

Manuscript Title

This manuscript ([permalink](#)) was automatically generated from [fmsabatini/TestManubot@f408ffb](#) on April 18, 2020.

Authors

- **Francesco Maria Sabatini**

 [XXXX-XXXX-XXXX-XXXX](#) ·  [fmsabatini](#) ·  [sPlot-iDiv](#)

Department of Biology, University of Halle-Wittenberg · Funded by Grant XXXXXXXX

- **Jane Roe**

 [XXXX-XXXX-XXXX-XXXX](#) ·  [janeroe](#)

Department of Something, University of Whatever; Department of Whatever, University of Something

Abstract

Policies to mitigate climate change and biodiversity loss often assume that protecting carbon-rich forests provides co-benefits in terms of biodiversity, due to the spatial congruence of carbon stocks and biodiversity at biogeographic scales. However, it remains unclear whether this holds at the scales relevant for management, with particularly large knowledge gaps for temperate forests and for taxa other than trees. We built a comprehensive dataset of Central European temperate forest structure and multi-taxonomic diversity (beetles, birds, bryophytes, fungi, lichens, and plants) across 352 plots. We used Boosted Regression Trees to assess the relationship between above-ground live carbon stocks and (a) taxon-specific richness, (b) a unified multidiversity index. We used Threshold Indicator Taxa ANalysis to explore individual species' responses to changing above-ground carbon stocks and to detect change-points in species composition along the carbon-stock gradient. Our results reveal an overall weak and highly variable relationship between richness and carbon stock at the stand scale, both for individual taxonomic groups and for multidiversity. Similarly, the proportion of win-win and trade-off species (i.e. species favored or disadvantaged by increasing carbon stock, respectively) varied substantially across taxa. Win-win species gradually replaced trade-off species with increasing carbon, without clear thresholds along the above-ground carbon gradient, suggesting that community-level surrogates (e.g. richness) might fail to detect critical changes in biodiversity. Collectively, our analyses highlight that leveraging co-benefits between carbon and biodiversity in temperate forest may require stand-scale management that prioritizes either biodiversity or carbon-in order to maximize co-benefits at broader scales. Importantly, this contrasts with tropical forests, where climate and biodiversity objectives can be integrated at the stand-scale, thus highlighting the need for context-specificity when managing for multiple objectives. Accounting for critical change-points of target taxa can help to deliver this specificity, by defining a safe operating space to manipulate carbon while avoiding biodiversity losses.

It doesn't seem to work

It actually works now. Yet, I'd prefer to keep everything private

References
