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**Toward more effective stream restoration: a demonstration sites network to assess efficiency.**

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**Abstract:** Hydromorphological river restoration has been encouraged since the publication of the Water Framework Directive all over Europe in 2000, in order to improve the ecological status of running waters. Thus, numerous restoration operations have been conducted with various objectives: restoring ecological continuity, increasing river habitat heterogeneity, etc. However, it is often impossible to conclude on their efficiency as many of these operations lacked suitable monitoring or had flaws in their design.

European projects concerning water bodies (e.g. Reform ERC, Walphy Life Environment) attempted to resolve this matter by analysing restoration outcomes of selected case studies. They provided a set of good practices to ensure more effective restoration. At the same time, it is also necessary to better plan restoration projects from conception to implementation, to improve monitoring and thus understanding of the processes sustaining successful restoration.

Since 2010 in France, such an approach is realised as part of the Demonstration Sites Network. Coordinated by the French Office for Biodiversity (OFB), it results from a collaboration involving practitioners, stakeholders and researchers. It currently includes about 40 sites, which are subject to restoration works. The methodological framework developed for this network comprises several key elements to allow for a robust assessment of restoration efficiency. On these sites, a scientific long-term monitoring is conducted following a BACI (Before After Control Impact) design and using standardised protocols for data collection. Guidance documents concerning monitoring have been published to support restoration approach at a site scale. A guiding procedure for the restoration project evaluation is currently being developed. Finally, this network is also a tool to promote adaptive management.

**Keywords:** Rivers, restoration strategy/planning, evaluation and monitoring