Summary of First Scientific report (1.4.2015-31.3.2016)

Overall goals and expected final results

High dioxin concentration in Baltic salmon and herring causes a risk for human health, and influences the use of catches and possibly also the management of these fisheries. The overall goal of BONUS GOHERR (www.goherr.com) is to increase the understanding of the dioxin problem, its causes, and its social and health implications, and to seek holistic solutions to benefit both society and the Baltic Sea. The project will provide recommendations for the ecosystem-based management of salmon and herring fisheries and the related dioxin problem, and for governance structures in support of that.

Work performed since the beginning of the project

As a starting point for outlining governance structures for the ecosystem-based management of Baltic herring and salmon fisheries, literature reviews focusing on multi-level, nested, and integrated governance overall and in the Baltic Sea, as well as on current legal and policy frameworks related to Baltic salmon and herring, have been undertaken.

An icebreaker game to start the stakeholder workshop

The existing management objectives relating to Baltic salmon, herring and dioxins have been identified, and structured into fundamental objectives (the ends that the decision makers value in the context of Baltic Sea fisheries management) and means objectives (the methods to achieve the ends). In February 2016, a stakeholder workshop focusing on the dioxin problem of Baltic herring was organised in Copenhagen. In the workshop, desired future states for the use of the herring resource were defined and pathways, including milestones, governance actions and actors, to reach them developed. A research paper based on this study will be presented in the Congress of the European Society for Agricultural and Food Ethics (EurSAFE 2016), in September 2016. A description of the workshop can be found in Opasnet workspace that we use for collecting, sharing and using information within the project (http://en.opasnet.org/w/Goherr:_Project).

Analysis on socio-cultural values that people associate with Baltic salmon and herring is ongoing, to understand how values influence fisheries management and if taking account of values in an explicit way could increase the legitimacy and effectiveness of decisions. For now, we have explored values through an extensive literature review and by analysing the stakeholder workshop discussions. The analysis has been presented in two symposiums at the University of Helsinki and will also be presented in EurSAFE 2016. The work continues by a comparative field study on the values that people in Estonia, Finland, Sweden and Denmark associate with Baltic salmon and herring, the interviews starting in May 2016.

Developing a salmon-herring interaction model has started, for analysing the effect of salmon-herring (sprat) interactions and different management schemes on the bioaccumulation of dioxins in these fishes. To preface the model development, a literature survey of salmon life history and the role of size-dependent interactions between salmon and herring for the bioaccumulation of dioxins has been done. Size-specific diet data of Baltic salmon has been analysed with respect to prey size (and species), based on stomach content of salmon caught in different parts of the Baltic Sea. Assessing data on recaptured tagged salmon is in progress.

A questionnaire for exploring consumers' fish eating habits has been designed and tested. The aim of the questionnaire is to find out whether and how much people eat Baltic herring and salmon, and to understand affecting factors, including dioxins, behind the eating habits. The questionnaire survey will be conducted in four Baltic Sea countries in autumn 2016.

A model for assessing the benefits and risks of Baltic fish intake has been designed and consequent data needs and requirements for creating an online modelling tool defined. As part of this model, the first working model version for assessing dioxin levels in Baltic herring is on view in Opasnet (http://en.opasnet.org/w/POPs_in_Baltic_herring). In addition, a model for assessing dioxin levels in humans based on intake is being developed.

A graduate thesis focusing on dioxin emission sources to Baltic Sea and possibilities to reduce the emissions will be completed by August 2016.

Preliminary structure for a decision support model is ready for further specifications and input. The model will be used for examining the effectiveness of alternative decisions in managing the salmon and herring fisheries and the dioxin risk, in relation to social, health, and ecological benefits.

Helsinki Baltic herring market 2015

Main results achieved during the reporting period

Ecosystem-based marine management (EBMM) has become a leading principle in all main marine policies within the EU. However, the application of EBMM is challenging because the concept and the related terminology is still unclear, and there are different views on its scope and operationalization. Currently the implementation of EBMM is in the hands of a fragmented European governance system that is unable to fully deal with the related challenges, especially in regard to ensuring coordination and collaboration in a multi-governance setting with a dynamic policy environment and various stakeholder groups and interests. Without a doubt EBMM calls for regionalisation of the governance system to match the (sub)eco-system. Our preliminary results suggest developing institutional interactions in a nested governance system at the level of the regional sea, as well as considering how the EU treaties should be developed to support this. The recently reformed Common Fisheries Policy shows a possible way forward for regionalisation by drawing on soft modes of governance.

Our study indicates that economic values and industrial efficiency currently determine the use and management of Baltic herring. The public image of herring as food is poor, which together with profit optimization has led to the use of herring catches mainly for fish meal and oil, and animal feed. It seems that the poor image of herring as food is due to several reasons, the dioxin problem being only one of them. Still, it seems that stakeholders consider increasing the human consumption of Baltic herring desirable and that there are several plausible ways to increase the use of herring as a source of healthy food despite of the dioxin problem. The use and management of Baltic salmon, on the contrary, is increasingly guided by values relating to species conservation, recreation, tradition and social justice, which culminate in conflicting interests, and claims to allocate the resource justly.

According to the biological study, the diet of salmon at sea differs in different parts of the Baltic Sea, being dominated by herring in the northern parts and sprat in the southernmost part. The stomach data also show a significant amount of stickleback in the diet of salmon. Most importantly, the size of the prey fish varies with the size of salmon. This relationship is crucial for understanding the interactions between salmon and their prey.

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