

Development of the Lillpite River Valley after Dam Removal

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Background



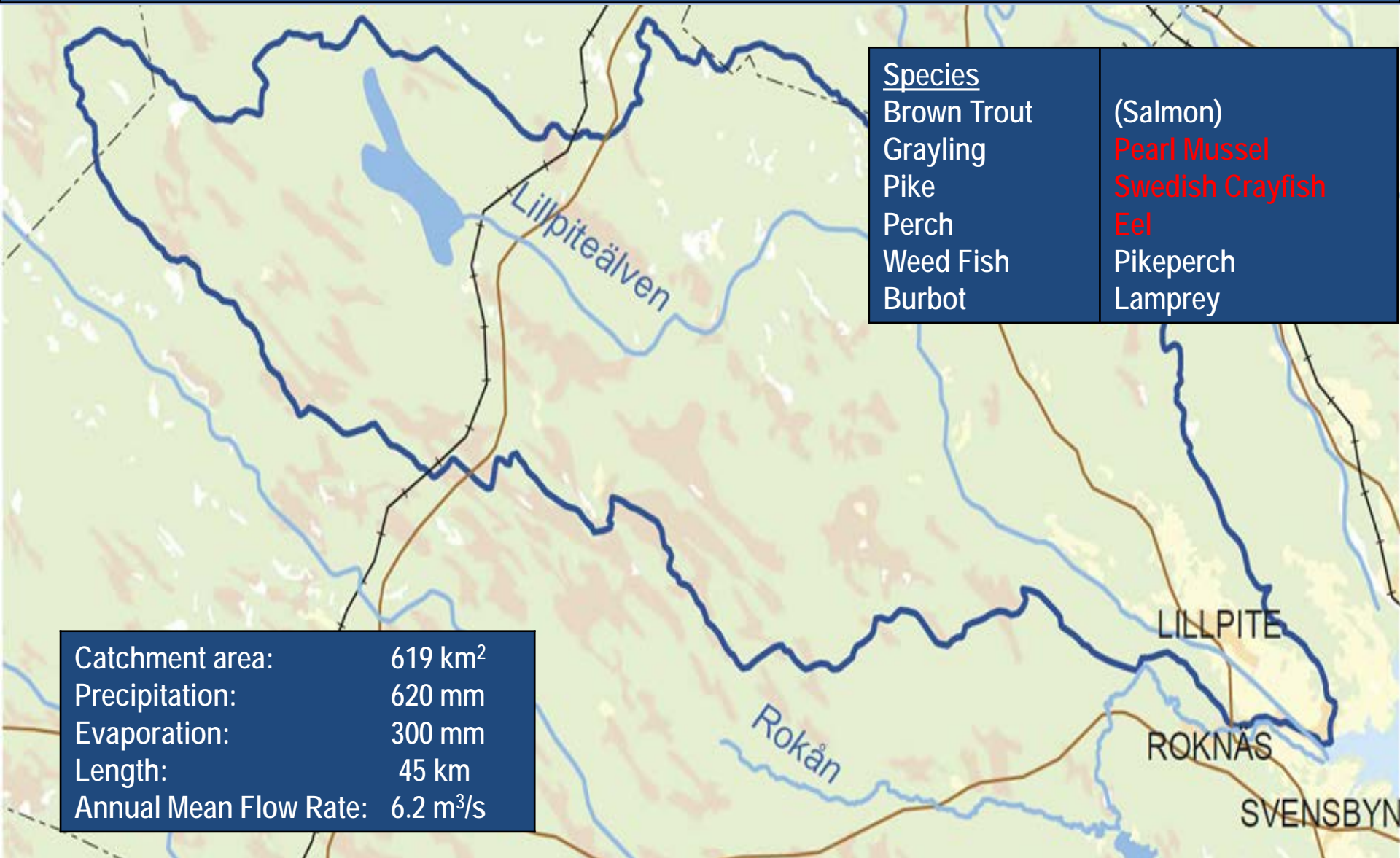
Fig. 1 The most northern province of Sweden, Norrbotten, covers 25% of the Swedish land area.

- Two hydropower dams were built 30 years ago in the Lillpite River. Now, the owner plans to close its unprofitable operation and remove the dams.
- Markbygden Wind Energy Project
 - * 1101 Wind Turbines
 - * Diameter: 126 m; Height: 200 m
 - * 10-12 TWh (10 % of Swedish demand)
- Wind Industry compensates for intrusion. The Lillpite River Economic Association (LREA) receives 600,000€ / year for the benefit of the villagers along the river
- LREA believes that restoring the Lillpite River is the key in developing the river valley after the dam removal. Many more projects are also discussed.

Wind turbines can be seen from the Lillpite River



The Lillpite River



Species

Brown Trout

Grayling

Pike

Perch

Weed Fish

Burbot

(Salmon)

Pearl Mussel

Swedish Crayfish

Eel

Pikeperch

Lamprey

Catchment area: 619 km²

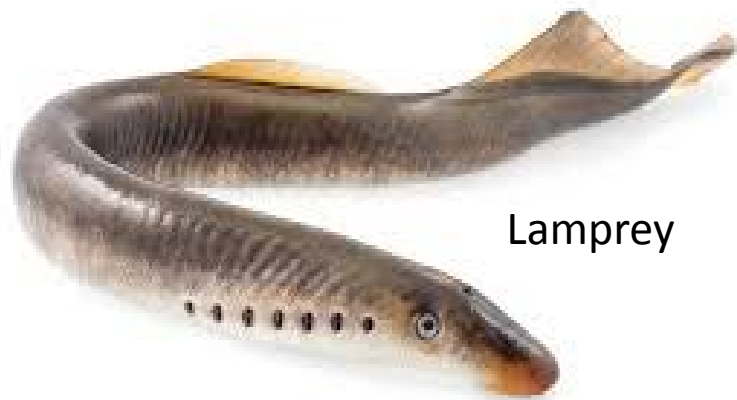
Precipitation: 620 mm

Evaporation: 300 mm

Length: 45 km

Annual Mean Flow Rate: 6.2 m³/s

The Lillpite River



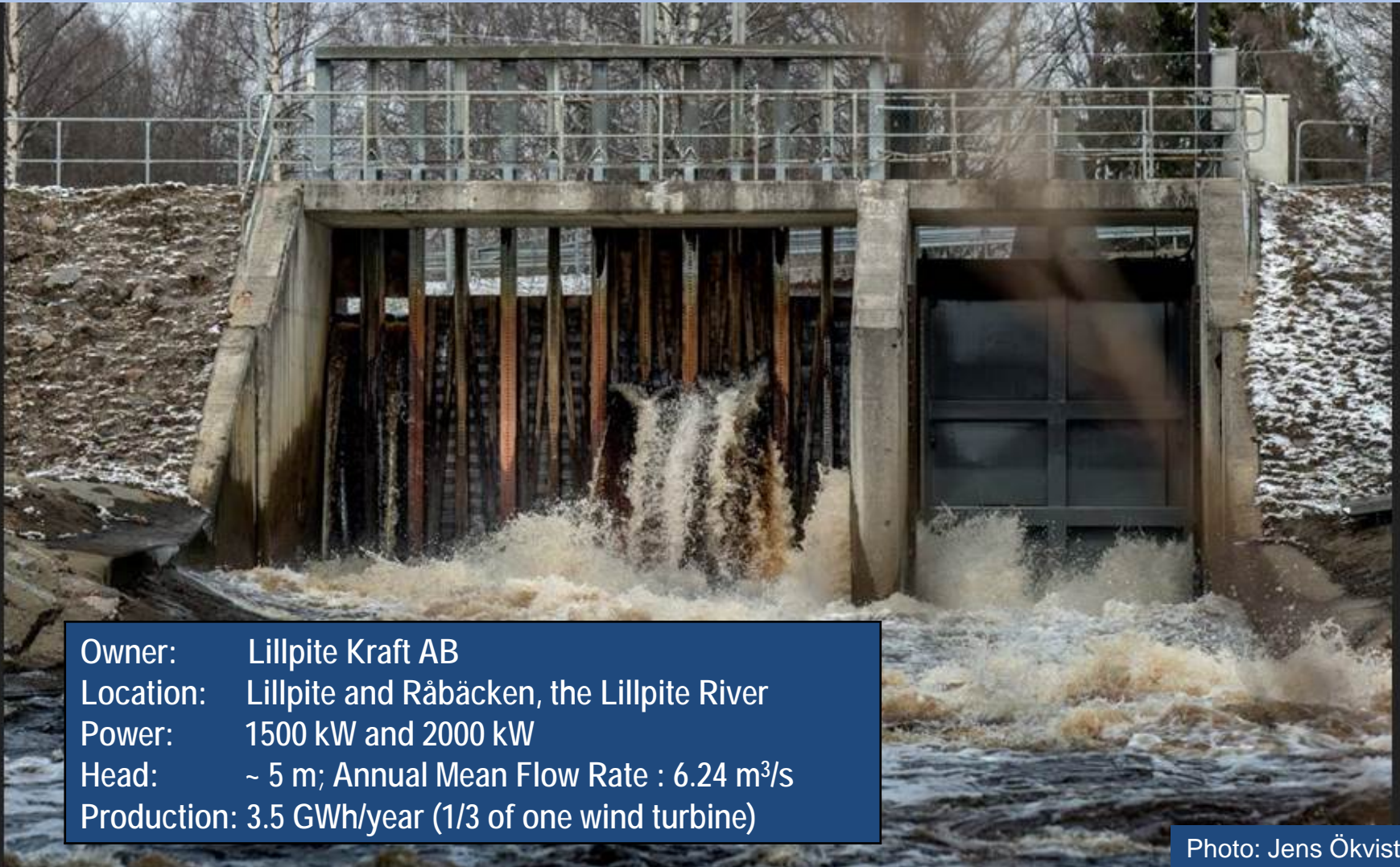
Lamprey

Colonies of Pearl Mussel in Kvarnbäcken (Mill Brook)



Kvarnbäcken (Mill Brook) hosts trout, grayling and impressing colonies of pearl mussel. Picture of 80 years old mussels. Photo: Bo Nordell, Sep. 2018.

The Hydropower Plants



Owner: Lillpite Kraft AB
Location: Lillpite and Råbäcken, the Lillpite River
Power: 1500 kW and 2000 kW
Head: ~ 5 m; Annual Mean Flow Rate : 6.24 m³/s
Production: 3.5 GWh/year (1/3 of one wind turbine)

Photo: Jens Ökvist, PT

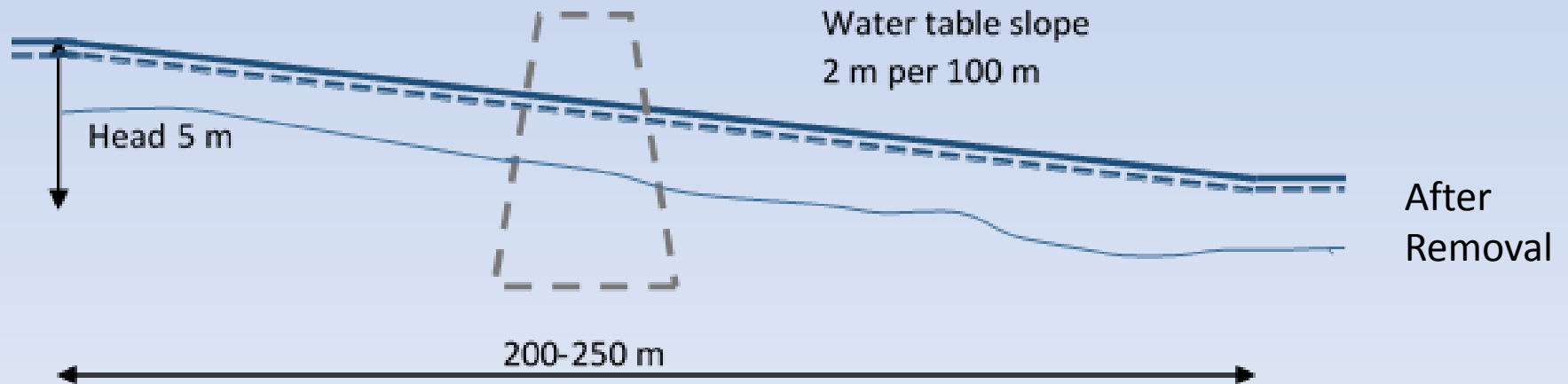
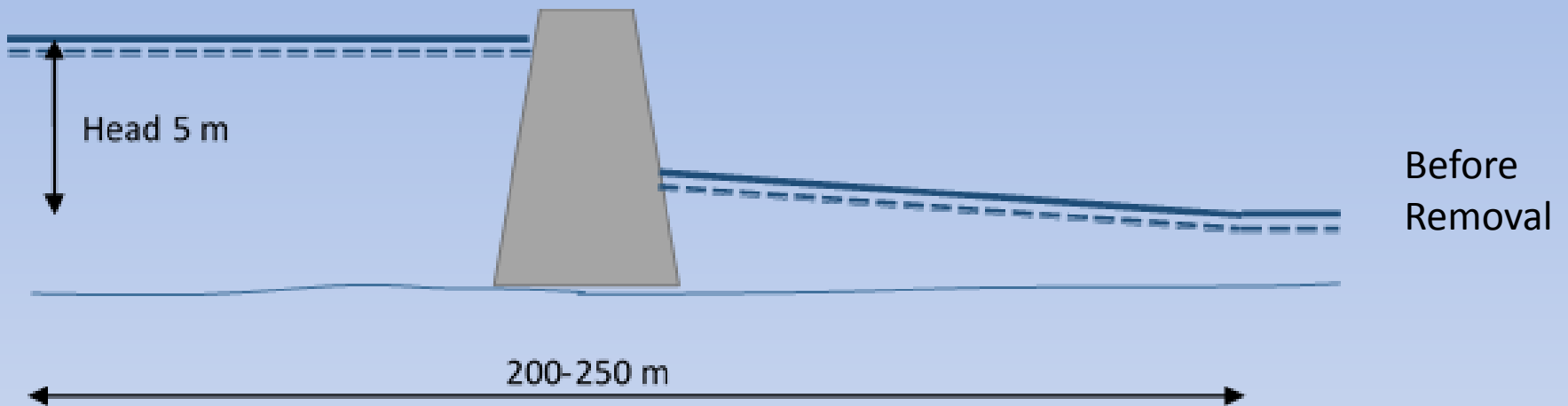
The Hydropower Plants

- Already 30 years ago, Lillpite Kraft AB was required to build fish ladders. Though the company never met this requirement, its documented annual loss is increasing
- The requirements for small power plants in EU, have now been tightened. Today more extensive and expensive bypass channels are required.
- Our County Government decided that the company should pay monthly fines until it met the new requirements.
- The company has not (yet) taken the formal decision to shut down its operation in the Lillpite River.
- Lillpite Kraft AB states; "the decision to terminate the business is enforced by economic reasons and can be reviewed if the economic conditions change."
- The majority owner of Lillpite Kraft AB is Piteå Municipality.

Opposition to Dam Removal

- LREA's position is that the formal decision to remove the dams is vital for continued development.
- However, not all the villagers consider this a good idea. Therefore, they have brought forward many unfounded problems that would arise by removing the dams.
- A common fear was that the water table of the river, upstream and downstream the current dams would change considerably. The fact is that a beautiful rapid water will replace the current water table.
- The slope of the rapid (2%) means that the water falls 2 m per 100 m or 5 m height difference over 250 m

Before and After Dam Removal



Current Problems with the Hydro Power Plants

Lillpite Kraft AB's biggest problem, is economical.

- With a few exceptions, the business has been unprofitable during its 30-year life.
- Now, with the much greater cost of the necessary bypass channels and the monthly fines, the business is becoming increasingly unprofitable.

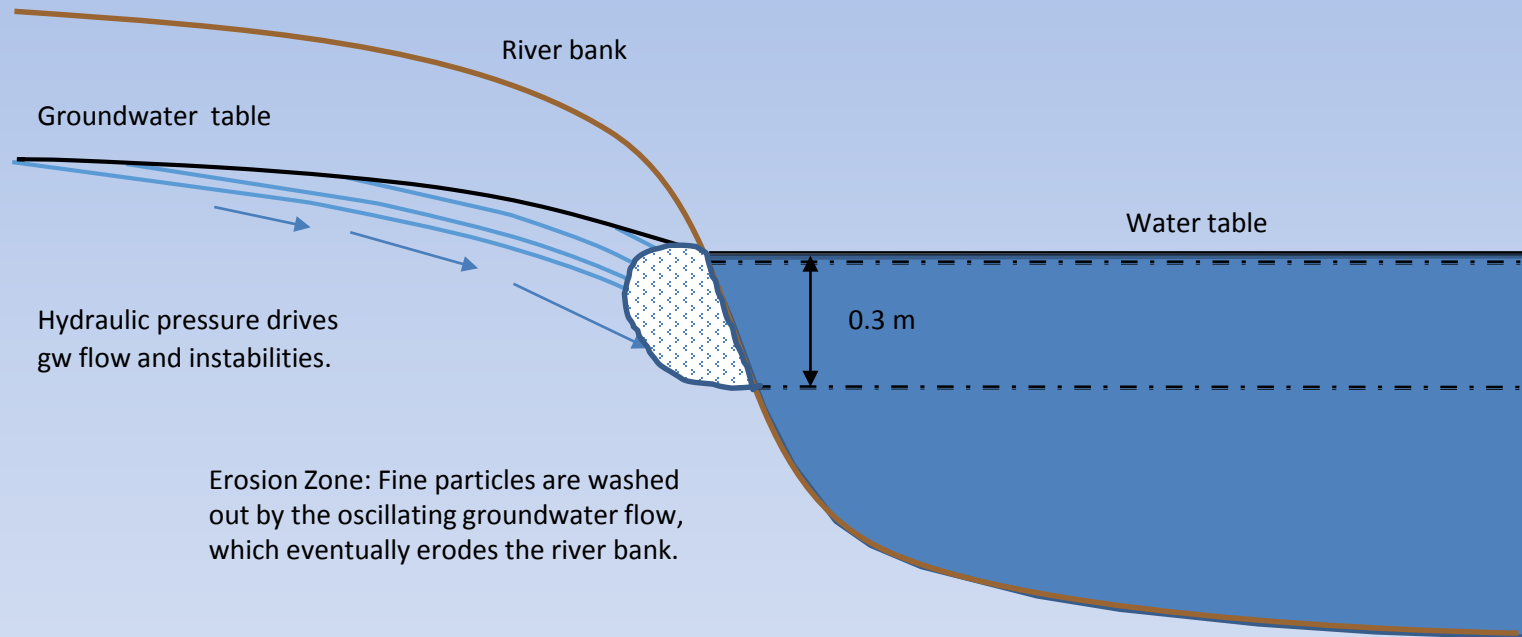
The environmental problem is that the dams are blocking the natural migration of fish, mussels, insects etc. that are essential for the natural environment of the river.

- The dams trap fine particles that normally would be transported to the mouth of the river.
- These particles accumulate at the bottom and is bad to the natural ecology of the river.

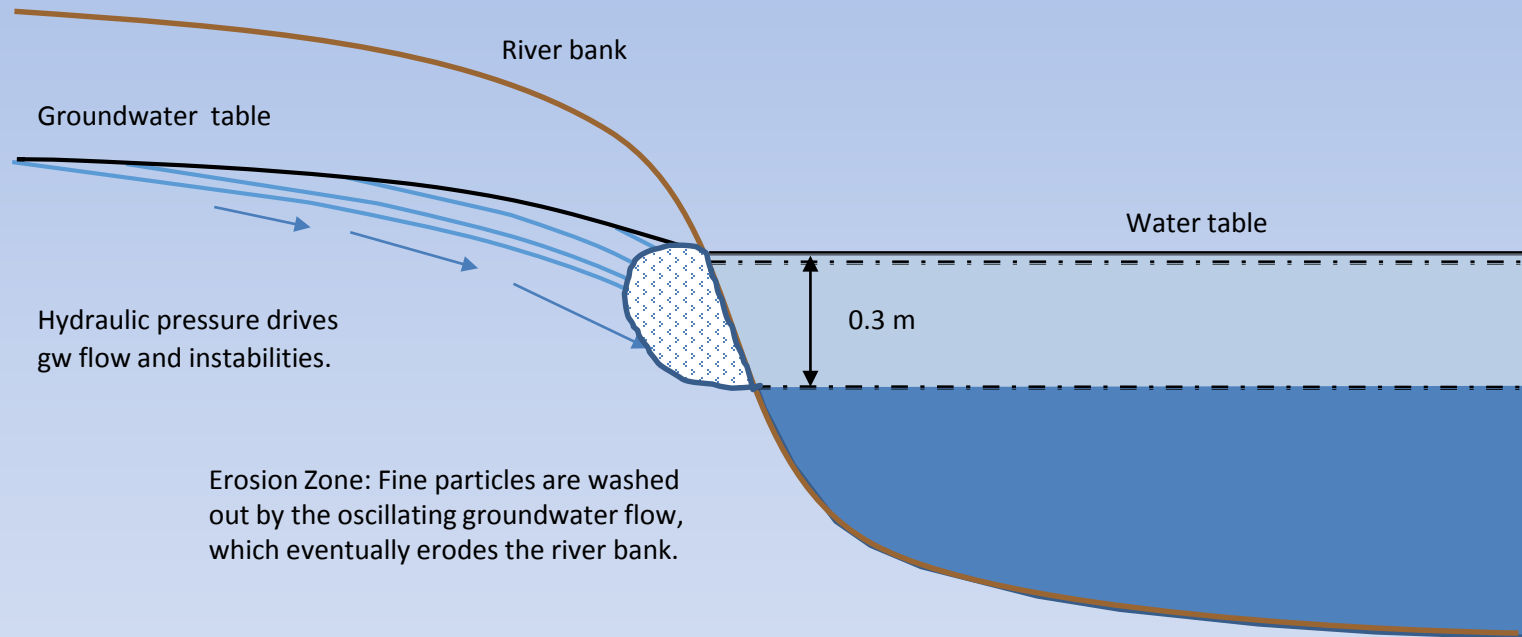
The hydropower operation means a 0.3 m daily fluctuation of the water level, to generate electricity when the best price occurs.

- This causes increasing risk of landslides along the river.

Rive Bank Erosion and Land Slides



Rive Bank Erosion and Land Slides



Rive Bank Erosion and Land Slides



Plans for the Future

- This International Seminar on Dam Removal is an excellent opportunity to:
 - Learn from people who have been through what we just started.
 - Get in contact with dedicated people who share their experience and knowledge
- The Lillpite River has amazingly good conditions for becoming the river it once was.
 - Water quality has not been better during the last 70 years
- Common fish conservation and fishing licence along the whole river.
 - Complicated because there are the several villages and landowners along the river
- How to meet sceptical locals?
 - The hydro plants are shutting down because of unprofitable operation but we need the villagers' support as they will have a say in how to use the money from the wind industry

Plans for the Future

What should/could we do while waiting for the dam removal in 2020?

- Mapping of the river (ecological, geographical, hydrological, geological, geotechnical)
- The status of the Lillpite River before dam removal (using drones?)
- Restoration of the river? Enhance the fish population of the stationary trout and grayling.
- Clearing the old floating trails as part of hiking trails along the river
- Gentle clearing along the river to reach attractive fishing locations and for canoeing
- Building wind shelters, bivouacs and hiking cottages
- Information about our river and its history will be available at the rest places
- Initiate scientific studies of the river valley in various fields (economics, political sciences, law, history, archaeology, hydrology, hydraulics, energy, ecology and biodiversity, rehabilitation, fish migration etc.)
- Collaboration with similar project all over Sweden and abroad.

Acknowledgement

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The Lillpite River at Lake Åträsk, 25 km upstream its mouth. Photo: Bo Nordell (May 2018).