

FISHCON – Biodiversity scenarios for fragmented landscapes; freshwater connectivity and the future of fish diversity

Since ancient times, freshwater ecosystems have provided human society with numerous essential ecosystem goods and services. However, their diverse and increasing use has also resulted in multiple anthropogenic impacts that threaten the functioning of these ecosystems. For example flood protection by levees had cut off most of the historic floodplains and caused significant drop in freshwater fisheries productivity. Freshwaters host ~10% of the world's fauna and one third of all vertebrates, while covering only 0.8% of the earth's surface. Today more than one third of Europe's freshwater fish fauna are classified as threatened by extinction.

Most predictions of how resilient biodiversity is to environmental change ignore how organisms are able to spread between different habitats. Habitat connectivity, the continuity between a species' suitable habitats, is particularly evident for organisms living in freshwater. Here, dispersal barriers imposed by the network structure of freshwater rivers and lakes leads to uneven dispersal among localities, and different species are affected by this in different ways.

The limited connectivity of freshwaters makes them particularly vulnerable to environmental impacts because organisms may not be able to colonize or recolonize streams or lakes even after environmental mitigations and habitat restorations. On the other hand, limited connectivity may have positive effects on biodiversity by hindering invasive species dispersal and thus providing refuges for native fauna in isolated lakes and streams.

FISHCON will investigate the interplay between management and future biodiversity scenarios using freshwater fishes as study organisms. The project's main objectives are to build models for freshwater fishes used in European environmental legislation (EU Water Framework Directive) and to explicitly link present-day management of habitat connectivity to future biodiversity scenarios. While past studies have evaluated suitable future habitats for fishes at the catchment scale, the researchers will combine detailed lake and stream data sets across Germany, Sweden and Norway, hence spanning a latitudinal gradient from 48 to 71 °N. FISHCON will predict future fish distributions both at large scale across Europe, and at small scales covering specific catchments that are relevant for local management.

The project includes collaboration with local managers and stakeholders to identify relevant strategies for managing habitat connectivity within focal catchments. Through this collaboration FISHCON will also investigate how management actions affect biodiversity scenarios.

Partners

Institute for Nature Research, NORWAY,
coordinator
Forschungsverbund Berlin e.V.,
GERMANY
University of Umeå, SWEDEN

Duration: 12-2012 to 08-2015

Total grant: €677 097

**Further information: Anders Finstad
(anders.finstad@nina.no)**

