

RC1: ['Comment on egusphere-2023-2623'](#), Anonymous Referee #1, 22 Dec 2023

Citation: <https://doi.org/10.5194/egusphere-2023-2623-RC1>

The manuscript "Rates of palaeoecological change can inform ecosystem restoration" focuses on data analysis for the past 150 years from Lago Grande di Avigliana lake. This is a very well written manuscript dealing with relevant environmental concerns, such as biodiversity and its restoration. I think that one of the relevant messages that makes this paper very interesting is the documentation of past acceleration of community transformation and the use of palaeoecological indicators. I would also like to highlight that the authors made an effort to include policy context. Overall, the paper is clear, well-structured, methodologically robust, and with an excellent quality.

> Many thanks for the overall positive assessment of our manuscript.

However, there are some minor aspects that to me requires a bit of improvement.

1) why the authors focused on Lago Grande di Avigliana requires a bit more of explanation.

I'm assuming that might be for the quality of the chronology and available data (some information on the section called "context"). However, to me, the manuscript could improve if the authors include a paragraph justifying the choice of study site and also why the results from this lake have the potential to help improving our understanding on restoration of ecosystems.

> Right, the manuscript was a little weak on the justification of the data set.

To address your comment, we have drafted a possible revision that may involve merging the '1 Introduction' with the '2 The context' sections and adding a sentence that sets the transition between the two sections (see underlined text here below):

"[...]. The examples chosen concern post-industrial transformations of both terrestrial and freshwater ecosystems, as documented by pollen and diatom records from a lake located in the forelands of the western Italian Alps (Finsinger et al., 2006). We chose these palaeoecological records because they have a high temporal resolution and a well-established chronology based on annual varve counts supported by short-lived radionuclide measurements and by biostratigraphic control points. Accordingly, these datasets (Fig. A1) disclose rapid environmental changes in terrestrial and aquatic ecosystems revealing compositional changes that occurred in conjunction with both undesired and desired changes of ecological properties during the past 150 years. Specifically, the pollen document an increase of tree cover [...]"

2) I found methods a bit short and limited in detail. How about including some of the information currently placed in the appendix in the methods section? I would suggest at least to include in the main text A1 Material.

> Many thanks for the suggestion. We will move the text "A1 Material" in the Methods section of the main text.

Very interesting manuscript!

> Many thanks for the encouraging remark on the manuscript. Much obliged.