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Fishwayplan to Koskenkoski Dam in River Kiskonjoki

DRAFT

Background

Koskenkoski dam (Fig 1) is situated in the southern part of the River Kiskonjoki, about 20 km from the river mouth and is a total migration barrier to fish. Center for Economic Development, Transport and the Environment (ELY Center) for South-western Finland has initiated the planning of a fishway next to Koskenkoski dam that is being used for hydropower. The power plant is owned by Vuorilinna Voima oy. The Hålldam dam upstreams controls and regulates the water to the Koskenkoski dam. In the project Hålldam dam would also be modified to more nature-like fishway in the project.



Fig 1. The Koskenkoski Dam. The fishway is planned to be built to dam's east side (on the right in the picture).

Aim of the project

The purpose of building a fishway to Koskenkoski dam and to the Hålldam dam, and restoring the channel that connects the fishway to river will all reach to open migration connection for fish to upstreams and improve the rivers ecological state. In the upstreams of Kiskonjoki River there is a native and genetically specified trout population. Salmon, trout, and whitefish are now able to spawn and migrate in Latokartano rapids area that is 10 km downstream from Koskenkoski dam. The objective of building fishway in FRESHABIT Life IP project is to improve spawning possibilities of native trout population and other migratory species and improve the migration between spawning and feeding areas. With this fishway 19 km of new river channel and connecting streams would be available for migratory fish. And by improving salmonid stocks the reproduction possibilities of environmentally protected freshwater pearl mussel (*Margaritifera margaritifera*) and thick shelled river mussel (*Unio crassus*) will increase in River Kiskonjoki. River Kiskonjoki has been selected as one of the Finnish watershed to be specially protected (1992) by the Finnish ministry of the environment and by Nordic council (1990). There are also many valuable Natura2000 areas situated in the watershed.



Fig 2. The catchment area of River Kiskonjoki. Red dots are trout living areas and black lines are dams.

Planning process

In the beginning of the fishway planning four fishway plans were introduced. These were short technical fishway, long western natural bypass fishway and two natural bypass fishways on the eastern side (shorter and longer). The technical fishway was not possible to build, because the landowner will only approve a natural bypass fishway to be constructed on his land.

The natural bypass fishway options have been evaluated with support of experts of constructed waters (ELY Center of North Ostrobothnia). The long western fishway would cause large landscape change, because the channel would require great land removing. In fishway planning the location of the downstream mouth of the fishway is essential for the functioning of the fishway. The long western fishway was seen to be the least good plan, because there would occur several problems to its function (difficulty to supervise, bad location of the upstream channel mouth, making livestock more difficult to move on the area because of the new channel and the contaminated land).

In the eastern plans the location is better for the fish than in the longer western one. Also regarding to the objectives of the FRESHABIT project, the natural by-pass fishway is recommended, because of its ecological benefits. Natural bypass fishway provides living, nesting and shelter areas for water species. There was a discussion on 23.10.2015 on the site with museum authorities and ELY Center experts of the natural bypass fishways. Then it was decided that the fishway can be built on the eastern side of the river but an archeological study would have to be made.

In addition in the eastern fishway plan the old rapids are will be restored making it a significant habitat area for water species. And by watering the area year-round (0,1 m³-0,4 m³) would fulfil the objectives of the FRESHABIT Life IP project. This would not be possible with the western fishway plan. The flow to the fishway is agreed with the power plant owner to be year-round 0,1 m³ and on 1.9.-30.9. it would be around 0,2 - 0,4 m³. Steering group for the fishway in Kiskonjoki River decided to forward the Koskenkoski dam's eastern and shorter fishway plan.

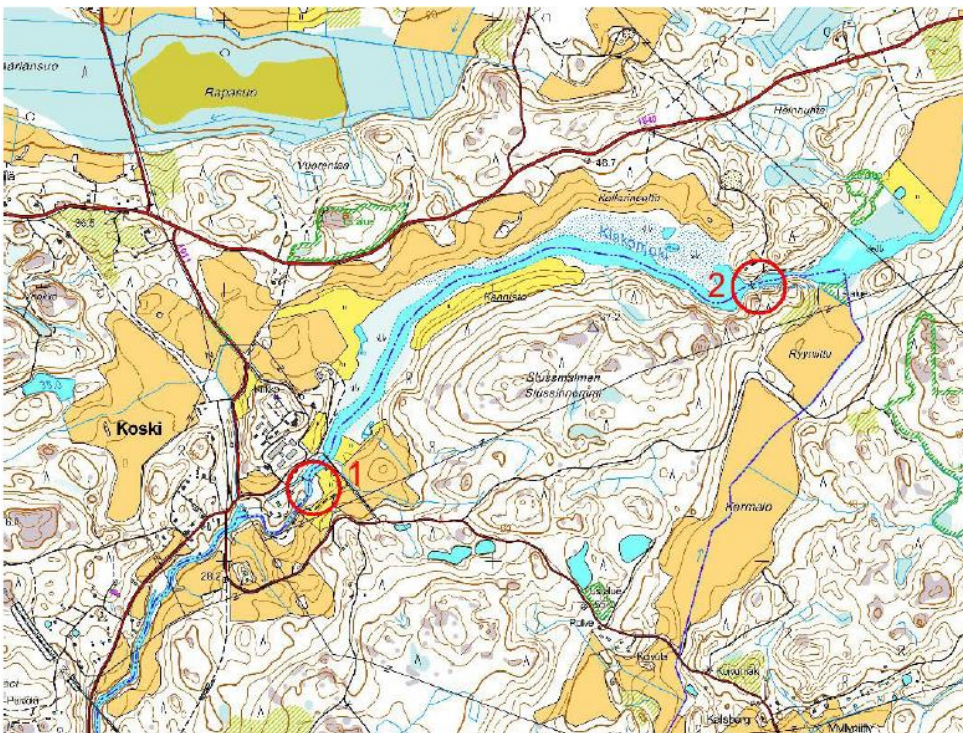


Fig. 3. Fishway (1) will be built downstream from Hålldam dam (2).



Fig 4. Hålldam Dam.

Fishway plans

Jami Aho from the Ympäristötekniikan insinööritoimisto made the plan for on the eastern shorter fishway for the Kiskonjoki Koskenkoski dam on the request of the ELY Center (Fig 5-9). The planner has a general agreement with ELY Centers. Planner made two options of the shorter fishway that would run on the eastern side of the Koskenkoski dam. The other is as short as possible 105 meters long that fits more naturally to the environment. The other is a bit longer (160 m) and provides more habitats for fish. Both of these options are functional for fish migration and for that matter these are possible to be build. The eventual fishway will be decided after the requested statement and taking into account comments and statements from other experts.

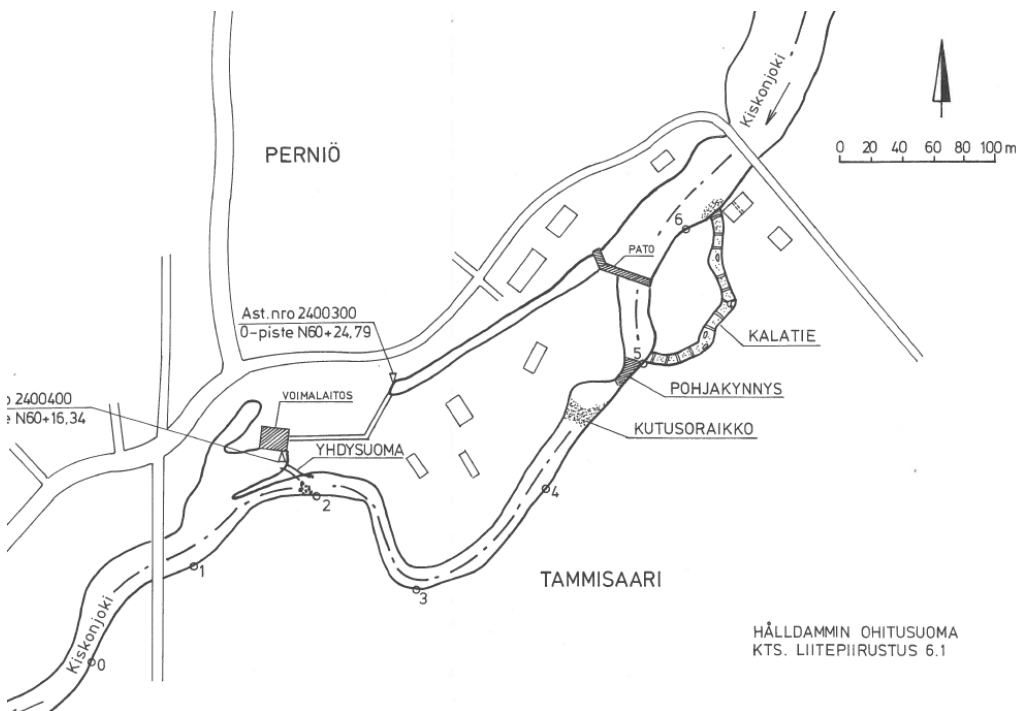


Fig 5. Fishway plan on the eastern side of the Koskenkoski Dam. (Jami Aho)



Fig 6. Fishway plan on the eastern side of the Koskenkoski Dam. (Jami Aho)

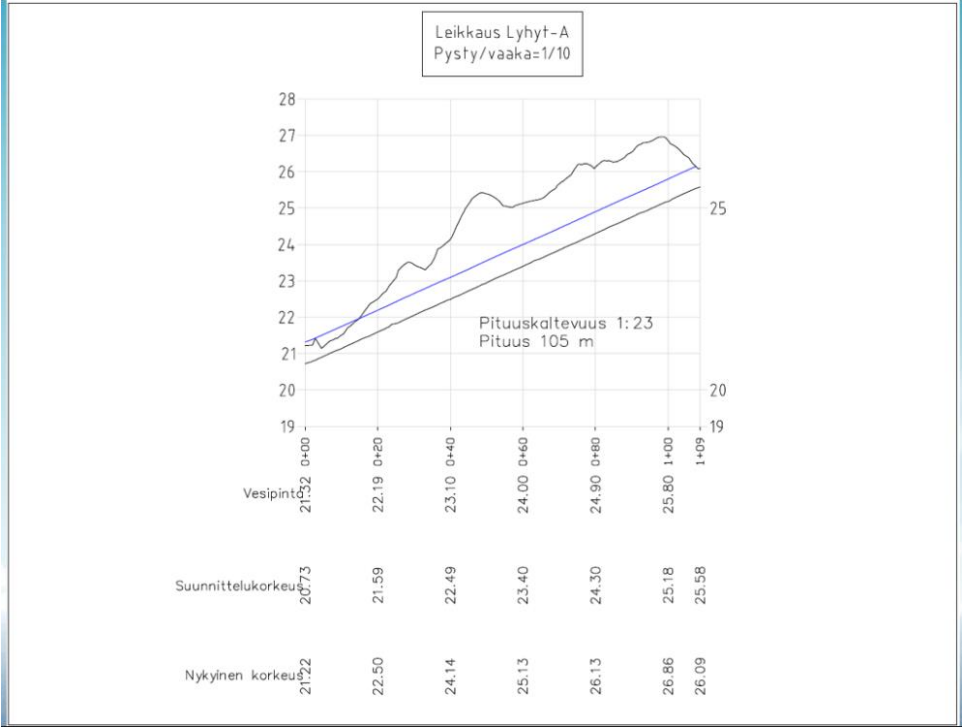


Fig 7. The gradient of the fishway. (Jami Aho)

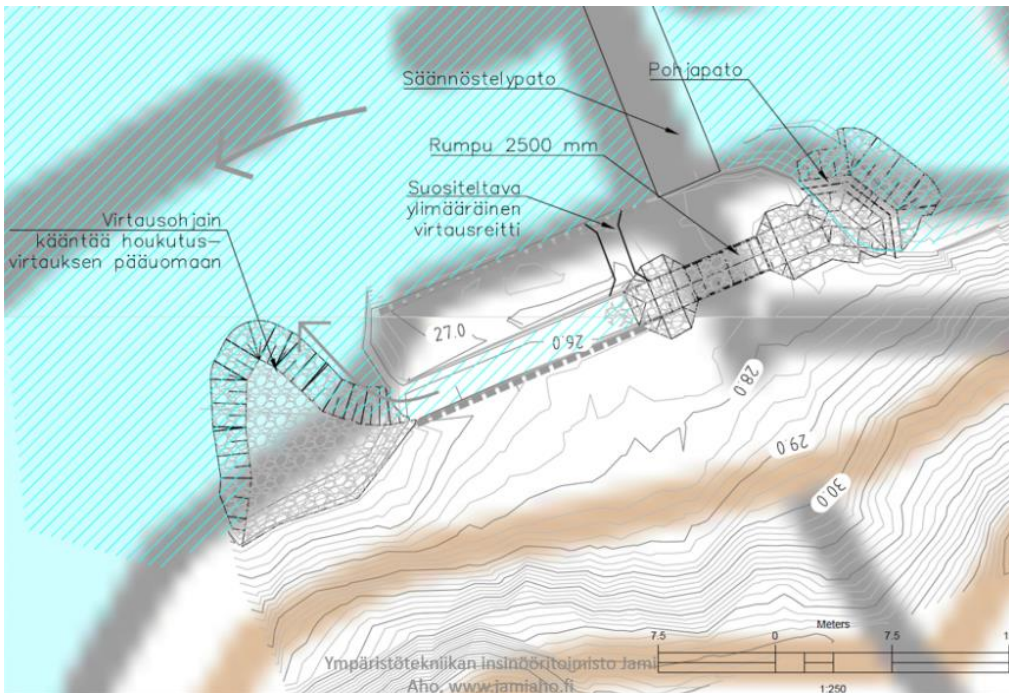


Fig 8. Fishway plan for the Hålldam Dam. (Jami Aho)

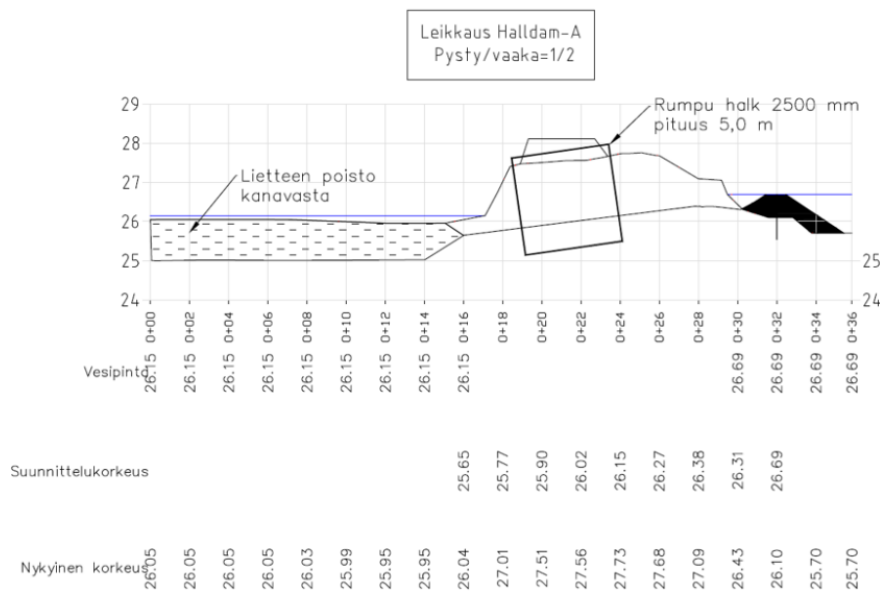


Fig 9. The gradient of the Hålldam dam. (Jami Aho)

Permits, costs and timetable

The Southeast Finland ELY Center asked a statement from the National Board of the Antiquities for these two fishway plans for Kiskonjoki River in January 2017. After that a permit for the fishways need to be applied. The fishways are planned to be built on 2019 and the restoration of the old rapids will be made year 2020.

Cost estimations for the fishways:

- Koskenkoski dam fishway 150 000 -200 000 €
- permit ~50 000 €
- Hålldam dam fishway 12 000 €
- Restoring the channel 15 000 -20 000 €
- Fishway planning xx €
- Archeological study 35 000- 45 000 €
- Fish calculator 30 000 - 40 000 €
- Automatisations for the flow/water control (?)