

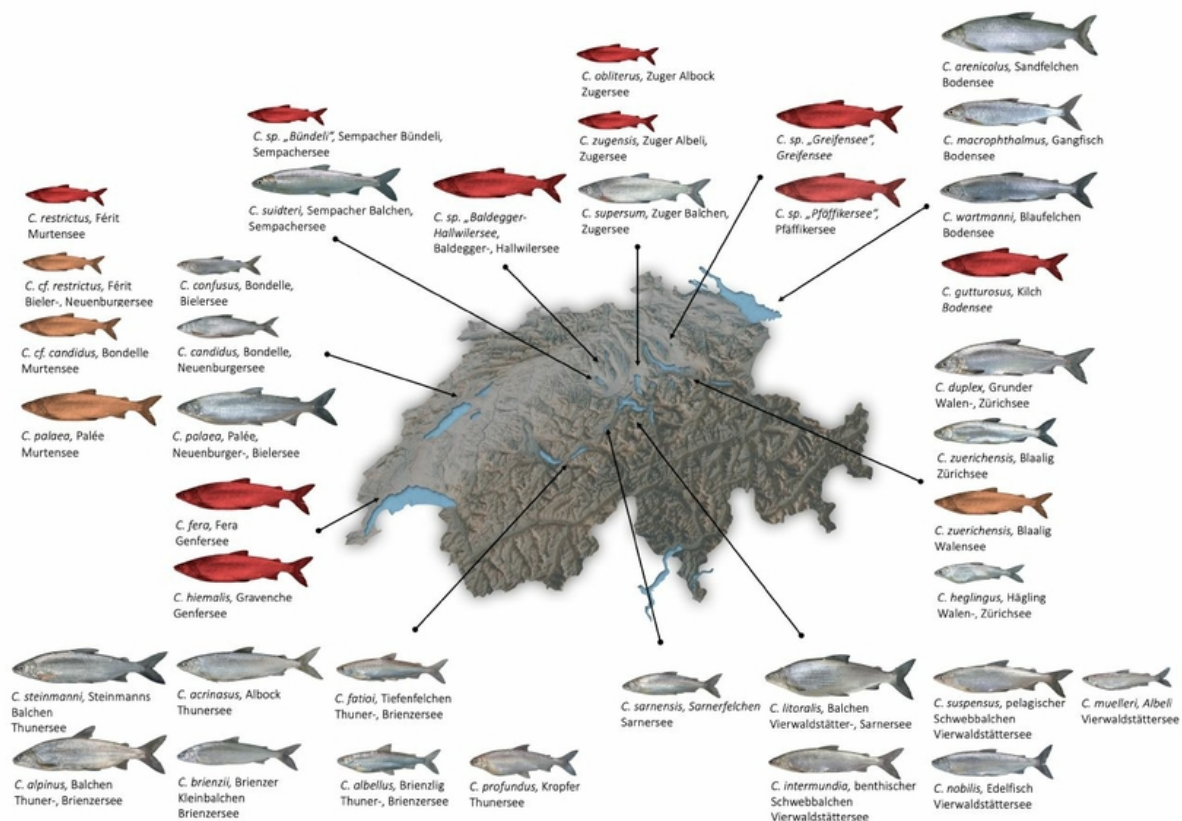
Exceptional diversity of whitefish

May 9, 2025 | Andri Bryner

Topics: Biodiversity | Ecosystems

The diversity of whitefish species in Swiss lakes is unique and plays a central role in lake ecosystems. A comprehensive Eawag report now summarises the results of 150 years of research on these fish. They make it clear that the mechanisms and environmental conditions that have contributed to their development must be taken into account in order to preserve this species diversity. Last but not least, protecting whitefish diversity helps to preserve the natural yield potential of lakes as a source of food for humans.

The diversity of whitefish species in the large Swiss lakes is unique. It has developed over the last 15,000 years or so and plays a central role in these ecosystems, as whitefish naturally represent by far the largest fish biomass in all habitats of the larger lakes - with the exception of the shallow shore zones. This large and diversified biomass has always represented a local and sustainable food resource for humans. According to fishing statistics from the Federal Office for the Environment (www.fischereistatistik.ch), whitefish have accounted for an average of 25 and 60 per cent of the total catch by anglers and professional fishermen over the last two decades. They also play a central role in lake ecosystems, as they represent by far the largest biomass in open water (pelagic) and in the deeper lake zones (profundal).



Whitefish diversity described from the lakes of Switzerland to date. Extinct species are shown as red fish and extinct populations of a whitefish species that still partially exists elsewhere are shown in orange. The size of the fish shown symbolises the differences in size between the species. Illustration from the report.

Understanding the mechanisms of speciation

Research into whitefish species diversity over the last two decades has improved our understanding of how this diversity has evolved, how it is ecologically and genetically structured, and why many species have become extinct over the last 80 years. The new findings show that the mechanisms and environmental conditions that led to the development of species diversity must be taken into account in order to preserve the remaining species diversity and ensure the long-term sustainable use of whitefish in fisheries.

Rethink management

The investigations have also shown that existing fisheries management should be partially reconsidered and new approaches developed. The federal and cantonal authorities are therefore currently working with Eawag on appropriate, scientifically based recommendations tailored to each lake. In addition, gaps in knowledge, for example in the ecology of individual whitefish species, must be closed in order to be able to take knowledge-based action in changing lake ecosystems in the future, for example as a result of climate change and invasive neozoa. Only in this way can biodiversity be preserved and utilised sustainably in the long term.

Great international responsibility

Switzerland's lakes are home to a diversity of 24 (originally at least 34) genetically, morphologically and ecologically distinct whitefish species that is unique in Europe. All of these species are found exclusively in Swiss lakes and the international waters of Lake Constance and Lake Geneva. Switzerland therefore bears a major international responsibility for the conservation of this unique biodiversity.

Selz, O. M.; Vonlanthen, P.; Kreienbühl, T.; Seehausen, O. (2025) Die aussergewöhnliche Vielfalt der Felchen der Schweiz - Ergebnisse aus 150 Jahren Forschung, 280 p, [Institutional Repository](#)

Seehausen, O.; Vonlanthen, P.; Selz, O. M. (2025) Beachtliche vielfalt der Schweizer Felchen. Ergebnisse aus 150 Jahren Forschung, *Aqua & Gas*, 64, [Institutional Repository](#)

Cover picture: Pair of whitefish (*C. lavaretus*) spawning near the shore in Lac d'Aiguebelette (Photo: Alamy).

Financing

Eawag Bundesamt für Umwelt

Contact



Ole Seehausen

Tel. +41 58 765 2121

ole.seehausen@eawag.ch



Andri Bryner

Media officer

Tel. +41 58 765 5104

andri.bryner@eawag.ch

Contact external

Oliver Selz

Wissenschaftlicher Mitarbeiter Sektion
Revitalisierung und Fischerei, Bundesamt für
Umwelt, BAFU

oliver.selz@bafu.admin.ch

<https://www.eawag.ch/en/info/portal/news/news-detail/exceptional-diversity-of-whitefish>