

Increasing biodiversity in heavily modified rivers without affecting production or balancing capacity of hydropower - examples of case studies

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ABSTRACT: About 45% of the Swedish electricity production comes from hydropower. Introducing more intermittent production as wind and solar in the system makes hydro more important for balancing of the electricity system. To fulfil demands connected to the Water Framework Directive a National Plan for the revision of the hydropower plant licenses have been decided. Most of Vattenfalls large-scale hydropower plants are situated in waterbodies that are classified as heavily modified. Therefore it is important to find measures that increase biodiversity without affecting production or balancing capacity.

Large-scale hydropower in Sweden have made major changes in rivers increasing more lake-like habitats and decreasing stream habitats. Connection to tributaries have been cut off. Species composition of benthic and fish fauna has been changed. The riparian zone in hydropower reservoirs is also affected. However it is still possible to improve biodiversity without affecting hydropower. Some examples of case studies are presented.

- 1) Restoration of connectivity between a tributary and the main river (Langas Lule river) – restoring spawning and nursing habitats for grayling and trout.
- 2) Site-specific restoration (Purkijaure Lule River) – Adaptation of an overflow dam. Creating new stream- and riparian habitats.
- 3) Create habitats adapted to regulated conditions (Juktån Ume River) - Change minimum flow pattern to imitate a more natural seasonal distribution to restore habitats for trout, grayling and riparian vegetation.

Some new measures are also planned to test. For example to create habitats for stream living fish in outlet channels and artificial floating islands to create habitats for riparian vegetation and benthic fauna.