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Hydrology and Earth System Sciences
Discussions

Interactive comment on "River restoration: morphological, hydrological, biogeochemical and ecological changes and challenges" *by* M. Schirmer et al.

Anonymous Referee #2

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Synopsis

This manuscript appears to be a literature review of the previously published articles on research on a restored and control reach of the River Thur in Switzerland. A wide variety of field data collection procedures are referenced in the contributing literature, and broad patterns that emerge from those data are discussed.

General comments

My overall reaction is that it is not clear what type of article the authors are trying to write.

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Interactive Discussion
Discussion Paper

The manuscript appears to be a literature review of previous published papers on a particular river site where research has occurred over the last two decades or so. This is a somewhat unusual type of article, and while that is not an issue in of itself, I feel in such cases there needs to be at least a little explanation as to why this article is needed/justified. In fact, I think all literature reviews need such justification. But I was unable to find such justification in the manuscript. And while some aspects of the discussion are interesting and potentially new (e.g., possibly the fact the surface water-groundwater exchange was more significant than vegetative uptake as a pollutant sink, and the spatial variability of N2O emissions across the floodplain – see P10922 L-24), many are not. There have been many conceptual/review articles of this general type on stream/river restoration over the last couple decades, and it is not clear how this one is different. To succeed as a review article, the authors must carve out a more specific niche, clearly articulate that niche, and sufficiently justify it. To review work done at a specific site over the years, some quantitative synthesis would be helpful in addition to merely the conceptual synthesis. Judged as a review article, it is not well justified, and should be sent back to the authors for justification, with subsequent evaluation of that justification by the editors.

The article is presented as a normal research article, which is clearly is not. Key elements of normal research articles that are missing here include specific objectives, detailed methods, quantitative results, specific conclusions in the abstract, and specific data gaps listed in the introduction. Some aspects of such sections are present, but there is insufficient detail, particularly in terms of methods and results. There are no figures, plots, or tables with any numbers in them. Many terms are undefined. Judged as a normal research article, it fails, and should be rejected.

Specific comments and technical corrections

P10915 L1 I feel “essential” is a poor choice of word. The ability of river restoration to consistently succeed at anything beyond making the river look nicer to humans and stabilize banks is in question in my mind. “promising” would be a better choice.

HESSD

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P10915 L6 why just groundwater quality? not surface water also?

P10916 L25 To my knowledge, hyporheic exchange processes have the been goal of very few legislative efforts, at least in the USA.

P10917 L7 “ecosystems services” – this is one metric of river restoration success, but what about a thriving ecosystem in its own right?

P10920 L8-9 Need to cite some of the class hyporheic restoration papers here by authors such as Boulton, Kasahara, Hester, etc. Also, some pollutants are made worse by hyporheic exchange (e.g. Hg methylation).

P10922 L7 define “ecosystem configuration”

P10922 L18 define “ecological gradients” and “functional processes”

P10922 L21 define “first time indices”

P10925 L26-28 Why did restoration remove the clogging layer? Where was the clogging layer?

P10927 L6-8 This statement is too sweeping, as well as the associate call for restrictive legislation. This conclusion will be valid for only a certain subset of floodplains.

P10928 L7-9 What is the mechanism behind this?

P10928 L11-17 Need to note that this level of detailed characterization will almost never be possible in practice.

Interactive comment on Hydrol. Earth Syst. Sci. Discuss., 10, 10913, 2013.