

# Reopening of the culverted Redon river

## The operation

Category	Restoration
Type of operation	Reopening of a culverted watercourse
Type of environment	Lowland watercourse
Issues at stake (water, biodiversity, climate)	River continuity
Start of operation	September 2006
End of operation	January 2007
Length of river affected by the works	230 m

## River in the restored sector

Name	Le Redon
Distance to source	10.5 km
Mean width	3 m
Mean gradient	Non déterminé
Mean flow rate	0.5 m <sup>3</sup> /s

## Aims of the project owner

- Restore river continuity particularly for lake trout.

## Environment and pressures

The Redon, a river about 12 km long, flows into Lake Geneva on the French shore. Its catchment covering an area of 33 km<sup>2</sup>, is affected by various developments: road infrastructure, quarries, etc. 1.5 km from its outlet, the Redon had been culverted for the purposes of a quarry. The passage of the river through a concrete culvert covering a 230 metre stretch prevents many of the fish from the lake from swimming upstream, to an ideal breeding ground. River trout and lake trout spawn in small quantities in the waters of the Redon. Lake trout, an emblematic subspecies which can reach up to 80 cm, is popular with anglers. Its presence is considerably endangered, in both France and Switzerland, by river discontinuities due to obstacles and the burial of watercourses.

## Location

Country	France
River basin	Rhône Mediterranean
Region	Rhône-Alpes
Département	Haute-Savoie
Commune	Margencel



Regulatory context: *Not applicable*

## References in relation to European Directives

Water body ref.	FRDR11140
Natura 2000 site ref.	<i>Not applicable</i>



The Redon buried in the downstream section. Before restoration work -2007.

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The Redon in the downstream section, 2 years after restoration work - 2009.

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## ■ Opportunities to act

The quarry where the culvert is located is no longer active. One of the priorities of the *contrat de rivière* (river contract) is the restoration of river continuity. In this context, it was decided to reopen the culverted section of the Redon.

## ■ Works and developments:

230 metres of the culverted river were reopened. In order to diversify the environment, a meandering bed was created. Plantation was used to protect the banks and the longitudinal section was stabilised.

## ■ Regulatory approach

- *Déclaration d'intérêt général (DIG)* - General Interest Statement

- "Dossier de déclaration" consent according to the French Water Act:

3.1.1.0: Installations, structures, embankments and groynes in the low water channel of a watercourse, creating: 1 An obstacle to flood flow, 2 An obstacle to river continuity

3.1.2.0: Modification of the longitudinal or cross section of a low-flow channel of a watercourse or diversion of a watercourse

3.1.3.0: Significant impact on brightness

3.1.4.0: Riverbank consolidation or protection

3.1.5.0: Destruction of spawning grounds

3.2.5.0: Dam.

## ■ Post-restoration management

It is planned to maintain vegetation every 2-3 years.



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Overview of the quarry before restoration work - 2007.



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Reopening of 230 metres of the Redon. Overview of the site after restoration work - 2009.

## Cost

Cost of studies	€ 10,500 ex. VAT
Cost of acquisitions	Not applicable
Cost of operations and developments	€ 135,200 ex. VAT
	per linear metre: € 400 ex. VAT
Coût de la valorisation	Not applicable
<b>Total cost of the action</b>	<b>€ 145,700 ex. VAT</b>

### Financial Partners and funding:

Agence de l'eau (Water Agency) (31%), General Council (28%), Regional Council (10%), Symasol (31%).

### Technical partner of the project:

Symasol, departmental environmental and agriculture division, the French National Agency for Water and Aquatic Environments (*Office National de L'Eau et des Milieux Aquatiques*), *Fédération départementale de la pêche* (departmental fishing federation), local fishing association, the commune.

## Monitoring

Pre-restoration works monitoring have been carried out. It includes a topographic survey for a hydraulic analysis of the site. Furthermore, fish rescue by electric fishing was performed at the opening of the culvert.

Fish stocks were monitored following the culvert removal on the Redon, six months after the restoration work. As part of the appraisal of the "Crossborder river contract for the southwest part of Lake Geneva" (2006-2012), fish stocks were monitored in all the watercourses in the area covered by the SYMASOL. For this, the fish population was counted in the Redon at the location of the work site in the summer of 2011, four years after the restoration work.

An IBGN survey was conducted in 2009 (two years after the work) by a consultancy.

## Outcome of the project and outlook

Lake trout can now swim up the whole length of the Redon.

Six months after the works, about 230 river trout were recorded throughout the reopened stretch, i.e. 3,800 individuals per hectare against only fifteen or so individuals identified during the fish rescue operation.

The results of the 2011 electric fishing confirm the trend noted six months after work was completed. Thus, 48 trout were counted on the upstream station, i.e. 3,678 individuals per hectare.



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The Redon after the reopening and development of the low water channel - 2009.

These results are very positive and seem to indicate that the fish population is stabilising in the part of the watercourse where the culvert has been removed.

The IBGN analysis suggests that the quality of water is restrictive in this portion of the Redon. The taxon indicator (Hydropsychidae) is relatively tolerant to poor water quality and taxonomic diversity is quite low (18 taxons identified). However, the absence of a sampling point before the restoration work does not allow the observation of a potential gain in terms of water quality or habitat diversity due to removal of the culvert.

The outcome in terms of overall assessment is excellent from the point of view of elected officials, residents and fishing stakeholders.

Pursuant to the River Contract (2006-2012), a general policy to review weirs preventing river continuity was implemented. Rocky boulders or bypasses were set up to make weirs passable.

## Promotion of the project

The project was broadly communicated: press articles, letters in municipal and river contract newsletters, field visits and an awareness day aimed at water stakeholders led by the Rhône-Alpes river association.



Project owner

Syndicat mixte des affluents du sud-ouest lémanique (Symasol)



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