

Response to reviewer 2 comments for “Root turnover and soil indicators capture belowground recovery following saltmarsh restoration”

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Comments

This manuscript presents a valuable assessment of belowground responses to ungulate exclusion in *Salicornia quinqueflora*-dominated saltmarshes in Swan Bay, Australia, using a well-structured space-for-time approach. The Introduction is clear and effective in outlining the broader context, research gap, study aims, and hypotheses. The Methods are detailed and transparent, while the Results are clearly presented and supported by a robust and interesting Discussion. Overall, I believe this study will be of considerable interest to researchers and practitioners working on saltmarsh restoration, nature-based solutions, and ecosystem services assessment, particularly because of its insightful discussion on soil condition dynamics and related indicators. I have only a few minor comments.

First, when discussing “ungulate exclusion” as a restoration approach, it would be helpful to clarify whether this refers primarily to livestock exclusion or also includes wild ungulates, as the current wording may create some ambiguity. This distinction is important because livestock grazing is a widespread management practice in saltmarshes globally, not only in Australia, and wild ungulates could potentially also exert pressure on natural marshes.

REPLY: Thank you for this feedback. We have now specified in the text that ungulate exclusion in practice is both for livestock and wild ungulates, and that this study is referring specifically to livestock exclusion. Specific sentences that have been changed are outlined below.

L22-24: This study used a space-for-time approach to evaluate belowground responses in *Salicornia quinqueflora*-dominated saltmarsh 25 years after livestock exclusion in Swan Bay, Victoria, Australia.

L61-64: Exclusion fencing as a coastal wetland restoration method, is especially relevant in an Australian context, as there is a disproportionate impact of introduced livestock and wild ungulates on marginal lands (Rowland and Lovelock, 2024).

L484-485: A strong positive correlation between DBD and soil strength showed significant reductions after livestock exclusion, likely improving erosion and root development (Cahoon et al., 2021; Daniel et al., 2002).

L553-554: Thus, the present study attests to the capacity of restoration practices, such as exclusion fencing of livestock, for the stabilisation of organic carbon.

Second, in the Methods section, please clarify whether the two selected natural reference sites are the only natural marsh remaining in the bay; if not, explain the rationale for selecting the two sites.

REPLY: The following sentence has been added

L132-133: We were limited to using the only two Natural Reference sites in Swan Bay. The third was not accessible due to lack of permissions.

Finally, in the Results section (line 339), please briefly define “alpha diversity” for non-specialist readers.

REPLY: The sentence has been changed to the following

L348-350: The Natural Reference sites had the highest *S. quinqueflora* cover ($\geq 90\%$) leading to the lowest alpha diversity (i.e. species richness and abundance) of the three rehabilitation categories (Figure 3, Figure S4).