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Report from the Technical and Scientific Committee (TSC) on Outcomes of EIFAAC Projects since the 29th Session of EIFAAC

Executive Summary

- This document summarizes the work of the Commission under the direction of the Technical and Scientific Committee (TSC) during the intersessional period July 2017-June 2019, namely the EIFAAC projects that were initiated or are ongoing under the Work Plan 2017-2019. A summary of the status of these projects will be presented at the 30th Session, for discussion by the Members.
- This document is for information only.

BACKGROUND

1. At its 26th Session of EIFAAC held in Zagreb, Croatia, 17-20 May 2010, a Technical and Scientific Committee was established. According to the Rules of Procedure, the Technical and Scientific Committee (TSC) works under the coordination of the Management Committee (MC). The TSC was created to support and strengthen the work of the Commission. The TSC consists of a chairperson and six members elected by the Commission during a session. Main tasks of the TSC are to provide recommendations, evaluations and monitoring results to the MC to support the decision making process on projects that contribute to achievement of the goals and objectives of EIFAAC in relation to inland fisheries and aquaculture sector. This document contains the work report of the TSC for the intersessional period July 2017-June 2019.

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2. The functions of the TSC in achieving the goals and objectives of EIFAAC are to:
- make, review, evaluate and as appropriate recommend to the Management Committee proposals for programs or projects to be carried out by the Commission in accordance with these Rules;
 - develop Terms of Reference for programs/projects and monitor project implementation against the Terms of Reference;
 - provide technical oversight, monitoring and evaluation of projects and related programs of work activities;
 - formulate and draft technical and scientific advice for consideration by the Management Committee;
 - function as an editorial and publications committee.
3. The 29th Commission re-elected Mr Teppo Vehanen (Finland) as the chairperson for the TSC. Selected members for the intersessional period September 2017 – September 2019 were: Ms Marina Piria (Croatia), Mr Piotr Parasiewicz (Poland), Mr Colin Bean (Scotland), Mr Cristian Skov (Denmark), Mr Robert Arlinghaus (Germany), and Ms Fiona Kelly (Ireland). Mr GianAndrea La Porte (Italy), Mr Andreas Melcher (Austria), Mr Jan Kubecka (Czech Republic), Mr Russell Poole (Ireland) and Mr Andrzej Kapusta (Poland) were selected as alternate members of the TSC. The TSC has had eight meetings during the intersessional period: six in 2018 and two in 2019.

NEW PROJECTS

4. Proposals for new EIFAAC projects may be developed by the Technical and Scientific Committee, a Member, a donor, a partner organization or an independent partner institution. According to the Rules of Procedure, the Technical and Scientific Committee shall review and evaluate each project proposal, taking into account the following criteria:
- the project proposal is consistent with the objectives and functions of the Commission and with the terms of its Agreement;
 - the project outcomes shall have relevance to one or more Members of the Commission;
 - to the extent possible, the project proposal is forward-looking, proactive and results-based.
- After the TSC has evaluated the project proposal, it forwards its recommendations to the MC. Once a project is accepted, a project template needs to be filled. Information on requesting new EIFAAC projects is available under "Projects" on EIFAAC webpage (<http://www.fao.org/fishery/rfb/eifaac/en>).
5. During the intersessional period six projects have progressed, reports on their achievements are included under Attachment 1. The projects are: 1) "Management / Threat of Aquatic Invasive Species in Europe", manager: Marina Piria (Croatia); 2) "Monitoring the Performance of Fish Passes; CEN standard ", manager: Emma Washburn (UK); 3) "Developing Advice on Sustainable Management Actions on Cormorant Populations", manager: Niels Jepsen (Denmark); 4) "Joint EIFAAC/ICES/GFCM Working Group on Eel (WGEEL)", coordinator: Alan Walker (UK); 5) "Workshop on Citizen Science in Fisheries", manager: Ciara O'Leary (Ireland); 6) "EIFAAC Symposium on Food Safety and Conservation in Inland Fisheries and Aquaculture", manager: Reinhold Hanel (Germany). One new project was started in spring 2019: 7) "Capacity development on systems and methodologies of data collection in inland fisheries", managed by FAO and Teppo Vehanen (Finland). Two successful projects ended in 2018: 8) "Development of eel stocks in Norway and Ireland", managed by Eva B. Thorstad (Norway), produced two scientific papers; 9) "Welfare of fishes in Aquaculture", managed by Helmut Segner (Switzerland), delivered the final project report which is to be published as FAO Circular.

PROJECT MONITORING

6. Project managers should report to the Technical and Scientific Committee no less than twice a year, to enable TSC to report to MC on the progress of the projects. Progress reports of projects (February 2019) are presented in Appendix I. Progress reports of all projects will be presented and discussed during the 30th Session of EIFAAC.

PUBLICATIONS

7. **EIFAAC Project on “Welfare of fishes in Aquaculture”**

Segner, H., Reiser, S., Ruane, N., Rösch, R., Steinhagen, D. and Vehanen, T. 2019. Welfare of Fishes in Aquaculture. FAO Fisheries and Aquaculture Circular No. 1189. Budapest, FAO.

8. **EIFAAC Project on “Management / Threat of Aquatic Invasive Species in Europe”**

Povž, M., Jakšič, G., Piria, M. (2018): The updated list of the non-native freshwater fishes in Slovenia with note of their potential impact in inland waters. Pakistan Journal of Zoology <http://dx.doi.org/10.17582/journal.pjz/2018.50>

Vilizzi, L., Gordon H. Copp, Boris Adamovich, David Almeida, Joleen Chan, Phil I. Davison, Samuel Dembski, F. Güler Ekmekçi, Árpád Ferincz, Sandra C. Forneck, Jeffrey E. Hill, Jeong-Eun Kim, Nicholas Koutsikos, Rob S. E. W. Leuven, Sergio A. Luna, Filomena Magalhães, Sean M. Marr, Roberto Mendoza, Carlos F. Mourão, J. Wesley Neal, Norio Onikura, Costas Perdikaris, Marina Piria, Nicolas Poulet, Riikka Punttila, Inês L. Range, Predrag Simonović, Filipe Ribeiro, Ali Serhan Tarkan, Débora F. A. Troca, Leonidas Vardakas, Hugo Verreycken, Lizaveta Vintsek, Olaf L. F. Weyl, Darren C. J. Yeo, Yiwen Zeng (2019): A global review and meta-analysis of applications of the freshwater Fish Invasiveness Screening Kit. Reviews in Fish Biology and Fisheries, <https://doi.org/10.1007/s11160-019-09562-2>

9. **EIFAAC Project on “Development of eel stocks in Norway and Ireland”**

Poole, W. R., Diserud, O. H., Thorstad, E. B., Durif, C. M., Dolan, C., Sandlund, O. T., Bergesen, K., Rogan, G., Kelly, S., and Vøllestad, L. Asbjør 2018. Long-term variation in numbers and biomass of silver eels being produced in two European river systems. – ICES Journal of Marine Science, doi:10.1093/icesjms/fsy05

10. **EIFAAC Project on “Developing Advice on Sustainable Management Actions on Cormorant Populations”**

Jepsen, N., Flavio, H. and Koed, A. 2019. The impact of Cormorant predation on Atlantic salmon and Sea trout smolt survival. Fisheries Management and Ecology 26, 183-186.

OTHER ACTIVITIES

11. All TSC activities were guided through projects.

Appendix I: Project templates**PROGRESS REPORT****EIFAAC Project “Management / Threat of Aquatic Invasive Species in Europe”**

The project contributes to the following SDGs: 2 (Zero Hunger) and 6 (Clean Water and Sanitation).

Manager: Marina Piria, University of Zagreb, Faculty of Agriculture, Department of Fisheries, Apiculture, Wildlife Management and Spec. Zoology
Date of reporting: February 2019, updated July 2019.

Introduction and chronology

In January 2012 a Project Proposal entitled ‘Management / Threat of Aquatic Invasive Species in Europe’ was submitted to the EIFAAC T&S Committee by Joe Caffrey (Inland Fisheries Ireland). The Project was agreed by both the Technical and Scientific Committee (TSC) and the Management Committee (MC) and commenced in early 2013.

In December 2016 manager of the EIFAAC project “Aquatic Invasive Species in Europe” became Marina Piria (University of Zagreb, Faculty of Agriculture).

In 2017 the project was added to Research gate:

<https://www.researchgate.net/project/EIFAAC-Project-on-Aquatic-Invasive-Species-in-Europe>

Terms of Reference

Purpose and objectives are available here:

<http://www.fao.org/fishery/static/eifaac/WPAquaticInvasive/WPAquaticInvasive2018.pdf>

The objectives of Project Proposal have been achieved to date, and further work has been planned on the broader theme of aquatic invasive species.

Achieved goals in 2018 and 2019

- I. Multilingual AS-ISK risk assessment for aquatic invasive species released.
- II. Review paper Vilizzi et al “A global review and meta-analysis of applications of the freshwater Fish Invasiveness Screening Kit” has been accepted for publication in Reviews in Fish Biology
<https://link.springer.com/article/10.1007/s11160-019-09562-2>

Goals 2019-2020***I. Publications***

Publication based on multilingual AS-ISK risk assessment with a title of “A global application of the Aquatic Species Invasiveness Screening Kit” is under preparation.

Guidance on freshwater alien fish species in Croatia (in local language) with a title of ‘Priručnik stranih vrsta slatkovodnih riba’ in cooperation with the Ministry of Environmental Protection and Energetic in Croatia is under preparation.

II. Conference preparation - FINS III

FINS-III should be organised by Dr. Elena Tricarico from Dipartimento di Biologia Evoluzionistica, Università degli Studi di Firenze, via Romana 17, 50125 Firenze, Italy in honor of Francesca Gherardi in 2020.

Deliverables***I. Multilingual AS-ISK risk assessment for aquatic invasive species:***

<https://www.cefas.co.uk/services/research-advice-and-consultancy/invasive-and-non-native-species/decision-support-tools-for-the-identification-and-management-of-invasive-non-native-aquatic-species/>

II. New publications

Piria, M., Špelić, I., Rezić, A., Šprem, N. (2019): Morphological traits and condition of brown trout *Salmo trutta* from Žumberak and Samobor mountain streams. Journal of Central European Agriculture, accepted.

Vilizzi, L., Gordon H. Copp, Boris Adamovich, David Almeida, Joleen Chan, Phil I. Davison, Samuel Dembski, F. Güler Ekmekçi, Árpád Ferincz, Sandra C. Forneck, Jeffrey E. Hill, Jeong-Eun Kim, Nicholas Koutsikos, Rob S. E. W. Leuven, Sergio A. Luna, Filomena Magalhães, Sean M. Marr, Roberto Mendoza, Carlos F. Mourão, J. Wesley Neal, Norio Onikura, Costas Perdikaris, Marina Piria, Nicolas Poulet, Riikka Puntala, Inês L. Range, Predrag Simonović, Filipe Ribeiro, Ali Serhan Tarkan, Débora F. A. Troca, Leonidas Vardakas, Hugo Verreycken, Lizaveta Vintsek, Olaf L. F. Weyl, Darren C. J. Yeo, Yiwen Zeng (2019): A global review and meta-analysis of applications of the freshwater Fish Invasiveness Screening Kit. Reviews in Fish Biology and Fisheries, <https://doi.org/10.1007/s11160-019-09562-2>

Povž, M., Jakšič, G., Piria, M. (2018): The updated list of the non-native freshwater fishes in Slovenia with note of their potential impact in inland waters. Pakistan Journal of Zoology <http://dx.doi.org/10.17582/journal.pjz/2018.50>

All previous publications can be downloaded here:

<https://www.researchgate.net/project/EIFAAC-Project-on-Aquatic-Invasive-Species-in-Europe>

Special issue of MBI (FINS II papers) can be downloaded here:

<http://www.reabic.net/journals/mbi/2017/Issue3.aspx>

FINS I paper can be downloaded here:

http://www.reabic.net/journals/mbi/2014/1/MBI_2014_Caffrey_etal.pdf

III. Conference abstracts (oral presentations):

Piria, M., Špelić, I. (2018): Diet overlap among invasive Ponto-Caspian gobies and native fishes from the Sava River. Book of abstract, GLOBAQUA conference Water river management under water scarcity and multiple stressors 17-19 December 2018, Residencia d'Investigadores, Barcelona, Spain – Barcelona, 40-41.

Piria, M. (2018): Slatkovodne strane vrste riba u hrvatskoj: problemi i trenutna situacija u akvakulturi (Freshwater alien fish species in Croatia: problems and current situation in aquaculture). 13th International Aquaculture Conference, “Co-operation of Production and Science – A Foundation for Successful, Sustainable Development of Aquaculture” Zbornik sažetaka, 29. - 30. 11. 2018., Vukovar, Croatia, 10-11.

Piria, M. (2018): Invasive alien freshwater fish species in the Danube River Basin – implications for management. FAO conference River habitat restoration for inland fisheries in the Danube river basin and adjacent Black Sea areas” in Bucharest, Romania on 13-15 November 2018, oral presentation, Proceedings, in press

Marina Piria, Ivan Špelić, Ana Gavrilović (2018): Distribution and impact of translocated predatory fish species in the Dalmatia ecoregion. 3rd Croatian symposium on invasive species with international participation 26-27 November 2018 Zagreb, Croatia, Book of Abstracts, 64.

Piria, M. (2018): Distribution of translocated predatory fish species: European catfish *Silurus glanis*, Pikeperch *Sander lucioperca* and Northern pike *Esox lucius*, and their potential impact on the Dalmatia ecoregion. Book of Abstracts, Aquainvad-ED: Management, Risk Control and Early Detection of Aquatic invasive species, 3 September 2018, Dun Laoghaire, Dublin Ireland, p16.

EIFAAC Project “Development of a European Standard for fish pass monitoring”

The project contributes to the following SDGs: 2 (Zero Hunger) and 6 (Clean Water and Sanitation).

Manager: Emma Washburn & Jon Hateley
Date of reporting: February 2019, updated July 2019

Introduction

EIFAAC is supporting a project to develop a European Standard for monitoring fish passes through the European Committee for Standardization (CEN).

More and better fish pass performance data are needed. Currently few fish pass construction projects provide budget for accompanying monitoring programmes and those monitoring studies that do take place vary widely in terms of overall objectives, terminology and methodology used. This variability of data and lack of transferable knowledge is a major constraint also at international level on the development of fish pass design. In order to maximize the benefit from expensive monitoring studies, the results need to be pooled and compared, which is not possible when studies measure different efficiency metrics and use different experimental designs.

The production of a European standard for assessing the performance of fish passes will enable us to improve and develop current fish pass designs by:

- Improving the quality of fish pass monitoring studies;
- Maximizing the benefit of each individual study and enabling data pooling across Europe.

Terms of Reference

The purpose of this project is to develop and publish a CEN standard for monitoring the efficiency of fish passage solutions. This will ensure that optimum fish pass designs are identified and shared throughout European countries, resulting in improved compliance towards WFD objectives. The project is linked to EIFAAC strategic objective IV.

The standard will be a set of guidelines, based on best practices, covering the definitions used to describe the efficiency of technical and nature-like fish passes; valid monitoring methods; experimental design; data interpretation and reporting.

Progress in the intersessional period

Final amendments on standards were submitted to CEN and the draft standard was formatted and translated into French and German. The formatted version: *prEN 17233. Water quality - Guidance for assessing the efficiency and related metrics of fish passage solutions using telemetry*, was released for public comment (the ‘Enquiry’ stage) ahead of the schedule in January 2018. Closing date for comments was 19 March 2018.

A total of 104 comments were received and considered. Dr Emma Washburn attended the meeting of the CEN/TC230/WG 24 in Brussels on 5 June 2018 to present and discuss comments.

The draft standard was amended to incorporate the suggested changes. The CEN working group suggested an additional short public comment phase to allow interested parties to assess changes. This took place during December 2018 and a further 3 comments were received and incorporated.

The aims, scope and contents of the draft standard were presented at the German Federal Institute of Hydrology (BfG) workshop on standardizing fish passes in Koblenz on 7 June 2018, with particular reference to lessons learnt from the work undertaken so far.

The final version of the draft standard is completed and will be submitted for a final vote once the copyright forms required for the inclusion of ‘real-life’ examples are finalized, signed and returned.

Benchmarks/deliverables

Jan - Mar 2018: CEN editing and preparation of the draft standard. Completed.

Apr - Jun 2018: Draft released for public comment and **vote** – the 'Enquiry' stage. During this stage, everyone who has an interest (e.g. manufacturers, public authorities, consumers, etc.) may comment on the draft. Completed.

July 2018 – Feb 2019 (revised dates: April-November 2018): Consideration of comments. Completed.

5th June 2018: Presentation to CEN/TC230/WG24 meeting in Brussels. Discussion of comments. Completed.

7th June 2018: Presentation to the German Federal Institute of Hydrology workshop in Koblenz. Completed.

November 2018 – Dispatch of Formal Vote Draft to CEN. Completed.

December 2018 – Additional Enquiry stage. Completed.

January 2019 - Consideration of comments. Completed.

January 2019 – Awaiting guidance from CEN regarding copyright forms.

February 2019 – Submission of copyright forms. Draft standard submitted for final vote.

EIFAAC Project “Developing Advice on Sustainable Management Actions on Cormorant Populations”

The project contributes to the following SDGs: 2 (Zero Hunger), 12 (Responsible Consumption and Production) and 15 (Life on Land).

Manager: Niels Jepsen (nj@aqua.dtu.dk)

Date of reporting: February 2019

Introduction

Understanding interactions among fish, fisheries, and cormorants is in the perspective of different stakeholders. A pan-European management plan has been set on the advisory list of EIFAAC. Currently only national, regional and local management actions have appeared but a pan-European dimension has been unreachable. The number of cormorants is still increasing, despite diverse national management actions. Conflicts seem to occur more frequently in most European countries and the impact from predation on EU freshwater fish populations cannot be underestimated. Recently, results from studies in Germany from the Koblenz-Landau University have indicated that cormorant predation may be the major reason for rivers not to reach good or high status, according to WFD. The same situation has been observed in Denmark, where some rivers have so low quantities of fish that no assessment on the ecological status can be implemented. Likewise, results from the NASCO-supported SMOLTRACK project may indicate that one of the reasons for the general decrease in salmon populations may be the heavy predation from cormorants on migrating smolts.

After the 26th Session the work of the project, acting as a liaison group, has concentrated on following and participating in discussions and meetings on cormorant issues in different countries, especially around the Baltic Sea. In Denmark, in spite of an adaptive management plan with wide measures to regulate cormorants, the current predation pressure from cormorants on river and lake fish populations generally remains very high. In particular grayling, salmon and larger (resident) brown trout are being predated during winter at apparently unsustainable levels in most rivers. Some populations of grayling are presently very close to local extinction. The same situation has been observed for decades in Central Europe/Alpine regions where Germany, Switzerland, the Czech Republic, Slovenia and Austria have lost many valuable populations of brown trout and grayling. Results have also demonstrated high predation pressure from great cormorants on lake fish populations, in particular on trout and perch. Preventive methods to protect vulnerable fish stocks have not succeeded so far. In a study of the efficiency of protective shooting, predation on wild salmon smolts increased from 45% in 2016 to 50% in 2017, despite very strong measures to protect smolts. These measures involved over 500 hunters (shooting in the river) and 33 boats shooting in the estuary during the smolt run as well as the destruction

of a breeding colony. Research from many European salmon rivers shows high rates of cormorant predation on salmon smolts.

The continuing increase in breeding cormorants in Sweden and Finland provides increasing conflicts along the coast in those countries, but also pose a problem for other countries by increasing the number of migrating cormorants causing conflicts due to winter in-river predation in Denmark, UK and Central Europe.

Terms of Reference

TOR was approved at the 27th Session of EIFAAC in Hämeenlinna, Finland, in 2012 and supported at the 28th Session in Lillehammer, Norway, in 2015. The 28th Session prepared recommendations that EIFAAC is concerned about the impact of cormorants on the status of fish stocks and eco-systems; EIFAAC recognizes the trans-boundary nature of this issue and also recognizes the need for international co-ordination and species management.

- Work for the pan-European cormorant management actions. – Completed.
 - Collect from different sources information on the abundance and distribution of cormorants in member countries. – Completed.
 - Assess the interaction between cormorants and different stakeholders. Completed mainly in the Nordic countries.
 - Assess cormorant's influence on socio-economic conditions of fisheries and aquaculture. –The conflict has developed beyond fisheries and aquaculture and is now is a threat to the functioning of ecosystems.
 - Gather information on new developments and experiences in controlling the number of cormorants and their influence on fish stocks, fisheries and aquaculture. Completed and the development in North America is also followed.
 - Identify possible knowledge deficits for different geographical regions. – In general, evaluations/assessments of the impact of cormorant predation of fish stocks and ecosystem status is not available. Very little research is accomplished, despite the high level of conflicts. Funding is generally difficult to get for such studies.
- Disseminate information through national focal points, project participants, project website and publications. – Completed to some extent, mostly in the Nordic Cormorant Group and the associated Facebook Group (700 members). Dr Niels Jepsen travels to and participates in several cormorant meetings, conferences and workshops every year to disseminate results and to provide advice for management actions.

Benchmarks/deliverables

1. Update of national statuses of cormorants and experiences on management plans in member countries.

- Information on the current situation in member states has been presented by the CorMan project in connection with the cormorant breeding colony count report (<http://dce2.au.dk/pub/TR22.pdf>).
- Updated information on cormorant issues is available on the websites of CorMan-project, EAA, Helcom, Wetland international and national research institutes.
- Development of project website is still underway due to organizational changes in the projects chair's home institute (Natural Resources Institute Finland).
- Denmark (Dr Niels Jepsen) is carrying out extensive research on the influences of cormorants on inland waters fishes and fish populations. However, it is becoming increasingly clear that even if measures to minimize predation in rivers and streams are identified, they will be costly and only possible in areas with well-organized volunteers. Extended international cooperation is needed to be able to efficiently address the problem.

2. Develop elements for management actions and relevant suggestions.

- DTU Aqua has strongly advocated a Nordic research and management project, where regulation efforts could be synchronized and current knowledge, observations and ideas could be exchanged. Currently a group from Sweden, Norway, Estonia, Finland and Denmark is supported by the Nordic Council of

Ministers and meets to develop common proposals to receive funding for networking and research activities.

- In Finland a cormorant working group finished their work in spring 2016 but their suggestions didn't change management. Nordic cormorant population is expected to keep increasing and moving north with the current management practice. There are also processes in Sweden and Finland to write management plans with measures to control cormorants as the pressure from declining fisheries is increasing. There is much public debate and political attention on the problem.

3. Advice Technical and Scientific Committee on draft Pan-European Cormorant Action Plan by éthe 30th Session.

1. Update on the national situation with cormorants and experiences on management plans in member countries. Dr Niels Jepsen is ready to receive, compile and synthesize national reports. *EIFAAC is requested to take action in collecting reports about the cormorant situation from members.* Current situation and management action experiences of Baltic states are discussed in the Nordic Group mentioned above and applications for research funds are continuously being submitted. In 2019, an attempt to obtain a common EMFF-supported project will be tried.

2. Develop elements for management actions and relevant suggestions.

- A workshop on cormorant management actions is necessary. The Nordic Group do make efforts to arrange such a meeting. A good starting point was the cormorant symposium held in Lillehammer, Norway 9-10 October 2018. Another meeting on cormorants will be hosted by the Swedish anglers in 2019. *EIFAAC is requested to take action to arrange a conference for all member states on the protection of fish stocks from cormorant predation.*

3. Agree on a common EIFAAC statement about the severity of the current situation. Prepare press releases to inform the public on the extent of the problem of cormorant predation in freshwater throughout Europe. Request for EU action. *EIFAAC is also requested to take action.*

4. Advice the Technical and Scientific Committee to draft a Pan-European Cormorant Action Plan at the 2019 Session, as currently the EU Commission is not interested in the preparation of such a plan, as it is indicated in the report from the cormorant hearing in Brussels, 9 October 2018.

Additional project documents available:

Report from Lillehammer meeting.

Report from the EU hearing in Brussels.

Two recently published papers on the impact of cormorant predation.

EIFAAC Project “Joint EIFAAC/ICES/GFCM Working Group on Eel (WGEEL)”

The project contributes to the following SDGs: 17 (Partnerships for the Goals).

Manager: Alan Walker, Chair.

Date of reporting: February 2019, updated July 2019

1. Introduction

The EIFAAC Working Group on Eel (WGEEL) has been active since the 1970's and acted as a major focus for collation of eel data and biology through its symposia in the 1980s and 1990s – a task it continues to achieve through its annual reports. A widespread severe decline in recruitment was observed in the early 1980s along with a longer term decline in landings. By 1993, this decline in recruitment, along with the stock-wide reduction in landings, was leading to serious concern and since 1998, the EIFAAC Working Group has operated on a joint basis with ICES, providing scientific advice on stock data and eel management, particularly in relation to the EU Action Plan for the Recovery of

Eel (EU 2007: COM(2005) 472). From 2014, the GFCM (General Fisheries Commission for the Mediterranean) is operating on a joint basis with EIFAAC and ICES on European Eel.

This report provides an update on activities undertaken during 2018, and a forward look to activities planned for 2019.

2. Work undertaken in 2018

2.1 Annual meeting of WGEEL

The 2018 meeting of WGEEL took place in Gdansk, Poland, 5-12 October, to address four Terms of References (ToR):

- ToR A: Report on developments in the status of European eel (*Anguilla anguilla*) stocks, their fishing and other anthropogenic impacts, based on the responses to Data call 2018 and WGEEL Country Reports
- ToR B: Produce the first draft of the ICES annual eel advice and other advisory documents, as requested
- ToR C: Report on updates on the scientific basis of the advice, including any new or emerging threats or opportunities
- ToR D: Address the generic EG ToRs from ICES and any further requests from ICES, EIFAAC or GFCM

Thirty-nine experts attended the meeting, representing 19 countries, along with a representative of the EU Commission DG MARE and a representative of the ICES Workshop on Evaluating Eel Management Plans 2018 (WKEMP).

The Working Group used data and information provided in response to the Eel Data Call 2018 (from 16 countries) and 19 Country Report Working Documents submitted by participants. Additional information was supplied through correspondence by Working Group members who were unable to attend the meeting.

Recruitment of European eel from the ocean remained low in 2018. Glass eel recruitment compared to the period of 1960–1979 was only 2.1% in the North Sea and 10.1% in Elsewhere Europe, based on available data series. For yellow eel data series, recruitment was provisionally 29% (not all series fully reported) of the level during the reference period.

Landings data were updated based on those reported to WGEEL, either through responses to the 2018 Data call, or in Country Reports, or integrated by WGEEL using data from previous reports. As some countries have not reported all their landings, even increased numbers reported here should be considered as minima.

Glass eel fisheries within the EU takes place in France, UK, Spain, Portugal and Italy. Glass eel landings have declined sharply from 1980, when reported values were larger than 2000 tonnes, to 58.6 t in 2018. Yellow and silver eel landings are not always reported separately, so they are also combined here. The total landings of yellow and silver eels decreased from 18,000–20,000 tonnes in the 1950s to 2,000–3,000 tonnes since 2009, and a reported 2,224 tonnes in 2017 (mostly Sweden, Poland, Germany, Denmark, the Netherlands, United Kingdom, France, Italy and Tunisia).

Recreational catches and landings are poorly reported, so amounts must be treated as a minimum but were estimated as 2 tonnes for glass eel in 2018 (Spain only), and 161 tonnes for yellow and silver eel combined in 2017 (mostly Denmark and Italy) (2018 data not available at the time of writing). Overall, the impact of recreational fisheries on eel stocks remains largely unquantified, although landings are believed to be at a similar level to that of commercial fisheries.

Aquaculture production of eel increased until the end of the 1990s but started to decline from the mid-2000s from about 8,000–9,000 tonnes, and in 2017 reported quantities of eel produced in aquaculture was 4,546 tonnes, mostly in the Netherlands and Germany. It should be noted that eel aquaculture is based on wild recruits, and part of the production is subsequently released as on-grown eel for stocking (around 10 million eels, which if assuming a mean weight of 20 g would be about 200 tonnes).

Restocking data for 2018 were incomplete at the time of writing as some of the restocking programmes were still ongoing. An update on the restocking amounts suggests that about 15 million glass eels, 14

million yellow eels and about 0.5 million silver eels were restocked in 2017, though these amounts also include eels moved into the same river basin where they were first caught (sometimes called assisted migration) and eels raised in aquaculture.

WGEEL compiled the biomass and mortality rate stock indicators reported in response to the 2018 eel data call. The ICES Workshop on Eel Management Plans (WKEMP) will examine these stock indicators in more detail. However, a preliminary analysis by WGEEL on the data reported by EU Member States found that from a total of 76 Eel Management Units (EMUs) that most recently reported escapement biomass as a percentage of pristine biomass, 16 (21%, representing six EU countries) are reaching or exceeding the 40% target, whereas 60 EMUs are below target.

The Working Group has made substantial progress in developing the use of the data call and database to refine data submission, checking, analyses and reporting. This has been the first year of complete data reporting, and data checking created a large but beneficial task. Two workshops were proposed for 2019 to further improve data call and use of reported data, and to standardize analytical approaches used to estimate stock indicators. Data call for 2019 will request updates for recruitment, landings, aquaculture and stocking.

An overview was prepared on methods countries apply to respond to a data call. Some misinterpretations, inconsistencies and incomplete reporting (life stages, habitats, geographical areas, etc.) were uncovered. A workshop in 2019 will address these issues.

The Working Group reviewed developments in previously specified emerging threats and opportunities, noting that most of these remained issues to address. New threats included (in no particular order):

- effects of high summer water temperatures and poor water quality, as eel mortalities and disease outbreaks were reported across the UK, Sweden and Estonia;
- uncertainties over the supply of some glass eel for restocking after the UK leaves the EU;
- increasing reports of illegal fishing and/or eel trade;
- increased risk of misreading the age of restocked eel because of artificial ‘annuli’ and its impact on age-based cohort models; and
- further concerns over disease transfer through restocking programmes.

New opportunities include:

- technologies to monitor eel behaviour in rivers and at sea; and
- a new multidisciplinary research project (Sudoang) between Spain, Portugal and France to provide tools and implement joint methods to support conservation of eel and habitats in the region.

The Working Group recognised that fishing impacts have received most attention in relation to quantifying impacts and effects of management measures. While this will continue, the Working Group will establish an annual activity taking forward quantification on impacts of non-fishery factors, and review methods for reducing such mortalities. In 2019, the Working Group will focus on impacts of hydropower facilities and water pumps.

The Working Group reviewed and organized the structure and content of the Country Reports, in light of the further refined data call process.

ToRs for 2019 (see 3.1 below) were drafted according to the multiyear plan proposed in 2016.

The report of the Working Group was published by ICES on its website and is available on:

http://www.ices.dk/sites/pub/Publication%20Reports/Expert%20Group%20Report/acom/2018/WGEEL/wgeel_2018.pdf

An official ICES Advice on European eel was prepared by ICES Advisory Committee (ACOM) in response to the annual request of the European Commission. The headline statement is that “*ICES advises that when the precautionary approach is applied for European eel, all anthropogenic impacts (e.g. caused by recreational and commercial fishing on all stages, hydropower, pumping stations, and pollution) that decrease production and escapement of silver eels should be reduced to – or kept as close to – zero as possible in 2019*”. The Advice is available here:

<http://www.ices.dk/sites/pub/Publication%20Reports/Advice/2018/2018/ele.2737.nea.pdf>

2.2 Workshop on Tools for Eels (WKTEEL)

A Workshop on Tools for Eel (WKTEEL), (chaired by: Dr Laurent Beaulaton, France), met in Rennes, France, 2-6 July 2018 to develop a code for data integration and analysis for WGEEL. Nine scientists representing six countries participated in the workshop. During the workshop the eel database was upgraded to improve the integration and use of collected data. R scripts were developed to automate: (i) verification of collected data before integration into the database; (ii) preparation of tables and graphs for WGEEL report. Two corresponding user-friendly web applications were initiated to simplify the use of the database by all members of WGEEL. All scripts are available through the WGEEL project on ICES GitHub workspace. The need for the improvement or development of a new functionality was also identified. Finally, improvements on data call spreadsheets were proposed to simplify data collection and improve guidance to data providers.

Workshop report is available via the following link:

http://ices.dk/sites/pub/Publication%20Reports/Expert%20Group%20Report/acom/2018/WKTEEL/wkteel_2018.pdf

2.3 Activities of WGEEL Chair

In addition to meetings above, the Chair was requested to attend several events:

- February – EU Committee on Fisheries and Aquaculture meeting, to introduce proposed templates for Eel Management Plan reviews.
- May – European Eel Range States meeting of the Convention on Migratory Species (CMS) in Malmo, Sweden, to present on stock assessment and management of European eel.
- July – East Asia Eel Symposium in Tokyo, Japan, to present on ICES and CITES issues for European eel.
- July, November & December – WKEMP (3 meetings plus intersessional work) to support independent reviewers.

3. Activities foreseen in 2019

3.1 Annual meeting of WGEEL

The Joint EIFAAC/ICES/GFCM Working Group on Eels (WGEEL), chaired by Dr Alan Walker (UK), will meet in Bergen, Norway, 27 August – 2 September 2019.

A draft ToR is as follows:

- A. Address the generic EG ToRs from ICES and any requests from EIFAAC or GFCM.
- B. Report on developments on the status of the European eel (*Anguilla anguilla*) stock, its fishing and other anthropogenic impacts.
- C. Report about the new scientific information which is used to update the advice for the management of European eel, including any new or emerging threats or opportunities
- D. Consider consequences of the Precautionary Approach on advice provided for the EU on the status of stocks and management of European eel

WGEEL will report by 16 September 2019 for the attention of ACOM, WGDIAD, SSGEF and FAO, EIFAAC and GFCM.

Update: In light of ToR A, EIFAAC has requested that WGEEL addresses the task to quantify efforts undertaken in commercial eel fisheries around Europe. During the 2019 the group should be requested to compile quantitative and/or qualitative descriptions of eel fishery efforts reflecting local situations and any reductions imposed under the Eel Regulation (1100/2007).

3.2 Second workshop on designing an eel data call

A second Workshop on Designing an Eel Data Call (WKEELDATA2) met in Rennes, France from 18 to 22 March 2019, to design a data call to all countries having natural production of European eel.

To achieve this aim, the Workshop will:

- a) Review WGEEL data requirements and define data quality standards;
- b) Define standards and guidelines for reported data, including analytical methods;
- c) Modify WGEEL data call spreadsheets to make them more efficient for data entry and analysis, in particular create automated tools to extract current data from the PostgreSQL database and send it back to national data correspondents. It will need to contain both actual and discarded data.
- d) Integrate information on the public status of data. Include questions in the spreadsheet and information cover letter. Modify database and integration scripts to ensure incorporation of the information into the database;
- e) Complete the database suitable for WGEEL data and associated shiny interface;
- f) Draft a proposal for the eel data call working with ICES (ACOM), EIFAAC and GFCM. The data call should be announced with a submission deadline suitable for the 2019 meeting of WGEEL and future meetings;
- g) Set up a server allowing distant access to the database to facilitate guided data integration by reporting countries. To facilitate this work we aim to: (1) set up a shiny / Postgres server hosted in one institute to provide access to shiny interface. This tool would help national representatives from each country to connect the interface, load their data and apply for quality checks themselves; (2) Set up a raspberry pie to act as a router to provide access to the database and shiny app to all users during WGEEL.

WKEELDATA2 reported by 15 April 2019 for the attention of WGEEL, WGDIAD, ACOM, SCICOM, EIFAAC, GFCM.

The final report is available at:

http://www.ices.dk/sites/pub/Publication%20Reports/Expert%20Group%20Report/Fisheries%20Resources%20Steering%20Group/2019/WKEELDATA2/wkeeldata2_2019.pdf

EIFAAC Project “EIFAAC Symposium on food safety and conservation in inland fisheries and aquaculture”

The project contributes to the following SDGs: 2 (Zero Hunger), 12 (Responsible Consumption and Production) and 17 (Partnerships for the Goals).

Manager: Reinhold Hanel
Date of reporting: February 2019, results of the symposium will be reported to the Session on site

Introduction

Commercial and recreational inland fisheries and aquaculture are embedded in a complex web of external anthropogenic pressures and societal demands that affect the structure and function of aquatic ecosystems and stakeholder expectations about sustainable governance and management. The EIFAAC International Symposium in Dresden represents a unique opportunity to develop and advance inter- and transdisciplinary approaches to pressing issues facing European aquaculture farmers, commercial and recreational inland fishers, fisheries managers and conservationists. Sessions will address novel issues related to food safety and security, product and sustainability certification as well as sustainability and conservation, with a particular emphasis on diadromous species and conservation conflicts.

Terms of Reference

Objectives of the project are to:

- Facilitate an EIFAAC Symposium in 2019 on food safety and conservation in inland fisheries and aquaculture.
- Establish a formal EIFAAC collaborative research and implementation platform.
- Position EIFAAC as the source of technical and scientific expert advice to support the sector.

EIFAAC should take a leading role in developing inland fisheries and freshwater aquaculture in Europe, facilitate discussion and cooperation in all related areas and position itself as a relevant source of expert

advice. EIFAAC should also improve its international interactions to ensure access to best available knowledge and practices.

Progress to date

- Symposium website was published in February 2019
- Contract with the Venue has been signed and advance payment deposited.
- Announcements and call for abstracts have been sent to several institutions, linked in groups and email addresses.
- Until May 2019 80 abstracts were received for the Symposium: 60 oral and 20 poster presentations.
- EIFAAC projects will also be presented in the form of posters.

Progress report of the project and recommendations from the Symposium is planned to be delineated and discussed under Agenda item 4 of the 30th Session of EIFAAC.

EIFAAC Project “Citizen Science Workshop”

The project contributes to the following SDGs: 17 (Partnerships for the Goals).

Manager: Ciara O’Leary

Date of reporting: February 2019

Introduction

Citizen science has many benefits to both the general public and the organisation involved in fisheries management. These include raising awareness of the state of our fish populations, gathering required information to help manage fish stocks and assess the quality of our waters. It can be used to encourage collaboration between agencies and invested stakeholders such as anglers, commercial fishers and general water users such as kayaker’s, divers etc. The type of data being collected already under citizen sciences includes water quality, marine debris, invasive species and biodiversity surveys. Fishery scientists cannot monitor every stretch of river, every lake and transitional water in our jurisdiction but by using citizen scientists we can get baseline data recorded for a greater number of sites. Combining the fishery scientist’s data with citizen science data will enable extrapolation from data rich areas to data poor areas.

Terms of Reference

The project started in 2018 and is managed by Dr Ciara O’Leary.

The project falls under the EIFAAC strategic objective IV) Protection and restoration of the environment and species.

Benchmarks/deliverables

- To organize a workshop on ‘citizen science in fisheries’ in Q1/Q2 2019
- Create a network of experts to aid project creation and expansion of existing citizen science programmes
- Create guidance/ information sheets to help to increase the number of citizen science projects in fisheries.
- Present an overview from the workshop at the EIFAAC Symposium in 2019

Progress to date

2018: A conference call was made on 04/04/2018 with Christian Skov and Kieran Hyder to discuss requirements for a workshop on citizen science and to highlight potential participants. It was agreed that presenting at the next EIFAAC Symposium in September 2019 could end the first period of the time frame of the project. Thus if the citizen science workshop could be organized in Q1 or Q2 of

2019, there would be time to finalize findings of the workshop and compile a useful overview to present to a target audience of fisheries scientists at the Symposium.

2019: Due to other work commitments the planning progress was slower than expected in Q3 and Q4 of 2018. As a result, the workshop would be organized later than anticipated. There is a concern about input into the workshop from UK participants with Brexit implications. Currently a questionnaire is under development to gauge opinion on citizen science and a logo/graphic will need to be designed for publicizing the workshop on social media and other venues. Potential speakers have been contacted to express interest in participating in the workshop. A final decision will shortly be made on the date and venue, taking into account the scheduling of other relevant fishery events. The latest option is to host it in Inland Fisheries Ireland, though capacities are limited.

EIFAAC Project “Capacity development on systems and methodologies of data collection in inland fisheries”

The project contributes to the following SDGs: 2 (Zero Hunger), 12 (Responsible Consumption and Production) and 13 (Climate Action).

Manager: Teppo Vehanen
Date of reporting: June 2019

Introduction

Inland fisheries, both commercial and recreational ones, lack data and information, which prevents a great majority of countries to develop and implement legitimate planning and monitoring. In the EU it is mainly under national management. Even in countries where data is collected, procedures and requirements of data collection methodologies are rather diverse, compiled information is incomplete and incomparable. The lack of proper knowledge on the situation causes uncertainties and failures in planning and implementation of management programs, policies, regulations or the evaluation of environmental, social and economic impacts. The European Inland Fisheries and Aquaculture Advisory Commission (EIFAAC) is a Pan-European network of research institutions and an FAO statutory body. EIFAAC is uniquely positioned to have good knowledge of ongoing research and has access to the pool of European researchers at various institutions, which are suitable to carry out the research required by this project for development of the good practice Guidelines

Terms of Reference

The project was started in May 2019 and continues until autumn 2020. A main objective of the project is to collect examples from European countries where data collection systems are available and also on proper methodologies possible to be applied for such purposes. This data is compiled into a scientific report on data methodologies used for valuation of inland fisheries in selected countries of the European Union. The results are also distributed by participating FAO’s Regional Symposium and a Regional Expert Meetings. European case studies are also presented at an FAO Workshop, September 2019, Dresden. Further, project provides assistance for the preparation of the FAO’s good practices Guidelines in inland fisheries data collection and valuation.

Benchmarks/deliverables

- 1) Prepare a research paper on experiences from European countries (end of June 2019)
- 2) Share findings at an EIFAAC International Symposium, Dresden, Germany, September 2019;
- 3) Participate in an expert meeting to develop the draft good practices Guidelines.

Progress to date

Natural Resources Institute Finland (LUKE) took the responsibility of the project implementation for EIFAAC. Five detailed country examples about inland fisheries data collection were prepared: Croatia, the Czech Republic, Denmark, Finland and Ireland. A review of the methods currently used to

collect inland fisheries data (both commercial and recreational ones) in Europe was produced. A draft report was delivered to FAO Budapest at the end of June 2019.

EIFAAC Project “Development of eel stocks in Norway and Ireland”

Manager: Eva B. Thorstad
Date of reporting: February 2019, project ended.

Introduction

European eel is distributed in Europe and non-European areas around the Mediterranean Sea. The eel stock is regarded as panmictic, and has greatly declined since the 1970s and 1980s. There are relatively few long-term monitoring data series on eel, especially in northern areas. Eel in these parts of the distribution area may suffer less from human impacts such as pollution and contaminants and may be more important components of the European population now than they used to be. To understand the causes for the decline and develop mitigation measures, it is important to analyse long-term data series that are available.

The purpose of this project was to perform comparative analyses of the long-term time-series on silver eel migration from River Imsa (Norway) and Burrishoole (Ireland), and thus obtain new information and knowledge for other scientists, EIFAAC/ICES eel group and EIFAAC members. The project was finalized in 2018.

Terms of Reference

Objectives of the project were:

- Compare quantitative development of out-migrating silver eel from two watersheds in Norway and Ireland from the 1970s until present.
- Discuss to what extent the development in these stocks coincides with the development of stocks in other parts of Europe.
- Study the effects of environmental parameters and climate change on migration patterns.

Benchmarks/deliverables

Due to the large amount of data and complex analyses, members of the project group produced two manuscripts for submission to international scientific journals, instead of one:

- **Manuscript 1:** Compare the annual quantitative development of silver eel migrating from Imsa and Burrishoole from the 1970s until today, and use statistical models to analyze the effect of environmental factors on variations in number of migrating silver eels among the years.
Manuscript 2: Analyze which environmental factors are impacting the onset and duration of annual silver eel run and which factors are impacting the daily number of migrants throughout the season in Imsa and Burrishoole.

EIFAAC Project “Welfare of fishes in Aquaculture”

Coordinator: Helmut Segner
Date of reporting: February 2019, project ended.

Introduction

Welfare in fish culture is of increasing public concern and of growing importance for fish farmers. The topic is discussed controversially, in particular as the available knowledge basis is limited. In this situation, the opinion of an independent institution on welfare of fishes in aquaculture is particularly valuable. Therefore, EIFAAC as the reference institution of competence in the field of inland fisheries and aquaculture decided to initiate a project on this topic.

Terms of Reference

The project started in 2014 and was finalized in 2018. It is linked to Strategic Objective II: “Interactions and avoidance or resolution of conflicts in inland fisheries and aquaculture”. The project was managed by Teppo Vehanen. Helmut Segner served as coordinator of the proposed project. This included coordinating the discussions among the participants of the working group, organization of workshops and guiding the preparation of the final report. Members of the working group were experts in the field of welfare of fishes.

Project objectives

The objective was to produce a critical overview of the actual knowledge concerning welfare of fishes in aquaculture and based on this knowledge to prepare a concise statement.

The project did not aim to produce another scientific review paper on fish welfare, but to derive from the existing knowledge recommendations on how to assess and support fish welfare in practical aquaculture.

Benchmarks/deliverables

Segner, H., Reiser, S., Ruane, N., Rösch, R., Steinhagen, D. and Vehanen, T. 2019. Welfare of Fishes in Aquaculture. FAO Fisheries and Aquaculture Circular No. xxxx. Budapest, FAO (under publication by FAO).