

In the game of love, local salmon have a home-ground advantage

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Atlantic salmon at their spawning grounds in northern Finland. Credit: Pekka Turri

Salmon spawning in their home rivers have the edge in mating over those born in other streams. This was the discovery of a new study examining the sex lives of Atlantic salmon in northern Finland. The results show that the local salmon produce vastly more offspring than salmon trying their luck on unfamiliar spawning grounds.

"Knowledge of the sex life of salmon can help us to preserve and protect local populations," explains Doctor Kenyon Mobley, a researcher at the Faculty of Biological and Environmental Sciences at the University of Helsinki and one of the lead authors of the study. The study was conducted by scientists from the University of Helsinki in cooperation with Natural Resources Institute Finland and the University of Turku. The results were published in the journal *Science Advances*.

DNA fingerprinting links parents with their offspring

Salmon are well known for their homing behavior, returning several years and many hundreds of kilometers later from the sea to the exact spot in the river where they were born. However, some returning salmon choose to spawn in new areas. This is known as straying. "We found that local fish have over three times more offspring than the strays, even if strays still get lucky from time to time," says Dr. Hanna Granroth-Wilding, a researcher at the University of Helsinki and co-lead author of the study.

To work this out, the research team genetically analyzed thousands of salmon over four years in spawning grounds in northern Finland. DNA fingerprinting allowed the researchers to link parents with their offspring in order to count how many offspring each pair had. These [genetic profiles](#) also identified which adults were locals and which were born in different streams so the researchers could work out if locals were more successful than the strays.

Reasons for the advantage remain cryptic

"Home ground advantage" is a phenomenon common to many sports. Local teams use subtle local knowledge to gain an advantage over their opponents and win more often at home than away.

"The sports metaphor is appropriate," says Professor Craig Primmer from the Faculty of Biological and Environmental Sciences at the University of Helsinki. "The cause for home ground advantage may be familiarity with the sports arena, or interactions with the fans, or a combination of these or other factors, but often, it is not known precisely. The same holds true for the spawning salmon. In our study, the reasons for the advantage remained cryptic. We do not find any detectable differences between the size or condition of local salmon and strays, but we cannot rule out that familiarity with the environment plays a role."

Home ground advantage may help wild salmon

This study also has implications for improving the health of wild salmon stocks. Knowledge of the underlying uniqueness of local populations can help fish breeders and managers make better plans to preserve the biodiversity of local populations.

"Our results support earlier studies recommending that only local stocks be used in rivers where population supplementation is necessary. Further, the home ground advantage that we found here may also benefit wild salmon by being more resilient to invasion by escapees from [salmon farms](#)," says Mobley.

More information: "Home ground advantage: Local Atlantic salmon have higher reproductive fitness than dispersers in the wild" *Science Advances* (2019). advances.sciencemag.org/content/5/2/eaav1112 , DOI: [10.1126/sciadv.aav1112](https://doi.org/10.1126/sciadv.aav1112)

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