



REMIBAR

- Remediation of Migratory Barriers in streams





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In the counties of Norrbotten and Västerbotten, a project called Remibar is under way, which aims to remove migration barriers for fish and other aquatic animals. Measures will be implemented in five main water catchments, three of which are situated in the county of Norrbotten (river Råneälven, river Varjisån and river Ängesån), and two of which are in located in the county of Västerbotten (river Lögdeälven and river Sävarån).

Measures in Norrbotten will be done at 24 locations within the river Ängesån, 49 locations in the river Råneälven, and at 47 locations in the river Varjisån. Most of the efforts in Norrbotten involve replacing incorrectly-installed culverts that currently are migration barriers. In Västerbotten, measures are planned for 75 culverts in the river Sävarån. 66 culverts within the river Lögdeälven will be fixed. In Västerbotten 31 dams will be removed. Otter passages will be constructed underneath a number of bridges. In total, the project will improve migration routes for fish and other animals at 304 locations in the counties of Norrbotten and Västerbotten.

An important part of the project is the dissemination of information. Through information, meetings and demonstration sites, the project will spread knowledge about migration barriers and how to prevent establishment of new ones.

Caption: Catchment areas included in the project.



Water systems are the veins of the landscape

Many animals and plants that live in streams are dependant on being able to move free lywithin the water system. There is also a rich diversity of plant and animal life in the environments near shores.

Most aquatic animals require free migration routes in order to spread and reproduce. For fish, movement in the water is vital in order to migrate between spawning grounds, nursery grounds and feeding grounds. Smaller animals, such as insects, also need to be able to move within the water system.

Terrestrial animals are also dependent of water systems. Badly designed bridges and culverts can force animals to cross roads, where they are at risk of being run over. One example of this is the otter. There are between 2000 and 3000 otters in Sweden. Approximately 50 of these are killed in traffic every year.

In Sweden, there is approximately a road crossing every two kilometres along a water system. On average, 30% of road crossings are migration barriers to fish. When other aquatic and terrestrial animals are taken into account, the situation is even worse.

Caption: Dam at lake Stor-Holmsjön in the Lögdeälven water system. Photo: The County Administrative Board of Västerbotten

Why do problems arise?

Culverts can cause different kind of migration barriers. Some of the most significant problems are:

- High water velocity
- Long culverts without resting places for fish
- Shallow water level within the culvert
- A waterfall from the culvert outlet
- Bridges or culverts without natural shores, which forces terrestrial animals to cross the road or choose to diverge from the stream.

The solutions!

There are several different ways to remediate migration barriers. Problematic culverts can be corrected by the following solutions:

- The existing culvert will be replaced with an arch or a bridge.
- The existing culverts will be changed to larger dimensions. The existing culvert will be set to a lower level than present.
- The existing culvert will be complemented with sills down stream to raise the water level.

Caption: Many culverts are migration barriers for fish and other animals. Here is a culvert in a tributary of the river Råneälven that has a waterfall at the outlet. Photo: Mats Bergquist



The measures will lead to:

- A continuous stretch with water velocity less than 0.2 m/s; average velocity of water is less than 0.4 m/s
- A natural varied bed through the whole culvert/bridge
- The created stream should emulate surrounding stream with regards to water velocity, bed structure and surrounding vegetation.

In order to facilitate passage for otters and other small animals, bridges will be adjusted by means of one of the following solutions:

- Constructed shores – made by creating a new shore underneath the bridge. The shore can be made from natural materials or artificial ones such as a concrete shelf. Constructed shores are the best option where the water is not too deep.
- Floating shelves – floating shelves is attached to the bridge and follow the fluctuations of the water.
- Shelves – installed both under bridges and in larger culverts. The shelf should be a natural extension of the shore, and be placed so that it can be used in most water levels.
- Marking stones – Otters mark their home territory with droppings, and can therefore be attracted to a culvert or bridge through creating good marking spots. This is done by placing marking stones under the bridge, and close to intakes and outlets.

Caption: Otters can be coaxed through a bridge/culvert through the placement of dry shores and marking stones. Photo: Reinhold Leitner, Shutterstock





The importance of biodiversity

Mankind is dependent on natural cycles. Functioning ecosystems are the basis of the ecosystem services that supply us with water, food, clothing, timber etc. Nature is also important for recreation, such as fishing, exercising or simply getting some fresh air. A rich and varied natural environment fills many of these functions.

A species in Sweden can have different genetic and other qualities than the same species in other countries. It is therefore of great importance that our indigenous genetic variants are preserved. It is not possible to foresee which species can be significant to humans, so we need to take great care when making use of nature. Additionally, nature has intrinsic value in itself for which we should show consideration – for its own sake.

The depletion of biodiversity is a result of various activities in the landscape. After agriculture and forestry, the transportation system comprises the greatest threat to biodiversity.

Traffic, roads and railways affect animals and plants through fragmenting the landscape – that is, dividing it up into smaller parts. Fragmentation leads to animals losing their living space, their natural habitats become polluted and disturbed; barriers are created in the landscape and animals are killed. Through various measures we can develop an environment that promotes biodiversity whilst allowing room for a properly-functioning transportation system.

Caption: Freshwater pearl mussels need trout or salmon to be nearby, since they live briefly as parasites on the gills of the fish. Can you find the bullhead in the picture?

Photo: Oskar Norrgrann.

ABOUT THE PROJECT

The project is a collaboration between the Swedish Transport Administration (Trafikverket), the County Administrative Boards of Norrbotten and Västerbotten, the Swedish Forest Agency (Skogsstyrelsen) and the forestry companies Sveaskog, Holmen Skog and SCA. The Swedish Agency for Marine and Water Management (Havs- och Vattenmyndigheten) is also a participant in the project. The project began in September 2011 and will conclude in 2016. The total cost for the project is estimated to be EUR 8.1 million, half of which is funded by the EU.

Photo: Ida Schönfeldt, Swedish Transport Administration (Trafikverket).



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Further information about the project can be found on the Swedish Transport Administration web site:

www.trafikverket.se/remibar



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