

Factsheets on restoration for 11 river types

The REFORM project produced factsheets for different types of rivers in various ecoregions across Europe which provide a synthesis of restoration experiences per river type, describe best and efficient restoration practices and include promising restoration techniques and variables suited for monitoring restoration.

The description of the factsheets is preceded by a literature meta-data analysis. Of the 22 REFORM river types, 12 types occurred in the database together with four combinations of 2-3 river types. In total, 11 pressure categories and 23 pressures were classified. Channelization was the most common pressure category in all river types. This is not surprising as the focus of the review was on hydromorphology. The second most common pressure category was habitat degradation followed closely by barriers/connectivity, bank degradation and flow alteration.

In-channel habitat conditions are mostly improved by restoration with a broad spectrum over actual measures. Next, floodplain and river planform appeared as mostly restored. Within the floodplain, the attention went to reconnecting and creating existing backwaters, oxbow-lakes and wetlands. The river planform measures dealt with re-meandering, widening and re-braiding. The riparian zone, mainly the development of natural vegetation on buffer strips, was also often implemented. Hydrological measures were much less often executed.



Figure 1: Small, single-thread, lowland river in the Netherlands (photo: Piet Verdonshot)

The literature meta-data analysis was followed by the factsheets for 11 river types (Table 1). Each factsheet gives information on: River type name, Pressure categories/pressures, Measure categories/measures, and Monitoring scheme (Table 2). The factsheets are meant to give insight into the diversity and similarities of restoration techniques for different types of rivers in terms of present

practice and promising, but to date little used, approaches.

The river typology adopted for the factsheets differs from the river reach typology developed in REFORM and refers to the (sub)catchment setting of a river in terms of altitude, size and geology and as such links to the European broad river types (ETC/ICM, 2015). The setting of these types does not change in time. In contrast, the REFORM river reach typology is designed for assessing the hydromorphological functioning of individual river reaches. REFORM river reach types may change in time because they represent the response of the river reaches to processes of flow, sediment and vegetation. Furthermore, river (sub-)catchments of a single type according to the types presented in these factsheets may and often will contain different REFORM reach types. Thus when identifying the most appropriate restoration techniques it is even for apparently similar river types (i.e. covered by the same factsheet) not a 'one size fits all' approach, but a tailor-made approach acknowledging the governing hydrological and morphological conditions and the interaction with vegetation. The factsheets drawn up by regional experts are thus meant to support decision making, and should not be used as cookbooks.

Table 1 River types (source: REFORM deliverable 4.5 'Factsheets for restoration projects')

1	Small, single-thread, lowland rivers
2	Large, single-thread, lowland rivers
3	Small, anastomosing, lowland rivers
4	Large, anastomosing, lowland rivers
5	Small, single- and multi-thread, mid altitude rivers
6	Mid-sized, single- and multi-thread, mid altitude rivers
7	Small, sinuous-straight highland rivers with bedrock-coarse mixed sediments
8	Mid-sized, sinuous-straight highland rivers with bedrock-coarse mixed sediments
9	Small, cascade, step-pool/plain bed, riffle-pool highland rivers with (very) coarse sediments
10	Mid-sized, cascade, step-pool/plain bed, riffle-pool, highland rivers with (very) coarse sediments
11	Glacial rivers (all Europe)

Table 2 Contents of a factsheet (source: REFORM deliverable 4.5 'Factsheets for restoration projects')

River type	Valley- and planform, Hydrology, Morphology, Chemistry, Riparian zone
Pressures	Major pressures, Problems and constraints for river restoration
Measures	Common restoration practice, Problems and constraints with common restoration practice, Promising and new measures

Monitoring scheme	
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For further reading: REFORM deliverable 4.5 'Factsheets for restoration projects'

Reference

ETC/ICM, 2015. European Freshwater Ecosystem Assessment: Cross-walk between the Water Framework Directive and Habitats Directive types, status and pressures, ETC/ICM Technical Report 2/2015, Magdeburg: European Topic Centre on inland, coastal and marine waters, 95 pp. plus Annexes

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