Optimizing river restoration efforts

Many Swiss watercourses are heavily engineered, and successful restoration projects require careful planning. Individual planning steps are defined in the Ecomorphology Level II method jointly developed by Eawag and the Federal Office for the Environment. The result is a plan in which measures are prioritized, indicating how the greatest possible improvements can be achieved with the resources available.

Channelization, flood protection, wastewater discharges, hydropower operations – most watercourses in Switzerland are seriously affected by human activities. This has been clearly demonstrated by the extensive investigations carried out using the Ecomorphology Level I method of the Modular Stepwise Procedure (see Box): a quarter of all rivers and streams have a non-natural structure or are heavily impacted or culverted. Below 600 m above sea level, the proportion is even higher – 50 %. In addition, upstream migration of fish is impeded by 88,000 artificial weirs and falls at least 50 cm high.

There is a huge potential for restoration measures, but where is the need for improvements particularly urgent? And where can most be achieved, using what measures? These questions are addressed by the Ecomorphology Level II method developed at Eawag.

From analysis of deficiencies to remedial measures

In contrast to Level I, the Level II method is not designed for regional application across a whole canton. Instead, it is suitable for detailed assessment of selected surface water systems, i. e. watercourse sections a few kilometres long, including tributaries. As a first step, significant structures and deficiencies are described: how natural is the river bed? Is the riparian zone sufficiently wide? Is the longitudinal connectivity impaired by barriers? The planning objectives are then formulated by the project managers: for example, if a river section lies in an extensively managed area, substantial widening of the riparian zone may be possible. In built-up areas, it may only be possible for the channel structure to be improved.

The importance of the river section also needs to be taken into consideration in planning. Barriers have particularly detrimental effects where one watercourse joins another, as they make colonization of the entire upstream section difficult or impossible.

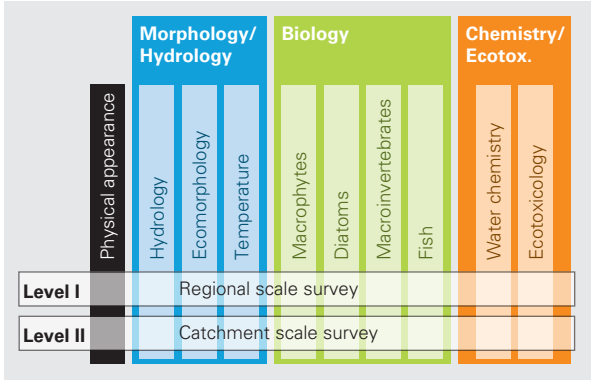
Studies of this kind make it possible to determine the ecological benefits of restoration measures. On this basis, river engineering measures are elaborated, prioritized and shown on a map. As well as a near-natural watercourse structure, particular attention needs to be paid to the provision of adequate room, without which near-natural dynamics cannot be achieved.

Promoting acceptance

Completion of the plan for remedial measures does not mean that excavation work can begin immediately. However, the results from the Ecomorphology Level II module can be fed into other planning – e. g. a regional drainage plan, a flood protection scheme or a landscape development project. The assessment method provides a clear rationale for the proposed measures and spells out the benefits for the watercourse and for stakeholders. This supports objective decision-making on the part of authorities and the public. ○ ○ ○

Hannes Scheuber

Few streams still flow as freely as the Gornerenbach in the Kiental valley. But a detailed knowledge of the current state, compared with the original natural state, makes it possible to define realistic goals for the restoration of degraded watercourses.



The modules used for assessing watercourses.

Joint project

The Modular Stepwise Procedure is a project run jointly by the Federal Office for the Environment, Eawag and cantonal water protection agencies. The aim is to develop standardized methods for investigating and assessing rivers and streams in Switzerland. Operating at different levels of intensity (survey steps), the methods (modules) cover structural and hydrological, biological, chemical and ecotoxicological aspects of watercourse quality. The methods are conceived primarily as enforcement aids for cantonal authorities. The procedure was launched in 1998 with the publication of the first method – Ecomorphology Level I – and additional methods have appeared periodically since then. The draft Ecomorphology Level II method is currently being tested in the cantons, and a revised (definitive) version is to be published by the end of the year. A method for assessment of the Flow Regime at Level I has also recently been developed.

▶ www.modul-stufen-konzept.ch

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