

Shallow water habitats important for young salmon and trout

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This is Normusån in Stenung municipality, north of Gothenburg. Credit: Rasmus Kaspersson

Research carried out at the University of Gothenburg shows that competition from older fish causes young salmon and trout to seek refuge in shallow water. Preserving such habitats may, therefore, be important for the survival of the young fish.

On two accompanying videos, during the interaction, violent tidal forces tear the galactic disks apart, generating spectacular tidal tails, plumes and prominent bridges of material connecting the two galaxies. The ultimate outcome of a series of increasingly close encounters is the inevitable merger of the disk galaxies into a single structure and the formation of a nuclear disk as shown in the last panel.

The simulated nuclear disks have masses of approximately a billion solar masses and exhibit prominent non-axisymmetric features known to produce strong gas inflows. The gas inflows are likely responsible for fueling the central black hole, but even higher resolution will be needed to study this process in detail.

Nevertheless, the simulations carried out by Kazantzidis and his collaborators provide the first direct evidence that gas originally in galaxies separated by hundreds of kiloparsecs is collected to sub-parsec scales simply as a result of the dynamics and [hydrodynamics](#) involved in the merger process.

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Using field studies in watercourses north of Gothenburg and laboratory experiments in Denmark and Scotland, scientist Rasmus Kaspersson at the Department of Zoology, University of Gothenburg, has studied the competition between different age groups of [Atlantic salmon](#) and brown trout.

Forced into shallow water

It has previously been believed that poor swimming ability forces young salmon and trout to remain in shallow habitats where the water flows at a lower velocity. Rasmus Kaspersson's work, however, shows that it is rather competition for habitats from the older fish that compels young fish to use [shallow water](#). Rasmus Kaspersson's experiments show that young-of-the-year move to deeper parts of the watercourse as soon as the number of older individuals is reduced.

"This suggests that young-of-the-year actually prefer to live in deep, rapidly flowing water, where they can find food easier and are protected from predatory birds and mink", says Rasmus Kaspersson.

Population determines survival

In the natural world, however, older and younger individuals are both present, and shallow habitats then function as refuge for the younger fish. The weight and length of young-of-the-year increased when older individuals were removed from parts of the watercourses studied. Thus it seems that the population of older salmon and trout in a watercourse affects indirectly the number of young-of-the-year that reach adulthood.

More protected habitats required

The results presented in Rasmus Kaspersson's thesis show how important it is to preserve and restore shallow parts of Swedish watercourses with low-velocity flow. This will provide more protected habitats for the young fish.

Provided by University of Gothenburg

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