Round #4

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by Karl Cottenie, 2020-04-02 23:12
Manuscript: https://www.biorxiv.org/content/10.1101/611939v4 version Version 4
Final statistical issue

It is obvious from the response from the author that my marble analogy did not clarify the statistical issue associated with the interpretation of the results. That is why I was glad to see the table in the response, because I think that will help me to explain the issue more clearly. If I understand the table correctly, the Revised Sites portion shows the streams that were selected for the new analyses. If that is correct, then

1) it clearly shows that the 2 treatments all replicates have in common are Bank Stabilization and In-Channel Manipulation. This thus means that the inference can only be applied to other streams that have received similar treatments. It does not matter if Riparian Forestation is present in a lot of them, because that treatment was not part of the selection regime. All replicate in an experiment should be as similar as possible to each other, except for the factors of interest (in this case whether they are Headwaters or Mainstems, and whether they received the treatments Bank Stabilization/In-Channel Manipulation or not). They are not similar in the Riparian Reforestation category.

2) the table also shows that Riparian Reforestation is confounded within the Headwaters and Mainstems category, since Reforestation is presence in all Mainstem streams and if absent, only absent in the Headwaters category. So any difference (or lack thereof) between Headwaters and Mainstems could potentially be caused the lack of Reforestation in the Headwaters streams.
I recommend that this table should be included in the manuscript, and the author should also discuss these limitations associated with their approach in re-analyzing the data. I don't think that this recommendation diminishes the value or novelty or impact of the manuscript. I just think that this is necessary to be clear and explicit about the correct inferences associated with the analyses.

Response: I think having that table cleared any confusion and disagreements, and now I agree with you. I will change references to "restoration" to "channel manipulations" and include the table showing the distribution of applied restoration treatments. I fully agree with the absence of reforestation in the headwaters potentially having a large, and potentially differential, effect. Stream ecology theorizes that headwaters are more dependent on allochthonous inputs from leaf litter subsidies, and only have having a subset of headwaters receive reforestation treatments could prevent observable effects of broader stream restoration.

I have uploaded the revised manuscript with track changes as a .docx file to facilitate the review process. The document uploaded to bioRxiv is identical.