

ICES Annual Science Conference

2006

Open and Invited Lectures

Open Lecture on Marine Biodiversity: the Exploration and Understanding of the Blue Planet

Carlo Heip, The Netherlands

There are over 230,000 marine plant and animal species and a few thousand marine microbes described worldwide. Many more await discovery. Their role in structuring marine ecosystems and driving biogeochemical cycles is only partially known. Besides, there are very different views on the respective roles of macro- and microbiota. Traditional theoretical ecology and fisheries biology tend to ignore bacteria and archaea altogether whereas in biogeochemistry and global change science the importance of higher organisms in driving the fluxes of elements is considered marginal at best. This has resulted in two (or more) very different world views, one where the earth is dominated by microbes, including viruses, and the other, more anthropocentric one, where species of interest (or visible) to humans are central. Top-down and bottom-up regulation of food webs are both valid approaches to understand ecosystem structure but they need conceptual reconciliation.

The recent discoveries in the microbial world have shown that our view of the oceans is still limited and even paradigms still shift easily. Examples of new genes and organisms abound and new biogeochemical processes are the recently discovered nitrification by Archaea, the Anammox reaction, and photosynthesis using rhodopsin-like pigments. But also our view of marine food webs and the role of higher organisms is still changing, for instance the importance of chemical messengers and chemical defences in the marine environment is only now becoming realized. These substances are potentially of great importance to mankind. Developments in technology are crucial for further exploration and molecular tools have already revolutionized knowledge on microbial and genetic diversity. New methods in using markers and tracers as well as new developments in modelling allow unravelling food webs in totally new ways.

The increasing human pressure on marine top predators in coastal areas and in the open ocean may have dramatic consequences on the functioning of benthic coastal systems and pelagic ecosystems worldwide. To this must be added the possible effects of climate change such as changing SST, circulation patterns, and ocean acidification. Despite over one century of systematic research on the marine environment, we still are lacking much basic knowledge on genetics, physiology, ecology, and behaviour that will allow for predictions on how populations will adapt to these changes. Again new technology will be crucial. Tagging and tracking of larger animals has allowed much better understanding of migration and feeding behaviour. And last but not least: exploration and discovery will continue to yield new information and new observation and information technology and data management technology are greatly improving our analytical capacity to understand and predict biodiversity and its change and therefore our capacity to protect and sustainably exploit the marine environment.

Biography

Carlo Heip (born 18 November 1945, Belgian nationality) is a marine biologist, presently director of the Centre for Estuarine and Marine Ecology of the Netherlands Institute of Ecology, director of the Royal Netherlands Institute for Sea Research (as of October 1, 2006) and professor at the universities of Gent (Belgium) and Groningen (The Netherlands). His current research is on the link between benthic biology, biodiversity, and biogeochemical cycles. He has over 100 papers in peer-reviewed journals and has edited six books. He was responsible for many EU-sponsored projects, including OMEX (Ocean Margin Exchange) and ECOFLAT, part of ELOISE (European Land-Ocean Interaction Studies). In recent years, as President of the European Marine Research Stations MARS network, he has been active in creating a marine biodiversity research programme for Europe. He is now co-ordinator of the EU Network of Excellence MARBEF (Marine Biodiversity and Ecosystem Functioning) and member of the steering and advisory committees of many European institutes and projects, and internationally in the DIVERSITAS programme and the Census of Marine Life.



Invited Lecture on Marine Data – A Big Issue

Lesley Rickards (UK)

Marine data underpin many of the activities we undertake including scientific research, modelling, monitoring, and assessment. These data are a unique resource, both now and in the future, and over the years a variety of databases have been compiled bringing together data from many different sources. In recent years there has been need for access to more interdisciplinary and integrated data sets to further our knowledge and understanding and to better manage the marine environment, including taking an ecosystem approach. In addition there is an increasing requirement for operational data in near-real-time for forecasting.

This presentation will highlight some of the recent advances and successes made in providing access to integrated data sets using a variety of examples (e.g. the WOCE data system, the Ocean Biogeographic Information System (OBIS), Argo, Canadian GeoBrowser, regional GOOS pilot projects). It will also consider briefly the use of modern IT techniques to improve the service to users (e.g. internet, web, distributed systems, GIS, XML, etc.) and the setting and use of the common standards (metadata, data quality control, data stewardship). Examples of developments will be described (e.g. within Europe the SeaSearch and SeaDataNet projects and in the USA, the Integrated Ocean Observing System (IOOS) Plan for Data Management and Communications (DMAC).

However, much remains to be done and an analysis of the missing elements will also be presented together with some ideas on how these can be resolved to allow simple access to all types of marine data (and information) on an appropriate time scale.

Biography

Lesley Rickards graduated from the University of East Anglia, Norwich, UK, in 1977 with a B.Sc. in Environmental Sciences.

Subsequently she obtained a Ph.D. in Geophysical Fluid Dynamics from Newcastle University (1982). She has worked at BODC since November 1980. In her early days at BODC she was responsible for quality control of moored current meter, sea level and CTD data, and assembling high quality data sets. Following on from this she took over responsibility for management of the UK's National Oceanographic Data Bank. She became Deputy Director of BODC in 2001.

Her current responsibilities within BODC include managing the UK Argo Data Centre and the GLOSS/CLIVAR Delayed-mode Sea Level Data Centre.



Nationally, she has held the post of the Marine Environmental Data Coordinator, under the auspices of the Inter Agency Committee on Marine Science and Technology (IACMST) since 1996. This has a remit of improving availability of, and access to, marine environmental data, including developing and making available national inventories of data, developing guidelines for data management, and improving mechanisms for exchange of marine data.

Over the last five years, Dr Rickards has led Work Packages for several EU-funded data management projects with a particular interest in metadata catalogues and data quality control standards. Currently she is leading the development of a quality control standard manual for the EU SeaDataNet project.

Currently, she is Chair of the IOC's International Oceanographic Data and Information Exchange Committee (IODE); she represents IODE on the Joint Commission for Oceanography and Marine Meteorology (JCOMM) Management Committee and is a member of the joint JCOMM/IODE Expert Team on Data Management Practices and the IOC/JCOMM Group of Experts on the Global Sea Level Observing System (GLOSS). Dr Rickards has been a member of the ICES Study Group on Management of Integrated Data and she chaired the ICES Working Group on Marine Data Management between 1993 and 1998 and also in 2002.

Invited Lecture on Marine ecosystems and fish stocks under climate variability and change

Svein Sundby, Norway

The world oceans comprise a diversity of marine ecosystems with their specific physical settings and climate regimes. Responses of fish stocks to ecosystem changes, climate variability and climate change are similarly diverse and the critical factors for growth and survival of the organisms in the various marine ecosystems may vary considerably. Additionally, critical factors may also vary with time within a specific marine ecosystem depending on the state of the system. Specific marine species, e.g. Atlantic cod, have developed different strategies of growth and survival (or through evolution developed different adaptations) depending on their habitats. Are there generic solutions to ecosystem-based approach and management under such diverse conditions? The understanding of the variability at lower trophic levels, as well as at higher trophic levels, and the mechanisms of trophic transfer are important factors towards this approach. Moreover, the understanding of how climate influences marine ecosystems needs to be de-convoluted from considering the influence of the thermal regime to exploring the functional effects of the full spectrum of interlinked climate variables. We need to distinguish between the physical variables influencing individual organisms and those having influence at the population level. The ocean dynamics and circulation have greater importance at lower trophic levels. In plankton populations, and particularly, in zooplankton populations, where generation time is long compared to advective times the changes in circulation pattern is the most important climate variable. This makes it important to assess local production compared to advected (or import) production when considering carrying capacity within a certain geographical region. When lacking information on variability in natural fish mortality this variable is often considered as a constant. However, natural mortality does vary with ecosystem state and climate conditions, and therefore effects of fishing mortality cannot be considered separate from natural mortality.

Climate-ecosystem correlations need to be followed by exploring the mechanisms behind. The ecosystem effect of a climate anomaly is dependent on the persistence. Multi-decadal climate variations have other effects on the ecosystem than decadal-scale and interannual climate variations. Although the amplitudes of interannual and decadal-scale climate variations are much larger than the amplitudes of multi-decadal climate variations, the latter seem to influence marine ecosystems more profoundly. This has implications for how we assess effects of climate change. The identification and understanding of the mechanisms of reversible and irreversible ecosystem responses needs to be done. The mechanisms behind irreversible ecosystem responses depend on the spatial scale considered. The issue of regime shifts is therefore also scale-dependent. Changes in ecosystems that appear as a regime shift on a limited spatial scale do not necessarily appear so on a larger spatial scale.

The issues of genetic separation of populations and identification of metapopulations are important aspects in the management of fish stocks, but the understanding of the mechanisms that keep fish stocks apart or mix them are poorly understood. The physical processes linked to climate change have the potential to influence such interactions, particularly during the egg, larval, and early juvenile stages.

Biography

Svein Sundby is principal oceanographer at the Institute of Marine Research, Bergen, chief scientist at Bjerknes Centre for Climate Research, and adjoint professor at the Geophysical Institute, University of Bergen. He started his scientific career as a physical oceanographer at the Institute of Marine Research in 1975 and later became a doctor in marine ecology. He has worked with fish recruitment processes in Arctic and boreal ecosystems as well as in upwelling ecosystems in the southern hemisphere, with emphasis on physical-biological interactions and ocean climate effects. He has been working with both modelling and field observations. As a professor at the



Geophysical Institute he lectures in physical-biological processes. Sundby knows GLOBEC from its early days. He was part of the small group of scientists that developed the ICES Cod and Climate Change Programme in the early 1990s. He was member of the GLOBEC Interim Steering Committee and later GLOBEC SSC that developed the Science and Implementation Plans until he stepped down from the committee in 1998. He was member of the IGBP/SCOR Task Team that developed the IMBER plan during 2002–2004. Under EUR-OCEANS European Network of Excellence he is currently leading System 1 on the Arctic and Nordic Seas. He has directed a number of national research projects and programmes.

Invited Lecture on Marine Sciences and Technologies in EC 7th Framework Programme for Research and Technological Development 2007–2013

Pierre Mathy, EC Commission

Marine Sciences and technologies have always been part of the EC Framework Programme for Research and Technological Development (FP) from its inception in the seventies.

The funding of marine research projects for the period 2002–2006 by the current FP 6 amounts to about €550 million. These projects address various thematic areas such as Space, Food Quality and Safety, Transport, Environment, and Energy.

Research into how to increase the competitive use of natural marine resources for the production of food and industrial materials, the understanding of marine ecosystem functioning in a changing environment, the prediction of future ecosystem patterns, and the protection of the marine environment and biodiversity are at the heart of the EC research action, as well as the support to EC policies, e.g. Environment and Fisheries policies.

Marine research contributes to the development of many sectors and addresses topics relevant to the public good in the broadest sense. It addresses the widest array of end-users from basic science to industry and policy-making. Marine sciences need a wider framework different from the national frameworks and must be structured on a European scale to be able to play a role on the global level. Marine sciences are also needed to address today's global environmental threats and challenges. Marine sciences can contribute to achieving the goals that European leaders set in Lisbon in March 2000 and in Barcelona in March 2002. For these reasons, a substantial marine research action is foreseen to be achieved within the Framework Programme 7 (2007–2013).

The orientations of this new Framework Programme in the field of marine research are widely based on the conclusions of the EUROCEANS 2004 Conference which took place in Galway (Ireland) in 2004 and on the “Galway Declaration” which was issued at this occasion.

The recent publication by the European Commission of the Green Paper “Towards a future Maritime Policy for the Union: A European vision for the oceans and the seas” has strengthened the Commission's intent to have a strong marine research action within FP7.

FP7 and the related Specific Programmes are currently discussed by the EU Council and the European Parliament in view of their adoption before the end of 2006. The first calls for proposals are expected to be issued in early 2007.

Biography

Pierre Mathy graduated as an Agricultural Engineer (University of Gembloux, Belgium) and began his career as Assistant at the University of Gembloux (Plant Biology Department and Air Pollution Laboratory) in 1974.

He joined the Belgian Forest Administration in 1978 where he was responsible for forest legislation, wood markets, and international relations.

He joined the EU Commission in 1984 as a Scientific Officer.

His main responsibilities have been in terrestrial ecosystems and global change. He gained experience in scientific cooperation and the preparation and implementation of EU Framework Programmes 3, 4, and 5 and is currently involved in executing Framework Programme 6.

In 2000 he became Head of Unit responsible for Management of Natural Resources under the 'Global Change and Ecosystems' programme.



Reports of Theme Sessions

Reports of Committees

Report of the Baltic Committee (BCC)

Chair: Cornelius Hammer (Germany)

Rapporteurs: Günther Nausch (Germany) and Thomas Neumann (Germany)

Summary

WKFDMM – was successful but will not be repeated for the time being

WKHRPB – time and venue should be harmonized with SGRECVAP

WKIAB – evolve to WGIAB

SGBEM – dissolved

SGABC – dissolved

SGMAB – dissolved

SGBFFI – renamed to SGBFFD with new ToRs, taking up remains from SGMAB

The meeting of BCC took part during two afternoons and started timely at 14:00 hrs on 20 September. 33 participants attended the sessions on 20 September while the meeting on 21 September had 45 participants.

- 1) The agenda was adopted with the addition of a discussion on a flounder workshop in Sweden under the topic AOB.
- 2) The appointed rapporteurs were for the first day Günther Nausch (Germany) and for the second day Thomas Neumann (Germany).
- 3) The proposal of the new advisory structure of ICES was briefly presented on the basis of the information available at that time, by means of a Power Point presentation from the Bureau. This was discussed and led to several questions:
 - It was questioned whether the new structure will lead to faster short-track advice;
 - It was doubted that one advisory meeting per year would be sufficient;
 - The advice-drafting or review groups are supposed to meet independent of each other and to draft the semi-finished advice without prior discussion with others. This is thought to lead to stagnation of the scientific discussion, unless a kind of AMAWG-meeting provides a platform for discussion and further development of the concepts;
 - The primary workload will be on the review groups. These are apparently supposed to be run at national expense; if so, is adequate attendance and chairmanship guaranteed?
 - It is not clear whether the proposed new structure will be able to cope with the given workload. Before making such far-reaching changes it would be important to have a work or resource allocation analysis. The workloads per group or level are neither quantified nor specified. On this basis the committee was not able to come to a qualified and informed decision.

Reports of Expert Groups

WKFDMM (Workshop on Fish Disease Monitoring) was very successful. Even though it was a single event only, it came up with a number of recommendations for follow-ups to establishing fish health monitoring programmes in the eastern part of the Baltic Sea. For the time being no continuation of the workshop is planned.

The **SGBFFI** (Study Group on Fish and Fisheries Issues) was discussed in conjunction with SGMAB and the new working group and study group structure as proposed by WKIAB (Fig. BCC1). The group will continue its work under its **new name** Study Group of Baltic Fish and Fisheries Dynamics (**SGBFFD**) (see below).

As a result BCC concluded that the number of SGs in support of BSRP should be reduced. The remaining SGs should then be recognized as regular ICES SGs. Financial support for attendance should be granted also to members of non-beneficiary countries. In the wake of this it was decided that **SGABC** (Study Group on Age Reading of Baltic Cod) should be terminated. SGABC concluded that in spite of its effort, it had not been able to solve the age reading problem for cod in the Baltic. It was felt that the upcoming EU-project (coordinated by Denmark) would be a better platform to address the issue. Remaining ToRs that need to be addressed have been passed on to SGBFFD.

Moreover, **SGBEM** (SG on Baltic Ecosystem Modelling) has been dissolved. The attendance of experts for Baltic ecosystem model development was not sufficient, despite the great efforts of the Chair to motivate adequate attendance. The SG was therefore not able to make the progress that was expected and needed. It was felt that this SG addressed important questions for the Baltic, but apparently the time is not yet ripe.

SGMAB (Study Group on Multispecies Assessment in the Baltic) postponed their spring 2006 meeting to autumn 2006. It was agreed in BCC that SGMAB would merge its work on multispecies model development into the new multispecies working group that deals with model development for the North Sea, Bay of Biscay, and the North Atlantic, and should consequently and preferably also do so for the Baltic Sea. Thus, SGMAB is going to be dissolved as such, and model development for the Baltic will take place in the over-arching multispecies working group, to harmonize the model development for the Baltic with those for other regions. This was felt to be important as model development and harmonization of models might otherwise take place without the Baltic, and necessary harmonization and development with other models would possibly not be given. However, it was considered important that actual MSVPA-runs were performed in a BCC environment. For this purpose SGBFFI was considered to be the best group to take this up, with new ToRs, the new name **Study Group of Baltic Fish and Fisheries Dynamics (SGBFFD)**, and a new focus, which now includes the application of multispecies models for the Baltic Sea. It was informally agreed that SGMAB will discuss the ToRs of SGBFFD and submit revised ToRs to BCC for decision in 2007.

These structural changes are embedded in an EG-Structure for the Baltic proposed by BCC in 2005 and have now been modified by the “slimming”-process of SG-groups in 2006 (Fig. BCC1). Essentially the Baltic Working Group Structure will consist of only two continuous working groups, the Working Group on Baltic Fisheries Assessment (**WGBFAS**) and the Working Group on Integrated Assessment for the Baltic (**WGIAB**) which in this process should evolve into a regular working group. It was the strong feeling of BCC that the WGIAB from 2006 should develop into a working group WGIAB immediately, based on the success of WGIAB and the fruitful relationships developed during the workshop with HELCOM.

A Workshop on Herring Recruitment Processes in the Baltic (**WKHRPB**) is planned to be conducted. It was proposed to attempt to coordinate this workshop with the Study Group on Recruitment Variability in North Sea Planktivorous Fish (SGRECVAP) by scheduling a back-to-back meeting in Plymouth in May 2007. The Chair of WKHRPB is asked to contact the Chair of SGRECVAP to try to arrange this.

Baltic Committee Group Structure

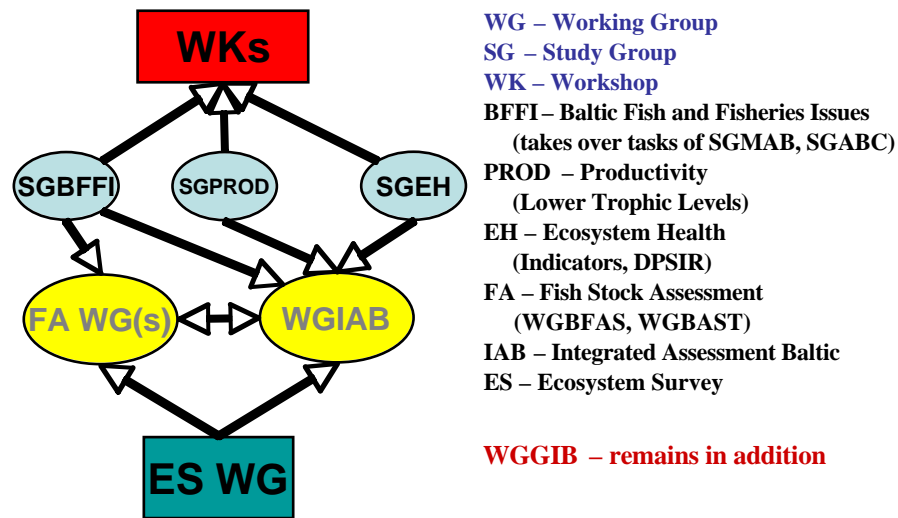


Figure BCC1. Structure diagram.

The two permanent working groups are supported by study groups of variable duration, depending on the functionality of the groups and the need at the time, to support the working groups with specific information. Naturally these SGs feed primarily into WGIAB. The SGs are supported by specific task- and problem-oriented workshops, which are created on demand. The permanent working groups are supported by the different survey working groups which provide the basis for coordinated ecosystem surveys and which make sure that the needed information for the two working groups is provided, e.g. providing sampling schemes for stomach sampling for MSVPA input or coordinating the collection of environmental data for WGIAB.

BCC unanimously felt that this is a sensible structure; including the reduction of study groups and that this is directly tuned to the needs in the Baltic Sea and is the outcome of a bottom-up approach to self-organization.

BONUS/BONUS-169

BCC supports strongly the BONUS-169 framework and science plan. BCC supports the underlying concept and is of the opinion that the research structure of the Baltic will immensely benefit from the implementation of BONUS-169 in the Baltic Sea.

Any other business

With regard to a flounder age-reading workshop planned for spring 2007, it was agreed that this should be organized under the umbrella of the Data Collection Regulation of the COM.

Report of the Diadromous Fish Committee (DFC)

Chair: Niall Ó Maoiléidigh (Ireland)

Rapporteur: Julian MacLean (UK, Scotland)

The Committee met on 20 and 22 September 2006. Between 16 and 30 people attended with 11 of the 26 committee members present over the 2 days.

Opening

The meeting was opened by the Chair who welcomed the participants. The agenda was adopted following the addition of items under AOB. The Committee appointed Julian MacLean (UK, Scotland) as rapporteur.

Committee business:

Matters arising from the Consultative Committee and the Advisory Committees

Discussion on restructuring process

An overview of the proposed restructuring of the ICES advisory structure, to be operational by 1 January 2008, was presented by the Chair. The new structure was still in development but one of the main objectives of the exercise was to develop an ecosystem approach, integrating fisheries and the environment into the advice process. The restructuring was to be cost neutral. DFC had four main issues which it wished to be clarified:

- How will the Advisory Group handle the development of an ecosystem approach given that the group is dominated by fishery experts?
- On a similar topic, as the process is changing to an ecosystem approach, what kind of final product is envisaged?
- What is the time scale for the output of expert groups to go through the review group?
- What are the arrangements for the Quality Assurance process?

Integrated ecosystem advice – continued request from the Consultative Committee for new ToRs to promote integration of fisheries and ecosystem advice

The DFC considered that the expert groups associated with DFC directly or indirectly (e.g. salmon and eels) had integrated changes in oceanic environmental factors (mainly SST) in the catch advice procedure or generally exerted their influence when assessing the status of stocks in assessments. Further integration is being explored which might enhance assessments.

Links with other committees and overlap

In general, DFC is content with the level of current linkage and overlap (e.g. with Mariculture, Living Resources, and ACFM) when proposing theme sessions, etc., and will continue to develop and strengthen cross-committee theme sessions.

Adequacy of arrangements for meeting

DFC reiterated that they were satisfied with the meeting arrangements and were pleased to note that their request for a conference style layout had been adopted for the DFC committee meetings.

Reports of expert groups

Overview of the Report of the Study Group on the Status of Diadromous Fish Species (SGSDS) and next steps

The document was to be used primarily to provide guidance on the status of specific diadromous fish species using national/international criteria. Two emergent issues relating to the status of these species were identified, namely;

- Water quality barriers in estuaries
- Human alterations to estuaries

DFC then considered possible ways in which to secure greater involvement from experts working on diadromous species other than salmon and eels. No firm conclusions were reached, but DFC was aware that ICES might ask for specific advice on particular species and that DFC would be required to respond.

Overview of the Working Group on North Atlantic Salmon (WGNAS) and ACFM advice and identify recommendations and new advances in research contained in the report

The current tenuous status of the stocks of North Atlantic salmon was noted. DFC then considered possible ways in which it could assist with some of the recommendations made in this report. Specifically, the DFC resolved to:

- Propose a Study Group on the Establishment of a Framework of Indicators for Salmon Stock Abundance to take place in November 2006.
- Propose a Workshop to collate and re-evaluate historical tag data from oceanic tag recoveries and oceanic tagging studies.

NASCO indicated that the priorities in the request to ICES in 2007 were both the development of a framework of indicators and the provision of catch advice for 2007.

Overview of the Working Group on Eel (WGEEL) and eel issues

An overview of the Working Group on Eel (WGEEL) was presented by the Chair of the Working Group, Willem Dekker (Netherlands). Recruitment values in 2005 remained low and prospects for recovery are being hampered by the slow development of EU management plans. In drafting the ToRs for the 2007 meeting it was recognized that the report would continue to focus on providing the traditional form of advice but that a separate research programme was required to enhance understanding of basic eel biology. It was stressed that until the biology was better understood, developing rational management practices was difficult.

A presentation on the forthcoming eel investigation under the Galathea 3 programme was given by Henrik Sparholt (ICES secretariat), who is involved in this project. This will take place in March and April 2007 in the Sargasso Sea. The aims are to investigate the spawning biology and genetic structuring of European and American eels. The specific tasks are to: describe the distribution of eel eggs and larvae, compare the distributions of European and American eels, compare these results with earlier studies, analyse the plankton ecosystem, assess the genetic diversity across the area of larval distribution, observe spawning eels, and capture mature eels. Any assistance by DFC members or associates with this project would be welcomed by the project group.

A presentation on a proposal for a CITES listing of eel was given by Håkan Wickström (Sweden). This is a Swedish proposal and, if successful, will provide an instrument to regulate the export trade of European glass eels which are currently being overexploited. DFC was

noted that there was an OSPAR proposal to protect eels and that some progress was also being made to protect the American eel.

Overview of the WGBAST and ACFM advice

The overview was presented by a member of the WGBAST, Lars Karlsson (Sweden). The assessment was performed on six groups of wild salmon, using a Bayesian approach. The status of wild salmon has increased over the last ten years, but the current smolt production is below the estimated full production capacity. On reviewing the report, ACFM found the Bayesian approach difficult to review and were concerned about the use of stock and recruitment parameters developed outside the Baltic. The WGBAST noted that the review group contained neither a salmon biologist nor a Bayesian statistician. DFC members acknowledged that the Bayesian approach was also adopted in some national assessments for North Atlantic salmon. Although somewhat more difficult to present than conventional methods, it could be an appropriate analysis in the right circumstances. The ACFM Chair confirmed that steps were being taken to review the approach and resolve the issue, stressing that ICES requires transparent models, with part of the concern being the need to communicate to stakeholders in a clear manner the way in which advice is formulated.

Forthcoming symposia and theme session topics

Report of the Joint NASCO/ICES Symposium on Interactions between Cultivated and Wild Diadromous Fish Stocks

A presentation was given by a co-convener, Lars P. Hansen (Norway). The objectives of the symposium were to:

- Summarize available knowledge of the interactions between aquaculture and wild salmon stocks and other diadromous fish species;
- Identify gaps in the current understanding of these interactions and to develop recommendations for future research priorities;
- Review progress in managing interactions, the remaining challenges, and possible solutions;
- Make recommendations for additional measures to ensure that aquaculture practices are sustainable and consistent with the precautionary approach.

Participants from 17 countries contributed to a total of 35 papers and 13 posters. A number of recommendations resulted, including improving farm salmon cage technology, developing methods to recapture escapees, controlling sea lice and understanding their dispersal mechanisms, and investigation of the socio-economic effects of farmed salmon. DFC considered the resultant recommendations with a view to developing future theme sessions.

Update on theme session "Is there more to EELS than slime"

Overall, the theme session was very successful, attracting 37 submissions covering management, biology, and modeling. Of concern was the limited progress in progressing basic investigations and answering biological questions. DFC attempted to identify the features that had made the session so successful so that these could be considered in the development of future theme sessions. Among the main features identified was an early announcement of the theme session and a focused theme which was easy to relate to.

Update on plans for a joint ICES/NASCO/PICES/NPAFC/Baltic Sea RAC Symposium on "Factors Affecting Mortality of Salmon at Sea" and update from NASCO on marine research initiative

Plans for the joint symposium are underway. Some of the drivers for increased marine mortality seen in both Pacific and Atlantic salmon may be the same. The likely cost of the

symposium will be in the region of \$70k which the sponsoring organizations will need to budget for.

An update on the NASCO International Atlantic Salmon Research Board's Inventory of Research was presented by Peter Hutchinson (NASCO). The inventory is used as a tool for co-ordinating research and identifying research gaps. A total of 51 projects are listed, 10 of which were new in the 2006 update. Total funding already committed for marine salmon research was estimated at approximately £5m.

A brief overview of the component parts of the NASCO Salmon at Sea (SALSEA) initiative was presented by Malcolm Windsor (NASCO). A team of international consultants (Brakelys) has been employed to assess the possibilities. They have identified a likely ceiling of £4m being possible from the private sector who are likely to relate easily to the aims and objectives of the study; thus, funding of SALSEA will need to progress as a public/private partnership. The cost of SALSEA is approximately £8m in total but this is based on the full and comprehensive package and all components. Keeping NGOs involved was seen as imperative as many of these organizations represent international groups (e.g. WWF, AST, ASF) who have significant experience in developing public awareness. The President of NASCO, Dr Ken Whelan, had taken on the role of main contact to present the proposal to international corporations and institutions. Recent meetings with international companies had proven to be very positive and significant interest had been generated. A further 16 meetings have been arranged with international institutions. The possibility of developing a programme to apply for EU FP7 is being considered and the EU Commission have been briefed on the importance of the project in terms of understanding the oceanic phase of the salmon life-cycle.

Election of new Chair of DFC

14 committee members or Delegates were available to vote. Ted Potter (UK) was the only candidate entered into the election and was elected unanimously.

Presentation and adoption of reports and draft resolutions

DFC resolution for a Study Group on Salmon Age Determination (SGSAD) in 2007

DFC had previously considered a wider remit for this salmon aging group which might include North Atlantic salmon. However, it was agreed that the present group should at least have their next meeting before this was decided.

DFC Resolution for a Study Group on Establishing a Framework of Indicators of Salmon Stock Abundance (SGEFISSA)

The driver for this work is directly linked to the move to provide multi-annual advice for both the West Greenland and Faroese fisheries where it is recognised that, in a phase of continued low abundance, catch advice will not change. The establishment and use of abundance indicators will give notice of any change in abundance within the period covered by the multi-annual advice.

DFC resolution for a Workshop on the Development and Use of Historical Salmon Tagging Information (from oceanic areas) (WKDUSTI)

After some discussion, DFC agreed that this should be in February 2007 and that recoveries of tags in ocean fisheries should also be included. Further, the issue of which organization would hold and maintain the resultant database should be decided before the study group takes place. Sponsorship from the International Atlantic Salmon Research Board of NASCO to help with travel for an expert (GIS/oceanographic field) was agreed in principle. The favoured venue

was Canada as Canadian scientists who had an important contribution had expressed concerns about traveling costs for meetings outside Canada.

DFC/Mariculture Committee Resolution for a theme session on “Stock Identification – Applications for Aquaculture and Fisheries Management” to be held in 2007

The DFC discussed widening topics to include stock identification, using scale and otolith microchemistry to attract more varied contributions and to strengthen the application of the methods rather than the development to be more attractive for managers and stock assessment biologists. Also, a stronger link to the Mariculture Committee was considered desirable, including having a co-convenor from the Mariculture Committee.

DFC resolution for a theme session on “Strategies for Monitoring and Assessing Diadromous Fish, Including Threatened and Endangered Species” to be held in 2008

The DFC considered that this could be strengthened by contacting and involving other groups whose brief included protection or wildlife e.g. IUCN, WWF, Atlantic Salmon Federation, etc. DFC considered that this theme session could include non-diadromous species also in order to expand the topic and encourage papers dealing with stock assessment for marginal or low abundance species.

AOB

Moving towards an action plan for European sturgeon restoration (WWF/IUCN)

A brief overview was given by the DFC Chair. This species, which was previously widespread throughout Europe now has only one small surviving spawning population in the Gironde, France. 13 separate action plans have been proposed with several specified sub-actions covering management, protection, review of legislation, etc. The DFC noted that the current EU Habitats Directive, while being extremely useful for many diadromous fish species does not adequately address species which are on the verge of extinction. Much more is required in terms of immediate actions than those indicated in the EU Habitats Directive.

Chairing of WGEEL

The outgoing Chair of WGEEL, W. Dekker has been in the position since 1996. He informed the DFC that there were currently no nominations for a new Chair. WGEEL members are reluctant to take on the role due to the lack of development at EU and national level in applying the Eel Management Plan. Some members of the WG stated that they would not be well supported in their home countries as the role required some extra travel and attendance at meetings. EIFAC and ACFM have been warned of situation, but no solutions have been identified so far. DFC considered that it was necessary to separate the problems of lack of progress with national eel plans and the basic job of running the WGEEL meeting. The DFC also considered that the Chair should come from within the group and that the group should be encouraged to nominate someone who would then be endorsed to their national delegates by ICES.

Closing

The outgoing Chair, Niall Ó Maoiléidigh thanked the committee members and others for all their feedback and support over the past four years. The incoming Chair, Ted Potter expressed his gratitude to the outgoing Chair on behalf of the committee.

Main highlights

- High attendance (30) on the day with no themes sessions, many off the street. Attendance was lower (18) on the second day, featuring 11 of 26 committee members.
- Feedback on the publication of ICES/NASCO Symposium on “Interactions Between Cultivated and Wild Diadromous Fish Stocks” was very good.
- More progress on updating plans for a joint ICES/NASCO/PICES/NPAFC/Baltic Sea RAC Symposium on “Factors Affecting Mortality of Salmon at Sea” and update from NASCO on marine research initiatives.
- The theme session “Is there more to EELS than slime” was very successful.
- A presentation on the forthcoming eel investigation under the Galathea 3 programme was given by Henrik Sparholt (ICES secretariat).
- Chair of WGEEL.
- New Committee Chair Ted Potter.

Report of the Fisheries Technology Committee (FTC)

Chair: François Gerlotto, France

Rapporteur: Bill Karp, USA

Introduction

Following ConC suggestions the FTC committee meeting was organized slightly differently than in 2005:

- The first four-and-a-half hour session was held on 20 September, at a time with no scheduled scientific theme sessions, letting the ASC participants free to “discover” science committee activities. 22 participants attended the whole session;
- A second four-hour session was held on 21 September. Less participants were present at this session (variable number, from 12 to 17).

The first session was devoted to scientific discussions on the theme of biodiversity and on the restructuring process of ICES. The second session was more specifically focused on the FTC activities during the year and on EG reports.

The higher presence of participants during the first session demonstrated the interest of such an agenda, with no theme sessions scheduled during the SC meeting. Nevertheless, with one exception, no new participants were present. Efforts in communication are still necessary to make the SC meetings attractive to non-members. The suggestion to open a discussion on the theme of the opening lecture seemed extremely fruitful and could be a good way to attract newcomers. It was felt that this opening lecture should be announced to attract newcomers to at least part of the SC meetings.

Opening

Adoption of the agenda

The Chair opened the meeting and welcomed attendees. The FTC meeting gathered 22 participants on the first day, and 17 on the second day.

Arrangements for the meeting

Appointment of Rapporteur

Bill Karp, USA, was appointed as rapporteur.

Committee business

FTC and biodiversity: what is our contribution? The ICES Head of Science asked the committees at the 2006 ASC to devote part of the SC agenda to discussion on the theme of the opening lecture by Dr Carlo Heip on "Marine Biodiversity: the Exploration and Understanding of the Blue Planet". In this domain, the FTC contribution is mainly focused on observation tools and methods. The FTC Chair listed the major sources of information on biodiversity that the committee is potentially able to explore:

- Visual (FAST/FTFB): surveys, specific composition, behavioural research, etc.
- Acoustics (FAST): surveys, behaviour, abundance estimates, etc.
- Fish sampling (FTFB): effect of fishery on communities, surveys, abundance estimates, behavioural research, etc.
- Experiments (FAST/FTFB): measurement of biases related to the different methods, effectiveness of fishing data for biodiversity research, ecosystem approach to fisheries, etc.

Some points were pre-identified for discussion:

- Autonomous observatories for biodiversity research?
- Surveys and stations?
- Adaptation of techniques and tools?
- Experiments?
- Behavioural ecology?

Then each WG presented its own activities focusing on biodiversity questions.

WGFAST and biodiversity

The WGFAST Chair, David Demer (USA) presented an overview of technologies and approaches for studying biodiversity. Necessary technologies included:

- Sensors (e.g. air-borne Light Detection and Ranging (LIDAR), and multifrequency, broadband width, and multibeam acoustics);
- Platforms (e.g. instrumented small craft, Autonomous Underwater Vehicles (AUVs), buoys, and satellites);
- Data telemetry (e.g. underwater modems, gliders, long-range ethernet radio, and satellite links; and
- Data fusion software (e.g. GIS and 4-D analysis) to augment or replace existing ecosystem observations and analyses.

WGFTFB and biodiversity

The WGFTFB Chair, Norman Graham (Ireland) presented an overview of activities developed in WGFTFB applicable for studying biodiversity. Relevant topics included:

- Bycatch & discard;
- Importance of surveys for providing baseline information;
- Concerns regarding catchability of some organisms;
- Effects of fisheries and fishing gears on biodiversity (capture and effect on the substrat).

Discussion

The Committee engaged in an enthusiastic discussion of this topic. Important points and issues discussed included:

- Multibeam acoustics is emerging as a powerful tool for observing and characterizing midwater scatterers. It was suggested that quantitative multibeam data be collected during all surveys to provide baseline information;
- Multifrequency acoustics is another issue allowing species ID. One general comment was that acoustics records all the individuals (animals) from 1 mm to the biggest fish,

but is still unable to clearly identify them. Multifrequency is likely to solve this problem in the near future. Once this is resolved, an acoustic survey is likely to give a quasi-exhaustive overview of the pelagic biodiversity for organisms above the dimensions of 1 mm.;

- The focus on biodiversity will require the ability to detect change. Temporal and spatial scales are important considerations in this context. Also, technologies and tools employed must be able to detect the levels of change considered important. Independent autonomous platforms (AUV, buoys, etc.) are potentially able to provide data usable for biodiversity research. It is worth noting that in this field biodiversity and ecosystem approach share the same methodologies of monitoring and survey;
- The need for field experimentation and concerns regarding catchability and monitoring bias were discussed at some length. An important issue is the understanding of behavioural patterns which often organize the biological structure of the communities. Experiments of the effects of fishing gears on the substrate as well as on fish behaviour should be undertaken;
- A discussion on the operational definition of biodiversity for the FTC (e.g. impossibility to observe the microbiological part of the biodiversity) lead to some conclusions: there is a need for boundary (threshold) definitions in order to show clearly what can be observed and what cannot; but this poses the risk of forgetting that arbitrary limits are put in our observation field. We then need to set the limits AND devote part of the activity to exploring what exists beyond these limits. The case of some misunderstandings in fisheries biology due to the idea that fishing data could be accepted as exhaustive ecological information has to be kept in mind;
- The committee concluded that this initiative of following the opening lecture with a discussion inside committee meetings is a fruitful idea, which allowed listing the activities developed by the FTC EGs that could provide information for biodiversity. Besides, the presentations made by the two WGs launched discussions between the different EGs and new ideas were presented that might improve the functioning of the SC. Finally it was suggested that the synthesis of the information from the open lecture, plus the discussions and material from all science committees could be published quickly in the ICES newsletter, showing what the contribution of ICES to this particular scientific question is.

Matters arising from the Consultative Committee and the advisory committees

Note: some of the matters arising from the Consultative Committee and transmitted to SC Chairs during the ConC mid-term session (Copenhagen, March 2006), and especially the results of WGREC, had been presented by the FTC Chair at the WG meetings in Hobart (27 March) and Izmir (3 April) during short “FTC business sessions” in each WG. The discussion at the FTC meeting in Maastricht was a continuation of these preliminary discussions. This experience showed that having a “FTC mid-term session” could be fruitful in the future:

- Meeting venue – concerns regarding out-of-area WG meetings have now been resolved by the Consultative Committee. The Izmir (WGFTFB) and Hobart (WGFAST) meetings were both considered to be especially successful and attracted a large number of international and local participants: FAST – 70 participants in Hobart (including 30 from Australia and New Zealand), and FTFB – 100 in Izmir (including 40 from Turkey), making it the most attended WGFTFB meeting ever;
- A large number of new and young participants;
- Providing new input and knowledge for FTC: in Hobart – invited speakers on southern hemisphere activities (including reports on CCAMLR); in Izmir – topic groups on new fields (fisheries science in Turkey);

- Experience shows the interest of having such meetings outside the ICES area (but not every year!);
- Invitations have been received from Chile and Peru: to be considered in the future;
- A “guideline for venues of meetings” was prepared and presented in Copenhagen by the FTC and LRC Chairs. The guideline has had positive feedback from the Bureau (June, 2006). The guideline should serve as ConC’s internal guidelines and should minimize the cases where the Council will have to interfere.

The restructuring process

The proposals of the Restructuring Group were discussed; general agreement was given to most of the RG proposals, with some exceptions, comments, and suggestions:

- Communication is not a major issue inside the committee, neither at the level of inter-EG communication nor at the level of committee–EG. All the participants agreed that there is no need for any major restructuring of the FTC. A strong concern was voiced on where the methodological and technical activities might be developed if there were only three committees (i.e. fisheries, ecosystem, and environment). Methodological activities are needed inside ICES and are worth a specific structure. Among the 4 proposals of SC restructuring, proposals 3 and 4 were strongly rejected. Members emphasized the importance of ensuring that WGFTFB and WGFASST both report to the same science committee, whatever new structure is selected;
- Communication between EGs and committees, membership, and meeting of committees (ConC and SC). There was a general agreement on these proposals;
- Proposal at the level of communications between EGs. Some concern was expressed at some of the proposals of the RG, especially proposal 1: *“All EGs should set up a list of « clients », including: ICES Head of Science, relevant SC Chair, relevant AC Chairs, Chairs of any linked EG”*. A potential result of such a proposal is the increase of the volume of ToRs transmitted by all the clients to the EG; in this case the workload of the EGs could be increased in such a way that they would not be able to respond;
- Continuity in the SC chairmanship. In order to avoid any difficulties when a new Chair is elected, ConC should consider whether a SC Chair could be elected for an overall period of 4 years, the first year as “Vice-Chair” of the SC, permitting him/her to be present at the ConC meetings as observer during the last year of activity of the former Chair, and the three following years as Chair, which is the present situation.

Integrated ecosystem advice

There is a continued request from the Consultative Committee for new ToRs to promote ecosystem and fisheries advice:

- WGFTFB does not consider this to be a problem – much of the WG work is now of an advisory nature;
- There was no direct input from WGFASST, although it was recognized that the production of *Cooperative Research Reports* by the WG is in part an advisory activity (e.g. the CRRs on noise of research vessels; on survey design; on acoustic seabed classification; etc.) Another potential role of the WGFASST deals with quality control and quality assurance for acoustic data.
- Some cases of lack of information and involvement of FTC expert groups in advisory activities were presented, especially that on the noise effect on marine life, where WGFASST should have been contacted at the beginning of the advisory process, rather than at the last moment. Due to this lack of communication, the WGFASST Chair

disagreed with some of the general conclusions of the report that do not represent the general opinion of the WGFASST on noise effects.

Discussion – the future of FTC in an ecosystem approach to fisheries

The organization of the FTC stems from the time of “single-stock analysis”. An ecosystem approach to fisheries requires a different type of organization, particularly a higher integration of the research already developed inside the FTC with the inclusion of new fields of research. Two major questions were discussed: the overall organization of the FTC, including the Joint Session, and the inclusion of new techniques and methods in the EG activities.

- 1) **FTC organisation.** The WGs of FTC act more as “sub-committees” than as classical ICES working groups: both WGs are normally attended by between 50 and 100 participants! This explains why their role as “mini-symposia” is important: they are forums of discussion for the scientists of the committee. The work is mainly done through EGs with limited life and precise ToRs: study groups with a duration of 3–4 years and topic groups with even shorter duration. There are no real working groups in the FTC, which explains the difficulty in creating new WGs. The question therefore was: are new WGs necessary? Study groups inside the “sub-committee” may be the only consistent solution. The Joint Session is acknowledged as important and has been fruitful as a forum for discussion across WGs; nevertheless, its organization around a specific ToR has not always given good results. Identifying a Chair for this joint session has often been a problem. For these reasons it was considered to transform the joint session into a committee mid-term session.
- 2) **Inclusion of new EGs for studying new techniques and methods.** The participants identified a series of new techniques and methods which should be considered by the FTC, and principally optical imaging, other remote sensing observation tools, tagging methods and techniques, unaccounted fish mortality, fish behaviour, and fish physiology. Concerning these two last items it was discussed whether these disciplines might be better considered in other committees. A proposal was to circulate a questionnaire inside ICES in order to define the needs of research in fish behaviour. In the particular case of the FTC, the word “behaviour” should be understood as “fish response to stimuli from fishery activities”, and not as a behavioural ecology topic. Nevertheless, the term “behaviour” appears almost in every EG of every SC working on ecosystem, and some structure should be defined. Physiology is another activity which is likely to grow in importance, e.g. effects of noise on the physiology of fish, effect of global warming, etc. Concerning the other disciplines, no clear agreement on the elaboration of new WGs was obtained. It seemed that the participants would rather prefer to expand the topics of the two existing WGs, and for instance change the Fisheries Acoustics Science and Technology Working Group into a “WG on Remote Control Methods for Observation of Marine Ecosystem”, which would include optical and other methods that would be more specifically studied in dedicated SGs.

Forthcoming symposia and theme session topics

A list of recommendations and activities for 2007 extracted from the EG reports is presented in the table below. For each of these recommendations the question whether a theme session was worth being organized was discussed.

Table 1. List of recommendations from FTC expert groups, theme sessions, and new symposia.

Recommendations & activities	2007	Theme session	Symposium
Fishery dependent data	FAST		2010
Nephrops selection	FTFB		
Fish pots for commercial fisheries	FTFB		
Catch composition and analysis	FTFB		
Survey trawl standardization	FTFB		
Fish behaviour & demersal trawls	FTFB		
Fishing behaviour and management advices	FTFB		
Mediterranean fisheries	FTFB		
Fish response to noise of vessels	FAST	2007	
Fisheries optical technologies	FAST	2007	
Species identification techniques	FAST		
Ghost fisheries	FTFB	2007	
Herring characteristics in the Baltic	FAST	2007	

Four theme sessions were proposed for 2007 and none for 2008 (see table above). 2008 is the year of the Fisheries Acoustics Symposium and most of the work will be presented there. The forthcoming symposia are: Boston, November 2006 (fisheries technology), Lima, November 2006 (Humboldt Current system), and Bergen, June 2008 (fisheries acoustics).

- Update from Bob van Marlen on Boston 2006 Fishing Technology Symposium: Everything is on track. Participants have been encouraged to visit the website of the symposium through the ICES website.
- 2008 Acoustics symposium in Bergen. Report from Egil Ona and David MacLennan. The website will be published by the end of 2006. The co-conveners reminded the Consultative Committee and the Publications Committee that there is a need for a 500-page volume of proceedings, which means a set of free extra pages. ConC and Pub. Comm. received this request favorably as the conveners of the symposium accepted to delay publication from 2007 to 2008, requiring a series of difficult discussions and decisions to change agreements already signed with institutions in Bergen.
- FTC support for the 2010 International Symposium on Collection and Interpretation of Fishery Dependent Data. Possible conveners are Bill Karp and Norman Graham (and others). Karp prepared a preliminary proposal for submission to FTC, LRC, and RMC. The idea is to obtain preliminary (non-binding) support for the topic and space in proceedings publication in JMS. Bill Karp presented a brief overview for committee Chairs and possible Consultative Committee discussion in 2006. A formal proposal will be drafted in Dublin.

Presentation and adoption of reports and draft resolutions

The detail of the resolutions and terms of reference of each EG is given in a separate document and synthesized in Table 2.

WGFAST Expert Groups

FTC:01 Working Group on Fisheries Acoustics Science and Technology (WGFAST)

- Report and terms of reference were approved by the FTC (see document on ICES website).

FTC:02 Study Group on Collection of Acoustic Data from Fishing Vessels (SGAFV)

- Final year of 3-year project;
- Editor has all draft chapters in hand;
- CRR manuscript to be submitted to Publications Committee by 31 January 2007.

FTC:03 Study Group on Acoustic Seabed Classification (SGASC)

- Final editing of CRR is now being carried out;
- Expect manuscript to be submitted soon.

FTC:08 Study Group on Target Strength Estimation in the Baltic Sea (SGTSEB)

- It was agreed that there was no need for an oral presentation of the report which has been posted on ICES website. Report and terms of reference were approved by the FTC (see document on ICES website). A theme session on Baltic herring is proposed for 2007.

FTC:09 Planning Group on the HAC Data Exchange Format (PGHAC)

- It was agreed that there was no need for an oral presentation of the report which has been posted on ICES website. PGHAC, as a surveying group, will continue its activities in 2007;
- Adoption of draft resolutions – WGFAST and related EGs;
- Report and terms of reference were approved by the FTC (see document on ICES website).

WGFTFB Expert Groups

FTC:06 Working Group on Fisheries Technology and Fish Behaviour (WGFTFB)

- Report and terms of reference were approved by the FTC (see document on ICES website).

FTC:05 Study Group on Survey Trawl Standardization (SGSTS)

- Report and terms of reference were approved by the FTC (see document on ICES website).

FTC:04 Workshop on Unaccounted Fishing Mortality (WKUFM)

- It was agreed that there was no need for an oral presentation of the report which has been posted on ICES website. Report and terms of reference were approved by the FTC (see document on ICES website).

FTC:07 Study Group on Unaccounted Fishing Mortality (SGUFM)

- It was agreed that there was no need for an oral presentation of the report which has been posted on ICES website. Report and terms of reference were approved by the FTC (see document on ICES website);
- Adoption of draft resolutions – FTFB and related EGs.

Other business

Discussion of the joint session (to be re-named “FTC mid-term meeting” from 2008):

- WGFTFB and WGFAST will be hosted by BIM in Ireland, 20–27 april 2007. They will have a joint session, chaired by Emma Jones (Aberdeen).

Closing

Table 2. List of FTC Expert Groups and activities.

NAME OF EXPERT GROUP	NEW	CONT.	END	CHAIR
WGFAST – Fisheries Acoustics Science and Technology Fish behaviour in response to vessels Survey techniques epibenthic, epipelagic, shallow spp Spp ID techniques SG reports		X		Rudy Kloser (Au)
WGFTFB – Fisheries Technology and Fish Behaviour WGECO review and Crangon shrimp beam trawling TG Application fish behaviour for sp separation in demersal trawl TG Mediterranean fisheries TG definitions and classification Fishing gear TG Fishing technologies issues/expertise	X X	X X X		Dominic Rihan (Ir) P. He (USA), M. Pol (USA) A. Sala (It), J. Sacchi (Fr), E. Massuti (Sp) J. Waldemarsen (No), W. Theile (FAO) D. Reid (UK), D. Rihan (Ir), N. Graham (Ir)
WKNEPHSEL – <i>Nephrops</i> selection	X			Dominic Rihan (Ir)
SGPOT – Development of fish pots for commercial fisheries and survey purposes	X			Bjarti Thomsen (Faroe)
SGCOMP – Catch comparison methods and analysis (FTFB)	X			Andy Revill (UK), Rene Holtz (Dk)
SGSTS – Survey Trawl Standardization (FTFB-FAST)		X		David Reid (UK)
SGFARV – Fish avoidance of research vessels (FAST)	X			François Gerlotto (Fr), Julia Parrish (USA)
SGFOV – Fisheries optical technologies (FAST)	X			E. Tenningen (No)
JAFTB – Joint Workshop FAST/FTFB		X		E. Jones (UK)
PGHAC – HAC common data exchange format (FAST)		X		L. Berger (Fr)
SGTSEB – TS Baltic herring (FAST)			X	J. Horne (USA)
SGAFV – Acoustics from fisheries vessels (FAST)			X	B. Karp (USA)
SGASC – Acoustic Seabed Classification (FAST)			X	J. Anderson (Can)
SGUFM – Unaccounted Fish mortality (FTFB/FAST)		X		Mike Breen (UK)
WKUFM2 – Unaccounted fish mortality (FTFB/FAST)	X			Mike Breen (UK)

WG = Working group SG = Study group WK = Workshop PG = Planning group TG = Topic group J = Joint session

Working Group on *Crangon* Fisheries and Life History (WGCRAN)

Julian Addison (UK) presented Doc. LRC:10.

The ToRs for WGCRAN were mostly fulfilled. It was noted that while there were good data on landings and catch, the group should collate more biological information on aspects such as growth, maturity, distribution, etc. Predation mortality was considered as very important, and a recent study on this had been completed in Belgium, but has not yet been reported to the WG. This fishery has a high bycatch/discard rate of young demersal fish, and significant progress has been made on gear-based technical measures. It was proposed that a study be made on the impact of these measures on the bycatch rates and on the impacted stocks. WGCRAN requested work from the following WGs:

- WGFTFB – to evaluate impacts of electric fishing and to evaluate impacts of new legislation to reduce bycatch;
- WGEKO – to review impacts of shrimp trawling on benthic habitats;
- WGBEAM – to assess relative efficiency of survey gears.

Study Group on the Biology and Life History of Crabs (SGCRAB)

Julian Addison (UK), Chair of SGCRAB, presented Doc. LRC:13.

The SG met by correspondence in 2005, and this led to some problems of contributions. Most data compiled were on the *Cancer pagurus* fisheries. The problems of defining effort were highlighted in these fisheries. Crab pots are known to have areas of attraction, and if these overlap, simple pot number becomes a poor effort indicator. The WG also highlighted the weak links between the monitoring of disease in these stocks and the assessment implications.

The SGCRA B once again recommended that after 9 years as a Study Group they should be designated a Working Group.

Working Group on Cephalopod Fisheries and Life History (WGCEPH)

Uwe Piatkowski (Germany) presented Doc. LRC:14.

WGCEPH met by correspondence in 2006. The WG noted continuing high cephalopod catches in the ICES area, and also a growing aquaculture sector. The group has largely completed their work on a new *Cooperative Research Report*, and this will be submitted shortly. Some examples were presented to the acclaim of the Committee.

It was again noted that the work of WGCEPH is carried out predominantly by scientists from a university background. As such, this should be encouraged by ICES; however, there remain problems obtaining funding to attend meetings. Recent work has been strongly linked with the EU-funded project CEPHSTOCK, which has helped ameliorate this problem, and a follow-on project, CEPHSTOCK II is in preparation.

Working Group on Fish Ecology (WGFE)

Dan Duplisea (Canada), Chair of WGFE, presented Doc. LRC:06.

The main activities included:

- Developing protocols to aid workers in reporting how they made their analysis and the key issues which might affect their interpretation;
- What properties of a community a large fish indicator is likely to reflect and how to calculate it;
- Spatial distributions of various rare elasmobranch species were determined and are presented in nice maps and graphs of survey abundance. Methods for determining extinction vulnerability were examined;
- Abundance range size relationships were explored in considerable detail for several species using both maps and geostatistical indicators;
- Essential fish habitat was again addressed though we still could not bring a real specialist in this area. Mapping work was done and some ideas about what might be considered EFH were considered;
- Relative catchability by length was estimated for the French *Thalassa* survey. Total North Sea biomass was also calculated using spatial catchability indices derived from the survey to VPA comparisons;
- Some upcoming nature conservation issues were outlined, including the Water Framework Directive (WFD) and estuarine fishes and the ability of WGFE to deal with the WFD;
- A roadmap for WGFE was developed. It is very broad and defines the kind of work WGFE is able to do. It is deliberately broad so as not to confine the group too much and

also limit its abilities to deal with new issues that could be considered in the group but were not anticipated.

The WG also recommended that:

- An IBTS meeting should be held to rectify data problems; Niels Daan would make an excellent Chair;
- Expand IBTS to include all trawl surveys in the ICES area;
- Work with the multispecies study groups to explore various models for assessing indicators as a simulation environment (get some SGMSNS people to attend WGFE and vice versa).

Study Group on Regional Scale Ecology of Small Pelagics (SGRESP)

Pierre Petitgas (France), Chair of SGRESP, presented Doc. LRC:05.

The SG completed its work in 2006. It highlighted the continuing need to carry out research in this subject area, particularly concerning the role of adult behaviour in closing the life cycle and the links to meso-scale oceanographic processes. The former led to the development of the “Entrainment hypothesis” presented at the 2006 ASC (B:07). The latter was the subject of a joint workshop (WKIMS) with OCC. The group updated the species ID cards, detailing the life histories and ecosystem links for a range of small pelagics. The group is seen as providing the pelagic fish perspective currently not covered by WGFE.

The SG proposed that a successor group entitled “Working Group on the Life Cycle and Ecology of Small Pelagic Fish [WGLESP]” should be set up to carry out this work. It was agreed that the new group would meet mostly by correspondence with the aim of proposing regular workshops on relevant subjects. The first of these would be the Workshop on Testing the Entrainment Hypothesis [WKTEST]. WGLESP was also requested to address a particular ToR from WGEKO in response to an OSPAR request, and it was agreed that it would meet in 2007 back-to-back with WGFE to address these and other common issues.

Working Group on Seabird Ecology (WGSE)

Stefan Garthe (Germany), Chair of WGSE, presented Doc. LRC:08.

The Chair reported that the relaxed EG participation rules had led to a wider and useful enhancement for the group. It highlighted the continued poor breeding performance of many species in the NW North Sea, although the situation was better in the southern North Sea. The lack of data on seabird diet was highlighted, and those monitoring these populations were encouraged to collect more such data. The group has added a ToR on diseases in seabirds and the transmission of these, particularly in the context of avian flu. The group was tasked to address a ToR deriving from OSPAR on changes in stocks that could be linked to ecosystem change.

Study Group on Stock Identity and Management Units of Whiting (SGSIMUW)

No report was presented for this group.

There is currently no incoming Chair for this group and its continued existence is in doubt.

Stock Identification Methods Working Group (SIMWG)

No report was presented for this group.

As agreed in 2005, the group continued to meet by correspondence, and to be prepared to deal with emerging issues. New requests have been forwarded to examine stock ID issues in red-fish, some shark species, and in some deepwater species. An action plan for these has been agreed and funding may be available from within ICES to support the attendance of members of SIMWG at the appropriate WG meeting.

Study Group on Recruitment Variability in North Sea Planktivorous Fish (SGRECVAP)

Mark Dickey-Collas (Netherlands), Chair of SGRECVAP, presented Doc. LRC:03.

The approach taken by this group was to:

- document the existing knowledge to date;
- determine whether there were significant common trends in the recruitment patterns of the three species;
- investigate potential hypotheses for trends in recruitment;
- consider the available time-series data which could aid testing of the hypotheses.

They were able to carry out this work in general but were limited in drawing conclusions due to the poor support from bio-physical modellers. The most likely hypothesis for the observed recruitment problems was trophic interactions, and this will be investigated in detail at the next meeting PROVIDED the appropriate scientists attend.

Working Group on Elasmobranch Fisheries (WGEF)

Maurice Clark (Ireland) presented Doc. ACFM:30.

Although WGEF is now under ACFM the WG also reported to LRC. The WG has been able to provide management advice and some analytical assessments in recent years. However, ACFM and the WG have agreed that the future emphasis should be on improving knowledge of the biology of the species covered. The group is working on the completion of a CRR on the component stocks and a timeline is being set up for this.

ConC and LRC business

Restructuring discussions

Advisory side

The Committee discussed the new draft plan, with the major comments being:

- LRC agreed that the proposed new layout made sense. However, questions were raised about who drafts the advice? It was felt that the EG should do it and not the review groups.
- There should be national representation in the groups that formulate the advice. How will there be national representation in the review groups?
- Where will the integration occur? In the review group or the advisory group? When should integration occur: after EG or within EG? If within, special requests and participation should be adequate.
- What will the timing be for the advisory group? One meeting per year does not seem realistic.

Science side

On the science side LRC raised the following issues:

- List of new committees: no particular improvement is apparent. Just system shaking.
- Integration requires interaction and communication. Perhaps a similar structure, but with more communication.
- Communication would be increased by having a meeting of committee and EG Chairs. However, an extra spring meeting may not be realistic; preference for retaining the meeting during or just before or after the ASC.
- The ASC is great and works well: does this indicate that the science side of ICES works correctly? ASC should remain with its theme sessions as it is: no change, please.
- ToRs coming from the advisory side and given to science EGs: communication on these is important to avoid swamping science EGs with advisory work. The bottom-up process should not to be stopped.
- What integration is expected at the committee level? Science committees are at the same level as the review groups on the advisory side. Science committees should be seen as clusters of coherent disciplinary activities. Higher integration would be obtained by communication between committees.

Theme sessions 2005

The committee noted that four theme sessions sponsored by LRC were held at the Aberdeen ASC. These were:

- Multidisciplinary approaches to the identification of stock structure of small pelagics: implications for assessment and sustainable management.
- Elasmobranch fisheries science.
- Advances in reproductive biology: methodology and applications for fisheries science.

- Marine mammals: monitoring techniques, abundance estimation, and interactions with fisheries.

All were well supported with papers and posters and well attended. This speaks well for the commitment and productivity of the LRC community and particularly the conveners.

Theme sessions 2006

Theme sessions proposed by LRC and currently agreed for 2006 are as follows:

- Large-scale changes in the migration of small pelagic fish and the factors modulating such changes. Conveners: Jürgen Alheit (Germany) and Dave Reid (UK).
- Census of Marine Life: Community and species biodiversity in marine benthic habitats from the coastal zone to the deep sea. Conveners: Michael Sinclair (Canada) and Myriam Sibuet (France).
- Evolutionary effects of exploitation on living marine resources. – With RMC. Conveners: Mikko Heino (Norway), Ulf Dieckmann (Austria), and Jeffrey A. Hutchings (Canada).
- Spatio-temporal characteristics of fish populations in relation to environmental forcing functions as a component of ecosystem-based assessment: effects on catchability. – With FTC. Conveners: François Gerlotto (France) and Doug Beare (Italy).
- Use of data storage tags to reveal aspects of behaviour important for fisheries management. – With FTF and RMC. Conveners: David Somerton (USA) and Julian Metcalfe (UK).
- Discarding: quantities, causes, and consequences. Conveners: Marie-Jöelle Rochet (France) and Lisa Borges (the Netherlands).

Theme sessions 2007

Theme sessions proposed by LRC for 2007 are as follows:

- Flying outside the ICES Assessment WG paradigm – Alternative approaches to providing fisheries management advice. Conveners: Julian Addison (UK), João Pereira (Portugal), and Verena Trenkel (France).
- Evolution in the ocean: a missing perspective in fisheries science? – With OCC and LRC. Conveners: Christian Jørgensen (Norway), Erin Dunlop (Austria), and Esben Moland Olsen (Norway).
- Monkfish across the world – common problems and common solutions. Conveners: Jean-Jacques Maguire (Canada), Pilar Pereda (Spain); Rafael Duarte (Portugal), and Helen Dobby (Scotland).
- Marine biodiversity: A fish and fisheries perspective. Conveners: Jim Ellis (UK), Remment ter Hofstede and Henn Ojaveer (the Netherlands).
- The role of sea ice in polar ecosystems. Conveners: Garry Stenson (Canada), Ken Drinkwater (Norway), and Kai Wieland (Greenland).
- Science underpinning stock abundance survey practice. – With FTC. Conveners: Dave Reid (Scotland) and Ken Weinberg (USA).

It was agreed that two theme session proposals are carried forward to 2008:

- Marine biodiversity and ecosystem functioning. Conveners: Carlo Heip and Hermann Hummel (the Netherlands).

- The impact of anthropogenic noise on marine organisms. – With FTC. Conveners: Kjell Olsen (Norway), Edward Trippel (Canada), Tony Hawkins (UK), Peter Tyack (USA), and Peter Liss (UK).

Theme sessions 2008

Theme sessions proposed by LRC for 2008 are as follows:

- The life history, dynamics, and exploitation of living marine resources: Advances in knowledge and methodology. Conveners: Olav Sigurd Kjesbu (Norway), Pauline Kamermans (the Netherlands), and Ian L. Boyd (Scotland).
- Mid-ocean ridges and seamounts: oceanography, ecology, and exploitation. Conveners: Uwe Piatkowski (Germany), Odd Aksel Bergstad (Norway), Filipe Porteiro (Portugal), Monty Priede (UK), Andrey Gebruk (Russia), and Astthor Gislason (Iceland).
- Marine spatial planning in support of integrated management – tools, methods, and approaches. Conveners: Paul Eastwood (UK) and Robert O'Boyle (Canada).
- Fishing capacity, effort, and fishing mortality: The understanding of fishery dynamics and their links to management. Conveners: Dave Reid (UK), Jos Smit (the Netherlands), Rögnvaldur Hannesson (Norway), and Paul Marchal (France).
- Comparative dynamics of exploited populations in the Baltic Sea and Gulf of St Lawrence ecosystems. – With BCC. Conveners: Brian McKenzie (Denmark) and Dan Duplisea (Canada).

Proposals for symposia

None noted.

Draft resolutions

Draft resolutions were adopted for all working/study and planning groups residing under the Living Resources Committee. Special attention was given to ToRs deriving from ACE and WGECO for WGFE, WGSE, and WGLESP with reference to advice requests from OSPAR.

Any other business

Proposals for new groups

Three proposals for new groups were presented to LRC. Full details and justifications are attached. The proposed new groups are:

1. **Working Group on Life Cycle and Ecology of Small Pelagic Fish [WGLESP].** This group is intended to follow up on the work of SGRESP on the ecology of pelagic fish, with an emphasis on meso-scale oceanographic interactions and on the role of adult behaviour. The group will liaise with WGFE and provide information for pelagic fish currently not covered by WGFE. The other role of the group will be to prepare and define a series of workshops on key subjects. The first of these, WKTEST (see below) is planned for 2007. A full proposal has been put forward.

Terms of reference:

- a) complete the specific work emanating from past activities (e.g. SGRESP, workshop);

- b) present and discuss new results on life cycle spatial patterns, environmental forcing on fish habitats and their modelling;
 - c) maintain overview of developments in the field and report to relevant ICES WGs (especially WGRED);
 - d) provide synthetic contributions from the ICES area to the SPACC programme of GLOBEC, in particular review the outcome of the ICES ASC 2006 Theme Session on Large-scale changes in the migration of small pelagic fish and the factors modulating such changes;
 - e) plan new workshops;
 - f) assess and report on changes in the distribution, population abundance, and condition of pelagic fish in the OSPAR maritime area in relation to changes in hydrodynamics and sea temperature, taking account of work conducted in the fish stock assessment working groups. Coordinate with the WGFE Chair as WGFE is also providing a response to this request (further details on the interpretation and handling of this ToR will be provided by ACE);
 - g) assess and report on the extent to which the changes reported in (f) can be reliably attributed to changes in hydrodynamics and sea temperature (further details on the interpretation and handling of this ToR will be provided by ACE).
- 2. A Workshop on the use of UWTV surveys for determining abundance in *Nephrops* stocks throughout European waters [WKNEPHTV] (Chair: Colm Lordan) to take place in Heraklion, Crete, in April 2007 to:**
- a) Review and report technological developments used in underwater TV surveys for *Nephrops*;
 - b) Compare survey designs employed in different areas and evaluate, where possible, the relative performance of these.
 - c) Report on work addressing outstanding issues influencing the accuracy and precision of TV estimates of abundance, *inter alia*, burrow identification, occupancy rate, counting method, survey data analysis, raising procedures;
 - d) Document the protocols used to conduct surveys across the range of European stocks, highlighting standard practices and 'norms' adopted in UWTV work.
 - e) Investigate and make recommendations on procedures for intercalibration, quality assurance, and the reporting of precision from TV surveys;
 - f) Report on developments in the translation of survey estimates into stock assessment information and catch forecast advice, recommending where additional work is most urgently required;
 - g) Consider the wider utility of the techniques employed in *Nephrops* UWTV surveys for estimation of other benthic species and habitat assessment.

3. Workshop on Testing the Entrainment Hypothesis [WKTEST]

Terms of reference:

- a) document diagnostic case studies in pelagic, demersal, and benthic fish that confirm or reject the entrainment hypothesis;
- b) based on the above further define the understanding of the mechanisms by which life cycle patterns are maintained or change;
- c) report on the consequences of the understanding for spatial fisheries management and recovery plans.

Close

The Chair thanked the Rapporteur for his help with the report of the LRC session and thanked all members for their participation in the discussions.