Diagnosing problems induced by past gravel mining and other disturbances in Southern European rivers: the Magra River, Italy (Belletti et al 2016) [1]

The multi-scale hierarchical framework developed within the REFORM project, for the study of the functioning of river reaches and their catchments, was applied to the Magra River catchment (Northern Tuscany, Italy). The Magra River is a quite dynamic gravel-bed river that has undergone severe channel adjustments over the last century (i.e. incision and narrowing). The REFORM framework was then applied in order to (1) explore the locations and causes of these adjustments, and (2) assess how different river reaches responded to specific human activities (i.e. land use changes, dams, gravel mining).

The work aims at providing information to aid sustainable river management and restoration. In accordance with the framework, initially, all the relevant spatial units (i.e. from the catchment to the reach scale) were delineated and then characterised in further detail. Then, a summary of the trajectories of change following human impact was provided. Combined with an overview of the main human pressures still influencing the river system, this allowed us to define the current conditions at the river reach scale. Finally, the knowledge acquired in the previous parts was assembled to build a better understanding of current river conditions and controls on past changes, as well as to enable the formulation of some future scenarios. The latter analysis was focussed on a couple of reaches located in a sensitive and relatively low impacted segment, in order to better highlight the interpretative power of the hierarchical framework. The framework was applied by combining the knowledge derived from previous studies and the computation of additional and relevant indicators. This study demonstrated the helpfulness of the hierarchical framework in diagnosing problems and supporting management strategies for a medium-sized, gravel-bed river catchment.

Keywords: Multi-scale hierarchical framework, Gravel-bed river, Channel adjustments, Gravel mining, Land use changes

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Link to DOI:

http://dx.doi.org/10.1007/s00027-015-0440-5 [2]

Links
[1] https://reformrivers.eu/diagnosing-problems-induced-past-gravel-mining-and-other-disturbances-southern-european-rivers-magra
[2] http://dx.doi.org/10.1007/s00027-015-0440-5

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