

Project „Cultural landscapes of mountain and highland river valleys”
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REFERENCE HYDROMORPHOLOGICAL CONDITIONS, ENVIRONMENTAL CHANGE AND POSSIBILITIES FOR THE RESTORATION OF POLISH CARPATHIAN RIVERS

**Bartłomiej Wyżga¹, Joanna Zawiejska²,
Artur Radecki-Pawlik³, Hanna Hajdukiewicz¹**

- 1 - Institute of Nature Conservation, Polish Academy of Sciences, Kraków, Poland
- 2 - Institute of Geography, Pedagogical University, Kraków, Poland
- 3 - Department of Water Engineering, Agricultural University, Kraków, Poland

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Case study: Twentieth-century changes in the morphological and sedimentary features of the Raba River caused by direct human impacts on its channel and environmental changes in the catchment

Identification of the reference hydromorphological conditions for the Raba River according to the proposed approach

Conclusions



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Conclusions

In the 20th century rivers of the Polish Carpathians were considerably modified due to human impacts, with significant detrimental effects of the impacts revealed in the channels and on the valley floors. Many reaches of these rivers run far from settlements and infrastructure and this makes their restoration possible without a danger to human life and property.

Environmental changes that occurred in the catchments of Carpathian rivers during the 20th century invalidate the historical state of the rivers as reference conditions for their restoration. Instead, reference conditions should be defined as those which exist or would exist under present environmental conditions in the catchment but without human influence on the channel, riparian zone and floodplain of the river.



Conclusions

While both the Czarny Dunajec and the Raba similarly experienced a reduction in sediment dynamics during the 20th century, they differed in their response to the environmental change. In the Czarny Dunajec fed with coarse, crystalline material in the Tatra massif and forming a non-cohesive alluvial plain on the Tatra Mountains foreland, the former braided river morphology changed to island-braided morphology in unmanaged channel sections. In the Raba draining a flysch catchment and largely fed with fine sediments, the regulated channel would most likely evolve into a meandering one with the unconstrained conditions of contemporary channel development. This emphasizes the need to base the reference state for river restoration on contemporary conditions even if the analogue from a different location must be taken as the reference with the lack of unmodified conditions on the river which is to be restored.

