diversity

MDPI

S1. Sampling design

All analyses were based on data collected inside the following 62 plots. Original sampling design was based on 69 plots, but 7 plots were discarded due to missing microclimatic data.

Table S1. Plot characteristics. Each plot has been characterised by the following variables: park (gpnp = Gran Paradiso National Park, ornp = Orsiera Rocciavré Natural Park, vdnp = Veglia Devero Natural Park); valley (corresponding to the altitudinal transects); coordinates of the plot centre (x and y, expressed as WGS84 UTM 32N); mean altitude a.s.l. (Alt); land cover, expressed as percentage of tall shrubs (Tshr), low shrubs (Lshr), trees (Tree), herbaceous layer (Herb), rock and bare ground (Gro); land cover structural diversity, calculated using land cover percentage (Hstr); the vegetation belt; microclimatic data, expressed as seasonal mean (Tme), maximum (Tma), minimum (Tmi) and standard deviation (Tsd), in °C.

Plot	Park	Valley	x	y	Alt	T shrub	L shrub	Tree	Herb	Gro	Hstr	Belt	T me	T ma	T mi	T sd
la	gpnp	cogne	370453	5049647	1700	0	0	5	95	0	0.91	montane	12.05	17.78	7.02	4.74
lb	gpnp	cogne	370088	5049584	1850	0	70	80	5	5	0.48	montane	12.43	17.76	8.32	4.5
lc	gpnp	cogne	369679	5049288	2000	0	5	40	90	0	0.53	subalpine	11.14	17.55	6.69	4.65
ld	gpnp	cogne	369031	5049027	2300	0	40	0	40	20	0.49	subalpine	10.63	18.68	4.22	5.95
le	gpnp	cogne	368450	5049179	2450	0	0	0	80	20	1	alpine	10.73	19.26	4.38	6.2
lf	gpnp	cogne	367605	5049150	2650	0	0	0	90	10	1	alpine	8.78	17.08	2.66	5.85
gpa	gpnp	orco	367461	5035088	1250	20	5	10	55	5	0.44	montane	15.41	21.4	11.04	4.5
gpc	gpnp	orco	367300	5035811	1600	5	5	30	60	10	0.46	subalpine	13.05	17.52	9.69	3.93
gpe	gpnp	orco	366364	5036409	2100	0	0	0	90	10	1	alpine	11.44	20.25	6.62	5.3
gpf	gpnp	orco	366362	5037109	2250	0	0	0	70	25	1	alpine	10.58	18.63	5.47	5.46
gpg	gpnp	orco	365898	5037608	2450	0	0	0	60	40	1	alpine	9.46	17.9	4.47	5.44
va	gpnp	rhemes	352122	5044558	1900	5	5	60	5	15	0.65	montane	10.72	19.35	5.74	5.24
vb	gpnp	rhemes	352198	5044114	2100	5	60	60	5	20	0.43	montane	10.25	17.33	6.22	4.74
vc	gpnp	rhemes	352684	5043746	2350	5	25	0	60	15	0.52	subalpine	9.53	16.44	4.84	4.93
vd	gpnp	rhemes	353231	5043677	2450	0	0	0	95	5	1	alpine	8.95	15.87	4.15	5.08
ve	gpnp	rhemes	353949	5043875	2650	0	0	0	90	10	1	alpine	9.12	17.32	3.92	5.8
sa	gpnp	soana	386187	5043036	1250	0	0	90	0	10	1	montane	13.93	17.52	10.97	3.3
sb	gpnp	soana	385159	5044527	1450	10	10	30	70	0	0.42	montane	14.19	19.48	10.49	4.01
sc	gpnp	soana	384893	5045333	1600	10	30	20	5	10	0.34	subalpine	13.65	21.23	9.72	4.52
sd	gpnp	soana	384757	5045635	1700	0	0	5	95	0	0.91	subalpine	11.68	16.07	8.49	3.82
se	gpnp	soana	385168	5046434	2000	0	0	0	95	5	1	alpine	12.43	20.45	7.62	5.44
sf	gpnp	soana	385565	5046333	2200	0	5	0	95	0	0.9	alpine	10.33	17.69	5.78	5.05
oa	gpnp	valsavarenche	360253	5049402	1650	0	5	0	95	0	0.91	montane	11.72	17.24	7.24	4.39
ob	gpnp	valsavarenche	360059	5049364	1750	0	0	95	0	5	1	montane	11.85	16.09	8.22	3.99
oc	gpnp	valsavarenche	359729	5048865	1950	0	5	5	85	5	0.81	subalpine	11.01	18.55	6.14	4.97
od	gpnp	valsavarenche	359113	5049322	2150	15	40	15	10	20	0.34	subalpine	10.53	16.29	6	4.57
oe	gpnp	valsavarenche	359103	5047847	2350	0	0	0	95	10	1	alpine	9.8	18.41	4.03	5.84
of	gpnp	valsavarenche	357933	5046913	2550	0	0	0	90	10	1	alpine	8.33	14.5	2.69	5.08
cha	ornp	chisone	348118	4988939	1600	20	15	85	20	20	1.1	montane	13.49	22.5	9.49	4.72
chb	ornp	chisone	348749	4989300	1800	5	10	65	75	5	1	subalpine	13.43	22.66	8.2	5.8
chc	ornp	chisone	349432	4990364	2000	5	40	50	30	5	1.2	subalpine	12.27	22.45	6.06	6.54
chd	ornp	chisone	349862	4991079	2250	5	35	5	40	20	1.05	subalpine	10.02	17.03	5.76	4.81

Plot	Park	Valley	x	y	Alt	T shrub	L shrub	Tree	Herb	Gro	Hstr	Belt	T me	T ma	T mi	T sd
che	ornp	chisone	350270	4991371	2400	0	5	0	55	45	0.29	alpine	8.97	15.75	4.08	5.1
chf	ornp	chisone	350558	4992045	2600	0	0	0	80	20	0	alpine	8.04	15.38	3.14	5.42
fa	ornp	foresto	351389	5000889	550	25	15	5	50	50	1.14	montane	20.74	26.3	15.61	4.76
fb	ornp	foresto	351319	5001288	800	60	5	30	5	10	0.97	montane	19.16	24.22	14.99	4.25
fc	ornp	foresto	350765	5001509	1000	50	40	25	30	40	1.35	montane	18.53	26.09	13.77	5.3
saa	ornp	sangone	359016	4987411	1400	30	50	40	30	5	1.36	montane	15.17	21.93	10.64	4.75
sac	ornp	sangone	356867	4986699	1850	0	5	0	90	10	0.21	alpine	12.01	16.45	8.58	3.88
sua	ornp	susa	350274	4995146	1450	5	10	95	95	0	0.95	montane	12.92	16.88	9.84	3.57
sub	ornp	susa	350489	4994455	1600	15	80	90	20	0	1.15	montane	12.49	18.33	8.24	4.35
suc	ornp	susa	350471	4993705	1850	30	30	35	70	0	1.31	subalpine	11.58	16.61	8.22	3.85
sud	ornp	susa	350146	4993273	2050	10	80	0	20	0	0.79	subalpine	11.43	16.49	7.72	4.11
sue	ornp	susa	349829	4992738	2250	0	20	0	70	10	0.53	alpine	9.37	13.61	5.44	3.86
suf	ornp	susa	349897	4992383	2350	0	80	0	10	10	0.35	alpine	7.42	9.99	4.81	2.86
baa	vdnp	bandiera	443413	5130659	1700	10	15	30	75	0	1.13	montane	11.73	16.34	7.98	4.18
bab	vdnp	bandiera	442984	5131216	1900	10	25	35	50	15	1.23	subalpine	10.9	17.35	7.02	4.43
bac	vdnp	bandiera	442442	5131460	2150	0	0	0	80	20	0	alpine	9.99	17.61	5.33	5.49
bad	vdnp	bandiera	441721	5131427	2400	0	0	0	40	60	0	alpine	8.05	14.74	3.9	5.12
bae	vdnp	bandiera	441382	5131243	2550	0	0	0	0	100	0	alpine	6.63	12.79	2.71	4.93
baf	vdnp	bandiera	441213	5130458	2700	0	0	0	25	75	0	alpine	6.09	12.41	1.88	4.79
dea	vdnp	devero	442857	5129720	1650	0	0	0	55	0	0.1	montane	11.7	20.93	5	5.68
deb	vdnp	devero	444751	5130458	1850	0	65	65	20	0	1	subalpine	11.24	17.54	7.35	4.21
dee	vdnp	devero	446968	5131144	2400	0	55	0	45	0	0.69	alpine	8.67	16.33	3.44	5.17
def	vdnp	devero	447708	5130913	2600	0	0	0	95	5	0	alpine	7.03	14.78	2.26	5.6
vea	vdnp	veglia	436495	5122551	1350	85	0	0	10	0	0.37	montane	13.68	19.82	9.3	4.3
veb	vdnp	veglia	435476	5122690	1500	0	0	0	90	0	0	subalpine	14.41	23.69	8.98	5.85
vec	vdnp	veglia	434103	5125322	1750	0	0	5	100	0	0.21	subalpine	13.1	24.04	6.25	7.02
ved	vdnp	veglia	435328	5125409	1950	0	75	85	25	0	1	subalpine	10.61	17.81	6.14	4.92
vee	vdnp	veglia	437102	5125766	2150	0	0	0	100	0	0	alpine	10.23	17.92	5.96	5.15
vef	vdnp	veglia	437410	5125582	2350	0	0	0	100	0	0	alpine	8.1	14.89	4.01	4.69
veg	vdnp	veglia	437785	5125164	2500	0	0	0	100	0	0	alpine	7.6	14.86	3.16	5.1

S2. Species selection

All analyses were based on 304 species: 45 Carabidae, 80 Lepidoptera Papilionoidea and Hesperiioidea, 99 Araneae, 40 Staphylinidae and 40 Birds. Among them, 43 were endemic and 68 vulnerable (high altitude species).

We considered as vulnerable those species restricted to high altitudes (species of the subalpine and alpine belts) and we considered as endemic those species which are exclusive to the Alpine Region (Alps and Appennines).

For the classification of each species we relied on different sources, depending on the taxon.

Butterflies. Balletto and Kudrna (1985); Balletto et al. (2015).

Staphylinids. Expert knowledge of altitudinal and geographical distribution (Adriano Zanetti, which refers not only to its personal experience but also to many different articles and technical national and European reports).

Carabids. Expert knowledge of altitudinal and geographical distribution (Gianni Allegro, which refers not only to its personal experience but also to many different articles and technical national and European reports).

Spiders. Pantini and Isaia (2018); Isaia et al. (2007); https://araneae.nmbe.ch/
Birds. Boitani et al. (2002).

References.

Balletto, E.; Bonelli, S.; Barbero, F.; Casacci, L.P.; Sbordoni, V.; Dapporto, L.; Scalercio, S.; Zilli, A.; Battistoni, A.; Teofili, C.; Rondinini, C. Lista Rossa IUCN delle Farfalle Italiane - Ropaloceri. ComitatoItaliano IUCN e Ministerodell'Ambiente e della Tutela del Territorio e del Mare, Roma; 2015.

Balletto, E.; Kudrna, O. Some aspects of the conservation of butterflies in Italy, with recommendations for a future strategy (Lepidoptera, Hesperiidae and Papilionoidea). Boll. Soc. Ent. Ita. 1985, 117, 39-59.

Boitani, L.; Falcucci, A.; Maiorano, L.; Montemaggiori, A. Rete Ecologica Nazionale. Ministerodell'Ambiente e della Tutela del Territorio e del Mare; 2002.

Isaia, M.; Pantini, P.; Beikes, S.; Badino, G. Catalogoragionatodeiragni (Arachnida, Araneae) del Piemonte e dellaLombardia. Mem. Ass. Nat. Piem. 2007, Vol. IX.

Pantini, P.; Isaia, M. Checklists of the Italian spiders. Version June 2018.
http://www.museoscienzebergamo.it/web/index.php?option=com_content&view=category&layout=blog&id=96&Itemid=94

https://araneae.nmbe.ch/ (Aranea, Spiders of Europe)

For each species we run three Maxent model classes (T, TR, TRV), for a total of 912 current distribution datasets. In 35 cases, individual species models were inadequate (AUC < 0.6): 29 models in Temp, 6 in Tempark and 0 in All. In these cases, the species presence was considered stable after the temperature increase.

The species richness per plot estimated by Maxent showed lower values in the model class TRV (mean 136.56 ± 4.08), when compared with T (mean 167.05 ± 4.22) and TR (mean 174.89 ± 2.93).

The outputs of the Maxent species distribution models for current conditions were then used as baselines for assessing the response to temperature increase. For each model class, we run the three different scenarios, for a total of 2736 future distribution outputs.

Table S2a. Species used in the modeling approach. For each of the 304 species, we showed the number of presence plots (training samples), the AUC values of each model class and if the species is vulnerable (high altitude specialist) and/or endemic to the alpine biogeographical region.

Taxon	Species	Training samples	AUC - T	AUC - TR	AUC - TRV	High altitude	Endemic
Birds	*Alectoris graeca*	11	0.6708	0.7610	0.7969	no	no
Birds	*Anthus spinoletta*	22	0.7654	0.7815	0.8079	yes	no
Birds	*Anthus trivialis*	18	0.7343	0.7343	0.8199	no	no
Birds	*Certhia familiaris*	9	0.6927	0.7303	0.8557	no	no
Birds	*Corvus corax*	5	0.7742	0.7742	0.9161	no	no
Birds	*Corvus cornix*	12	0.5901	0.7876	0.8078	no	no
Birds	*Cuculus canorus*	21	0.7174	0.7181	0.8157	no	no
Birds	*Dendrocopos major*	7	0.7765	0.8295	0.8779	no	no
Birds	*Dryocopus martius*	5	0.8484	0.8581	0.9129	no	no
Birds	*Emberiza cia*	11	0.7500	0.7632	0.7779	no	no
Birds	*Erithacus rubecula*	16	0.7818	0.7873	0.8105	no	no
Birds	*Fringilla coelebs*	37	0.6861	0.6857	0.6981	no	no
Birds	*Garrulus glandarius*	12	0.8085	0.8233	0.8266	no	no
Birds	*Lophophanes cristatus*	4	0.7419	0.7419	0.9435	no	no
Birds	*Lyrurus tetrix*	5	0.5000	0.6952	0.8597	yes	no
Birds	*Monticola saxatilis*	4	0.8266	0.9113	0.8831	no	no
Birds	*Motacilla alba*	9	0.6470	0.7330	0.7814	no	no
Birds	*Motacilla cinerea*	10	0.6823	0.7484	0.8274	no	no
Birds	*Oenanthe oenanthe*	23	0.7830	0.7942	0.8072	no	no
Birds	*Parus major*	10	0.8823	0.8839	0.8855	no	no

Taxon	Species	Training samples	AUC - T	AUC - TR	AUC - TRV	High altitude	Endemic
Birds	*Periparus ater*	18	0.8011	0.8347	0.8490	no	no
Birds	*Phoenicurus ochruros*	35	0.6369	0.6401	0.6862	no	no
Birds	*Phoenicurus phoenicurus*	4	0.7238	0.8569	0.8952	no	no
Birds	*Phylloscopus bonelli*	4	0.8710	0.8710	0.8710	no	no
Birds	*Phylloscopus collybita*	19	0.7950	0.7933	0.8230	no	no
Birds	*Picus viridis*	6	0.8011	0.8199	0.8333	no	no
Birds	*Poecile montanus*	19	0.7462	0.7496	0.8107	no	no
Birds	*Prunella collaris*	16	0.8226	0.8296	0.8488	yes	no
Birds	*Prunella modularis*	19	0.7564	0.7750	0.8048	no	no
Birds	*Pyrrhocorax graculus*	17	0.7747	0.7813	0.8287	yes	no
Birds	*Pyrrhocorax pyrrhocorax*	7	0.7984	0.8445	0.8894	no	no
Birds	*Saxicola rubetra*	6	0.8172	0.8091	0.8454	no	no
Birds	*Sylvia atricapilla*	10	0.8629	0.8629	0.8774	no	no
Birds	*Sylvia borin*	9	0.7885	0.8136	0.8656	no	no
Birds	*Sylvia curruca*	7	0.6521	0.6959	0.7880	yes	no
Birds	*Troglodytes troglodytes*	32	0.6348	0.6479	0.7041	no	no
Birds	*Turdus merula*	9	0.8539	0.8970	0.9014	no	no
Birds	*Turdus philomelos*	9	0.8280	0.8459	0.8647	no	no
Birds	*Turdus torquatus*	5	0.5403	0.6790	0.7839	yes	no
Birds	*Turdus viscivorus*	23	0.7139	0.7174	0.7819	no	no
Butterflies	*Aglais urticae*	31	0.5479	0.5911	0.6285	no	no
Butterflies	*Agriades glandon*	8	0.7762	0.8337	0.8538	yes	no
Butterflies	*Aporia crataegi*	14	0.7327	0.7949	0.7995	no	no
Butterflies	*Argynnis aglaja*	24	0.7379	0.7352	0.8001	no	no
Butterflies	*Argynnis niobe*	18	0.6564	0.7191	0.8136	no	no
Butterflies	*Argynnis paphia*	4	0.9234	0.9274	0.9597	no	no
Butterflies	*Aricia agestis*	4	0.8669	0.8710	0.9113	no	no
Butterflies	*Boloria euphrosyne*	17	0.7685	0.7865	0.8240	no	no
Butterflies	*Boloria napaea*	10	0.7355	0.7484	0.7694	yes	no
Butterflies	*Boloria pales*	27	0.7210	0.7372	0.7605	yes	no
Butterflies	*Boloria titania*	13	0.7581	0.7618	0.7717	no	no
Butterflies	*Coenonympha arcania*	9	0.8728	0.8602	0.8799	no	no
Butterflies	*Coenonympha darwiniana*	8	0.6583	0.9345	0.9365	no	yes
Butterflies	*Coenonympha gardetta*	20	0.7500	0.7839	0.8181	no	yes
Butterflies	*Coenonympha pamphilus*	8	0.7560	0.7641	0.8306	no	no
Butterflies	*Colias alfacariensis*	5	0.6677	0.7226	0.7710	no	no
Butterflies	*Colias crocea*	24	0.6509	0.6704	0.7298	no	no
Butterflies	*Colias palaeno*	7	0.5714	0.7327	0.7350	yes	no
Butterflies	*Colias phicomone*	23	0.7356	0.7391	0.7714	yes	no
Butterflies	*Cupido minimus*	15	0.6667	0.7366	0.7688	no	no
Butterflies	*Cyaniris semiargus*	4	0.6734	0.6935	0.8871	no	no
Butterflies	*Erebia aethiops*	13	0.8052	0.8114	0.8455	no	no
Butterflies	*Erebia albergana*	22	0.7306	0.7449	0.7958	no	no
Butterflies	*Erebia dromus*	25	0.7671	0.7787	0.7852	yes	yes
Butterflies	*Erebia epiphron*	20	0.7347	0.7516	0.8032	no	no
Butterflies	*Erebia euryale*	20	0.6911	0.8194	0.8278	no	no

Taxon	Species	Training samples	AUC - T	AUC - TR	AUC - TRV	High altitude	Endemic
Butterflies	*Erebia gorge*	18	0.7115	0.7581	0.7814	yes	no
Butterflies	*Erebia medusa*	14	0.7707	0.7730	0.8007	no	no
Butterflies	*Erebia melampus*	24	0.6875	0.7130	0.7500	no	yes
Butterflies	*Erebia meolans*	9	0.7724	0.7867	0.8065	no	no
Butterflies	*Erebia mnestra*	11	0.7889	0.8416	0.8504	yes	yes
Butterflies	*Erebia montana*	15	0.7903	0.7855	0.8194	no	yes
Butterflies	*Erebia pandrose*	12	0.8199	0.8293	0.8602	yes	no
Butterflies	*Erebia pharte*	10	0.6774	0.7210	0.7774	yes	no
Butterflies	*Erebia pronoe*	7	0.6544	0.8111	0.9286	no	no
Butterflies	*Erebia tyndarus*	12	0.6653	0.8737	0.8770	yes	yes
Butterflies	*Euphydryas glaciegenita*	7	0.8041	0.8272	0.9055	yes	yes
Butterflies	*Hesperia comma*	22	0.6521	0.6862	0.8002	no	no
Butterflies	*Hipparchia fagi*	4	0.9395	0.9395	0.9395	no	no
Butterflies	*Hipparchia semele*	4	0.8831	0.8750	0.8871	no	no
Butterflies	*Hyponephele lycaon*	5	0.7097	0.7677	0.8226	no	no
Butterflies	*Issoria lathonia*	9	0.6765	0.7258	0.7823	no	no
Butterflies	*Lasiommata maera*	16	0.8185	0.8196	0.8558	no	no
Butterflies	*Lasiommata megera*	5	0.9435	0.9565	0.9565	no	no
Butterflies	*Lycaeides idas*	5	0.5387	0.6629	0.7613	no	no
Butterflies	*Lycaena eurydame*	8	0.6552	0.6956	0.7177	no	yes
Butterflies	*Lycaena subalpina*	6	0.7473	0.7823	0.8306	no	yes
Butterflies	*Lycaena virgaureae*	8	0.7097	0.7560	0.8044	no	no
Butterflies	*Maculinea arion*	6	0.6344	0.7688	0.8011	no	no
Butterflies	*Melanargia galathea*	18	0.7858	0.8038	0.8199	no	no
Butterflies	*Melitaea deione*	4	0.6613	0.8750	0.9274	no	no
Butterflies	*Melitaea didyma*	4	0.5000	0.6492	0.6492	no	no
Butterflies	*Melitaea nevadensis*	5	0.5000	0.6742	0.7355	no	no
Butterflies	*Melitaea phoebe*	4	0.7258	0.8145	0.8306	no	no
Butterflies	*Melitaea varia*	15	0.7124	0.7452	0.8554	yes	yes
Butterflies	*Ochlodes sylvanus*	11	0.7977	0.8167	0.8519	no	no
Butterflies	*Papilio machaon*	7	0.8203	0.8871	0.8871	no	no
Butterflies	*Parnassius apollo*	16	0.6815	0.6935	0.8185	no	no
Butterflies	*Parnassius phoebus*	6	0.6478	0.7796	0.8347	yes	no
Butterflies	*Pieris brassicae*	11	0.6818	0.6848	0.7493	no	no
Butterflies	*Pieris bryoniae*	13	0.6563	0.7568	0.7519	yes	no
Butterflies	*Pieris callidice*	12	0.8145	0.8306	0.8710	yes	no
Butterflies	*Pieris napi*	14	0.6244	0.6498	0.7247	no	no
Butterflies	*Pieris rapae*	14	0.8168	0.8168	0.8301	no	no
Butterflies	*Plebejus argus*	9	0.5000	0.6532	0.7159	no	no
Butterflies	*Plebejus trappi*	6	0.4892	0.6909	0.7863	no	yes
Butterflies	*Polyommatus bellargus*	5	0.7000	0.8000	0.8387	no	no
Butterflies	*Polyommatus coridon*	28	0.6158	0.6434	0.7310	no	no
Butterflies	*Polyommatus damon*	5	0.6452	0.6452	0.8742	no	no
Butterflies	*Polyommatus eros*	6	0.6962	0.6532	0.7849	no	no
Butterflies	*Polyommatus icarus*	22	0.6554	0.7317	0.7742	no	no
Butterflies	*Pyrgus alveus*	5	0.5419	0.6710	0.7871	no	no

Taxon	Species	Training samples	AUC - T	AUC - TR	AUC - TRV	High altitude	Endemic
Butterflies	*Pyrgus carlinae*	12	0.6270	0.7695	0.8172	no	yes
Butterflies	*Pyrgus malvoides*	9	0.5941	0.7303	0.7536	no	no
Butterflies	*Pyrgus serratulae*	5	0.6806	0.7226	0.9387	no	no
Butterflies	*Satyrus ferula*	10	0.8371	0.8371	0.8371	no	no
Butterflies	*Thymelicus lineola*	16	0.7238	0.7611	0.7939	no	no
Butterflies	*Thymelicus sylvestris*	11	0.7786	0.7786	0.7786	no	no
Butterflies	*Vanessa atalanta*	12	0.6243	0.6243	0.6882	no	no
Butterflies	*Vanessa cardui*	4	0.5000	0.6129	0.7399	no	no
Carabids	*Amara aulica*	6	0.7473	0.7554	0.8656	no	no
Carabids	*Amara equestris*	9	0.6649	0.7966	0.8441	no	no
Carabids	*Amara erratica*	7	0.8295	0.8295	0.8525	yes	no
Carabids	*Amara infuscata*	5	0.8774	0.8774	0.9419	yes	no
Carabids	*Amara lunicollis*	5	0.6823	0.7016	0.8548	no	no
Carabids	*Amara nitida*	4	0.7036	0.7560	0.9355	no	no
Carabids	*Amara praetermissa*	4	0.7500	0.8347	0.9194	yes	no
Carabids	*Amara quenseli*	7	0.8756	0.9055	0.9147	yes	no
Carabids	*Calathus erratus*	6	0.7070	0.7823	0.8172	no	no
Carabids	*Calathus fuscipes*	6	0.8306	0.8441	0.9086	no	no
Carabids	*Calathus melanocephalus*	32	0.6341	0.6729	0.7324	no	no
Carabids	*Calathus micropterus*	16	0.7389	0.7601	0.8448	no	no
Carabids	*Carabus concolor*	9	0.8710	0.9292	0.9292	yes	yes
Carabids	*Carabus depressus*	24	0.6694	0.6411	0.7755	no	yes
Carabids	*Carabus fairmairei*	8	0.7883	0.9345	0.9345	no	yes
Carabids	*Carabus germarii*	6	0.8118	0.8280	0.9489	no	no
Carabids	*Carabus heteromorphus*	10	0.7919	0.8935	0.9032	yes	yes
Carabids	*Carabus problematicus*	8	0.7550	0.8579	0.8599	no	no
Carabids	*Cymindis cingulata*	5	0.6968	0.7161	0.7742	no	no
Carabids	*Cymindis humeralis*	5	0.7403	0.9000	0.9371	no	no
Carabids	*Cymindis scapularis*	4	0.5000	0.6492	0.8468	no	no
Carabids	*Cymindis vaporariorum*	10	0.8419	0.8516	0.8839	yes	no
Carabids	*Harpalus honestus*	6	0.6909	0.6909	0.6909	no	no
Carabids	*Harpalus rubripes*	5	0.7806	0.8419	0.9355	no	no
Carabids	*Harpalus rufipalpis*	4	0.8226	0.8347	0.8952	no	no
Carabids	*Harpalus solitaris*	12	0.7043	0.7231	0.7728	yes	no
Carabids	*Laemostenus janthinus*	11	0.6950	0.7273	0.8284	no	yes
Carabids	*Notiophilus biguttatus*	5	0.8290	0.8355	0.8516	no	no
Carabids	*Ophonus laticollis*	6	0.7527	0.8159	0.8925	no	no
Carabids	*Oreonebria castanea*	14	0.7984	0.7949	0.8007	yes	yes
Carabids	*Platynus complanatus*	8	0.6754	0.7097	0.6935	no	yes
Carabids	*Poecilus lepidus*	4	0.7863	0.8589	0.9073	no	no
Carabids	*Poecilus versicolor*	10	0.7887	0.8484	0.8887	no	no
Carabids	*Pterostichus auratus*	6	0.8038	0.9059	0.9167	no	yes
Carabids	*Pterostichus cribratus*	8	0.7177	0.8831	0.8911	yes	yes
Carabids	*Pterostichus externepunctatus*	8	0.7278	0.8629	0.9052	no	yes
Carabids	*Pterostichus flavofemoratus*	12	0.6452	0.8145	0.8374	no	yes
Carabids	*Pterostichus morio*	6	0.8629	0.9315	0.9341	yes	yes

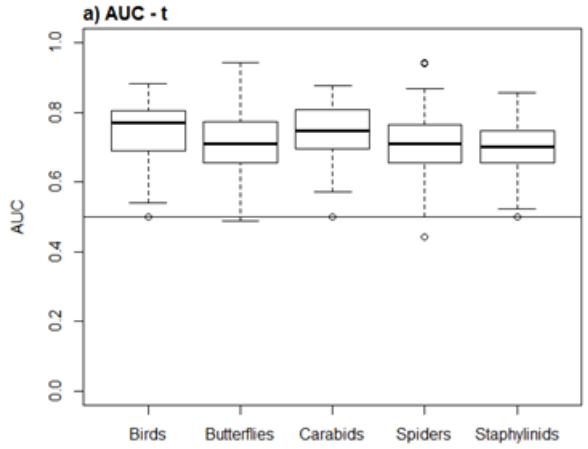
Taxon	Species	Training samples	AUC - T	AUC - TR	AUC - TRV	High altitude	Endemic
Carabids	*Pterostichus multipunctatus*	18	0.7330	0.7858	0.8351	no	no
Carabids	*Pterostichus oblongopunctatus*	5	0.8387	0.8823	0.9274	no	no
Carabids	*Pterostichus truncatus*	7	0.6187	0.7131	0.8698	no	yes
Carabids	*Pterostichus yvanii*	11	0.5726	0.7977	0.8035	yes	yes
Carabids	*Stomis elegans*	5	0.6387	0.6258	0.8258	no	yes
Carabids	*Synuchus vivalis*	9	0.8082	0.8611	0.8656	no	no
Carabids	*Trichotichnus laevicollis*	12	0.7177	0.7487	0.7849	no	yes
Spiders	*Agroeca cuprea*	5	0.6565	0.7306	0.6823	NA	no
Spiders	*Agroeca proxima*	11	0.7625	0.7962	0.8856	NA	no
Spiders	*Agyneta cauta*	13	0.6632	0.6619	0.7798	NA	no
Spiders	*Agyneta gulosa*	7	0.7892	0.9136	0.9147	no	no
Spiders	*Agyneta orites*	4	0.6048	0.9113	0.9274	yes	yes
Spiders	*Agyneta rurestris*	9	0.7097	0.8172	0.8226	no	no
Spiders	*Alopecosa accentuata*	8	0.5948	0.5948	0.7681	NA	no
Spiders	*Alopecosa aculeata*	18	0.7070	0.7070	0.8365	yes	no
Spiders	*Alopecosa cuneata*	6	0.7581	0.7581	0.7823	yes	no
Spiders	*Alopecosa pulverulenta*	13	0.6911	0.6911	0.7531	no	no
Spiders	*Anguliphantes monticola*	7	0.6244	0.7120	0.7857	yes	no
Spiders	*Araeoncus anguineus*	5	0.6613	0.6677	0.8726	yes	no
Spiders	*Arctosa alpigena*	6	0.7030	0.7809	0.9503	no	no
Spiders	*Asagena phalerata*	7	0.5000	0.6313	0.7903	no	no
Spiders	*Bolyphantes alticeps*	7	0.7719	0.7811	0.8272	no	no
Spiders	*Bolyphantes luteolus*	4	0.6714	0.7117	0.8952	no	no
Spiders	*Centromerita bicolor*	4	0.6935	0.8750	0.9315	NA	no
Spiders	*Centromerus arcanus*	7	0.7189	0.7512	0.7512	no	no
Spiders	*Centromerus pabulator*	8	0.5464	0.6250	0.7994	yes	no
Spiders	*Centromerus sellarius*	10	0.7371	0.7468	0.7976	no	no
Spiders	*Centromerus subalpinus*	4	0.7702	0.8931	0.9637	yes	no
Spiders	*Centromerus sylvaticus*	6	0.6761	0.6761	0.7849	no	no
Spiders	*Ceratinella brevipes*	4	0.7782	0.8266	0.8649	NA	no
Spiders	*Ceratinella brevis*	4	0.6815	0.8548	0.8629	no	no
Spiders	*Coelotes mediocris*	4	0.7661	0.7702	0.8508	no	no
Spiders	*Coelotes pickardi*	13	0.8040	0.8201	0.8213	yes	yes
Spiders	*Coelotes rudolfi*	5	0.6371	0.6532	0.8565	yes	yes
Spiders	*Coelotes terrestris*	5	0.7129	0.7258	0.7419	NA	no
Spiders	*Cryphoeca silvicola*	5	0.8129	0.8226	0.9226	no	no
Spiders	*Cybaeus intermedius*	9	0.7581	0.8387	0.8692	no	yes
Spiders	*Diplostyla concolor*	7	0.6751	0.7143	0.8295	no	no
Spiders	*Drassodes cupreus*	29	0.6452	0.6468	0.6741	no	no
Spiders	*Drassyllus praeficus*	5	0.6694	0.7694	0.8290	NA	no
Spiders	*Drassyllus pusillus*	6	0.5000	0.6909	0.8172	no	no
Spiders	*Euophrys rufibarbis*	6	0.7581	0.7984	0.8280	NA	no
Spiders	*Gnaphosa badia*	13	0.6024	0.6024	0.7686	yes	no
Spiders	*Gnaphosa leporina*	6	0.7688	0.8737	0.8844	no	no
Spiders	*Gnaphosa lugubris*	12	0.7251	0.7278	0.7957	no	no
Spiders	*Gnaphosa petrobia*	5	0.9419	0.9516	0.9484	yes	no

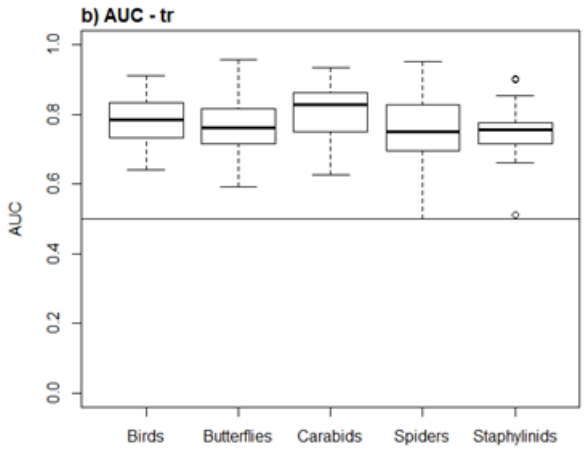
Taxon	Species	Training samples	AUC - T	AUC - TR	AUC - TRV	High altitude	Endemic
Spiders	*Haplodrassus signifer*	32	0.6462	0.6547	0.6870	no	no
Spiders	*Harpactea hombergi*	4	0.8508	0.8911	0.8911	NA	no
Spiders	*Harpactocrates drassoides*	8	0.7843	0.8427	0.8710	yes	yes
Spiders	*Histopona leonardoi*	17	0.7766	0.8150	0.8245	no	yes
Spiders	*Incestophantes frigidus*	12	0.7554	0.7608	0.7769	yes	no
Spiders	*Lepthyphantes nodifer*	7	0.6959	0.7512	0.8975	NA	no
Spiders	*Mansuphantes pseudoarciger*	13	0.6799	0.6948	0.7295	yes	yes
Spiders	*Mecynargus brocchus*	5	0.8677	0.9355	0.9419	yes	yes
Spiders	*Mecynargus paetulus*	5	0.6613	0.8774	0.9129	yes	no
Spiders	*Micaria aenea*	5	0.5000	0.7661	0.9323	NA	no
Spiders	*Micaria fulgens*	5	0.7419	0.7290	0.7645	NA	no
Spiders	*Micaria pulicaria*	9	0.5789	0.5789	0.7652	no	no
Spiders	*Micaria rossica*	6	0.7581	0.8253	0.8387	NA	no
Spiders	*Micrargus herbigradus*	9	0.5000	0.6228	0.6228	NA	no
Spiders	*Mughiphantes handschini*	5	0.7903	0.7742	0.8290	yes	no
Spiders	*Oreoneta montigena*	5	0.7290	0.8290	0.8677	yes	no
Spiders	*Ozyptila atomaria*	5	0.7484	0.7484	0.8113	NA	no
Spiders	*Palliduphantes pallidus*	22	0.7339	0.7273	0.7357	no	no
Spiders	*Pardosa blanda*	36	0.6035	0.6185	0.6667	yes	no
Spiders	*Pardosa ferruginea*	4	0.6835	0.6835	0.9597	yes	no
Spiders	*Pardosa giebeli*	4	0.8589	0.8891	0.9234	yes	no
Spiders	*Pardosa lugubris*	8	0.7782	0.7782	0.7843	no	no
Spiders	*Pardosa mixta*	17	0.6727	0.6812	0.7600	yes	no
Spiders	*Pardosa nigra*	12	0.8091	0.8091	0.8535	yes	no
Spiders	*Pardosa oreophila*	5	0.7113	0.8435	0.9210	yes	no
Spiders	*Pardosa palustris*	8	0.5000	0.7117	0.8266	no	no
Spiders	*Pardosa riparia*	11	0.8314	0.8358	0.8431	yes	no
Spiders	*Pardosa torrentum*	8	0.6280	0.7389	0.7681	no	no
Spiders	*Pelecopsis elongata*	5	0.6790	0.7306	0.7952	NA	no
Spiders	*Phlegra fasciata*	4	0.7379	0.7621	0.8548	NA	no
Spiders	*Phrurolithus festivus*	11	0.7529	0.7808	0.8138	no	no
Spiders	*Phrurolithus minimus*	4	0.8185	0.8669	0.8871	NA	no
Spiders	*Piniphantes pinicola*	4	0.5000	0.5000	0.7581	yes	no
Spiders	*Robertus lividus*	7	0.6866	0.7028	0.7627	no	no
Spiders	*Robertus truncorum*	6	0.6962	0.6962	0.8683	NA	no
Spiders	*Saitis barbipes*	4	0.9395	0.9435	0.9677	NA	no
Spiders	*Scotargus pilosus*	4	0.6855	0.7218	0.8024	NA	no
Spiders	*Silometopus rosemariae*	4	0.7097	0.7097	0.8024	NA	no
Spiders	*Tapinocyba pallens*	4	0.8508	0.9395	0.9375	NA	no
Spiders	*Tegenaria silvestris*	5	0.8097	0.8355	0.9161	no	no
Spiders	*Tenuiphantes flavipes*	6	0.7581	0.8925	0.8844	no	no
Spiders	*Tenuiphantes mengei*	10	0.6258	0.7274	0.7492	NA	no
Spiders	*Tenuiphantes tenebricola*	13	0.7283	0.7407	0.8083	NA	no
Spiders	*Tenuiphantes tenuis*	8	0.6190	0.6381	0.6925	no	no
Spiders	*Tiso vagans*	10	0.6161	0.8331	0.8653	NA	no
Spiders	*Trochosa terricola*	10	0.8177	0.8194	0.8645	no	no

Taxon	Species	Training samples	AUC - T	AUC - TR	AUC - TRV	High altitude	Endemic
Spiders	*Troglohyphantes lucifuga*	4	0.4435	0.7379	0.9153	no	yes
Spiders	*Walckenaeria antica*	4	0.7540	0.7540	0.8387	NA	no
Spiders	*Walckenaeria cuspidata*	9	0.6344	0.6398	0.7545	NA	no
Spiders	*Walckenaeria monoceros*	5	0.7387	0.7935	0.8226	NA	no
Spiders	*Xysticus cristatus*	11	0.8211	0.8673	0.8827	no	no
Spiders	*Xysticus desidiosus*	13	0.7333	0.7333	0.7605	no	no
Spiders	*Xysticus erraticus*	9	0.6523	0.6882	0.8029	no	no
Spiders	*Xysticus gallicus*	7	0.6267	0.6486	0.8226	no	no
Spiders	*Xysticus kochi*	5	0.6581	0.6742	0.8581	no	no
Spiders	*Xysticus lanio*	4	0.6794	0.8629	0.9052	NA	no
Spiders	*Xysticus ninnii*	8	0.8226	0.8387	0.8387	no	no
Spiders	*Zelotes subterraneus*	20	0.7363	0.7278	0.7786	no	no
Spiders	*Zelotes talpinus*	12	0.5007	0.5800	0.8011	yes	no
Spiders	*Zora nemoralis*	5	0.7226	0.7452	0.7871	NA	no
Staphylinids	*Acidota cruentata*	7	0.7696	0.7972	0.8917	no	no
Staphylinids	*Anthophagus alpestris*	4	0.7218	0.7016	0.8831	no	no
Staphylinids	*Bryophacis rufus*	7	0.6429	0.7558	0.7995	yes	no
Staphylinids	*Dinothenarus fossor*	24	0.7658	0.7712	0.7964	no	no
Staphylinids	*Eusphalerum anale*	6	0.8065	0.8522	0.8817	yes	no
Staphylinids	*Ischnosoma splendidum*	8	0.7006	0.7954	0.8044	no	no
Staphylinids	*Lordithon bimaculatus*	5	0.7161	0.7629	0.9323	no	no
Staphylinids	*Mycetoporus dispersus*	4	0.8185	0.8185	0.9556	no	no
Staphylinids	*Mycetoporus punctus*	9	0.5000	0.6604	0.7339	no	no
Staphylinids	*Ocypus fulvipennis*	13	0.6799	0.6960	0.7630	no	no
Staphylinids	*Ocypus ophthalmicus*	18	0.6541	0.6734	0.7585	no	no
Staphylinids	*Ocypus picipennis*	9	0.6344	0.7276	0.7652	no	no
Staphylinids	*Omalium caesum*	8	0.6562	0.7712	0.7712	no	no
Staphylinids	*Omalium excavatum*	22	0.6716	0.7339	0.7742	yes	no
Staphylinids	*Omalium rivulare*	7	0.7995	0.8111	0.8364	no	no
Staphylinids	*Philonthus aerosus*	5	0.6903	0.7677	0.8935	no	yes
Staphylinids	*Philonthus carbonarius*	5	0.7161	0.7161	0.9161	no	no
Staphylinids	*Philonthus cognatus*	9	0.6774	0.7437	0.8387	no	no
Staphylinids	*Philonthus decorus*	9	0.7258	0.7222	0.8082	no	no
Staphylinids	*Philonthus mannerheimi*	5	0.7532	0.7661	0.8323	no	no
Staphylinids	*Philonthus marginatus*	6	0.6640	0.7554	0.7715	no	no
Staphylinids	*Philonthus montivagoides*	5	0.8097	0.9000	0.9194	yes	yes
Staphylinids	*Philonthus montivagus*	12	0.6317	0.7218	0.8024	no	no
Staphylinids	*Philonthus nimbicola*	5	0.8000	0.9032	0.9161	no	yes
Staphylinids	*Platydracus fulvipes*	9	0.6998	0.7186	0.7276	no	no
Staphylinids	*Platydracus stercorarius*	14	0.6083	0.6843	0.7419	no	no
Staphylinids	*Quedius dubius*	8	0.6774	0.7137	0.7359	no	yes
Staphylinids	*Quedius mesomelinus*	11	0.5227	0.5110	0.6606	no	no
Staphylinids	*Quedius muelleri*	5	0.5839	0.6968	0.8032	yes	yes
Staphylinids	*Quedius obscuripennis*	20	0.7435	0.7548	0.8048	no	no
Staphylinids	*Quedius ochropterus*	9	0.7249	0.7751	0.8360	no	no
Staphylinids	*Quedius paradisianus*	15	0.6855	0.7565	0.8253	no	no

Taxon	Species	Training samples	AUC - T	AUC - TR	AUC - TRV	High altitude	Endemic
Staphylinids	*Quedius punctatellus*	4	0.6532	0.7742	0.9093	yes	no
Staphylinids	*Tachinus elongatus*	6	0.6425	0.7110	0.7742	yes	no
Staphylinids	*Tachinus laticollis*	11	0.7713	0.7771	0.8563	no	no
Staphylinids	*Tachinus pallipes*	5	0.7323	0.7613	0.8839	no	no
Staphylinids	*Tachyporus dispar*	4	0.6492	0.6694	0.9153	no	no
Staphylinids	*Tasgius morsitans*	7	0.8571	0.8456	0.9194	no	no
Staphylinids	*Xantholinus linearis*	6	0.7030	0.7702	0.8333	no	no
Staphylinids	*Xantholinus tricolor*	5	0.7226	0.8323	0.9226	no	no

Figure S1. AUC values. For each model class, boxplots of the AUC values are shown, separately for each taxon. The box shows median values and the first and third quartiles, whiskers indicate minimum and maximum values and outliers are plotted as circles. A straight line correspond to 0.5.





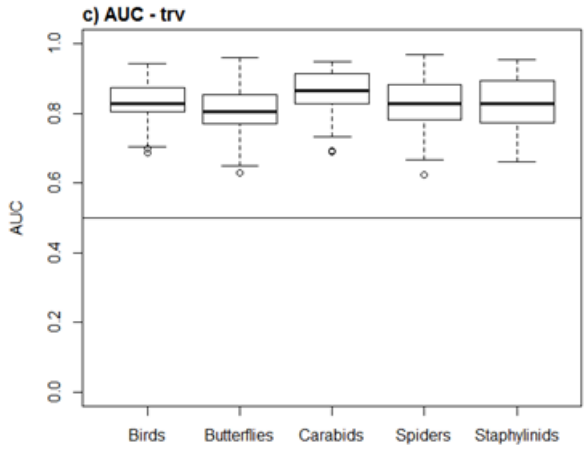


Table S2b. AUC thresholds. For each model class (T, TR, TRV), the number of species (out of 304) satisfying different AUC thresholds are shown. The number of species with an AUC > 0.9 are extremely low, making senseless a community level analysis using such a threshold. Also considering 0.7 and 0.8 as thresholds, the number of species is strongly reduced (in particular for T and TR model classes). Consequently, we selected 0.6 as threshold. In this way we have an enough high number of species to carry out trustworthy community level analysis. At the same time, considering our sampling design (that avoid sampling bias), our background selection methodology and our conservative selection of projection area (62 monitored plots), we retain trustworthy also an AUC of 0.6.

	T	TR	TRV
AUC > 06	275	298	304
AUC > 07	175	241	290
AUC > 08	58	105	205
AUC > 09	5	17	56

Table S2c. Species richness correlations. For each model class (T, TR, TRV), the species richness of each scenario and current condition is compared between the AUC threshold of 0.6 and the AUC thresholds of 0.7 and 0.8. Species richness obtained summing species with an AUC > 0.6 is always highly correlated with species richness obtained considering only species with an AUC > 0.7. In the TRV model class, also correlations between species richness with an AUC > 0.6 and species richness with an AUC > 0.8 are high.

All the correlations (r Pearson correlation coefficients) are highly significant (p-value < 0.001).

		AUC07	AUC08
T	Current	0.959	0.455
	Min	0.952	0.612
	Max	0.948	0.537
	Grado	0.948	0.557
TR	Current	0.983	0.491
	Min	0.981	0.611
	Max	0.983	0.554
	Grado	0.980	0.575

		AUC07	AUC08
TRV	Current	0.999	0.941
	Min	0.999	0.937
	Max	0.999	0.940
	Grado	0.998	0.938

S3. Model selection

Table S3. Explorative model selection. Results from the explorative model selection, carried out by using linear mixed-effects models (with plot identity as random effect). We used as explanatory variables model classes, scenarios and taxa with their interactions and selected the best model by using the Akaike's Information Criterion corrected for small samples (AICc). The best model identifies no effects of scenarios, but a significant interaction of taxa and model classes (mod7).

	Int	Mod	Sce	Tax	Mod:Tax	Sce:Tax	Mod:Sce	Mod:Sce:Tax	df	logLik	AICc	delta	weight
mod7	***0.003***	**+**		**+**	**+**				***20***	***4746.49***	***-9452.73***	***0***	***1.00***
mod10	0.002	+	+	+	+	+	+	+	56	4758.27	-9402.60	50.12	0.00
mod2	0.002	+		+					10	4704.40	-9388.74	63.99	0.00
mod1	0.002	+	+	+					12	4705.90	-9387.71	65.01	0.00
mod4	0.004			+					8	4689.53	-9363.02	89.70	0.00
mod3	0.004		+	+					10	4691.02	-9361.97	90.75	0.00
mod8	0.004		+	+		+			20	4695.81	-9351.37	101.36	0.00
mod5	0.004	+							5	4578.55	-9147.09	305.64	0.00
mod9	0.003	+	+				+		11	4581.95	-9141.83	310.89	0.00
mod0	0.006								3	4564.77	-9123.54	329.18	0.00
mod6	0.006		+						5	4566.15	-9122.29	330.44	0.00

	Estimate	*SE*	*DF*	*t-value*	*p-value*
Intercept	0.003	0.006	3269	0.49	0.624
taxonbirds	-0.012	0.006	3269	-1.94	0.053
taxonbutterflies	0.044	0.006	3269	7.479	0.000
taxoncarabids	0.009	0.006	3269	1.512	0.131
taxonspiders	-0.032	0.006	3269	-5.471	0.000
taxonstaphylinids	-0.002	0.006	3269	-0.381	0.704
modeltr	-0.004	0.006	3269	-0.704	0.482
modeltrv	0.009	0.006	3269	1.441	0.150
taxonbirds:modeltr	0.028	0.008	3269	3.373	0.001
taxonbutterflies:modeltr	-0.029	0.008	3269	-3.444	0.001
taxoncarabids:modeltr	-0.008	0.008	3269	-0.924	0.355
taxonspiders:modeltr	0.011	0.008	3269	1.274	0.203
taxonstaphylinids:modeltr	0.004	0.008	3269	0.481	0.631
taxonbirds:modeltrv	0.03	0.008	3269	3.592	0.000
taxonbutterflies:modeltrv	-0.023	0.008	3269	-2.747	0.006
taxoncarabids:modeltrv	-0.021	0.008	3269	-2.534	0.011
taxonspiders:modeltrv	0.004	0.008	3269	0.424	0.671
taxonstaphylinids:modeltrv	0.018	0.008	3269	2.093	0.036

	numDF	denDF	F-value	p-value
Intercept	1	3269	2.375	0.123
taxon	5	3269	53.398	<.0001
model	2	3269	15.246	<.0001
taxon:model	10	3269	8.482	<.0001

S4. Correspondence analysis

Characterization of the first and second CA axes, used to analyse changes in community composition after warming scenarios.

Table S4a. Explained variances of CA axes. For each taxon and for all the taxa pooled together, the variance explained by the first (CA1) and the second (CA2) axes is shown. The values are averaged across scenarios (differences among scenarios are small, 0.217±0.041 for the first axis, 0.127±0.020 for the second axis). The largest explained variance for the first axis, in all the taxonomic groups was in the T model class (mean values across scenarios, from 42.51% for staphylinids to 52.36% for birds), followed by TR (mean values across scenarios, from 26.23% for staphylinids to 44.45% for birds) and TRV (mean values across scenarios, from 19.68% for staphylinids to 36.70% for birds). For the second axis, the largest explained variance was found, for all taxonomic groups, in the TR model class (mean values across scenarios, from 13.32% for birds to 23.14% for carabids).

Axis	Taxon	T	TR	TRV
CA1	All taxa	44.27	31.18	21.94
	Carabids	45.71	28.86	20.19
	Staphylinids	42.51	26.23	19.68
	Spiders	43.61	31.08	21.01
	Butterflies	43.80	34.92	25.44
	Birds	52.36	44.45	36.70
CA2	All taxa	9.293	16.466	12.053
	Carabids	14.128	23.144	17.245
	Butterflies	7.806	18.293	16.465
	Spiders	9.714	15.598	11.245
	Staphylinids	13.956	20.121	14.972
	Birds	11.446	13.319	9.320

To interpret axes in terms of environmental factors, we used the Pearson correlation coefficient between plot scores and environmental variables. The first axis, was determined by altitude (Pearson correlation coefficient above 0.7 in 54 cases to 54, ranging in absolute values from 0.81 to 0.93), T_{min} (54 to 54, from 0.70 to 0.88) and T_{mean} (51 to 54, from 0.71 to 0.92). No clear and common trend has been found for the second axis: only in 10 cases we found a correlation above 0.70, always with T_{sd} (from 0.70 to 0.80).

Table S4b. Correlation of CA axes with environmental variables. For each taxon and for all the taxa pooled together, and for all the model classes and scenarios, the first (CA1) and the second (CA2) axis were correlated with the environmental predictors. Only values above |0.7| were shown.

Mclass (Model classe): T = temperature; TR = temperature + region; TRV = temperature + region + vegetation; Scen (Scenarios): d = 1Degree; max = 1.5Maximum; min = 1.5Minimum. Environmental predictors: Tshrub (tall shrub coverage); Lshrub (lowe shrub coverage); Tree (tree coverage); Herb (coverage of herbaceous layer); Gro (coverage of stone and bare ground); Alt (altitude); Tme (mean daily temperature); Tma (maximum daily temperature); Tmi (minimum daily temperature); Tsd (standard deviation of daily temperature).

Axis	Taxon	Mclass	Scen	Tshrub	Lshrub	Tree	Herb	Gro	Hstr	Alt	Tme	Tma	Tmi	Tsd
CA1	All taxa	T	d							0.907	-0.846		-0.889	
CA1	All taxa	T	max							0.910	-0.845		-0.891	
CA1	All taxa	T	min							0.904	-0.845		-0.886	
CA1	All taxa	TR	d							0.901	-0.850		-0.892	
CA1	All taxa	TR	max							0.905	-0.848		-0.894	
CA1	All taxa	TR	min							0.897	-0.850		-0.889	
CA1	All taxa	TRV	d							0.857	-0.824		-0.859	
CA1	All taxa	TRV	max							0.854	-0.822		-0.857	
CA1	All taxa	TRV	min							0.853	-0.822		-0.857	
CA1	Birds	T	d							0.928	-0.834		-0.878	
CA1	Birds	T	max							0.928	-0.829		-0.876	
CA1	Birds	T	min							0.925	-0.831		-0.875	
CA1	Birds	TR	d							0.909	-0.792		-0.851	
CA1	Birds	TR	max							0.909	-0.788		-0.848	
CA1	Birds	TR	min							0.908	-0.794		-0.850	
CA1	Birds	TRV	d							0.864	-0.754		-0.801	
CA1	Birds	TRV	max							0.864	-0.754		-0.808	
CA1	Birds	TRV	min							0.862	-0.752		-0.788	
CA1	Butterflies	T	d							0.904	-0.860		-0.894	
CA1	Butterflies	T	max							0.908	-0.861		-0.897	
CA1	Butterflies	T	min							0.897	-0.856		-0.889	
CA1	Butterflies	TR	d							0.918	-0.884		-0.914	
CA1	Butterflies	TR	max							0.922	-0.882		-0.915	
CA1	Butterflies	TR	min							0.909	-0.881		-0.908	
CA1	Butterflies	TRV	d							-0.910	0.868		0.898	
CA1	Butterflies	TRV	max							-0.909	0.868		0.901	
CA1	Butterflies	TRV	min							-0.905	0.865		0.889	
CA1	Carabids	T	d							0.858	-0.811		-0.855	
CA1	Carabids	T	max							0.862	-0.810		-0.858	
CA1	Carabids	T	min							0.852	-0.812		-0.851	
CA1	Carabids	TR	d							-0.751	0.777		0.768	
CA1	Carabids	TR	max							-0.758	0.774		0.775	
CA1	Carabids	TR	min							-0.734	0.765		0.750	
CA1	Carabids	TRV	d							-0.703	0.726		0.714	
CA1	Carabids	TRV	max							-0.706	0.724		0.719	
CA1	Carabids	TRV	min							-0.701	0.724		0.709	
CA1	Spiders	T	d							0.911	-0.843		-0.896	
CA1	Spiders	T	max							0.913	-0.842		-0.898	
CA1	Spiders	T	min							0.909	-0.843		-0.893	
CA1	Spiders	TR	d							0.872	-0.824		-0.868	
CA1	Spiders	TR	max							0.878	-0.825		-0.872	
CA1	Spiders	TR	min							0.874	-0.826		-0.869	
CA1	Spiders	TRV	d							-0.764	0.768		0.792	
CA1	Spiders	TRV	max							-0.763	0.766		0.795	
CA1	Spiders	TRV	min							-0.766	0.770		0.786	
CA1	Staphylinids	T	d							0.881	-0.826		-0.854	
CA1	Staphylinids	T	max							0.882	-0.825		-0.855	

Axis	Taxon	Mclass	Scen	Tshrub	Lshrub	Tree	Herb	Gro	Hstr	Alt	Tme	Tma	Tmi	Tsd
CA1	Staphylinids	T	min							0.880	-0.827		-0.852	
CA1	Staphylinids	TR	d							0.807			-0.793	
CA1	Staphylinids	TR	max							0.807			-0.792	
CA1	Staphylinids	TR	min							0.806			-0.794	
CA1	Staphylinids	TRV	d							-0.733	0.717		0.751	
CA1	Staphylinids	TRV	max							-0.717	0.704		0.745	
CA1	Staphylinids	TRV	min							-0.726	0.709		0.735	
CA2	All taxa	T	d											0.701
CA2	All taxa	T	max											
CA2	All taxa	T	min											-0.748
CA2	All taxa	TR	d											
CA2	All taxa	TR	max											
CA2	All taxa	TR	min											
CA2	All taxa	TRV	d											
CA2	All taxa	TRV	max											
CA2	All taxa	TRV	min											
CA2	Birds	T	d											
CA2	Birds	T	max											
CA2	Birds	T	min											
CA2	Birds	TR	d											
CA2	Birds	TR	max											
CA2	Birds	TR	min											
CA2	Birds	TRV	d											
CA2	Birds	TRV	max											
CA2	Birds	TRV	min											
CA2	Butterflies	T	d											
CA2	Butterflies	T	max											
CA2	Butterflies	T	min											
CA2	Butterflies	TR	d											
CA2	Butterflies	TR	max											
CA2	Butterflies	TR	min											
CA2	Butterflies	TRV	d											
CA2	Butterflies	TRV	max											
CA2	Butterflies	TRV	min											
CA2	Carabids	T	d											-0.791
CA2	Carabids	T	max											-0.780
CA2	Carabids	T	min											-0.798
CA2	Carabids	TR	d											
CA2	Carabids	TR	max											
CA2	Carabids	TR	min											
CA2	Carabids	TRV	d											
CA2	Carabids	TRV	max											
CA2	Carabids	TRV	min											
CA2	Spiders	T	d											0.705
CA2	Spiders	T	max											
CA2	Spiders	T	min											0.745
CA2	Spiders	TR	d											
CA2	Spiders	TR	max											
CA2	Spiders	TR	min											
CA2	Spiders	TRV	d											
CA2	Spiders	TRV	max											
CA2	Spiders	TRV	min											
CA2	Staphylinids	T	d											0.790
CA2	Staphylinids	T	max											0.800
CA2	Staphylinids	T	min											0.796
CA2	Staphylinids	TR	d											
CA2	Staphylinids	TR	max											
CA2	Staphylinids	TR	min											

Axis	Taxon	Mclass	Scen	Tshrub	Lshrub	Tree	Herb	Gro	Hstr	Alt	Tme	Tma	Tmi	Tsd
CA2	Staphylinids	TRV	d											
CA2	Staphylinids	TRV	max											
CA2	Staphylinids	TRV	min