

19-February-2024

Dear Editorial Board,

Please find enclosed the revision of the manuscript: “**Social-ecological models with social hierarchy and spatial structure applied to small scale fisheries**”, by Sophie Wulfing and Easton R. White for consideration in *Theoretical Ecology* as a Research Article. All sources of funding are acknowledged in the manuscript. There is no financial interest to report. I certify that the submission is our own original work and is not under review at any other publication, and this publication is available as a preprint on https://www.biorxiv.org/.

We believe this manuscript will be of general interest to the readers of *Theoretical Ecology* for both the scientific insights and the implications for collective management of small scale fisheries. We build on previous socio-ecological replicator dynamics studies to add social hierarchy and space components to these models. We found that fish movement is a major driver of model dynamics and that societal influence between groups of people was key to ensuring stable fishery dynamics. Next, we developed a case-study of a co-managed fishery where one group fishes sustainably while another was over-harvests, resulting in a fishery collapse of both patches. We also found that because effective strategies were not communicated in our model, increased social pressure actually decreased the sustainability of the fishery. The findings of this study indicate the importance of including spatial components to socio-ecological models and highlights the importance of understanding species movements when making conservation decisions. Further, we demonstrate how incorporating fishing methods from outside sources can result in higher stability of the harvested population, indicating a need for diversified information when managing resources.

We look forward to hearing from you at your earliest convenience.

Sincerely,



Sophie Wulfing M.S.

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