

Towards the restoration of watercourses and aquatic environments

80 examples of river hydromorphology restoration projects

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1 collection of river hydromorphology restoration examples

- More than 80 examples of river hydromorphology restoration undertaken over the past 20 years.
- Hundreds of indexed documentary and bibliographic references.

Water Framework Directive scope of actions in France:

- 525,000 kilometres of watercourses in metropolitan France.
- Over 34,000 ponds, lakes and reservoirs.
- 1,500 aquifers covering an area of more than 10 km².
- 1.8 million hectares of wetlands.
- 8,245 kilometres of coastline, biologically very rich but also fragile coastal environments, including in the French Overseas Départements and Collectivités.



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► Meander of a lowland river



► The Drôme, a lowland river with a braided channel



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► Example of a main channel habitat required for the reproduction of certain species

For whom is this collection intended?

Today, numerous river hydromorphology restoration projects are being undertaken under the impetus of project holders, which play a vital role in conjunction with a multitude of stakeholders at the national, departmental and regional levels.

This collection is thus intended for any public managers and project owners likely to become involved in this type of process, namely: local authorities, elected representatives, river associations, nature protection associations, national managing authorities (Voies navigables de France – French Inland Waterways, Office national des forêts – French Forestry Commission, etc.), regional national parks, Water Agencies, local SAGE (Schema d'aménagement et gestion des eaux – Water Development and Management Scheme) water committees, water enforcement departments, territorial offices of Onema, etc.



➤ The Maria stream in October 2004 during the removal of a weir – Nièvre

What information can be found in this collection?

The first part of this publication provides arguments, recommendations, and information in the form of information sheets about many aspects of the physical restoration of watercourses. These sheets shed light on issues such as:

- Basic information about the benefits of restoration, as river dynamics are at the origin of biodiversity and good ecological conditions, and the fact that aquatic environments have much to offer society, etc.
- Information about the approach to be adopted: managing aquatic environments in a global and integrated manner, including the restoration project in the development of the local area and ensuring that the project owner's authorized scope of action is adapted to the area covered by the project.



➤ Way marking of the trail around the meadows at Kernansquillec – Côtes d'Armor

In its second part, the collection contains a discerning and targeted selection of more than 80 examples, gathered from throughout France, on preservation and restoration carried out in order to re-establish the hydromorphological processes of watercourses. In order to improve the reader's understanding of the approaches employed by project holders and their partners, these examples are grouped according to the type of operation:

- River gravel input;
- Remeandering;
- Reconnection of side arms or ancient meanders;
- Partial or total weir/dam removal;
- Removal of riverbank protection or river embankment;
- Reopening of a culverted river;
- Pond removal or derivation of watercourse;
- Returning a watercourse to its original bed;
- Modification of a river bed's geometry.

► The former straight channel of the Marolles stream prior to restoration – Indre-et-Loire

Before



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After

► The Marolles stream after restoration, in July 2009 – Indre-et-Loire



Each river restoration example presents the context from which the actions emerged, in addition to the initiating factors, the type of works undertaken, funding, any monitoring that was carried out, an assessment of the action, the outlook and how the operation was promoted or enhanced by the project holder.

This feedback facilitates contact with the project owner involved in the operation as contact details are provided at the end of each sheet.

Why do we need a collection of river hydromorphology restoration examples?

This publication is intended as an aid to the launching and implementation of new restoration projects.



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The European Framework Directive on Water (EFD – 23 October 2000), which emphasises the importance of the hydromorphology, non-degradation or achievement of good ecological status in at least two-thirds of watercourses by 2015, is a priority.

In order to achieve this aim, numerous actions seeking to re-establish hydromorphological processes, which are essential components of good ecological functions, have been carried out for several years. The aims of these river hydromorphology restoration projects may include reducing the risks of flooding, facilitating sediment transport, restoring continuity for aquatic species, re-establishing hydraulic connections and habitats, improving water quality and developing areas for relaxation and recreation.

► Canoes passing through Ormans – Doubs



© Michel Bramard - Onema

► Promotion of a restoration project through the creation of an educational trail – Essonne



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Restoration operations provide both environmental and social benefits (development of economic and tourist activities).

Where can you find the collection?

Sharing and disseminating examples on restoring the hydromorphology of watercourses.



The collection results from a partnership between the French Ministry responsible for sustainable development, Water Agencies and ONEMA (French National Agency for Water and Aquatic Environments). It is available in PDF format on:
> http://www.onema.fr/recueil_restoration_hydromorphologie

Or from the French national website for Wetlands:
> www.zones-humides.eaufrance.fr,
Under the following heading: "Retours d'expériences" (Examples), then under "Agir" (Acting).

You can then search for information about the restoration conducted according to its type, location in a particular catchment area or in a specific environment (e.g. lowland, head waters, valley).

Every Thursday, you can read about an example of restoration on the website www.onema.fr



Direction générale
«Le Nadar» - Hall C
94 square Félix Nadar
94 300 Vincennes
Tél. : 01 45 14 36 39
Fax : 01 45 14 36 60
www.onema.fr

