Fish passage facilities in a new hydropower plant at Hvammur in River Thjorsa, Iceland

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ABSTRACT: A new 93 Mw hydropower station will be built in River Thjorsa at Hvammur, South Iceland. River Thjorsa is partly a glacial river with average flow of 360 m^3/s. Already there are 7 power plants and reservoirs in the river system. All of them are up in the highland above Hvammur. River Thjorsa has a good run of Atlantic salmon, *Salmo salar*. The salmon population has increased in size for two reasons. One is that the river flow is more even, and the turbidity of the river water is lower as glacier silt stops in reservoirs where the river flow is regulated. The other is that a fishway was built in 1991 in the waterfall at Budi opened new parts of the river and doubling available habitat for salmon. Salmon is now inhabiting all these areas. The salmon population has been monitored for a long time. The annual run of salmon in Thjorsa last years has varied from 6 to 15 thousand salmon with the average of about 10 thousand salmon. A smaller run of sea trout, Salmo *trutta*, also inhabits River Thjorsa. Net fishing is the main fishing methods in the river, but rod fishery has been increasing.

Hvammur Power Plant will be located 55 km from the estuary. The river will be dammed forming a 4 km^2 intake reservoir. Number of fish migration measures will be taken to maintain the salmon run and the continuum of the biota. A fishway will be built in the dam. It is a vertical slot fishway with a slope of 1:13 and maximum height of head drop of pool 0,30 m and minimum flow of water 1m^3/s. A smolt bypass will also be built in the power plant. It is situated at the top of the intake to the power plant where 35 m^3/s of surface water will flow to the smolt bypass bringing the smolts gently to the river channel below the dam. Environmental flow below the dam is secured with minimum flow of 10 m^3/s. Monitoring program will be in place to evaluate the mitigation measures.