

Water and genes flow between the two largest Baltic salmon rivers

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Juvenile salmon from the Tornio River. Credit: Ville Vähä

Salmon from upstream reaches of the two northernmost Baltic rivers are different from downstream salmon. A recent study found that upstream salmon from the large Tornio and Kalix Rivers in Finland and Sweden are genetically distinct and migrate at different times and ages than their downstream counterparts. However, there seems to be no such distinction between salmon from these two neighboring rivers.

Traffic is busy below the surface of the Baltic Sea and rivers flowing

into it. Starting in [early summer](#), mature [salmon](#) migrate from the sea into their home rivers to spawn. The study by the University of Helsinki, Natural Resources Institute Finland (Luke) and Swedish University of Agricultural Sciences (SLU) found that salmon destined to spawn far upstream entered the Tornio (Torne in Swedish) River at an earlier date during their spawning migration.

Moreover, salmon heading to the upper parts of the river system had almost always spent more than one year at the sea. This is relevant for fisheries, as salmon grow larger the more time they spend at sea. Old and large salmon are particularly prized catches, and essential for the stocks' wellbeing: large salmon produce the most offspring. How to preserve this kind of diversity is an important consideration in the management and conservation of the largest wild Baltic salmon stocks.

"Salmon that entered the Tornio River earliest in the summer appeared to be mostly on their way to the upper reaches. This suggests that there is good reason to study and closely follow how fishing early in the season may affect the upstream populations," says lead author of the article Antti Miettinen, from the Faculty of Biological and Environmental Sciences, University of Helsinki.

Salmon don't follow borders

The Tornio River acts as the border between Finland and Sweden, whereas the neighboring Kalix River is located entirely in Sweden. These rivers host by far the largest remaining wild Baltic salmon stocks.

Surprisingly, the study found no clear genetic differences separating salmon from the two rivers. This may partly be explained by the rivers being connected to each other by one of the largest bifurcations in the world. About half of the water from the Swedish Torne River flows into the Kalix River through the bifurcation. From the salmon's perspective,

it makes the rivers one vast system to navigate in. In practice, salmon and their genes have a way of reaching the other river.

"The bifurcation and intriguing genetic similarity between salmon from these rivers highlight the significance of cross-border collaboration in conserving and managing this important salmon stock," Miettinen says.

More information: Antti Miettinen et al, A large wild salmon stock shows genetic and life history differentiation within, but not between, rivers, *Conservation Genetics* (2020). [DOI: 10.1007/s10592-020-01317-y](https://doi.org/10.1007/s10592-020-01317-y)

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