

Il Maglio (Favini paper factory)

Decision - 12 June 2018

The hydropower plant

- Name: *Il Maglio*
- Owner and contact information: Favini Srl
Via Alcide De Gasperi 26, 36028 Rossano Veneto (VI) Italy
- Year of construction:
- Average capacity: 386 kW
- Annual electricity production (on average): 2.2 GWh
- Fall height: 7.30 m
- Turbine type: 1 Kaplan turbine

Il Maglio is a hydropower plant producing power for the Favini paper factory in Omegna municipally, Piedmont region in the Northwest Italy (Figure 1). It is located adjacent to the paper mill, on a purpose built side-channel of the Strona River. It is one of a chain of power plants utilising the by-channel for electricity production. The average outflow from the power plant by-channel into Strona river is 1.38 m³/s.

The Strona river

The Strona is a small, alpine river originating near Monte Capezzone. flowing through Strona valley before entering river Toce. Strona acts as the main outflow for Lake Orta through Nigoglia canal, and connects Lake Orta with lake Maggiore via river Toce. The Strona has a hydro-morphological profile typical to the Piedmont region with a wide and shallow waterbed. The dominant substrate is pebble and stone. The river velocity varies depending on the season and year, with the average May flow of 17.9 m³/s and 11.1 m³/s (in wet and dry years, respectively) and average January flow of 4.6 m³/s and 1.7 m³/s.

At the opening of the by-channel, a weir allows some of the water flow to be directed away from the main stem of the Strona, towards the hydropower plants, and then back out into the Strona further downstream. The by-channel is a typical artificial canal, with homogeneous flow and concrete waterbed directing water through high pressure pipes inside the power plant.

The water quality in Strona river has been studied in the past, and received the environmental index classification of "sufficient and good" in terms of pollution levels, nutrients and water oxygenation based on data collected between 2003 and 2006.

Fish

- Have migratory fish moved upstream before the power plant was built: *No, the power plant is located on a purpose build by-channel.*
- Is there a fish pass or other solution to safeguard the migration of fish upstream and

downstream: *Yes, there is a fish ladder on the weir that directs water flow from the main stem of the Strona river into the by-channel.*

The main fish population of the Strona catchment area are cyprinids, such as carp, minnow and brook barbels. Salmonids such as Brown trout are rare due to the warmer water flowing from the Orta Lake during the summer months. Orta Lake also has a history of high acidification and pollution from the surrounding land use.

In 2017 a fish ladder was built inside the Strona river weir. The fish ladder consists of a sequence of irregular pools that somewhat mimics the natural flow (see Figure 2) and allows for upstream and downstream migration of fish. The follow up monitoring and reporting on the function and usage of the fish ladder is in progress.

Mitigating measures

- Are there measures identified to minimise the impact of this power plant? *Yes fish ladder on the weir, and adequate water flow through the main river stem downstream from the hydropower plant (where the by canal joins the river)*

In addition to the already mentioned fish ladder, another mitigating measure implemented by the power plant is the outflow from the power plant. The current average flow of 1.38 m³/s is a 72 % increase of the regulated outflow that was implemented in the past (average flow of 0.8 m³/s). This improvement in the flow conditions in the by-channel was suggested through an environmental study that (using computer modelling) investigated the available habitats for trout species in the river system. The study concluded the increase in the water flow, in addition to the fish-ladder development would have positive effects on the fish populations in the area.

Conclusion

Il Maglio is a small hydropower plant built on a purpose-built by channel and operated with environmental considerations. Since 2017, there is a fish-ladder and average flow considerations in place, allowing for better environmental conditions for aquatic life. Therefore we accept the power plant for the use of EKOenergy.

ANNEX



Figure 1: The location of the hydropower plant in Northern Italy.



Figure 2. An aerial image of the weir and the fish-ladder in the Strona river.