

# It takes patience to restore watercourses

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A previously restored tributary to the Vindel River has been developed by returning boulders and trees to the water. This is an attempt to create complex habitats for flora and fauna. Credit: Christer Nilsson, Umeå University. N.B. This photo may only be used in contexts related to this news release.

A common way to restore Swedish streams previously used for timber-floating has been to return rocks. A group of researchers at Umeå University has studied the effects of improved methods that also add large boulders and trees. Creating complex channels and watercourses is easy, but reintroducing plants and aquatic animals is a challenge, according to Umeå researchers. The results have been published in *Ecosystems*.

"Restoration is in itself a disturbance that watercourses need to recover from. We've seen that the ability for various species to re-enter varies depending on landscape and happens at a much slower pace in northern streams," says Christer Nilsson, professor in landscape ecology at Umeå University.

Over more than a century beginning in the 19th century, human kind cleared, straightened, channelized and dammed Swedish watercourses to simplify for timber-floating. When timber-floating was discontinued in the 1970s, the work of restoring watercourses was introduced. So far most restoration projects have been single activities without further evaluation. Conservationists have only in a few cases been able to improve their own methods based on learnings from former studies.

The novel method in this project, named Vindel River LIFE and funded by the EU Life Foundation, was to collect very large boulders and trees from the adjacent upland areas to place in the water as well as adding gravel to spawning beds in reaches of tributaries that have previously been restored using more basic methods. In that way, the restored reaches became more complex, which ought to improve biodiversity.

Researchers later compared the more restored river reaches with reaches where only basic restoration had been made.

"It was obvious that the shape of the reach and its hydraulics showed an

increased variation. Riparian soil chemistry, riparian vegetation and fish fauna, however, showed no evident reaction to the restoration in the first five years when the two types of river reaches were compared. The variation was greater between the various tributaries than between the different types of restoration," says Christer Nilsson.

However, vegetation along river reaches where only basic restoration had been done showed improvements in comparison to river reaches that had never been restored. The expectation was therefore for the new restoration to yield an even better result.

"The fact that it takes a long time for plants to establish can depend on the lack of seeds in the vicinity," says Christer Nilsson. When it comes to fish, it is possible that part restorations of reaches are not sufficient in order to gain clear results. As we know, many fish move across large areas. It can also be due to prey not having recovered or on anchor ice, i.e. ice anchored to the bottom, killing spawn and small fish.

"To increase the chances of successful restorations, we recommend restoring entire river basins. Furthermore, follow-up studies are required for decades to be able to follow the result. The slow recovery of ecosystems after restorations in northern streams is also an important reason to protect them from future harm," concludes Christer Nilsson.

**More information:** Christer Nilsson et al. How Do Biota Respond to Additional Physical Restoration of Restored Streams?, *Ecosystems* (2016). [DOI: 10.1007/s10021-016-0020-0](https://doi.org/10.1007/s10021-016-0020-0)

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