Supporting Information to the paper Biurrun I. et al. Benchmarking plant diversity of Palaearctic grasslands and other open habitats. *Journal of Vegetation Science.*

Appendix S6. Interpolation of richness data to other grain sizes.

While we provide richness values for eight "standard grain sizes", each separated by one order of magnitude, this data source also allows easy and reliable interpolation of richness values S_i (mean, minimum, maximum, ...) for any grain size A_x between two subsequent standard grain sizes A_1 and A_2, with $A_2 = 10\ A_1$ by the following formula:

$$S_x = 10\ \hat{}\ (\log_{10} S_1 + (\log_{10} A_x - \log_{10} A_1)\ (\log_{10} S_2 - \log_{10} S_1))$$

This formula is based on the power function, which in a recent study had turned out to be the best model to describe the species-area relationship in Palaearctic open habitats (Dengler et al., 2020). However, the formula does not assume any specific exponent (*z*-value) nor expects it to be constant across all grain sizes; instead, it just derives the "local *z*-value" (Williamson, 2003; Zhang et al. 2021) from the data. To exemplify the use of the formula, let's assume a user has selected either in the GrassPlot Diversity Benchmarks or in the GrassPlot Diversity Explorer a certain vegetation type in a certain region and found that the mean richness in 1 m² is 15 and the mean richness in 10 m² is 25 species. The expected richness in 4 m² would then be:

$$S_4 = 10\ \hat{}\ (\log_{10} 15 + (\log_{10} 4 - \log_{10} 1)\ (\log_{10} 25 - \log_{10} 15)) = 20.4$$

References

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