

ICES TGRECORDS REPORT 2009

SCICOM STEERING GROUP ON ECOSYSTEM FUNCTIONS

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Report of the Transition Group on the Science Requirements to Support Conservation, Restoration and Management of Diadromous Species (TGRECORDS)

23 September 2009

Berlin, Germany



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International Council for
the Exploration of the Sea

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Executive summary

TGRECORDS held an informal meeting on 5 June 2009, during the NASCO Annual Meeting in Molde, Norway. The meeting was chaired by Ted Potter (UK) and attended by 10 participants from 8 countries.

The annual meeting of TGRECORDS was held on 23 September 2009, during the ICES Annual Science Conference in Berlin, Germany. The meeting was chaired by Ted Potter (UK) and attended by 15 participants from 7 countries.

TGRECORDS was established to provide a forum for the coordination of work on diadromous species during the restructuring of the ICES Science Programme, following the disbanding of the Diadromous Fish Committee (DFC). The role of TGRECORDS is to coordinate work on diadromous species, organise Expert Groups, Theme Sessions and Symposia, and help to deliver the ICES Science Plan.

At the meeting in Molde initial discussions were held on the requirements for Expert Groups to address new and ongoing issues on eels and Atlantic salmon.

At the Annual Meeting the Group considered the contribution of Expert Groups working on diadromous species to the delivery of the ICES Science Plan and potential collaboration and coordination with other groups and programmes outside ICES.

The Group recommended the development of one new Study Group (Study Group on International Post-evaluation on Eels [SGIPEE]) and the continuation of four existing Study Groups (Study Group on Data Requirements and Assessment Needs for Baltic Sea Trout [SGBALANST], Study Group on Biological Characteristics as Predictors of Salmon Abundance [SGBICEPS], Study Group on Salmon Stock Assessment and Forecasting [SGSSAFE] and Study Group on Anguillid Eels in Saline Waters [SGAESAW]); ToRs were developed for these groups.

Proposals for a Workshop on Age Reading of European and American Eel [WKAREA II] and a Study Group on Salmon Age Determination [SGSAD] were passed to PGCCDBS.

During the year, it was proposed that WGRECORDS could provide coordination between three EU InterReg programmes relating to diadromous species (including the Celtic Sea Trout Programme and Living North Seas); this will be developed in 2010.

The Group recommended that TGRECORDS should be reconstituted as a Working Group (WGRECORDS) and, as proposed by SSGEF, should coordinate the activities of Expert Groups on diadromous species. It should meet annually for one day immediately prior to the ASC.

1 Meetings held in 2009

An informal meeting of TGRECORDS was held during the NASCO Annual Meeting in Molde, Norway on 5 June 2009. The meeting was attended by 10 participants from eight countries. This meeting provided the opportunity for preliminary discussions about the organisation of the Expert Groups, particularly on topics relating to Atlantic salmon.

The formal annual meeting of TGRECORDS was held on 23 September 2009, during the ICES Annual Science Conference. The meeting was attended by 15 participants from seven countries (Annex 1). This report mainly addresses the proceedings of the annual meeting.

2 Opening of annual meeting and adoption of the agenda

The Annual Meeting was opened by the Chair who explained that the Transition Group (TG) had been established in 2008 to provide a forum for the coordination of work on diadromous species during the restructuring of the ICES Science Programme, following the disbanding of the Diadromous Fish Committee (DFC). The role of the TG was to coordinate work on diadromous species, organise expert groups and to help to deliver the ICES Science Plan. It potentially also has a wider role in the coordination of activities between other scientific groups working on diadromous species outside the ICES framework.

The TG was assigned to the SCICOM Science Steering Group on Ecosystem Function (SSGEF), which is addressing the first of the three Themes in the ICES Science Plan. It had been proposed that the TG would represent all the Expert Groups on diadromous species within SSGEF.

The agenda (Annex 2) for the annual meeting was adopted and the Group appointed Julian MacLean (UK, Scotland) as the meeting rapporteur.

3 International scientific cooperation on diadromous fish issues

The TG had been asked to “identify research activities relating to the conservation, restoration and rational management of diadromous fish species that will contribute to and support the new ICES Science Plan” and to “provide a mechanism through which estuarine and freshwater issues can be addressed and coordinated within the new ICES science plan”

3.1 Diadromous species in the ICES Science Plan

The group reviewed the ICES Science Plan with the aim of identifying where the work of the TG and its associated Expert Groups could contribute. The Science Plan consists of three broad Themes, each containing a number of High Priority Topics, and it was concluded that the Group could support delivery of science across many of these themes and topics as summarised below:

Theme 1 - Understanding ecosystem function

Topic 1.1- Climate change processes and predictions of impacts

Changes in environmental conditions, including possible impacts of climate change, are major issues for the Expert Groups on diadromous species. SGBICEPS is consid-

ering changes in biological characteristics of salmon and seeking to link these with changes in mortality or estimates of abundance.

Topic 1.2 - Fish life history information in support of EAM

SGBICEPS is considering how biological characteristics can be used as indicators of abundance and mortality.

Topic 1.3 - Biodiversity and health of the marine ecosystem

Diadromous species contribute to diversity at community levels, particularly in estuarine and coastal waters. Diversity among salmon and trout stocks is also a major management issue. Many diadromous species are listed in the OSPAR convention and NATURA 2000 is important to a number of diadromous species.

Topic 1.4 - Role of coastal zone habitat in population dynamics of commercially exploited species.

The coastal zone is a vital transition habitat for all diadromous species. For example, the contribution of coastal populations of eels to total stocks is being considered by SGAESAW. The TG considered that widening the species considered beyond those of commercial concern would have the advantage of focussing attention and coordinating science on to other important species such as Allis shad, a species which spends much of its life history in coastal waters.

Topic 1.5 - Role of top predators in marine ecosystems

The expansion of seal populations has been an ongoing concern in relation to the potential impact on salmon stocks. Piscivorous birds, particularly cormorants, are of concern to both salmon and eel populations in some areas.

Topic 1.6 - Sensitive ecosystems, as well as rare and data-poor species

Data on a number of diadromous species (e.g. shads, lampreys and sturgeon) are very limited but these species are nevertheless important in the context of biodiversity directives.

Topic 1.7 - Integration of surveys and observational technologies

Scientists working on diadromous species have made extensive use of remote sensing data in stock studies. For example, sea surface temperature and CPR data have been used in studies of salmon and eel in the ocean and GIS systems are extensively used for mapping freshwater habitats. Survey techniques have been developed for catching salmon post smolts in the sea, but there is a need for less selective methods.

Theme 2 - Understanding of interactions of human activities with ecosystems

Topic 2.1 - Impacts of fishing on marine ecosystems

This is a relatively minor issue for diadromous species, although there is some concerns about potential by-catches of salmon post smolts in pelagic fisheries in the Southern Norwegian Sea .

Topic 2.2 - Carrying capacity and ecosystem interactions associated with mariculture

There are on-going concerns about the potential effects of salmon farming, particularly on wild populations of Atlantic salmon but also Pacific salmon on the west coast of North America. Potential impacts include spread of diseases and parasites between

farmed and wild stocks, influx of escaped farmed fish into rivers with wild stocks and effects of cage facilities on local ecosystems.

Topic 2.3 - Influence of development of renewable energy resources on marine habitat and biota

There are major concerns about the potential effects of generating facilities (e.g. wind and tidal power) on migratory fish, and particularly barrage developments in estuaries. The development of low-head hydropower schemes within rivers is also a major concern for many diadromous species.

Topic 2.4 - Population and community level impacts of contaminants, eutrophication, and habitat changes in the coastal zone

All diadromous species make use of coastal zones and contaminants may have lethal and sub-lethal effects. Contaminants within the freshwater environment have been shown to affect subsequent survival of fish when they transfer into salt water, and the same may be true for fish moving from salt to fresh water.

Topic 2.5 - Introduced and invasive species, their impacts on ecosystems and interactions with climate change processes

There are major concerns about both accidental and deliberate transfers of fish in freshwater. Stocking (introduction of hatchery-reared fish) is widely practiced for salmonids in particular, but carries significant risks for natural populations.

Theme 3 – Development of options for sustainable use of ecosystems

Topic 3.1 - Marine living resource management tools

Assessment and management of diadromous species generally requires the development of specialised and novel tools.

Topic 3.2 - Operational modelling combining oceanography, ecosystem and population processes

There are currently major initiatives to links fish distribution and behaviour to oceanographic information with respect to salmon through the EU-Salsea-merge programme and with respect to eels through the EU-Eeliad project.

Topic 3.3 - Marine spatial planning, including the effectiveness of management practices and its role in the conservation of biodiversity

No focus.

Topic 3.4 - Contributions to socio-economic understanding of ecosystem goods and services, and forecasting the effect of human activities

Socio-economic factors have a high profile in salmon management. The socio-economic impacts of reducing fisheries and restricting hydropower schemes also need to be considered with respect to eel management.

The TG concluded that scientists working on diadromous species can contribute across themes and topics within the Science Plan and consequently can expect requests for work from other steering groups within the new ICES structure. Its role is to provide a forum for the exchange of information and cooperation and to identify research requirements.

3.2 Coordination of science on diadromous species

The TG considered mechanisms through which science on diadromous species and issues relating to estuarine and fresh waters can be addressed and coordinated within the new ICES science plan. During 2009 the following activities were pursued.

Celtic Sea Trout Programme

Discussions were held with the Steering Group of the Celtic Sea Trout Programme, which is a project under the EU Cross-border Territorial Cooperation Programme, INTERREG IV. This project aims to protect and enhance sustainable tourism, environmental protection and cross-border biodiversity by filling a major gap in the knowledge and management of sea trout fisheries, which are of particular importance to Ireland and UK(Wales). Protecting and managing sea trout fisheries to fully realise their social and economic benefits and their biodiversity value requires an understanding of how the resource is distributed, its structure and the ecological processes affecting it across its habitats. The key aim of the project is to provide this missing knowledge and to translate it into better advice for management of this joint resource shared by countries bordering the Celtic seas. The benefits will be realised through enhanced and protected stocks and fisheries contributing to social well-being, sustainable tourism especially in rural communities, improved understanding to better manage response to climate change and emergent technologies and protection of international biodiversity.

It was agreed that the TGRECORDS could assist in disseminating the outputs from the CSTP and providing a link with other similar programme.

Living North Seas

Discussions were also held with the programme co-ordinators of the Living North Seas project, which is an INTERREG project involving 14 Partners from six countries in the North Sea Interreg Area. The project will address essential aspects for the management of migratory fish needed to inform policy for Sustainable Coastal Zone, national and international management. The work packages focus on sea trout and eelbut will be applicable to all migratory fish as dictated by future circumstances. One of the objectives of the LNS project is to have an expert group on diadromous fish to influence policy and coordinate work around the North Sea area. It has been suggested that TGRECORDS could assist in this process and also provide a mechanism to link activities with CSTP and other similar programmes.

DIADFISH

This is a network of European Research Institutes working on diadromous fish which was created in 2002. The network aimed to bring together experts and users of this resource in a joint approach throughout the range of species in question to improve knowledge and to ensure the sustained management of diadromous fish in Europe. Although the group is no longer very active, it still provides some communication of relevant activities, and it was suggested that TGRECORDS might be able to provide a mechanism to support additional activities.

The TG also considered how preparation of a plan for science activities supporting ICES advice on diadromous fish species could be formulated. It was felt that this would be best achieved by setting up expert groups, prioritising tasks and by emphasising where the outputs of these expert groups contribute to achieving the overall ICES science plan (see Section 4).

4 Review of Expert Groups on diadromous species

The annual meeting received reports from all the Experts Groups working of diadromous species and considered the need for further meetings or revised terms of reference. These discussions are summarised below.

4.1 Joint EIFAC/ICES Working Group on Eel [WGEEL] (Chair: Russell Poole)

The main terms of reference of the WGEEL were to gather data, to look at trends in recruitment and in the fisheries, to develop stock status methods, and to evaluate the impact of the EU Eel regulations. Measures of recruitment have continued to decline and are now considered to be between 4–11% or 1–9% (dependent on which base value is used) of historic levels. The rate of decline was greater in the northern areas and 2009 recruitment values were 50–55% less than in 2008. A further reduction in both landings and the level of stocking (probably as a consequence of reduced landings) was also recorded. Concerns were expressed about the quality of data available to assess eel stock status, for example catch data is unreliable and cpue data is missing. The Group considered that greater international coordination is required for data collection and acknowledged that while the EU DCR may help in this matter landings continue to decrease.

The group developed a stock assessment system to evaluate the outcome of the EU Eel regulation and concluded that the impact of management measures may be slight and that silver eel escapement will continue to decline such that by 2012, when the first EU evaluation is required, there will still not be an increase in escapement and further, it will be difficult to identify any subtle changes in stock status that might be expected from the implementation of management plans.

The Group reported that as glass eels are now almost unavailable, stocking has decreased. The performance of stocked eels has been reported as being between one quarter to parity compared to wild eels and consequently a call was made to optimise the quality of glass eels used in stocking programmes. The eel quality database was updated. A case study has shown that the level of contaminants present in eels from a number of countries is greater than that shown to have an impact on whiting stocks. The group recommended that a Study Group should take forward the post evaluation of the EU regulations, supported a call for local assessments in saline waters (see SGAESAW below), and reiterated that there was a need for international coordination through an eel advisory group.

4.2 Study Group on Anguillid Eels in Saline Waters [SGAESAW] (Chair: David Cairns)

The aim of the Study Group was to review current knowledge on eels in saline waters and to develop new methods of estimating eel densities in saline waters. Two meetings, one on either side of the Atlantic, were held.

A number of important observations were highlighted at the meetings. For example, there is evidence that the majority of silver eels leaving the Baltic sea have not been in freshwater; in the Netherlands, a by-catch study revealed that yellow eels can occupy a narrow fringe of shallow coastal waters; in France the majority of landings in the Mediterranean area are from saline lagoons highlighting the need for better information from such environments.

A number of new methods to estimate eel densities in saline waters were reviewed including, drop traps, large scale fyke nets and glass bottomed boats.

The group recommended that; further research is undertaken on the demographics of eels in saline waters, the precautionary approach should be applied in management, assessment models that take into account the different collection regimes currently used in coastal and freshwater environments be developed, a further Study Group should be convened to continue the work of the present Group.

4.3 Workshop on Age Reading of European and American Eel [WKAREA] (Chair: Françoise Daverat)

The aging of eels has always been problematic, partly due to marked differences in length at age between sexes and because otolith methodologies have been rarely validated. The aim of the group was to agree a standard methodology for aging eels and this was particularly timely as age data is now part of the DCR and is required for EMPs and the last meeting on this topic was held back in 1988.

Four aging methodologies were reviewed and the workshop members concluded that the burning and cracking method was the best available. In addition, standard methods for the collection and storage of otoliths and the rules for age zero for continental growth were agreed.

A “blind” intercalibration exercise was conducted by those attending the meeting. Some problems were identified and it was concluded that prior to aging all ancillary data (e.g. location of capture, date, etc.) should be considered in the age determination. A manual detailing the agreed procedures for age determination was produced and the group recommended that a further workshop be convened in 2011 to specifically collate a reference collection of otoliths and to rerun intercalibration tests.

4.4 Working Group on Baltic Salmon and Trout Working Group [WGBAST] (Chair: Atso Romakkaniemi)

An overview of the meeting of WGBAST was presented by the Working Group chair. The stock assessment is performed on five of the six recognised groups of wild salmon in the Baltic (categorised according to genetic, geographic, migration, fisheries exploitation and fisheries management criteria), and a Bayesian approach is used. No assessment has been made for assessment group 6 (Gulf of Finland). Input variables to the assessment were improved by including ladder counts of adult salmon and by re-evaluating the Polish catch information. The assessment highlighted the continued overall decrease in post smolt survival over the last 20 years to the current low level, although it was noted that abundance in northern groups has been increasing. It was recognised that the work of SGBICEPS would be of relevance to this Working Group with respect to factors impacting upon marine survival. Stock projections, providing estimates of both catch and spawning stock were made under differing effort scenarios and ICES recommended the setting of TACs on the basis of the low effort scenario. There is an ongoing debate over frequency at which assessment meetings should take place.

With respect to Baltic trout, parr density surveys show a low abundance of 0+ parr, particularly in the northern areas (Gulf of Bothnia and Gulf of Finland) which is thought to be due to a combination of higher fishing pressures and habitat problems. Management advice is therefore to introduce fishing restrictions in the northern areas, to reduce exploitation, and to restore rearing habitats. In the Main Basin, the advice is to improve habitat and improve access to spawning and rearing areas. In addition fishing restrictions are required in some regions of the Main Basin.

WGBAST recommended the cessation of Carlin tagging programmes, the extension of work on sea trout, the incorporation of genetic stock estimates into the assessment procedure and continued studies into the decline in post smolt survival.

4.5 Working Group on North Atlantic Salmon [WGNAS] (Chair: Jaakko Erkinaro)

An overview of the Working Group on North Atlantic Salmon (WGNAS) was presented. The status of the stocks, before distant water fisheries, in the NEAC area was different in the northern and southern regions. In the former, both 1SW and MSW stocks were at full reproductive capacity while, in the latter, both 1SW and MSW stocks were at risk of suffering reduced reproductive capacity. Forecasts of abundance were previously only available for one of the four NEAC stock (MSW southern) but newly developed Bayesian models have now produced forecasts for all four NEAC stocks. The Bayesian projection for the MSW southern stock is similar to that forecast by the previous regression model and the Bayesian projections, for all four stocks, up to 2012, show that no increase in abundance is predicted. Further, marine survival indices continue to decline. The management advice for the Faroese fishery, based on a consideration of the status of the NEAC stock complexes, was that no fishery should take place.

In the NAC area all six geographic areas were below their conservation limits. As for the NEAC area, the new Bayesian forecast model produced similar results to the previous model. The management advice is that there are no catch options for the composite NAC fisheries.

In WG the catch taken is for subsistence reasons only. The stock composition is currently mainly of North American origin. Management objectives take into account the status of stocks in NAC and in the NEAC southern MSW stock. The projected status of these stocks indicates that there are no catch options for the WG fishery in 2009, 2010 or 2011.

4.6 Study Group on Data Requirements and Assessment Needs for Baltic Sea Trout [SGBALANST] (Chair: Stig Pedersen)

The terms of reference for SGBALANST were to consider the future of the group, to propose methods for assessment and to select representative areas to begin the collection of stock and recruitment data.

The group concluded that as more than one country is exploiting the same stock and that poor post smolt survival was continuing to cause concern that international assessment continues to be required and therefore, that the work of the group should continue for another two years. Specific recommendations were to continue data collection at the parr stage, improve data coverage in all major geographic regions, improve the accuracy of catch data and implement an index river network for sea trout. In addition, the group should explore the possibility of either the extending work to include North Atlantic populations or set a similar group to do so.

4.7 Study Group on Biological Characteristics as Predictors of Salmon Abundance [SGBICEPS] (Chair: Ian Russell)

This Study Group was convened to investigate whether biological characteristics can predict salmon abundance. The Group produced a literature survey, looked at a number of case studies where changes in biological characters had been recorded and began the process of compiling data on biological characteristics of salmon from monitored rivers in a standard manner. Analyses were undertaken with a view to

identifying whether patterns could be identified. Visualisation of trends in biological characters did reveal some patterns at a regional scale and a meta analysis summary was produced. A major finding was that smolt age has decreased in many stocks although the implications of this on survival and whether changes in environmental variables (e.g. AMO, NAO and salinity) are linked to this observation are currently unknown.

Among the Group's recommendations were the need for a further meeting, the collation and analysis of more data on biological characteristics (particularly in the freshwater stages) and the development of investigations into the links of biological characters with both environmental and abundance variables.

4.8 Study Group on Salmon Stock Assessment and Forecasting [SGSSAFE] (Chair: Gerald Chaput)

The Study Group was convened to support the WGNAS through the development of common PFA forecast models for both NAC and NEAC stocks for use by WGNAS. Input data for the NAC area was modified to make it consistent with NEAC and a Bayesian model was developed for both the NAC and NEAC areas. An important outcome is that all four NEAC stocks can now be forecast. In addition, the new model is an improvement over the previous NEAC model for southern MSW stocks where forecasts were dependent upon year. However, some concern has been expressed that the models have not incorporated information on post smolt growth and continue to use lagged spawners as an input variable. It was noted that there is a EU project to develop a tool box of Bayesian tools for assessment over a number of species and it was suggested that those concerned with salmon forecasts should consider collaborate to harmonise methods over areas and improve forecasts.

The group recommends a further meeting to consider model diagnostics and the use of population dynamic and other alternative models.

4.9 Workshop on Learning from Salmon Tagging Records [WKLUSTRE] (Chair: Lars Peter Hansen)

This was the third and final workshop looking at historical ocean tagging information. The aim of the workshops was to collate the entire available ocean tagging information and test hypotheses relating to the distribution and behaviour of salmon in the ocean. The distribution of recaptures taken at West Greenland was not uniform across the NAFO divisions, the distribution was not temporally stable and furthermore distributions varied among home water countries. Recaptures from the Faroese fishery also showed differences in spatial distribution among the home water countries.

The Workshop has proposed that at least two peer-reviewed publications be prepared from the work undertaken. In addition the full tag recovery data set should be held by the ICES Data Centre to ensure that it is not lost, and a related Cooperative Research Report prepared to provide a full account of the data sources. Restrictions on access to these data will need to be agreed with participating scientists/institutes.

4.10 Study Group on Salmon Age Determination [SGSAD] (Chair: Jari Raitaniemi)

The Study Group assessed the reliability of ageing salmon by means of blind reading procedures and identified that there were issues with reliability. The major issue was distinguishing between wild and farmed salmon. The group has catalogued reference

material which will aid future attempts in developing a more consistent approach to age determination.

The group recommended that future work should include those involved with Atlantic salmon (possibly through the current EU SALSEA MERGE programme) and would assess and agree aging methodologies including pelvic fin rays and St/Ca ratios.

5 Proposals for New SCICOM Expert Groups in 2009 and 2010

TGRECORDS discussed the proposed Terms of References and meeting arrangements for existing and new Expert Groups. ToRs were drawn up during and following the meeting (Annex 3) and submitted to SSGEF for approval.

5.1 Proposals for Theme Sessions in 2010 and 2011

A proposal was submitted in 2009 for a theme session entitled "Causes and Variations in Natural Mortality in Fish (Conveners: Dave Reddin, Dan Duplisea, Niels Hintzen)". Members were encouraged to support the selection of this proposal for the 2010 ASC and to help stimulate the production of papers.

The group suggested that a theme session on eels may be required should the proposed symposium under the EU Eeliad programme not take place. It was agreed that this should be reviewed at the 2010 meeting.

5.2 Proposals for Symposia

An update on plans for NASCO/ICES Symposium on "Factors affecting Mortality of Salmon at Sea" and SALSEA Research Programme was presented. The symposium will be organised jointly between ICES and NASCO and will take place in 2011, probably in October in France. The organisers will invite keynote speakers from the Pacific and the proceedings will appear in the ICES Journal of Marine Science.

A potential Eel symposium, in 2012, possibly linked to the Wild Fisheries Congress, was briefly discussed. No further details were available at the time of the meeting.

6 Recommendations for future of TGRECORDS

The meeting noted that TGRECORDS only had a temporary status, but there was a strong feeling that was a continuing need for such a group within ICES. It was therefore agreed that a proposal should be submitted to SGEF that the TG should be re-constituted as the Working Group on the Science Requirements to Support Conservation, Restoration and Management of Diadromous Species (WGRECORDS) (See ToRs in Annex 3). Its role would be to oversee the continuation of work on diadromous species to the successful delivery of the ICES science plan. It would achieve this through proposing and supporting expert groups, theme sessions and symposia and would provide assistance to other ICES groups. The WG could also assist with the coordination of activities and dissemination of information between groups and projects involved with diadromous species. The group concluded that a one day meeting prior to the ICES ASC would be appropriate.

7 Any other business

A proposal for an overview of projects on diadromous species to be compiled and made available electronically was received. The group agreed that this should be

considered as a task for the new Working group on diadromous species should it come into being.

8 Close

The chair thanked TG members, and other participants, for their active participation and support during the meeting and looked forward to a continuation of such collaboration in the future.

Annex 1: List of participants

- meeting held on 6 June 2009 ⁽¹⁾
- meeting held on 23 September 2009 ⁽²⁾

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Annex 2: Agenda

Meeting held on Wednesday 23 September 2009, 09:00 – 13:00

Lyon Room, Estrel Convention Centre, Berlin, Germany

- 1. Adoption of Agenda and Appointment of Rapporteur**
- 2. Diadromous species in the ICES Science Plan**
 - 2.1 research on diadromous fish species that will support the ICES science plan;
 - 2.2 mechanisms through which estuarine and freshwater issues can be addressed and coordinated within the new ICES science plan;
 - 2.3 preparation of a plan for science activities supporting ICES advice on diadromous fish species;
- 3. Review of Expert Groups on diadromous species**
 - 3.1 Joint EIFAC/ICES Working Group on Eel [WGEEL] (Chair: Russell Poole)
 - 3.2 Study Group on Anguillid Eels in Saline Waters [SGAESAW] (Chair: David Cairns)
 - 3.3 Workshop on Age Reading of European and American Eel [WKAREA] (Chair: Françoise Daverat);
 - 3.4 Working Group on Baltic Salmon and Trout Working Group [WGBAST] (Chair: Atso Romakkaniemi)
 - 3.5 Working Group on North Atlantic Salmon [WGNAS] (Chair: Jaakko Erkinaro)
 - 3.6 Study Group on Data Requirements and Assessment Needs for Baltic Sea Trout [SGBALANST] (Chair: Stig Pedersen)
 - 3.6 Study Group on Biological Characteristics as Predictors of Salmon Abundance [SGBICEPS] (Chair: Ian Russell)
 - 3.6 Study Group on Salmon Stock Assessment and Forecasting [SGSSAFE] (Chair: Gerald Chaput)
 - 3.9 Workshop on Learning from Salmon Tagging Records [WKLUSTRE] (Chair: Lars Peter Hansen)
 - 3.10 Study Group on Salmon Age Determination [SGSAD] (Chair: J. Raitaniemi)
- 4. Proposals for New SCICOM Expert Groups in 2009 and 2010**
- 5. Proposals for Theme Sessions in 2010 and 2011**
 - 5.1 Causes and Variations in Natural Mortality in Fish
 - 5.2 Other proposals?
- 6. Proposals for Symposia**
 - 6.1 Update on plans for NASCO/ICES Symposium on “Factors affecting Mortality of Salmon at Sea” and SALSEA Research Programme
 - 6.2 Other proposals?
- 7. Recommendations for future of TGRECORDS**
- 8. Any other business**

Annex 3: WGRECORDS and associated Expert Groups terms of reference for the next meeting

2009/2/SSGEF19 The Transition Group on the Science Requirements to Support Conservation, Restoration and Management of Diadromous Species (TGRECORDS), chaired by Ted Potter, UK, will be renamed **Working Group on the Science Requirements to Support Conservation, Restoration and Management of Diadromous Species** (WGRECORDS), will work by correspondence and will meet in Nantes, France, 19 September 2010 in conjunction with the ASC 2010 to:

- a) Oversee and coordinate the contribution of work on diadromous species to the delivery of the ICES Science Plan;
- b) Propose activities (experts groups, theme sessions and symposia etc) to support the Science Plan and the work of ACOM Experts Groups on diadromous species;
- c) Report by 15 March on potential contributions to the high priority topics of ICES Science Plan by completing the document named "SSGEF_workplan.doc" on the SharePoint site. Consider your current expertise and rank the contributions by High, Low or Medium importance;
- d) Prepare contributions for the 2010 SSGEF session during the ASC on the topic areas of the Science Plan which cover: Individual, population and community level growth, feeding and reproduction; The quality of habitats and the threats to them; Indicators of ecosystem health.

WGRECORDS will report provisionally to SSGEF at the 2010 ASC and will report by 31 December 2010 (via SSGEF) for the attention of SCICOM, WGNAS, WGBAST and WGEEL.

Supporting Information

Priority	The Working Group will provide the mechanism required to support the implementation of the ICES Science Plan with respect to science undertaken in support of the conservation, restoration and rational management of diadromous fish species. It will also permit ICES to respond fully to request from NASCO and the EU for scientific advice on research needs and data deficiencies in these areas.
Scientific Justification	<p>There are many topics within the new ICES Science Plan that are very relevant to the research on diadromous fish species currently being undertaken or planned. However, there is a need to be able to draw the various elements of this work together to support the management advice provided on diadromous fish. In particular there is a need to support the science required to deliver commitments under various regulations, including the EU-Habitats Directive, the EU Water Framework Directive and the EU regulation 'establishing measures for the recovery of the European eel stock'.</p> <p>In addition, NASCO asks ICES annually to identify research needs and data deficiencies and provides the inventory of current research to assist this process. This task is currently assigned to WGNAS, but this group has insufficient time to complete the work and has not been able to provide a comprehensive response.</p> <p>ToRs c) and d) This is in response to a request from SSGEF.</p>
Resource Requirements	Meeting facilities at the ASC 2010.

Participants	National representatives and other invited experts working on diadromous fisheries
Secretariat Facilities	Secretarial support for organisation of the meeting and preparation of the report.
Financial	None
Linkages To Advisory Committees	The group will have strong links to ACOM in supporting the work of the WGs on salmon and eel.
Linkages To other Committees or Groups	There are linkages with SCICOM, SSGEF and all Expert Groups working on issues relating to diadromous species in relation to improving scientific understanding of salmon and coordinating scientific activities. The WG will also endeavour to build links with groups outside ICES working on diadromous species.
Linkages to other Organisations	NASCO

2009/2/SSGEF20 The **Study Group on International Post-Evaluation on Eels** (SGIPEE), chaired by Laurent Beaulaton*, France, will be established and will meet in Vincennes, France, 10–12 May 2010 and in 2011 [to be announced] to:

- a) Review stock assessment and post-evaluation methods available for species of eels, and those used by ICES Expert Groups on other species, that could be successfully applied to eels at the stock-wide level in 2012;
- b) Adapt methods for stock-wide post-evaluation of *Anguilla anguilla* and apply them to data collated by WGEEL at its annual meetings; (this may include aggregation of EMU post-evaluation);
- c) Analyze sensitivity of the selected methods to stock improvement or deterioration using simulated data;
- d) Submit recommendations to WGEEL on: the best available post-evaluation method for 2012; gaps in data or knowledge that need to be filled before 2012; and methods that should be developed and data that should be collected after 2012 for the next stock-wide evaluation.

SGIPEE will report by 15 July 2010 and **DATE** 2011 (via SSGEF) for the attention of WGEEL, WGRECORDS and SCICOM.

Supporting Information

Priority	Evaluating the status of the stock and post-evaluating the effect of management plans at the European level should be of the uttermost priority. An urgent requirement to prepare for EU 2012 reporting.
Scientific justification	<p>European and American eel stocks are currently in a severely depleted state. ICES has proposed that biological reference points for eels could be derived from spawner-per-recruit (SPR) analysis and the EU Regulation for the Recovery of the Eel Stock requires biomass estimates of current silver eel escapement.</p> <p>So far the difficulty of having many different independent parts of the stock isolated in different river basins and areas with varying anthropogenic impacts, and levels of information has hampered the achievement of a stock-wide analysis of the stock and precluded fully informed analyses of the stock-recruitment and recruitment-stock relationships. Nevertheless, the attempts made so far to estimate the restoration time and to calibrate required management actions are alarming and highlight the necessity of better knowing the stock status, and threats posed by density-dependent (depensatory,</p>

	<p>compensatory) mechanisms.</p> <p>Management plans when put into action should bring a wealth of new data, which will fail to produce a clear picture of the stock if they lack the structure and coordination required for a stock wide assessment. However, if collected correctly and used judiciously they could be used to enhance the current knowledge of stock status, and provide a European overview of current mortalities and biomass levels. Analyses, development and testing of the methods, and their dependence on data, will help to build a consistent pan-European post evaluation tool, leading in turn to calibrate future measures.</p> <p>It is highly likely that ICES will be requested to undertake the evaluation of the outcome of the Regulation following Member State reporting in 2012 and 2015. It is beyond the capacity of the WGEEL in its annual meetings to develop this capacity and WGEEL strongly recommend the formation of the SG. DGMARE have funded a pilot study to estimate silver eel biomass at the local level but neglected to include a stock-wide post-evaluation mechanism in the project. This SG is aimed at filling this gap.</p>
Resource requirements	
Participants	Members of WGEEL and invited experts from areas of the North Atlantic and elsewhere with eel populations.
Secretariat facilities	A centralized database should help the achievement of international post-evaluation
Financial	
Linkages to advisory committees	The proposal is of direct relevance to ACOM in relation to the development of appropriate assessment methods for eel.
Linkages to other committees or groups	WGEEL, WGRECORDS, SCICOM , other Working Groups on inshore fisheries.
Linkages to other organizations	EU FP7 EELIAD, European Union Recovery Plans; DGMARE pilot project on estimating silver eel escapement; Canadian Eel Science Working Group, U.S. Atlantic States Marine Fisheries Commission Eel Technical Committee

2009/2/SSGEF11 **The Study Group on Data Requirements and Assessment Needs for Baltic Sea Trout (SGBALANST)**, chaired by Erik Degerman*, Sweden, will meet by correspondence from January 2010 to March 2011, and will meet one day before the annual WGBAST meetings in St-Petersburg, Russia, 23 March 2010 and in 2011 [date and venue to be announced] to:

- a) review habitat classification systems for sea trout used by all countries;
- b) establish a common classification system of habitat quality, using both field and GIS data, to facilitate the use of data from sea trout index rivers on a wider scale;
- c) identify the habitat range of sea trout with respect to depth, water quality and main substrate on the macro-habitat scale, and with respect to stream slope and width, discharge and catchment size on a metahabitat scale;
- d) establish, where possible, habitat quality criteria for water temperature, oxygen, total-phosphorus, nitrogen and pH;
- e) provide a provisional list of rivers to be selected as index rivers in different areas of the Baltic Sea.

SGBALANST will report by 30 April 2011 (via SSGEF) for the attention of

WGBAST, ACOM, SCICOM and WGRECORDS.

Supporting Information

Priority	The work of the Group is essential if ICES is to progress the developments of techniques for the assessment of Baltic sea trout stocks, which will be required to address advice requirements for these stocks
Scientific justification	<p>In 2007, the review group for the WGBAST report was not in a position to provide advice on sea trout stocks in the Baltic stating that: "The framework for evaluating the state of the sea trout stocks is being reconsidered by ICES. In the absence of an agreed framework, ICES does not provide advice for the sea trout stocks this year".</p> <p>The review group further noted that although it appeared that information regarding smolt potential and present smolt production was available it was difficult to see how much of this was well supported by data and the quality of these data. The review group suggested that a better description of the data and the methods used to obtain the data should be reviewed and encouraged WGBAST to consider how this could be better displayed in the report.</p> <p>SGBALANST was established in 2008 and reviewed the availability and quality of data being used in the assessment of wild and mixed Baltic sea trout stocks and their fisheries; as requested they also developed ToRs to expand on issues identified at the first SGBALANST meeting.</p>
Resource requirements:	No specific resource requirements beyond the need for members to prepare for and participate in the meetings.
Participants:	Members of WGBAST and invited experts from North Atlantic areas with sea trout populations and established sea trout assessment programmes.
Secretariat facilities:	Secretarial support for meeting at ICES HQ. No additional software/hardware is anticipated beyond that which is currently available.
Financial:	None
Linkages to advisory committees:	Close link with ACOM to support advice on sea trout in the Baltic.
Linkages to other committees or groups:	SCICOM, WGBAST, WGRECORDS
Linkages to other organizations:	Part of the wider brief for the Baltic Assessment plan

2009/2/SSGEF03 The **Study Group on Biological Characteristics as Predictors of Salmon Abundance** (SGBICEPS), chaired by Ian Russell, UK, will meet at ICES HQ, Copenhagen, 24–26 November 2009 to:

- a) identify data sources and compile time series of data on marine mortality of salmon, salmon abundance, biological characteristics of salmon and related environmental information;
- b) consider hypotheses relating growth, mortality (freshwater and marine) and/or abundance trends for Atlantic salmon stocks with changes in biological characteristics of all life stages and environmental changes; and
- c) conduct preliminary analyses to explore the available datasets and test the hypotheses.

SGBICEPS will report by 28 February 2010 (via SSGEF) for the attention of the

WGNAS, ACOM, WGRECORDS and SCICOM.

Supporting Information

Priority	In June 2009, NASCO asked ICES to 'continue the work already initiated to investigate associations between changes in biological characteristics of all life stages of Atlantic salmon, environmental changes and variations in marine survival with a view to identifying predictors of abundance'. WGNAS has begun work on this question but has been unable to make significant progress due to other work pressures. There is therefore a need for a separate expert group to take on this task if significant progress is to be made with addressing NASCO's request for this advice.
Scientific Justification	NASCO has indicated that there is interest in determining if declines in marine survival of Atlantic salmon coincide with changes in the biological characteristics of juveniles in freshwater or are modifying characteristics of adult fish (size at age, age at maturity, condition, sex ratio, growth rates, etc) and with environmental change. WGNAS has been unable to make significant progress on this request from NASCO due to lack of time. By addressing this topic within a Study Group it will be possible to provide the opportunity for scientists working on both Baltic and Atlantic salmon to contribute to the work.
Resource Requirements	None
Participants	Members of the WGNAS and WGBAST and other designated salmon experts.
Secretariat Facilities	None
Financial	None. NASCO will sponsor the attendance of up to two analytical experts to expand the scope of the preliminary analyses already carried out by WGNAS.
Linkages To Advisory Committees	The Study Group will have direct significance to ACOM in supporting the provision of advice, via WGNAS, to NASCO.
Linkages To other Committees or Groups	There are linkages with WGBAST, SCICOM and WGRECORDS in relation to improving scientific understanding of salmon and co-ordinating science on diadromous species.
Linkages to other Organisations	NASCO

2009/SSGEF21 The Study Group on Salmon Stock Assessment and Forecasting (SGSSAFE), chaired by Gerald Chaput, Canada, will work by correspondence during 2009–2010 and will meet in 2011 [date and venue to be announced] to:

- a) Update and further develop stock and/or catch forecast models for salmon stocks in the NASCO North American and North East Atlantic Commission areas;
- b) Explore the possibility of incorporating physical and biological variables into the models that may explain variation in salmon survival;
- c) Evaluate options for developing forecast models which include all sea-age classes;
- d) Evaluate methods for incorporating uncertainty in the assessments;
- e) Develop risk analyses for the provision of salmon catch advice.

SGSSAFE will report provisionally at the annual meetings of WGNAS in 2010 and

2011 will submit the report by 31 July 2011 (via SSGEF) for the attention of WGNAS, ACOM, WGRECORDS and SCICOM.

Supporting Information

Priority	NASCO requests annual (or multi-annual) catch advice from ICES for North Atlantic salmon in the North American and North East Atlantic areas. The current models have been in use for at least 10 years, and are in need of review and updating to ensure that NASCO is being provided with the best scientific advice.
Scientific justification	Salmon stock forecast models currently used for North Atlantic salmon are at least 10 years old. The models for estimating and forecasting salmon stock abundance in the NASCO - NEAC area were developed as interim approaches but have not been significantly modified since. The models contain a number of weaknesses and inconsistencies which need to be reviewed in the light of current knowledge and new modelling techniques. WGNAS has been unable to allocate significant time to this task due to lack of time. Undertaking this work within a Study Group will also allow experts from WGNAS and WGBAST to share knowledge and experience in tackling these problems. Initial work was conducted by this Study Group in 2009 and the results were carried forward to the report of WGNAS. The outputs received some criticism from the ACOM Review Group and further work is required to finalise the models, including addressing these concerns.
Resource requirements	Provision of a meeting room at ICES Headquarters.
Participants	Members of the WGNAS and WGBAST and other designated experts salmon stock assessment.
Secretariat facilities	Secretariat support for meeting at ICES Headquarters.
Financial	None
Linkages to advisory committees	There are strong links to ACOM in the context of the provision of advice to NASCO.
Linkages to other committees or groups	There are also linkages with WGBAST in relation to salmon stock assessments and with SCICOM and WGRECORDS in relation to improving scientific understanding of salmon and co-ordinating science on diadromous species.
Linkages to other organisations	NASCO

2009/2/SSGEF22 **The Study Group on Anguillid Eels in Saline Waters (SGAESAW)**, chaired by [to be announced] will meet in VENUE, DATE [to be announced] to:

- a) Extract and examine eel data from general fish stock surveys in open marine waters;
- b) Review and develop local stock assessment methods in anguillid eels in saline waters with reference to habitat use, demographic characteristics and sampling techniques and in comparison with these features in fresh waters;
- c) Make recommendations on the use of habitat-specific demographic characteristics in population models (e.g. SPR, biomass targets, silver eel escape rates), and on overall conservation approaches that embrace salinity-based differences;

- d) Define research and analytic approaches for anguillid eels in saline waters that will advance progress towards constructing robust stock-wide management models.

SGAESAW will report by 31 December 2010 (via SSGEF) for the attention of WGEEL, SGIPEE, ACOM, WGRECORDS and SCICOM.

Supporting Information

Priority	The work of the Group is essential if ICES is to be appropriately placed to advise on the development of recovery plans for eels in Europe and North America, and particularly the Eel Management Plans required under EU Regulation 1100/2007.
Scientific justification	European and American eel stocks are currently in a severely depleted state. ICES has proposed that biological reference points for eels could be derived from spawner-per-recruit (SPR) analysis and the EU Regulation for the Recovery of the Eel Stock requires biomass estimates of current silver eel escapement. For this approach to provide meaningful results at the local and stock (species) scale, biologists need to know the relative importance of the habitat types used by eels and what demographic characteristics they exhibit in these habitats. One key habitat distinction is between fresh and saline (brackish/salt) waters. While recent research has increasingly revealed the importance of brackish and sheltered salt water habitats for eel, little remains known about eels in estuarine and particularly coastal waters, and most assessments currently take little or no account of the importance of these habitats in the production of potential spawners. The Study Group will inform the future development of assessment methods. A major gap identified by SGAESAW 2009 was the lack integrated assessment methods to determine the density and biomass of the local stocks.
Resource requirements	None.
Participants	Members of WGEEL and invited experts from areas of the North Atlantic and elsewhere with eel populations.
Secretariat facilities	None.
Financial:	Covering the expenses of travel & meetings would be appropriate
Linkages to advisory committees	The group is of direct relevance to ACOM in relation to the development of appropriate assessment methods for eel.
Linkages to other committees or groups	WGEEL, SGIPEE and SCICOM, other Working Groups on inshore fisheries, Canadian Eel Science Working Group, U.S. Atlantic States Marine Fisheries Commission Eel Technical Committee
Linkages to other organizations	Institutes participating in EU FP7 EELIAD, Organisations developing EU Eel Management Plans, DGMARE Pilot study on estimating silver eel biomass

PROPOSAL TO PGCCDBS

The **Workshop on Age Reading of European and American Eel** [WKAREA II] (Chair: Françoise Daverat, France) will exchange information by correspondence in 2010 and meet in Bordeaux, France in March 2011:

- a) to exchange samples (>100 per species) of European and American eel otolith pictures, including known age eels, with samples prepared using different protocols and representing a range of eel subpopulations, and environment types encountered in both species range

- b) to apply the age estimation criteria defined during the previous meeting in an inter-calibration process involving the exchanged images and a significant number of readers (>20).
- c) to analyse readings and interpret the results of the inter-calibration of European and American eel age reading
- d) to make recommendations and feedback on the age estimation criteria to increase age estimation precision and accuracy and improve the inter reader agreement
- e) to incorporate the findings with the report and manual developed by WKAREA 2009 for formal publication

WKAREA 2 will report by 1 May 2011 for the attention of WGRECORDS, WGEEL, SSGEF and PGCCDBS.

Supporting Information

Priority:	The work of the Group is essential if ICES is to be appropriately placed to advise on the development of recovery plans for eels. Integral to the age requirement of DCR.
Scientific justification	European and American eel stocks are currently in a severely depleted state. ICES has proposed that biological reference points for eels could be derived from spawner-per-recruit (SPR) analysis and the EU Regulation for the Recovery of the Eel Stock requires biomass estimates of current silver eel escapement. For this approach to provide meaningful results at the local and stock (species) scale, biologists need to estimate eel age with precision. The previous meeting (WKAREA) setup a process for otolith preparation, image exchange, established age estimation criteria for European and American eel and printed a manual of eel age determination and images. A small scale age intercalibration was conducted during the meeting based on known age eel samples. This exercise pointed out the need for a larger scale age intercalibration reading in order to apply the newly established age estimation criteria, and to measure the accuracy and precision of readers.
Resource requirements:	No specific resource requirements beyond the need for members to prepare for and participate in the meeting.
Participants:	Members of WGEEL and invited experts from areas of the North Atlantic and elsewhere with eel populations.
Secretariat facilities:	No additional software/hardware is anticipated beyond that which is currently available.
Financial:	Covering the expenses of travel & meetings would be appropriate
Linkages to advisory committees:	The proposal originates from WGEEL to WGRECORDS but is of direct relevance to SCICOM and review group activities in relation to the development of appropriate assessment methods for eel. Maybe refer to PGCCDBS?
Linkages to other committees or groups:	WGEEL, WGRECORDS, SCICOM, other Working Groups on inshore fisheries, Canadian Eel Science Working Group, U.S. Atlantic States Marine Fisheries Commission Eel Technical Committee
Linkages to other organizations:	EU FP7 EELIAD, European Union Recovery Plans

The **Study Group on Salmon Age Determination [SGSAD]** (Chair TBA) will meet in the winter period of 2010 to:

- a) evaluate the status of examination of thin slice from salmon pelvic fin ray;
- b) evaluate the possibility to differentiate real spawning marks from other erosion marks
- c) evaluate the status of the preparation of a description of salmon life cycle (blue book of IBSFC)
- d) evaluate the status of the investigations on possibilities to assess post smolt survival rate on the basis of scale growth pattern

- e) evaluate the possibilities to use the number and width of striae as an aid in the interpretation of difficult scales
- f) evaluate the experiences from the use of strontium-calcium relationship in the research on e.g. early emigration behaviour of fry

SGSAD will report by 1 June 2010 or 2011 (depending on the date of SGSAD meeting) to the attention of WGBAST, WGRECORDS and SSGEF.

Supporting Information

Priority:	The highest priority of SGSAD is to increase and maintain a high level of reliability in age determination of salmon as a basis for the stock assessment and other research concerning salmon.
Scientific justification	<p>In age determination of fish, quality assurance is vital to ensuring the reliability of age determinations. With the Baltic populations of salmon, cooperation of age readers from different countries and laboratories can be used as a means to improve and validate the age determinations and to maintain high quality and repeatability.</p> <p>In addition to age determination, SGSAD contributes to the use of scientific methods that utilize calcified structures e.g. scale, otoliths and fin rays.</p> <p>Stock assessment of salmon and investigations into marine mortality will also be linked to the work of SGSAD.</p>
Resource requirements:	None
Participants:	The Group is normally attended by some 10–20 members and guests.
Secretariat facilities:	None.
Financial:	BSRP has supported the work of SGSAD by funding travelling expenses of the participants from countries under the BSRP.
Linkages to advisory committees:	Direct linkages with the WGBAST and ACOM in terms of provision of advice and accurate stock assessment.
Linkages to other committees or groups:	There are linkages with WGBAST and WGNAS in relation to the use of age data in salmon stock assessments and with SciCom and TGRECORDS in relation to improving scientific understanding of salmon and co-ordinating science on diadromous species.
Linkages to other organizations:	Links to ongoing initiatives within NASCO, particularly in relation to marine survival investigations.

Annex 4: Recommendations

RECOMMENDATION	FOR FOLLOW UP BY:
1. TGRECORDS should be reconstituted as WGRECORDS with ToR as shown in Annex 3.	SSGEF
2. WGRECORDS should have a full day meeting immediately prior to the 2010 ASC	ICES Secretariat
3. The Chair of WGRECORDS should maintain links with the CSTP and LNS INRERREG Programmes and report back to the next annual meeting.	Chair
4. Review proposals for a theme session on eels at the 2010 meeting.	Chair/2010 meeting
5. Consider compiling an overview of projects on diadromous species and make this available electronically.	Chair/2010 meeting
6. The group will consider making a theme session proposal on eels should the proposed symposium under the EU Eelad programme not take place.	Chair/2010 meeting