

## Biodiversity meets music

# Renaturalization of streams in lower mountain range



Rivers and streams are vital ecosystems that play a crucial role in supporting biodiversity and providing various ecological services. However, many of these water bodies in North Rhine-Westphalia, as in other parts of Europe, are facing significant ecological deficits as per the EU Water Framework Directive. One of the main causes of these deficits is the lack of permeability in rivers and streams due to barriers such as weirs, which prevent the movement of important keystone species like the European river lamprey and salmonids.

The historical development of rivers and streams in North Rhine-Westphalia has seen extensive modifications over the years, with many rivers being straightened, deepened, and modified for human use, such as flood control, navigation, and hydropower. These modifications have resulted in altered river dynamics, loss of natural habitats, and disrupted ecological processes, leading to the deterioration of water quality and the decline of many species dependent on these water bodies.

One of the key indicators of the ecological health of rivers and streams is the presence of indicator species and biological indicators of water quality, such as stoneflies, caddisflies, whirligig beetles, and river snails, which are used in determining the saprobic index.

Physicochemical parameters, e.g. temperature, pH, dissolved oxygen, conductivity, turbidity, flow velocity, ammonium, nitrate, phosphate, as well as river structure, such as the presence of natural banks and small-scale river structures, are important in assessing the ecological status of rivers and streams.

## Restoring Ecological Balance

To restore the ecological balance of rivers and streams in North Rhine-Westphalia, several key recommendations can be made.

First, the removal or modification of weirs and other barriers to restore river continuity and allow for the free movement of fish species, particularly those with migratory behaviors, should be a priority. This can involve the construction of fish passes or the complete removal of weirs to restore natural river dynamics and allow for fish migration.

Another important recommendation is the restoration of riparian habitats and creation of small-scale river structures, such as the creation of floodplain areas, to provide diverse habitats for a wide range of species, improve water quality, and enhance the resilience of river ecosystems to climate change and flood events. These measures can also contribute to natural flood control, reducing the risk of flooding in adjacent areas.

Additionally, the adoption of sustainable land management practices, such as reducing agricultural runoff and preventing pollution from industrial and urban sources, can help to improve water quality and overall river health.

In conclusion, the restoration of rivers and streams is crucial for restoring ecological balance and ensuring the health and resilience of these vital ecosystems. By addressing the main causes of ecological deficits, such as the lack of river continuity and the loss of natural habitats, and incorporating biological, physical, and chemical indicators of water quality, along with sustainable land management practices, we can promote the recovery of rivers and streams, enhance biodiversity, and improve the overall health of these important ecosystems.