

Table S1. List of model runs

List of model runs for different metawebs, biotic metrics, cross-validation runs, and distribution data.

1. Metawebs: MW1=the potential metaweb with interactions for all life stages except eggs; M2=same as M1 except relationships are constrained such that predator-prey combinations must occur in at least one pixel together). MW-Globi=metaweb built from GLOBI data available for european vertebrates.
2. Biotic metrics: 25%=competitor richness (defined as species that share at least 25% of their prey species out of the total number of prey for that species); 90%=competitor richness (defined as species that share at least 90% of their prey species out of the total number of prey for that species); All=competitor richness (defined as species that share at least one prey); the logged version of both competitors (the 25% threshold) and prey; and a model including prey richness and total species richness (SR) in place of competitor richness.
3. Taxonomic groups: Birds, Mammals, Reptiles and Amphibians
4. Cross-validation runs: Cross-validation runs include different types of sampling for training and testing data (random sample, spatial block-longitude and spatial block-latitude). For each type of cross-validation, three sets of model were run including all variables (Full) and partial models (Part.) with only abiotic or only biotic variables.
5. Distribution data: data used in manuscript (Original) compared to GBIF distributions (only for amphibian species).

For each runs listed below, all species that had at least on prey species (all predators in the dataset) were modelled separately and two different model algorithms were used: bayesian generalized linear models and boosted regressions trees (>10k total models)

Set of runs	Group	Metaweb	Biotic Metric	Predictors	Cross-validation	Distribution Data
1	Amph.	MW1	25%	Full	All data	Original
2	Amph.	MW4	All	Full	All data	Original
3	Amph.	MW2	All	Full	All data	Original
4	Amph.	MW2	25%	Full	All data	Original
5	Amph.	MW2	90%	Full	All data	Original
6	Amph.	MW2	log	Full	All data	Original
7	Amph.	MW2	SR	Full	All data	Original
8	Amph.	MW2	25%	Full Model	Random	Original
9	Amph.	MW2	25%	Biotic Only	Random	Original
10	Amph.	MW2	25%	Abiotic Only	Random	Original
11	Amph.	MW2	25%	Full Model	Spatial-long	Original
12	Amph.	MW2	25%	Biotic Only	Spatial-long	Original
13	Amph.	MW2	25%	Abiotic Only	Spatial-long	Original
14	Amph.	MW2	25%	Full Model	Spatial-lat	Original
15	Amph.	MW2	25%	Biotic Only	Spatial-lat	Original
16	Amph.	MW2	25%	Abiotic Only	Spatial-lat	Original
17	Amph.	MW2	25%	Full Model	All data	GBIF
18	Amph.	MW2	25%	Full Model	All data	GBIF
19	Bird	MW1	25%	Full	All data	Original
20	Bird	MW4	All	Full	All data	Original

(continued)

Set of runs	Group	Metaweb	Biotic Metric	Predictors	Cross-validation	Distribution Data
21	Bird	MW2	All	Full	All data	Original
22	Bird	MW2	25%	Full	All data	Original
23	Bird	MW2	90%	Full	All data	Original
24	Bird	MW2	log	Full	All data	Original
25	Bird	MW2	SR	Full	All data	Original
26	Bird	MW2	25%	Full Model	Random	Original
27	Bird	MW2	25%	Biotic Only	Random	Original
28	Bird	MW2	25%	Abiotic Only	Random	Original
29	Bird	MW2	25%	Full Model	Spatial-long	Original
30	Bird	MW2	25%	Biotic Only	Spatial-long	Original
31	Bird	MW2	25%	Abiotic Only	Spatial-long	Original
32	Bird	MW2	25%	Full Model	Spatial-lat	Original
33	Bird	MW2	25%	Biotic Only	Spatial-lat	Original
34	Bird	MW2	25%	Abiotic Only	Spatial-lat	Original
35	Mammal	MW1	25%	Full	All data	Original
36	Mammal	MW4	All	Full	All data	Original
37	Mammal	MW2	All	Full	All data	Original
38	Mammal	MW2	25%	Full	All data	Original
39	Mammal	MW2	90%	Full	All data	Original
40	Mammal	MW2	log	Full	All data	Original
41	Mammal	MW2	SR	Full	All data	Original
42	Mammal	MW2	25%	Full Model	Random	Original
43	Mammal	MW2	25%	Biotic Only	Random	Original
44	Mammal	MW2	25%	Abiotic Only	Random	Original
45	Mammal	MW2	25%	Full Model	Spatial-long	Original
46	Mammal	MW2	25%	Biotic Only	Spatial-long	Original
47	Mammal	MW2	25%	Abiotic Only	Spatial-long	Original
48	Mammal	MW2	25%	Full Model	Spatial-lat	Original
49	Mammal	MW2	25%	Biotic Only	Spatial-lat	Original
50	Mammal	MW2	25%	Abiotic Only	Spatial-lat	Original
51	Reptile	MW1	25%	Full	All data	Original
52	Reptile	MW4	All	Full	All data	Original
53	Reptile	MW2	All	Full	All data	Original
54	Reptile	MW2	25%	Full	All data	Original
55	Reptile	MW2	90%	Full	All data	Original
56	Reptile	MW2	log	Full	All data	Original
57	Reptile	MW2	SR	Full	All data	Original
58	Reptile	MW2	25%	Full Model	Random	Original
59	Reptile	MW2	25%	Biotic Only	Random	Original
60	Reptile	MW2	25%	Abiotic Only	Random	Original
61	Reptile	MW2	25%	Full Model	Spatial-long	Original
62	Reptile	MW2	25%	Biotic Only	Spatial-long	Original
63	Reptile	MW2	25%	Abiotic Only	Spatial-long	Original
64	Reptile	MW2	25%	Full Model	Spatial-lat	Original
65	Reptile	MW2	25%	Biotic Only	Spatial-lat	Original
66	Reptile	MW2	25%	Abiotic Only	Spatial-lat	Original