

Description of Additional Supplementary Files

File Name: Supplementary Data 1

Description: Final model results and statistics for all main text models. Sample sizes are given as number of observations with number of studies in parentheses. Log-likelihood ratio tests (LRT) and p values in comparison to intercept-only null models are provided. Total model variance (σ^2), total unexplained heterogeneity (I^2) and R^2 are provided. Note that some models had extremely low heterogeneity (particularly Root Biomass), leading to R^2 of 100%. We thus calculated an alternative R^{2*} , which is the proportion of total variance in y explained by moderator (see Methods). Contrasts between factors (e.g., nativeness levels) were conducted with two-tailed tests with the t-distribution. Contrast estimates (e.g., difference between nativeness levels) are provided along with 95% confidence intervals, degrees of freedom, t-test statistic, and p-values.

File Name: Supplementary Data 2

Description: Final model comparisons following exclusion of influential observations ('observation level') or studies ('study level'). Influential data was determined with Cook's distance. Number of retained and excluded observations and articles are given ('N retained' and 'N excluded') as number of observations (number of articles). Table gives contrast results (as estimated difference between nativeness categories $\pm$ 95% CIs), degrees of freedom, t-statistic for the two-tailed contrast test, and p-values.

File Name: Supplementary Data 3

Description: Distribution of sample sizes across all categories. The final dataset included many responses for which we lacked sufficient sample size to analyze (set *a priori* to 3 articles per response category). The numbers in each column indicate the number of observations and, in parentheses, articles per megafauna analysis group.

File Name: Supplementary Data 4

Description: The nesting structure of response categories. Note that this includes response categories for which we did not have sufficient sample size (see Supplementary Data 3).

File Name: Supplementary Data 5

Description: Multilevel publication bias tests revealed two models (soil pH and vertebrate diversity in models with African megafauna versus introduced megafauna) with significant evidence of publication bias. Publication bias tests were based on (Nakagawa et al. 2022) and used multilevel error structures to test whether effect sizes were a function of the inverse of the square root of effective sample size. We then used a similar model with $1/\text{effective N}$ to estimate bias-corrected estimates (reported in second row). We also report intercept-only model results to provide comparison (from main text models).

File Name: Supplementary Data 6

Description: All references used in meta-analysis.