DEVELOPMENT AND PLANNING OF CONCEPTUAL RIVER REVITALIZATION

PROJECTS IN THE REGION OF OBERHASLI

Supervisors: Paolo Perona (EPFL), Steffen Schweizer & Matthias Meyer (KWO)

CONTEXT

According to the Swiss environmental legislation, the company KWO needs to develop ecological measures in the Oberhasli region for the extension of their power plants. This project concerns the revitalization of the Aarebinnenkanal. Near to the Aare river, the river flows into the Brienz lake. Its quality is influenced by the proximity of a military airport and agricultural lands, which are possible sources of chemical pollution. This study is focused on the circled area.

RESULTS

CURRENT SITUATION

The water quality is good but measures should be performed after the fertilization season. The section is quite natural except some problems of waste and clogging.

SIMULATION

The 1-year flood is not very important. The 100-year flood overflows out of the riverbed and runs into the forest.

Traction force is not important, hence there is no need to stabilize the shores.

REVITALIZATION MEASURE

The proposition of revitalization is to dig a part of the forest. With varying elevations in the new river section, a broader range of water depths and velocities will be created. That will create more habitats and permits spawning and juvenile fish life will be possible.

SIMULATION

The 1-year flood remains in the same state. The 100-year flood overflows out of the new river section, so the forest acts as a floodplain.

HABITAT SUITABILITY FOR FISH

The brown trout is the main species in this river. There was no fish observed in the section during the collection of data in Mid-March and mid-April. Depth and velocities were not optimal for juvenile fishes and spawning. Even if adults can swim up to the section. The suitability is evaluated according to the results of the simulation.

CONCLUSION

RELIABILITY OF THE RESULTS

Due to some errors of the program used to create the mesh and to the corrections made, the results of the simulations are not entirely trustworthy. In fact, the simulation results in less water depth variability, probably due to a smoother topography than in reality. Hence our results are probably too pessimistic compared to the existing situation in this river section.

PROPOSITIONS

Fishes do not reach this section of the river. Connectivity to the lake must be improved in order to make this revitalization measure efficient. However, the solution proposed is a good start to improve the ecological state of the river:

- Dig a channel into the forest
- With varying depth
- With meanders
- Add stones to improve friction
- Monitor the quantity of chemicals in the river
- No floodplain to create as the forest acts as one