

## S2 Supplementary Results

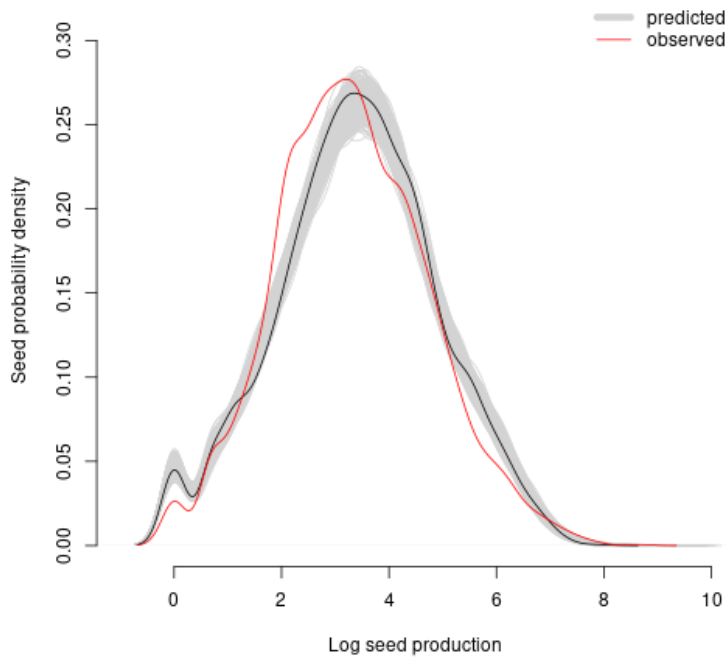


Figure S3: Posterior predictive check showing the density distribution of observed seed production values (red line) to simulated seed production values (light grey) as estimated by the RIM only, on a log scale. Simulated values were generated using the 80% posterior confidence intervals for each parameter, the black line shows simulated values using the median of each parameter.

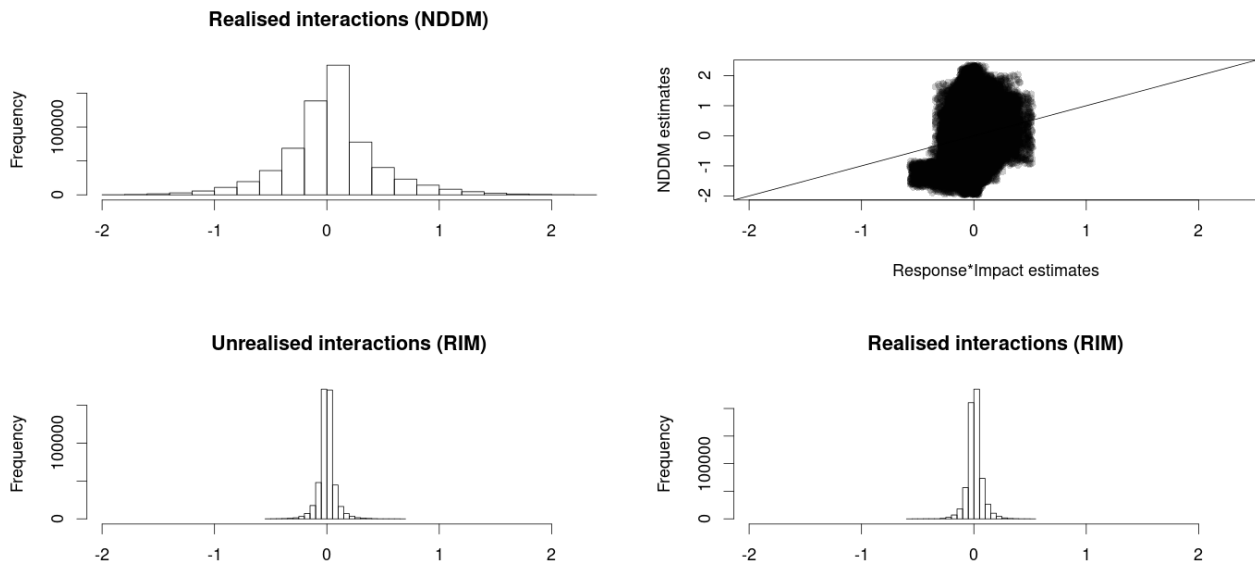


Figure S4: Distribution of interaction estimates from our case study. Parameter estimates are sampled from the 80% posterior confidence intervals returned by STAN. Upper left panel shows the distribution of observed interactions as estimated by the NDDM ( $\beta_{i,j}$ ), which are then plotted against the corresponding RIM estimates ( $r_i e_j$ , x-axis) in the upper right panel. Bottom rows show the distribution of *unidentifiable* (left) and *identifiable* interactions estimates returned by the RIM. Interaction estimates are unscaled.

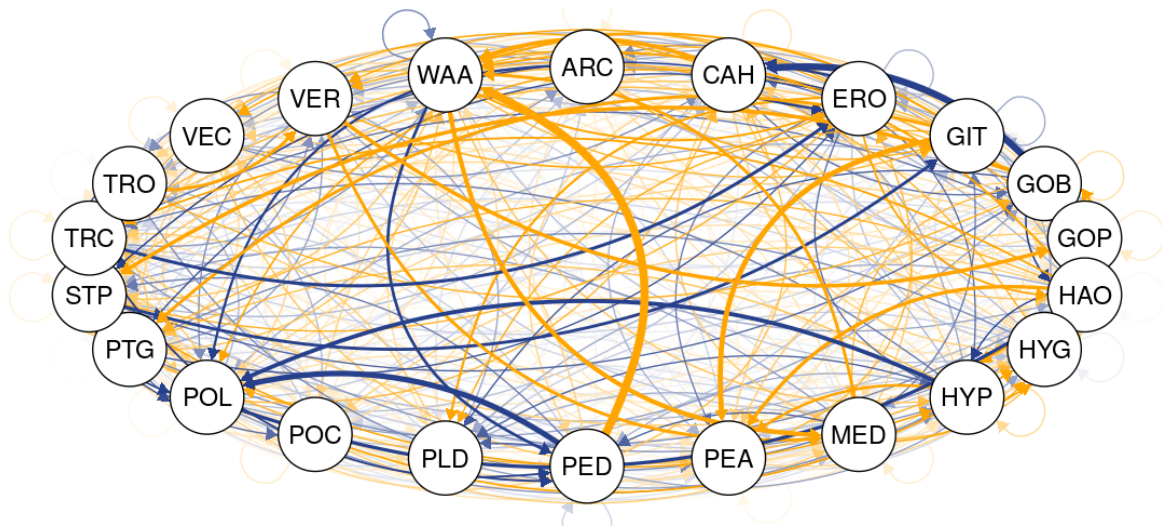


Figure S5: The full network of unscaled interactions between 22 focal species as estimated by the joint modelling framework presented here. Arrows point to species  $i$  and line thickness denotes median interaction strength over 1000 samples drawn from the 80% posterior confidence interval of each parameter. Facilitative interactions are shown in blue and competitive interactions are shown in yellow.

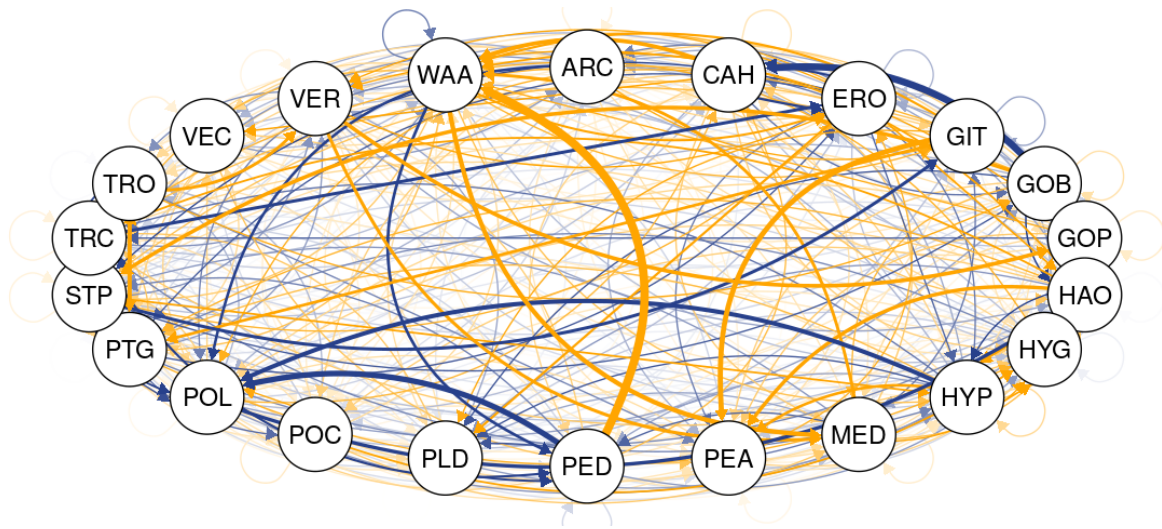


Figure S6: Network of identifiable interactions (unscaled) between 22 focal species as estimated by the NDDM, unidentifiable interactions are not shown here. Arrows point to species  $i$  and line thickness denotes median interaction strength over 1000 samples drawn from the 80% posterior confidence interval of each parameter. Facilitative interactions are shown in blue and competitive interactions are shown in yellow.

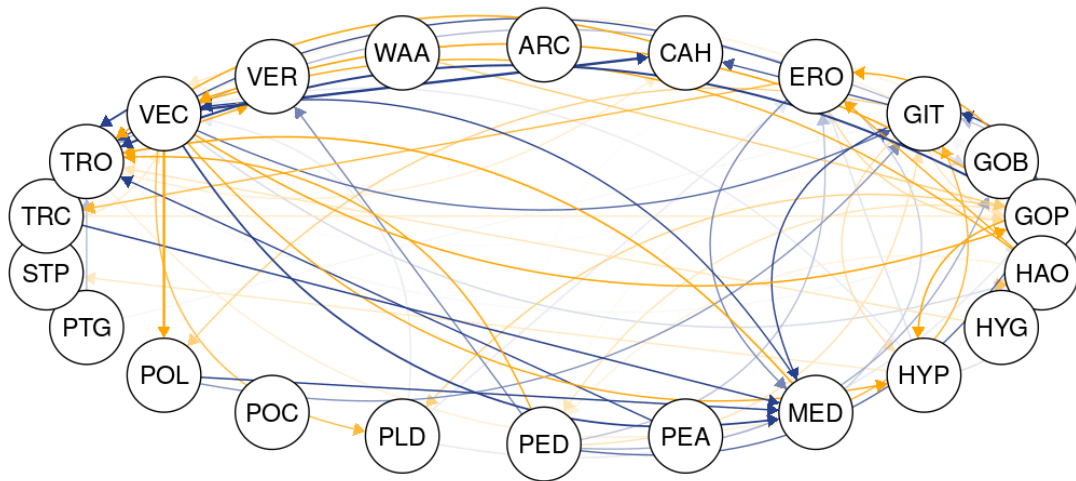


Figure S7: Network of unidentifiable interactions (unscaled) between 22 focal species as estimated by the RIM. Arrows point to species  $i$  and line thickness denotes median interaction strength over 1000 samples drawn from the 80% posterior confidence interval of each parameter. Facilitative interactions are shown in blue and competitive interactions are shown in yellow.