampling points from the former UK Young Fish survey along the English coast. The extended French survey could	PGCCBDS and the French authorised persons responsible for the French Young Fish survey	Survey	This should be referred to the appropriate survey planning group (WGBEAM).

ID	Stock	Data Problem	How to be addressed in	By who	Additional Comments from ICES secretariat	Action proposed by PGCCDBS
WGNSSK11_10	Haddock in IV and IIIa	Stock structure	There is increasing evidence that the IV-IIIa and VIa haddock stocks should be assessed as one joint Northern Shelf haddock stock. A preliminary attempt was made at this during WGNSSK 2011, but a more complete data collation and analysis job is required, along with consideration of what this would entail for advice.	Scottish delegation	Stock identity Comment from the Stock Identification Methods Working Group 2011: SIMWG feel there is insufficient ground for assuming a single-stock unit of haddock across the North Sea and the West of Scotland. SIMWG advises that more research is necessary on this topic. Stock identity	PGCCDBS agrees and recommends the SIMWG to specify a study.
WGNSSK11_11	Nep 7-10, 34	Lack of Scottish effort data	Anomalies in effort extractions from different Marine Scotland databases require further investigation to be resolved. Ability to provide an LPUE series for FU 10 (no UWTV survey) would improve basis for advice.	Scottish delegation	Data deliver	No action by PGCCDBS

ID	Stock	Data Problem	How to be addressed in	By who	Additional Comments from ICES secretariat	Action proposed by PGCCDBS
WGNSSK11_12	Nop34	Missing Norwegian CPUE data by vessel category for 2008, 2010 and 2011 should be made available. Missing Norwegian data time series of samplings should be made available in Intercatch.	Norway should provide these data in advance of the May2012 assessment	Norwegian WGNSSK members	Data deliver	PGCCDBS agrees
WGNSSK11_13	Nep 32	Lack of Norwegian CPUE data. Lack of Norwegian sampling of commercial catches	Norwegian cpue data require further investigation. The sampling issue seems to be solved as the Norwegian Coast Guard from now on will measure CL of *Nephrops*, not TL	Norwegian delegation	Data deliver	No action by PGCCDBS
HAWG11_01	HERAS survey Combined acoustic; all countries	Stock ID on mixed catches	Incorporate splitting methodology and sampling of individuals for this in the survey design. Get all participating countries to split their herring into stock ID's.	WGIPS + recommendation by PGCCDBS		PGCCDBS agrees. But is not convinced of feasability.

ID	Stock	Data Problem	How to be addressed in	By who	Additional Comments from ICES secretariat	Action proposed by PGCCDBS
HAWG11_02	WBSS	Stock ID on mixed catches	Increase and/or redesign sampling for spawning data in herring catches in ICES area IVa and IIIa and 22–24	PGCCDBS to re-iterate this through the DCF to the National laboratories		PGCCDBS refers this dataproblem to the applicable RCMs to specify a sampling strategy.
HAWG11_03	Sprat in the Celtic Seas (Subareas VI and VII)	Discrepancy between WG data and official recorded data	Discrepancies between the WG historical data on catches of sprat in this eco-region and the FishStat impairs the impression of the historical exploration of sprat in the eco-region. The National laboratories will be approached by HAWG to check historical data.	National laboratories need to check this and report back to HAWG. In the future, these catches should be part of the data exchange sheet		No action by PGCCDBS

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HAWG11_04	Sprat in North Sea	Maintaining the sprat acoustic survey of the North Sea	HAWG is planning a benchmark assessment of North Sea sprat in 2013. The acoustic survey will probably form an important component of the assessment. Thus the acoustic survey of the North Sea should maintain at least both herring and sprat as the target species of the survey.	WGIPS and national laboratories	Survey	To be forwarded to WGIPS
HAWG11_05	Herring in VIaS, VIIb, c	Age reading of stock components	The effect of possible changes of autumn, winter and spring spawning components in VIaS/VIIbc, will have an impact on the catch at age data. Investigate the effect that the interpretation of the last winter ring may have in this mixed stock, bearing in mind that the birth date is the 1st January.	National Laboratories and PGCCDBS	Age	PGCCDBS suggested a NSS Herring exchange. The coordinators are Manolo and Jane.

ID	Stock	Data Problem	How to be addressed in	By who	Additional Comments from ICES secretariat	Action proposed by PGCCDBS
HAWG11_06	North Sea Sprat	Commercial landing are too poorly sampled. (quarter 4 with most catches: 0.1 samples per 1000 tonnes instead of the recommended level of 0.5 samples per 1000 tonnes)	Increase sampling commercial catches, particularly with regards to spatiotemporal coverage	Recommendation by PGCCDBS to follow sampling recommendations by the DCF	Sampling intensity	The DCF specifies target CVs for length/age compositions and minimum number of trips to sample by metier, not samples per tonne. Forward to RCMNS&EA 2012 for consideration.
HAWG11_07	Clyde herring	Poor sampling has been performed for this stock for years	Sampling of age-weight-length information needed	PGCCDBS: this sampling should be a part of the DCF for relevant countries	Sampling intensity/data deliver	Refer to UK Scotland
HAWG11_08	Components within the Malin shelf herring acoustic survey (MSHAS)	Stock ID on mixed catches	Incorporate splitting methodology and sampling of individuals for this in the survey design. Get all participating countries to split their herring into stock IDs	Recommendation by PGCCDBS to the National Laboratories to initiate this	Age	Study proposal is picked up by Lotte and will be further developed intersessionnally and will be adressed again at the 2013 PGCCDBS.
HAWG11_09	Components within the Malin shelf herring acoustic survey (MSHAS)	Continuation of this survey is mandatory. In 2011 UK(Northern Ireland) will no longer participate	Written into the DCF by the relevant countries	Recommendation by PGCCDBS to included in the DCF	Survey	No action by PGCCDBS

ID	Stock	Data Problem	How to be addressed in	By who	Additional Comments from ICES secretariat	Action proposed by PGCCDBS
HAWG11_10	All	HAWG is concerned to learn that there is a strong likelihood that certain countries will lose their pelagic observer programmes in 2011.	All efforts be made to maintain observer coverage across fleets that catch a substantial proportion of pelagic fish	Fundamental demand. PGCCDBS must make this a fundamental part of the DCF	Sampling intensity	This is already covered by the DCF in relation to estimation of discards. Refer this issue to the appropriate RCMs covering pelagic fisheries.
HAWG11_11	All	HAWG is concerned about the lack of information on discarding levels in the herring fisheries. Currently only one nation reports its discard for inclusion in the assessment. This nation is about to lose its pelagic observer programme (see above point)	All efforts should be made to maintain observer coverage across fleets that catch a substantial proportion of pelagic fish and to report on the observed discard levels.	PGCCDBS	Sampling intensity	See comment under HAWG11_10. This comment was discussed at PG and RCMs in 2011. It is recognised that the 'observer effect' on board pelagic vessels can be detrimental to collection of accurate data. The new CFP will probably introduce a total discard ban on pelagic vessels in the first instance. This will have implications on future pelagic observer programmes.

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HAWG11_12	North Sea, VIaN and VIaS & VIIb,c	With the addition of a new VIa MIK survey to the collection of surveys that provide potential indices, there is a requirement for understanding the catchability of small larvae with this gear, based on experimental observations. This has implications for both the new VIaN survey and for our understanding of the current IBTSO (North Sea) survey.	Standard MIK net mesh should be tested along with a finer mesh to determine the selectivity curve	WGIBTS	Survey	No action by PGCCDBS
HAWG11_13	Herring in VIIaN	Age reading of stock components	The effect of possible changes of autumn and winter spawning components in VIIaN, may have an impact on the catch at age data and survey numbers at age. Investigate the effect that the interpretation of the last winter ring may have in this mixed stock, bearing in mind that the birth date is the 1st January.	National Laboratories and PGCCDBS	Age	PGCCDBS 2012 has proposed a Study Project on stock and component related issues for the herring in the West of Scotland, West of ireland, Irish Sea and North Sea.

ID	Stock	Data Problem	How to be addressed in	By who	Additional Comments from ICES secretariat	Action proposed by PGCCDBS
HAWG11_14	Herring in VIIaN	Stock ID on mixed catches and survey estimates.	Incorporate splitting methodology of individuals in catch and survey.	Recommendation by PGCCDBS to the National Laboratories to initiate this		This recommandation is repeated a few times by HAWG. See PGCCDBS comment under HAWG11_13.
WGWIDE11_01	Blue Whiting	Latest exchange revealed low agreement between age readers	A workshop should be implemented to standardize the age reading between the laboratories and to ensure the implementation of the ageing protocol/guidelines	PGCCDBS, IMR	Age	WKARBLUE is scheduled for June 2013.
WGWIDE11_02	Blue Whiting	Non-compliance with the blue whiting survey time table	Survey participants should be advised to stick to the planned survey schedule in order to maintain the survey coverage	WGNAPES, Survey Participants	Survey	No action by PGCCDBS
WGWIDE11_03	Boarfish	Lack of sampling and age data.	Following the MoU between ICES and EU boarfish (Capros aper) was included into WGWIDE. Sampling data are only very limited accessible. Therefore boarfish should be included in the list of DCF species.	PGCCDBS, RCM, EU	Age The needed to include boarfish in DCF was already highlithed by ICES at the Liaison Meeeting	PGCCDBS agrees.

ID	Stock	Data Problem	How to be addressed in	By who	Additional Comments from ICES secretariat	Action proposed by PGCCDBS
WGWIDE11_04	Boarfish	Boarfish only measured to the 1 cm on the IBTS.	Following the MoU between ICES and EU boarfish (Capros aper) was included into WGWIDE. Boarfish should be measured to the 0.5 cm on the IBTS due to the small length range and the relatively high ages observed.	PGCCDBS, ICES IBTSWG	Survey	PGCCDBS agrees
WGWIDE11_05	Boarfish	Acoustic survey established for one year only self-funded by industry	Following the MoU between ICES and EU boarfish (Capros aper) was included into WGWIDE. The Acoustic survey needs to be continued annually and should be considered under the DCF.	PGCCDBS, EU	Survey The needed to include boarfish in DCF was already highlithed by ICES at the Liaison Meeeting	This is for consideration by the EC in relation of cost-effective use of DCF survey funds.
WGWIDE11_06	Horse Mackerel – Western Stock	Uncertainties in the use of the current egg production method for the assessment	Evaluation of the assessment model based on egg production and fecundity	ICES-WGMEGS in 2012	Survey	No action by PGCCDBS

ID	Stock	Data Problem	How to be addressed in	By who	Additional Comments from ICES secretariat	Action proposed by PGCCDBS
WGWIDE11_07	Horse Mackerel – North Sea Stock	Lack of sampling and survey data. Currently only IBTS data are available which are not entirely suitable for pelagic species	Collection of information from other working groups. Possible implementation of an acoustic survey for horse mackerel in 3rd or 4th Quarter.	PGCCDBS, RCM, ICES-HAWG	Survey	Refer to ICES acoustic survey planning group.
WGWIDE11_08	Horse Mackerel – North Sea Stock	Age reading results show conflicting data for VIId which may be related to the variable mix of Western and North sea stock in VIId	A horse mackerel age reading exchange and genetic studies of stock components should be considered	PGCCDBS, National Laboratories	Age The WKARHOM, will take place in April	PGCCDBS will not take action until after the WKARHOM. PGCCDBS-recommendations will depend on the WKARHOM results.
WGWIDE11_09	Northeast Atlantic Mackerel	Lack of samples for some area/quarter/fleet combinations	Sampling coverage could be improved by increased cooperation between national laboratories (especially those with similar fleets)	PGCCDBS, RCM, National Laboratories	Methodology	To be forwarded and discussed at RCMNEA 2012.

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WGWIDE11_10	Northeast Atlantic Mackerel	Lack of discard information	National sampling programmes should provide information if discarding occurs for all national fishing metiers / fleet segments and should provide discard data for those fisheries where discarding occurs.	National Laboratories, RCMs, ICES-SGPIDS.	Discards/data deliver	To be forwarded and discussed at RCMNEA 2012.
WGWIDE11_11	Norwegian Spring Spawning Herring	Contrasting age distributions between laboratories in the May survey	It is recommended that a workshop on age reading is required for NSS herring to address discrepancies across nations, encountered during the recent May surveys	PGCCDBS to consider	Age	PGCCDBS has planned a small scale exchange to assess the discrepancies as suggested in the PG guidelines. Coordinator: Jane Amtoft Godiksen (Norway)

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WGBFAS11_01	WB cod	No tuning index from fishery independent surveys for ages 4–6+.	Due to low internal consistencies it was decided during WKROUND 2009 to not include ages 4-6+ from the Havfisken and Solea (BITS) into the assessment. It should be examined if the index from the two surveys could be combined into one index and/or what is needed (calibration?...) to achieve this	WGBIFS	Survey Could this be a case study for the WGISDAA??????	No action by PGCCDBS
WGBFAS11_02	WB cod	Commercial tuning fleet	As the Danish commercial tuning fleet is the only one covering older age groups it would be beneficial to have an alternative tuning fleet from Germany to explore consistency.	Germany		No action by PGCCDBS

ID	Stock	Data Problem	How to be addressed in	By who	Additional Comments from ICES secretariat	Action proposed by PGCCDBS
WGBFAS11_03	WB cod	Mixing of cod stocks in subdivision 24-Quality data from otoliths	Due to the mixing between east and west Baltic it could be beneficial to get the German and Danish otolith data to explore the mixing of otolith in SD 24. The quality of the otoliths may be one way to explore the mixing	Denmark and Germany	Age This recommendation was already forward to ICES Delegates: Germany and Denmark	PGCCDBS refers to the ongoing study in DTU aqua; contactperson: Karin Hüssy (kh@aqua.dtu.dk)

ID	Stock	Data Problem	How to be addressed in	By who	Additional Comments from ICES secretariat	Action proposed by PGCCDBS
WGBFAS11_04	Herring 25-29, 32 (excl. Gulf of Riga)	Mixture of herring and sprat in pelagic fisheries. Estimation procedures for catch proportions not always described	It is expected that misreporting of catches occurs (either underreporting or overreporting), as the species composition of clupeoids is hard to estimate in mixed pelagic fishery. Since 2006 the restrictions on unsorted landings, including EU member states obligation to ensure adequate sampling may have improved the accuracy of estimating proportions of sprat and herring in the catches. It is not clear to WGBFAS however how the sampling is used to modify proportions of clupeoids compared to the official landing statistics. The sampling and calculations of landing figures would be recommended to be in depth analysed in connection with the next benchmark assessment.	All countries participating in the fisheries		PGCCDBS agrees

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WGBAST11_01	Baltic salmon	Misreporting and unreporting of catches	A large scale misreporting of salmon as sea-trout and also unreporting of catches in the Polish sea fishery could be prevented by an improved inspection by the Polish and EU fisheries authorities		Data quality	To be discussed on WKESDCF
WGBAST11_02	Baltic salmon	Reporting rate of catches	Estimates for the rate of unreporting for each fishery need to be re-evaluated by compiling the expert opinions from each country	WG	Data quality	To be discussed on WKESDCF
WGBAST11_03	Baltic salmon	Amount of discards	The amount of undersized salmon in long-line fisheries and in the by catch of other fisheries (e.g. pelagic trawling) should be evaluated	National institutes under DCF, RCM Baltic Sea	Discards	To be discussed on WKESDCF

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WGBAST11_04	Baltic salmon	Age and stock composition of catches	Returns of the tagged salmon are low. Alternative tagging methods should be tested. Also a supplementary catch sampling is needed in each fishery. An evaluation of the associated data collected under DCF should to be evaluated.	WG	Data quality	PGCCDBS welcomes every initiative regarding data qualtiy and studies incorporating known age datasets.
WGBAST11_05	Baltic salmon	Stock-recruit data	It is important that index rivers are established in relevant assessment units to increase precision in assessment, such as estimates of sea survival	National institutes under DCF, RCM Baltic Sea	Data quality	To be discussed on WKESDCF
WGBAST11_06	Baltic salmon	Baseline genetic data	Baseline samples of the selected salmon stocks, particularly in AU 5 and AU 6, should be updated.	National institutes under DCF, RCM Baltic Sea		To be discussed on WKESDCF

ID	Stock	Data Problem	How to be addressed in	By who	Additional Comments from ICES secretariat	Action proposed by PGCCDBS
WGBAST11_07	Baltic sea trout	Missing catch data	Catch estimates of the recreational fisheries are defective or completely missing from part of the countries. Studies to estimate these catches should be carried out.	National institutes under DCF, RCM Baltic Sea	Data deliver	No action by PGCCDBS
WGEEL11_01	Eel	Eel specific fisheries independent surveys are lacking in most member states and need international impetus and co-ordination. Fisheries dependent surveys, especially recruitment data, are becoming increasingly vulnerable. Analysis of recruitment time series data has been the main tool in the past for assessing the overall status of the stock.	It is proposed that a workshop be convened to assess and make recommendations for improved fisheries dependent sampling and scientific surveys in the DCF.	PGCCDBS	Survey The WKESDCF will address this	No action need, at this stage.

Annex 13: Updated list of AWG data contact persons 2012

List of data contact persons 2012

Expert Group	Name	E-mail
AFWG	Gjert Dingsör	gjert.endre.dingsoer@imr.no
HAWG	Lotte Worsøe Clausen	law@aqua.dtu.dk
NWWG	Heino Fock	heino.fock@vti.bund.de
WGBAST	Tapani Pakarinen	tapani.pakarinen@rktl.fi
WGNAS	Ian Russell	ian.russell@cefas.co.uk
WGBFAS	Katja Ringdahl	katja.ringdahl@fiskeriverket.se
WGHMM	Iñaki Quincoces	iquincoces@azti.es
WGCSE	Colm Lordan	clordan@marine.ie
WGNSSK	Alexander Kempf	alexander.kempf@vti.bund.de
NIPAG	Carsten Hvingel	carsten.hvingel@imr.no *
WGWIDE	Jens Ulleweit	jens.ulleweit@vti.bund.de
WGHANSA	Alexandra Silva (sardine IXa, VIIIc) Beatriz Roel (sardine VIIIab, VII, VI and IV) Lionel Pawlowski (anchovy VII,VI and IV) Leire Ibaibarriaga (anchovy VIII) Fernando Ramos (anchovy Div. IXa) Alberto Murta (horse mackerel IX)	asilva@ipimar.pt beatriz.roel@cefas.co.uk * lionel.pawlowski@ifremer.fr * libaibarriaga@azti.es fernando.ramos@cd.ieo.es amurta@ipimar.pt
WGDEEP	Leonie Dransfeld	leonie.dransfeld@marine.ie
WGEEL	Allan Walker	alan.walker@cefas.co.uk
WGMIXFISH	Alexander Kempf	alexander.kempf@vti.bund.de
WGEF	Graham Johnston	graham.johnston@marine.ie
WGBYC	Bram Couperus	bram.couperus@wur.nl
WKRED 2012	Christoph Stransky	christoph.stransky@vti.bund.de
IBP NEW 2012	To be announced	
WKROUND 2012	To be announced	
WGNEW	Kelle Moreau	kelle.moreau@ilvo.vlaanderen.be
WKFLAT 2012	Robert Scott	robert.scott@cefas.co.uk

*Not confirmed during PGCCDBS 2012

Annex 14: Proposal for format of RCM Recommendations Database

ID	RCM	Topic	Priority	Description	Follow-up actions needed	Reciever	Contact person	Deadline	Comments & follow-up	Status
NSEA_2010_01	NSEA2010	métier		RCM NS&EA recommends France to allocate sea-sampling effort to OTB_DEF_100-119_0_0 and to sample this metier for discards	France to sample and to amend their National Programme	France		June 2010	RCMNS&EA notes that this is adjusted in the French NP and the allocation scheme was checked with Joël Vigneau	OK
NSEA_2011_01	NSEA2011	stock		The RCM NS&EA recommends that the task sharing species are investigating by MS participating in current age reading programs and decide whether task sharing is desirable or possible for the future.	MS to investigate each task sharing opportunity with specific MS taking responsibility for each species and report for the chair of RCM NS&EA	MS		01/12/2011		
NA_2011_01	NA2011			RCM NA recommends MS to describe the methodology on the determination of the catches of the 2 *Lophius* species. This information should be available to the 2013 benchmark assessment	Prepare a document to be forwarded to the WGHMM *Lophius* stock coordinators	MS		end of 2011		

ID **An ID specifically allocated to the RCM as the sender. The ID of ICES is kept for the recommendations for which the RCM or the LM is the receiver.**

RCM **The RCM who is the sender of the recommendation, strategic comment or suggestion.**

Topic	**According to the DCF set up: métier, biological, transversal, data quality, general.**
Priority level	**Some of the recommendations are more strategic issues or suggestions.**
	R = "real" recommendation.
	SCS = Strategic Comments and Suggestions.
	As well the R as the SCS are given a number according to the priority linked to the R or SCS.
Description	**A clear description of the recommendation, the strategic issue or the comment.**
Follow up actions	**The actions to be taken by the receiver to whom the recommendation is addressed.**
Receiver	**The body or person who needs to take the action described.**
Contact person	**The contact person for this recommendation in the RCM.**
Deadline	**The deadline for follow up.**
Comments & follow up	**Gives some more information if the receiver has taken action and up to what extent problems were arising during follow up.**
Status	**Indicates if the action is finalized or still in progress and up to which extent still to be followed up .**

finalized = recommendation is followed-up and can be closed.

rejected = recommendation was rejected after consideration.

forwarded = recommendation was not addressed at the right forum, but is forwarded to the right place.

Annex 15: PGCCDBS 2013 ToRs

2012/x/ACOMxx The **Planning Group on Commercial Catches, Discards and Biological Sampling** [PGCCDBS] chaired by Mike Armstrong, UK, and Gráinne Ni Chonchuir, Ireland, will meet in Belfast, Northern Ireland from the 18th–22nd of February 2013.

Review last year's PGCCDBS recommendations and responsive actions taken.

a) Review the outcomes of workshops, study groups, exchange schemes and other intersession work related to sampling design, collection, interpretation and quality assurance of data on stock-related biological variables (age and growth; maturity and fecundity; sex ratio).

b) Review the outcomes of workshops, study groups and other intersession work related to sampling design, collection, interpretation and quality assurance of data on fleet/métier related variables (discards estimates and length/age compositions of landings and discards).

c) Respond to data issues reported to PGCCDBS by ICES Expert Groups, Assessment Working Groups (including PGCCDBS-AWG contact persons) and RCMs by providing advice on suitable actions and responsibilities for those actions.

d) Report on the implementation of the Quality Assurance Framework (QAF) by ICES Expert Groups, and make recommendations for further development of the QAF and procedures for ensuring its full implementation in stock assessments and associated advice.

e) Review and present practical examples of progress in developing enabling technologies and equipment for data collection from fisheries.

PGCCDBS will report by 29 March 2013 for the attention of ACOM.

Supporting Information

Priority:	Essential
Scientific justification:	The Planning Group and workshops are proposed in response to the EC-ICES MoU that requests ICES to provide support for the Data Collection Framework (DCF; EC Reg. 199/2008 and 665/2008, Decisions 2008/949/EC and 2010/93/EU). PGCCDBS is the ICES forum for planning and co-ordination of collection of data for stock assessment purposes; it coordinates and initiates the development of methods and adopts sampling standards and guidelines. Many activities in this group are closely linked to the activities of the EU DCF and DG MARE is a member of PGCCDBS to ensure proper coordination with the DCF activities. Stock assessment requires data covering the total removal from the fish stocks and the PG serves as a forum for coordination with non-EU member countries where appropriate. The PG shall develop and approve standards for best sampling practices within its remits and for fisheries in the ICES area. The implementation of these practices is discussed regionally and implemented nationally. The PG coordinates initiatives for workshops and other activities to address specific problems. The success of the workshops requires a substantial amount of preparatory work in the laboratories. This preparatory work is the responsibility of the national laboratories. ICES have been informed that this work is included in the national annual DCF work plans. Under ToR b) and c), recommendations for further work should be compiled and a workplan for 2014 should be agreed. Under ToR b), a suitable format for reporting information from age workshops and exchanges on likely errors in age composition data to the Assessment Working Groups should be developed. ToR c) includes the following task: - Review developments between Regional Advisory Councils and ICES in developing regional taskforces to address data deficiencies and problems impeding assessments, and recommend how these could link most effectively with PGCCDBS. ToR d) includes the following tasks: - Develop a summary overview of the types of data problems reported to PGCCDBS, and provide advice to the Liaison Meeting and relevant RCMs on where recurring problems could be addressed through improvements in sampling design, coverage, intensity and international collaboration within the EU Data Collection Framework. ToR e) includes: Review latest developments in setting up regional data bases, and advise on the information needed from the data bases to produce reports on quality indicators for time-series data; taking into account aspects of sampling design and data analysis recommended by WKs PRECISE, ACCU, MERGE, PICS, etc. - Evaluate the impact of any recent changes in data collection on the continuity of data series. - Consider how to develop a suitable format for reporting information from age workshops and exchanges on likely errors in age composition data to the Assessment Working Groups and propose to WKSABCAL. - Propose development of the WKACCU scorecard to include weightings allowing identification of the key sources of bias affecting the quality of stock assessments and advice. The meeting will take place in Belfast, Northern Ireland and will be held in parallel with the corresponding planning group for the Mediterranean EU fisheries (PGMED).
Resource requirements:	Participation for a maximum of two people from each MS should be considered for funding within the DCF.
Participants:	Scientists involved in the EU Data Collection Framework and other data collection schemes, usually 30–40 participants.
Secretariat facilities:	
Financial:	
Linkages to advisory committees:	ACOM
Linkages to other committees or groups:	SciCom, fish stock assessment working groups, RCM's, Expert Groups, The Commission
Linkages to other organizations:	DG MARE (DCF)

Annex 16: PGCCDBS 2012 Workplan

The following Workshops and Study Groups are scheduled for 2012.

Acronym	Dates	Chairs	Venue
WKARHOM Workshop on Age Reading of horse mackerel (*Trachurus trachurus*), Mediterranean horse mackerel (*Trachurus mediterraneus*) and blue jack mackerel (*Trachurus picturatus*)	23–27 April 2012	Alberto Murta (Portugal) and Pablo Ablaunza (Spain)	Lisbon, Portugal
WKADS-2 Workshop on Age Determination of Salmon	June 2012	Jonathan White, Ireland	Londonderry, N.Ireland
WKACM2 Workshop on Age reading red mullet (*Mullus barbatus*) and striped red mullet (*Mullus surmuletus*)	2–6 July 2012	Kelig Mahé, France	Boulogne-sur-Mer, France
WKAMDEEP Workshop on Age Estimation Methods of Deep-water Species	22–26 October 2012	Ole Thomas Albert, Norway, and Beatriz Morales Nin, Spain	Esporles, Spain

Acronym	Dates	Chairs	Venue
WKMSTB Workshop on Sexual Maturity Staging of Turbot and Brill	5–9 March 2012	Ingeborg de Boois and Cindy van Damme, The Netherlands	Ijmuiden, The Netherlands
WKMATCH Workshop for maturity staging chairs	11–15 June 2012	Fran Saborido-Rey, Spain	Split, Croatia
WKMSGAD Workshop on Sexual Maturity Staging of Cod, Whiting, Haddock, Saithe and Hake	12–16 November 2012	Francesca Vitale, Sweden, and Maria Korta, Spain	San Sebastian, Spain
WKMSEL-2 Workshop on sexual maturity staging of elasmobranchs	19–23 November 2012	Fabrizio Serena, Italy and Barbara Pereira, Portugal	Lisbon, Portugal

Acronym	Dates	Chairs	Venue
WKPICS2 Workshop on practical implementation of statistical sound catch sampling programmes	6–9 November 2012	Jon Helge Vølstad (Norway) and Mike Armstrong(UK)	ICES HQ
SGPIDS2 Study Group on Practical Implementation of Discard Sampling Plans	25–29 June 2012	Edwin van Helmond, (the Netherlands)	ICES HQ

The following Exchanges are scheduled for 2012.

Species	Coordinator
Turbot- Full scale exchange	Annemie Zenner, Belgium
Brill- Small scale exchange	Annemie Zenner,Belgium
Megrim-Small scale exchange	Mark Etherton
North Sea Sole-Small scale exchange	Mark Etherton

Annex 17: PGCCDBS 2013 and beyond proposals

Proposals for Workshops 2013 and beyond

Below is a list of proposed workshops scheduled for 2013 and beyond.

- WKARBLUE, Workshop on age reading of Blue whiting, Chaired by M. Meixide, Spain and J. Amtoft Godiksen, Norway will meet in Bergen, Norway, from 10–14 June 2013.
- WKNARC2, The Workshop of National Age Readings Coordinators, Chaired by Ângela Canha, Portugal, and Lotte Worsøe Clausen, Denmark, will meet in Horta (Portugal), 13–17 May 2013.
- WKSABCAL, Workshop on the Statistical Analysis of Biological Calibration Studies has been postponed until 2014; the ToRs for this WK are available in the PGCCDBS 2011 report.
- WKAVSG, Workshop on Age Validation Studies for Gadoids, Appointed chair Karin Hussi,Denmark, and Beatriz Morales-Nin, Spain, will meet in IMEDEA, Mallorca and the 22–26 April 2013.
- WKMIAS, Workshop on Micro increment daily growth in European Anchovy and Sardine, will meet in Mazara del Vallo, Sicily from 21–25 October 2013. Appointed chairs , G. Basilone, Italy, B. Villamor, Spain and M. La Mesa, Italy.
- WKPICS3, Workshop on the Practical Implementation of Statically Sound Catch Sampling Programmes, Chaired by Jon Helge Vølstad, Norway and Mike Armstrong, UK, will meet at ICES in Copenhagen in November 2013.

Proposals for exchanges 2013 and beyond

The following are proposals for small scale and full scale age exchanges in 2013.

- Sprat, Full scale exchange North Sea only. Appointed coordinator Lotte W. Clausen (Denmark).
- Mackerel, small scale exchange. Appointed coordinator Jens Ulleweit (Germany).
- Herring (Norwegian spring spawner), small exchange. Appointed coordinator Jane Amtoft Godiksen (Norway).
- Saithe, Full exchange using only images for all areas. Appointed coordinator: Kélig Mahe (France).
- Capelin. A small exchange was scheduled between Iceland and Norway in 2013 but is no longer necessary as a non-ICES exchange took place between Norway, Iceland, Russia and Canada in 2010-11. The results will be reported to PGCCDBS in 2013.
- Dab, The proposed 2012 Dab exchange is now postponed until 2013.
- Sea bass, Full exchange. Coordinator Kélig Mahe (France).

Proposal for collaborative studies contracts

PGCCDBS 2012 makes three proposals for study contracts. Two are related to stock-based biological variables:

i) A collaborative study on anglerfish (*Lophius piscatorius*) Priority 1.

ii) A study on stock- and component related issues for the herring in the West of Scotland, West of Ireland, Irish Sea and North Sea. Priority 2.

The anglerfish study is considered to have the highest priority of the two proposals (see Sections 3.9.1 and 3.9.2 for more details).

The third is related to sampling survey design:

iii) A collaborative study contract on "Support design based regional data collection programmes". Further details can be found in Section 4.3.4

Proposal for ICES Cooperative Research Report

PGCCDBS has proposed an ICES cooperative research report (CRR) on the Protocols on the ageing of different fish species in the ICES area. More details can be found in Section 3.10 and the full draft resolution for this CRR is available in Annex 7.

Proposal for ICES training course

PGCCDBS recommends that ICES provide a series of training courses covering the design of statistically sound catch sampling for fisheries monitoring programmes. The full proposal is detailed in Section 4.3 and in Annex 11.

Proposal for 2013 ICES ASC Theme Session

PGCCDBS proposes a theme session at the 2013 ICES Annual Science Conference – "Improving statistical survey methods for monitoring commercial catches" – A template will be submitted in time for consideration by September 2012. Further details are available in Section 4.3.3.

Annex 18: PGCCDBS actions and recommendations 2012

PGCCDBS actions

Section 1.4

Improving the integration of PGCCDBS and PGMed

- For the meetings: (i) when possible, join all presentations of potential interests for the Mediterranean together, so that PGMed can have more time to work on their specific ToRs; (ii) presentation of PGMed main results and discussions in plenary on the last day.
- For the report: (i) include a summary of relevant issues discussed in plenary in the PGMed report; (ii) include the list of ToRs of each group in the other's report; (iii) include the list of participants of each group in the other's report; (iv) add a link to the online report; (v) include the list of workshops of potential interest of each PG. To be actioned by the chairs of PGCCDBS and PGMed.

Section 3.5

Maintaining and updating the Interactive Tables for Age and Maturity

- The Interactive table of age calibration reports by ICES species-stocks will be uploaded to the PGCCDBS European Age Readers Forum and all age calibration reports will be moved to the PGCCDBS docs repository, with links back to the original ICES database locations (e.g. the European Age Readers Forum SharePoint site (Cristina Morgado). Missing age calibration reports located by PGCCDBS scientists and colleagues will be sent to Jane Godiksen who will coordinate with the ICES Secretariat to keep the table updated. Francesca Vitale will coordinate with the ICES Secretariat to keep the Interactive table of maturity calibration reports by ICES species-stocks updated, and this will be uploaded onto the PGCCDBS docs repository.

Section 3.6

European Age Readers Forum

- All members of the European Age Readers Forum SharePoint should be informed that they can be alerted to updates on the site by activating the e-mail notification system. To be Actioned by the ICES Secretariat.
- Details of the location and ownership of Reference collections of both annotated agreed age images and calcified structures should be housed on the forum. To be actioned by Workshop coordinators.

Section 3.6

WebGR

From recommendations of WebGR users some short-term needed developments have been identified.

- Develop installation packages in order to allow an easy set-up of the tool in servers different from the one provided by the WebGR consortium and in Windows and Linux environments.

- System need to provide better information about errors encountered during the batch upload of images, since it has been identified as the major problem by coordinators when setting up a new workshop.
- Since the average user is not an IT professional a better user manual need to be written and an FAQ system would be desirable in WebGR's wiki page.
- A tool allowing calibrating a set of images from the pixel to real distance ratio for having a calibration bar in the annotation screen is expected to be a great help for readers.
- An R package (RWebGR) on statistical methodologies that will be developed during WKSABCAL 2014 for analysis of results of maturity and ageing workshops needs to be developed and its direct link to WebGR.
- Develop a tool that allows performing daily rings study.
- In the medium term and considering that WebGR has an Adobe Flash based interface that is likely to be discontinued by Adobe, start migrating the interface to other standards like HTML5 would be advisable to.

Section 4.1

Revision of ToRs

- Changes to the ToRs of WKPICS2 and SGPIDS2. In relation to fleet based biological sampling were recommended during the PGCCDBS 2012 meeting. To be actioned by the chairs of WKPICS2 and SGPIDS2 and ICES Secretariat.

Section 6.4

Follow-through of SGPIDS and WKPICS recommendations

- PGCCDBS recommends that the PGCCDBS 2013 meeting reviews progress by SGPIDS and WKPICS in identifying quality indicators and how they may be best used to, inform national sampling coordinators that may need to revisit their sampling designs and or improve on their sampling frequency and inform end users whether or how the data can be used for the assessment they are attempting. To be actioned by the PGCCDBS chairs for the PGCCDBS meeting 2013.

Section 7.1

Enabling technologies

- PGCCDBS would like to encourage and stimulate any initiative to develop electronic facilities for collecting data e.g. length and weight measurements. To speed up the process, there is a need to make more people aware of the existing technologies as well as getting a broader involvement of other expertise. In order to start this process the following action is proposed:
- An article will be written in the ICES InsideOut and other fisheries magazines where possible on current technology in use and on emerging enabling technologies which simplify biological data collection. This will be done jointly by Els Torreele, Belgium and Jørgen Dalskov, Denmark.

PGCCDBS recommendations to other groups

Section 5.4

PGCCDBS Recommends that a Recommendations Database set up by the **ICES secretariat** on the RCM Share Point for all areas. It will be accessible by all RCM members in read-only format and the RCM chairs will have read/write access. All recommendations, as well all strategic comments and suggestions, should be available in the recommendations database.

Section 6.1

PGCCDBS recommends the **RDB Steering Group** should consider how to produce reports on quality indicators for time-series data; taking into account aspects of sampling design and data analysis recommended by WKs PRECISE, ACCU, MERGE, PICS, and in a format useful to the end users (AWGs/EGs, etc.).

Section 6.3

PGCCDBS recommends that **WKNARC2** should review what experience there may be, worldwide, of incorporating age based uncertainties into age based assessments.

Section 6.4

PGCCDBS recommends that **SGPIDS** forward the outcome of their latest meeting to WKPICS2 who will coordinate responses relating to both onshore and offshore sampling schemes and make recommendations on the development of the WKACCU score cards. This may lead to a more focussed workshop on the development of these score cards in 2013–2014.

Section 7.2

PGCCDBS recommends that the **Commission and ICES** jointly consider how to address the following concern and ensure that Member States receive access to VMS data:

> As real time access to logbook and VMS data is crucial for carrying out cost efficient data collection and ensuring quality of the sampling process the PGCCDBS would like to stress the importance for the national authorities holding this data to find solutions for the national institutes to get on line access to the data.