

# MANAGING SALMONIDS IN EUROPE

**Salmolnva** tackles the many causes and consequences of non-native salmonid invasions in Europe with the aim to guide their management

**B**ackground: Salmonids are among the most important fish in Europe. They are targets for recreational and commercial fishing, part of our cultural heritage, and serve as flagship species for river restoration. Because of their fisheries value, salmonids have been translocated widely outside their natural range since the late 19th Century. Ecological conditions vary considerably within Europe, which historically has affected both the natural distribution of native salmonids, and the current invasion potential for non-native salmonids. Differences across countries are also reflected in varying legislation and management practices. Furthermore, stakeholder perceptions vary within nations and across Europe where, for example, Scandinavian and continental Europeans may have different views on biodiversity in general and exotic salmonids in particular. Thus, a Pan-European approach is needed to integrate the knowledge required for managing invasive salmonids in Europe.

## The project

Salmolnva is a research project within the BiodivERsA-network including scientists from Sweden, Norway, Germany, France and Canada. The project is funded by the Swedish Research Council Formas, the French National Research Agency, the German Research Foundation and the Research Council of Norway. The aim of Salmolnva is to provide recommendations for policy and management of salmonid invasions in Europe. We use a multidisciplinary approach to integrate eco-evolutionary and socioeconomic hypotheses to evaluate the consequences of non-native salmonid invasions.

## Research highlights

In field experiments we investigate the ecological performance and impacts of invasive salmonids. How are native salmon or trout affected by competition from non-native salmonids? Do such interactions have cascading effects on stream ecosystems and their productivity? We also use a meta-analytic approach reviewing published data to investigate the global ecological impacts of salmonid invaders. The results show that invading salmonids have negative effects on native fish and also suggest that con- and heterospecific invaders affect different levels of biological organisation. Non-native species can, for example, interbreed with native ones, as exemplified by the “tiger trout”, a hybrid between resident brown trout and invasive brook charr (Fig. 1).

Can recreational fishing protect wild salmonids? In a unique experiment with anglers from the Swedish Sportfishing Association, we investigate whether angling can be used to mitigate the effects of invasive salmonids. Invasive species or populations are often characterised by a bolder behaviour than natives and such fish may therefore be more vulnerable to angling. Our results support this hypothesis – more non-native fish are caught on the rod.

We compare the governance systems for fisheries in France, Germany, Sweden, Norway and Canada to understand how



cross-national differences in the structure of these systems may facilitate or limit the spread of non-native salmonids in Europe, and if there are lessons to be learnt from the Canadian situation. Using specially designed surveys, we analyse the social and psychological determinants of fish stocking decisions made by angling club managers. Preliminary analyses suggest interesting cross-country similarities in attitudes and beliefs. Surveys are also being conducted to understand the public perception of biological invasions in Europe, comparing public views in Sweden, Norway, France and Germany.

## Stakeholders and dissemination

Salmolnva receives feedback from a reference group of key stakeholders from the participating European countries. Several stakeholder meetings are arranged and a final workshop to disseminate results and recommendations will be held in Gothenburg in early 2017. The project has already attracted considerable interests as results have been presented at numerous international, national and local meetings. The project has also interested the Swedish King Carl XVI Gustaf who was informed about Salmolnva when he visited the University of Gothenburg in November 2015.



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