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### Reply to Rubenstein and Rubenstein

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*Published in:*

Proceedings of the National Academy of Sciences of the United States of America

*DOI:*

[10.1073/pnas.1521891113](https://doi.org/10.1073/pnas.1521891113)

**IMPORTANT NOTE: You are advised to consult the publisher's version (publisher's PDF) if you wish to cite from it. Please check the document version below.**

*Document Version*

Publisher's PDF, also known as Version of record

*Publication date:*

2016

[Link to publication in University of Groningen/UMCG research database](#)

*Citation for published version (APA):*

Svenning, J. C., Pedersen, P. B. M., Donlan, C. J., Ejrnæs, R., Faurby, S., Galetti, M., Hansen, D. M., Sandel, B., Sandom, C. J., Terborgh, J. W., & Vera, F. W. M. (2016). Reply to Rubenstein and Rubenstein: Time to move on from ideological debates on rewilding. *Proceedings of the National Academy of Sciences of the United States of America*, 113(1), E2-E3. <https://doi.org/10.1073/pnas.1521891113>

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REPLY TO RUBENSTEIN AND RUBENSTEIN:

# Time to move on from ideological debates on rewilding

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In their comment (1) on our review and perspective on trophic rewilding science (2), Rubenstein and Rubenstein launch a critique not so much directed at our study as at trophic rewilding as a conservation approach. They first lament that Pleistocene rewilding has not been scientifically studied since the term was introduced. This is much in line with our study, where we conclude that empirical research on trophic rewilding is rare, fragmented, and geographically biased, with the literature dominated by essays and opinion pieces, and follow this up by providing recommendations for research opportunities and priorities. Rubenstein and Rubenstein (1) then claim that we repackage the concept of Pleistocene rewilding (3) under the new term “trophic rewilding,” defined as species introductions to restore top-down trophic interactions and associated trophic cascades to promote self-regulating biodiverse ecosystems (2). However, the two concepts are not identical. Notably, with the name and definition of trophic rewilding we provide emphasis on a clear, testable functional objective rather than on a certain time frame.

As their third point, Rubenstein and Rubenstein (1) argue that large-scale reintroductions of proxy species are too risky. Rather than dismissing an entire approach based on opinion, we argue for developing a systematic research program on the scientific basis for trophic rewilding, including for evaluating benefits and risks. Furthermore, we recommend that scientific assessments and monitoring efforts should be integrated into the increasing number of rewilding projects that are being implemented. We also believe

Rubenstein and Rubenstein (1) exaggerate the risks when comparing rewilding to geoengineering proposals, because reintroductions would concern species or functional types with long histories in the focal region and because large animals can be controlled. Further, there are a number of analogous cases of unintentional rewilding, none of which has led to ecological catastrophes [e.g., reintroductions of horses to the New World (4)].

Finally, Rubenstein and Rubenstein (1) argue that trophic rewilding is a failed conservation strategy and that we instead should focus on preserving the ecosystems and species that remain, focusing on ways to feed the increasing human population without destroying biodiversity. This is a strange critique. Given that rewilding has yet to be broadly implemented, it is hardly fair to blame it for biodiversity's precarious state. Further, Rubenstein and Rubenstein (1) seem to overlook the fact that proposals for rewilding explicitly argue for it as part of the solution to maintaining biodiversity in a human-dominated world, with relevancy in both densely populated regions and wilderness areas (3, 5). Rubenstein and Rubenstein (1) end, “It is time to be practical, not sensational. It is time to move on.” We agree. Practitioners are increasingly implementing rewilding (e.g., Rewilding Europe). It is time to move on from an essentially data-free, ideological debate to developing a scientific program for trophic rewilding science to inform policy makers and conservation practitioners, with the goal of reversing the decline in biodiversity.

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The authors declare no conflict of interest.

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