Table S1. General information about each reserve and the elevation of sample sites used for the study.

	Feature	Chebaling National Nature Reserve	Nanling National Nature Reserve	Shimentai National Nature Reserve	Xiangtou Mountain National Nature Reserve	Yunkai Mountain National Nature Reserve
General information	Flagship species	White-eared Night-heron (*Gorsachius magnificus*), Yellow-breasted Bunting (*Emberiza aureola*)	Mangshan Pit Viper (*Protobothrops mangshanensis*), Cabot's Tragopan (*Tragopan caboti*), White-eared Night-heron (*Gorsachius magnificus*), Yellow-breasted Bunting (*Emberiza aureola*)	Yingde Leopard Gecko (*Goniurosaurus yingdeensis*), White-eared Night-heron (*Gorsachius magnificus*),	Golden Eagle (*Aquila chrysaetos*), Chinese Pangolin (*Manis pentadactyla*)	Red Junglefowl (*Gallus gallus*), Chinese Pangolin (*Manis pentadactyla*)
	*Mean temperature (℃)	19.6	17.7	20.9	21.8	17
	Highest peak (m)	1260	1900	1580	1020	1700
	Area_total (hectare)	7540	58590	33560	10700	12510
	Area_core zone	2510	27670	13920	3640	4860
	Area_buffer zone	2110	13820	8860	4000	3610
	Area_experimental zone	2920	17100	10780	3060	4040
Elevation of sample points (m)	Mean	417.1	858	429.7	496.5	1131
	SD	80.7	373.5	134.4	290.1	172.3
	Min	341	409	190	48	763
	Max	630	1373	680	846	1362

* Mean annual temperature

Table S2. List of bird species and their traits. Mean abn represents mean abundance per point and # of sites is the number of paired points where species was detected across all surveys.

Common name	Scientific name	Body mass (g)	Migratory status	Diet[1]	Foraging	# of sites	Mean abn
Asian Black Bulbul	*Hypsipetes leucocephalus*	51.8	Resident	Omnivorous[2]	High	41	7.189
Asian Dollarbird	*Eurystomus orientalis*	143.02	Resident	Invertebrate	Low	4	0.216
Barred Cuckoo-dove	*Macropygia unchall*	168	Resident	PlantSeed	High	5	0.068
Bay Woodpecker	*Blythipicus pyrrhotis*	132	Resident	Invertebrate	Low	15	0.284
Bianchi's Warbler	*Seicercus valentini*	7.3	Migrant	Invertebrate	High	2	0.054
Black Baza	*Aviceda leuphotes*	193.98	Resident	Invertebrate	Low	2	0.108
Black Kite	*Milvus migrans*	734.1	Migrant	Verterbrate	Ground	4	0.068
Black-browed Barbet	*Megalaima oorti*	87.69	Resident	Fruit/Nectar	High	31	0.743
Black-necklaced Scimitar-babbler	*Pomatorhinus erythrocnemis*	58.15	Resident	Invertebrate	Ground	14	0.311
Black-throated Laughingthrush	*Garrulax chinensis*	78.64	Resident	Invertebrate	Low-high	3	0.068
Black-throated Tit	*Aegithalos concinnus*	6.1	Resident	Invertebrate	Low	5	0.649
Blue Magpie	*Urocissa erythrorhyncha*	151.52	Resident	Omnivorous	Low-high	16	0.486
Blue Whistling-thrush	*Myophonus caeruleus*	157.98	Migrant	Invertebrate	Ground	10	0.135
Brownish-flanked Bush-warbler	*Cettia fortipes*	9.59	Resident	Invertebrate	Low	10	0.338
Chestnut Bulbul	*Hemixos castanonotus*	38	Resident	Omnivorous	High	72	6.73
Chestnut-bellied Rock-thrush	*Monticola rufiventris*	53.2	Resident	Invertebrate	Ground	2	0.041
Chestnut-crowned Warbler	*Seicercus castaniceps*	5.3	Migrant	Invertebrate	High	2	0.081
Chestnut-winged Cuckoo	*Clamator coromandus*	74.59	Resident	Invertebrate	High	5	0.095
Chinese Bamboo-partridge	*Bambusicola thoracicus*	264.79	Resident	PlantSeed	Ground	8	0.23
Chinese Goshawk	*Accipiter soloensis*	164.77	Migrant	Verterbrate	Ground	3	0.054
Chinese Hwamei	*Garrulax canorus*	62.78	Resident	Invertebrate	Ground	6	0.162
Collared Finchbill	*Spizixos semitorques*	39	Resident	Omnivorous	High	7	0.459
Collared Owlet	*Glaucidium brodiei*	59.39	Resident	Verterbrate	Ground	4	0.054
Common Kingfisher	*Alcedo atthis*	31.09	Resident	Verterbrate	Ground	2	0.027

Common name	Scientific name	Body mass (g)	Migratory status	Diet[1]	Foraging	# of sites	Mean abn
Common Pheasant	*Phasianus colchicus*	1120.31	Resident	PlantSeed	Ground	2	0.027
Common Tailorbird	*Orthotomus sutorius*	7.5	Resident	Invertebrate	Low	12	0.23
Crested Serpent-eagle	*Spilornis cheela*	597.74	Resident	Verterbrate	Ground	4	0.054
Daurian Redstart	*Phoenicurus auroreus*	16.2	Migrant	Invertebrate	Low	4	0.068
Dusky Fulvetta	*Alcippe brunnea*	17.43	Resident	Invertebrate	Low	14	0.324
Dusky Warbler	*Phylloscopus fuscatus*	8.74	Migrant	Invertebrate	Low-high	3	0.054
Fire-breasted Flowerpecker	*Dicaeum ignipectus*	5.72	Resident	Fruit/Nectar	High	5	0.108
Fork-tailed Sunbird	*Aethopyga christinae*	5.2	Resident	Fruit/Nectar	Low-high	34	0.784
Great Barbet	*Megalaima virens*	202	Resident	Fruit/Nectar	Low	21	0.486
Great Tit	*Parus major*	16.25	Resident	Omnivorous	High	20	0.473
Greater Necklaced Laughingthrush	*Garrulax pectoralis*	145.12	Resident	Invertebrate	Ground	20	1.514
Grey Laughingthrush	*Garrulax maesi*	78.64	Resident	Invertebrate	Ground	3	0.135
Grey Treepie	*Dendrocitta formosae*	102.74	Resident	Omnivorous	Low-high	20	0.811
Grey-capped Woodpecker	*Dendrocopos canicapillus*	25.76	Resident	Invertebrate	High	4	0.068
Grey-cheeked Fulvetta	*Alcippe morrisonia*	15.26	Migrant	Invertebrate	High	65	9.095
Grey-chinned Minivet	*Pericrocotus solaris*	14.5	Resident	Invertebrate	High	17	2.068
Grey-faced Woodpecker	*Picus canus*	137	Resident	Invertebrate	Ground	4	0.054
Hainan Blue-flycatcher	*Cyornis hainanus*	26.84	Migrant	Invertebrate	High	3	0.068
Hair-crested Drongo	*Dicrurus hottentottus*	79.19	Migrant	Invertebrate	High	3	0.243
Hill Prinia	*Prinia atrogularis*	11.8	Resident	Invertebrate	Low	4	0.095
Inornate Warbler	*Phylloscopus inornatus*	6.59	Migrant	Invertebrate	High	3	0.108
Japanese White-eye	*Zosterops japonicus*	11.29	Resident	Fruit/Nectar	High	18	1.919
Large Hawk-cuckoo	*Cuculus sparverioides*	151	Migrant	Invertebrate	High	13	0.189
Large-billed Crow	*Corvus macrorhynchos*	513.14	Resident	Omnivorous	Ground	16	0.514
Lemon-rumped Warbler	*Phylloscopus proregulus*	6	Migrant	Invertebrate	Low-high	12	0.662
Lesser Necklaced Laughingthrush	*Garrulax monileger*	83.7	Resident	Omnivorous	Ground	6	0.27
Lesser Shortwing	*Brachypteryx leucophrys*	15.8	Resident	Invertebrate	Ground	7	0.108

Common name	Scientific name	Body mass (g)	Migratory status	Diet[1]	Foraging	# of sites	Mean abn
Light-vented Bulbul	*Pycnonotus sinensis*	34.2	Resident	Omnivorous	Low-high	5	0.405
Long-tailed Shrike	*Lanius schach*	51.51	Resident	Invertebrate	Ground	3	0.041
Mountain Bulbul	*Hypsipetes mcclellandii*	32.5	Resident	Omnivorous	Low-high	31	1.297
Mountain Tailorbird	*Orthotomus cuculatus*	5.9	Resident	Invertebrate	High	17	0.473
Olive-backed Pipit	*Anthus hodgsoni*	21.3	Migrant	Invertebrate	Ground	2	0.135
Orange-bellied Leafbird	*Chloropsis hardwickii*	32.29	Resident	Fruit/Nectar	Low-high	5	0.108
Orange-flanked Bush-robin	*Tarsiger cyanurus*	13.43	Migrant	Invertebrate	Low	6	0.135
Oriental Magpie-robin	*Copsychus saularis*	36	Resident	Invertebrate	Ground	3	0.041
Oriental Turtle-dove	*Streptopelia orientalis*	232.94	Resident	PlantSeed	Ground	2	0.027
Plain Prinia	*Prinia inornata*	7	Resident	Invertebrate	Low	2	0.068
Pygmy Wren-babbler	*Pnoepyga pusilla*	12	Resident	Invertebrate	Ground	10	0.176
Red-billed Leiothrix	*Leiothrix lutea*	21.39	Resident	Invertebrate	Low	28	1.973
Red-headed Trogon	*Harpactes erythrocephalus*	80.29	Resident	Invertebrate	High	7	0.162
Red-rumped Swallow	*Hirundo daurica*	22.2	Migrant	Invertebrate	High	3	1.486
Red-whiskered Bulbul	*Pycnonotus jocosus*	29.47	Resident	Omnivorous	Low-high	20	1.811
Rufous-capped Babbler	*Stachyris ruficeps*	10.3	Resident	Invertebrate	High	33	1.541
Scarlet Minivet	*Pericrocotus flammeus*	23.3	Resident	Invertebrate	High	9	0.5
Silver Pheasant	*Lophura nycthemera*	1230	Resident	Omnivorous	Ground	6	0.135
Slaty-backed Forktail	*Enicurus schistaceus*	31	Resident	Invertebrate	Ground	23	0.392
Small Niltava	*Niltava macgregor*	11.95	Resident	Invertebrate	Low	5	0.122
Southern Blyth's Leaf-warbler	*Phylloscopus reguloides*	7.63	Migrant	Invertebrate	High	5	0.27
Speckled Piculet	*Picumnus innominatus*	10.2	Resident	Invertebrate	Low-high	4	0.054
Spotted Dove	*Stigmatopelia chinensis*	159	Resident	PlantSeed	Ground	2	0.027
Spotted Forktail	*Enicurus maculatus*	40.39	Resident	Invertebrate	Ground	7	0.122
Streak-breasted Scimitar-babbler	*Pomatorhinus ruficollis*	31.61	Resident	Invertebrate	Low	40	0.973
Striated Yuhina	*Yuhina castaniceps*	11.8	Resident	Invertebrate	Low-high	26	4.581
Two-barred warbler	*Phylloscopus plumbeitarsus*	7.25	Migrant	Invertebrate	Ground	3	0.068

Common name	Scientific name	Body mass (g)	Migratory status	Diet[1]	Foraging	# of sites	Mean abn
Verditer Flycatcher	*Eumyias thalassinus*	18.1	Migrant	Invertebrate	High	2	0.041
White Wagtail	*Motacilla alba*	23.93	Resident	Invertebrate	Ground	2	0.027
White-bellied Yuhina	*Erpornis zantholeuca*	11.8	Resident	Invertebrate	High	10	0.595
White-browed Shrike-babbler (Pied Shrike-babbler)	*Pteruthius flaviscapis*	38.67	Resident	Invertebrate	High	2	0.108
White-necklaced Partridge	*Arborophila gingica*	253	Resident	Omnivorous	Ground	5	0.149
White-tailed Robin	*Cinclidium leucurum*	26.83	Resident	Invertebrate	Ground	2	0.027
Yellow-bellied Prinia	*Prinia flaviventris*	7	Resident	Invertebrate	Low	2	0.027
Yellow-cheeked Tit	*Parus spilonotus*	18.8	Resident	Invertebrate	High	14	0.824

[1] Of diet traits, vertebrate was excluded from diet trait-level analysis. Although there are 5 species preying on vertebrates, they have different preference for prey type. In particular, one species (common kingfisher) is more specialized for fish and their habitat differs from all other species considered for analysis in this study.

[2] While Black bulbuls prefer fruits (40% of their diet), they also eat insects, seeds, and nectars (each 20%). For our analysis, we consider Black bulbuls as omnivores.

Table S3. Significance of associations between response (species richness and community weighted mean values of each trait) and explanatory variables. Zone represents the type of management zone (i.e., core, buffer, experimental, and boundary areas).

Response	Explanatory	Chisq	Pr(>Chisq)
Species richness	Elevation	0.281	0.596
	Zone	2.752	0.432
	Reserve	11.575	0.021
Body mass	Elevation	2.62	0.106
	Zone	2.98	0.395
	Reserve	1.481	0.83
Insect	Elevation	1.131	0.288
	Zone	2.945	0.4
	Reserve	40.601	<0.001
Fruit/Nectar	Elevation	5.479	0.019
	Zone	1.917	0.56
	Reserve	19.491	<0.001
Omnivorous diet	Elevation	0.228	0.633
	Zone	4.473	0.215
	Reserve	31.435	<0.001
Plant/Seed	Elevation	0	0.995
	Zone	3.672	0.299
	Reserve	4.118	0.39
Ground	Elevation	0.016	0.9
	Zone	2.682	0.443
	Reserve	2.063	0.724
Low	Elevation	10.795	0.001
	Zone	5.066	0.167
	Reserve	23.878	<0.001
Low-high	Elevation	2.592	0.107
	Zone	3.509	0.32
	Reserve	5.518	0.238
High	Elevation	1.76	0.185
	Zone	3.457	0.326
	Reserve	18.217	0.001
Migrant	Elevation	0.001	0.977
	Zone	2.26	0.52
	Reserve	20.456	0.001

Figure S1. The number of sites used for analyses. Abbreviations: NL, Nanling National Nature Reserve; CBL, Chebaling National Nature Reserve; SMT, Shimentai National Nature Reserve; XTS, Xiangtou Mountain National Nature Reserve; YKS, Yunkai Mountain National Nature Reserve; Zone1, core zone; Zone2, buffer zone; Zone3, experimental zone; Zone4, reserve boundary area zone (outside of reserve).

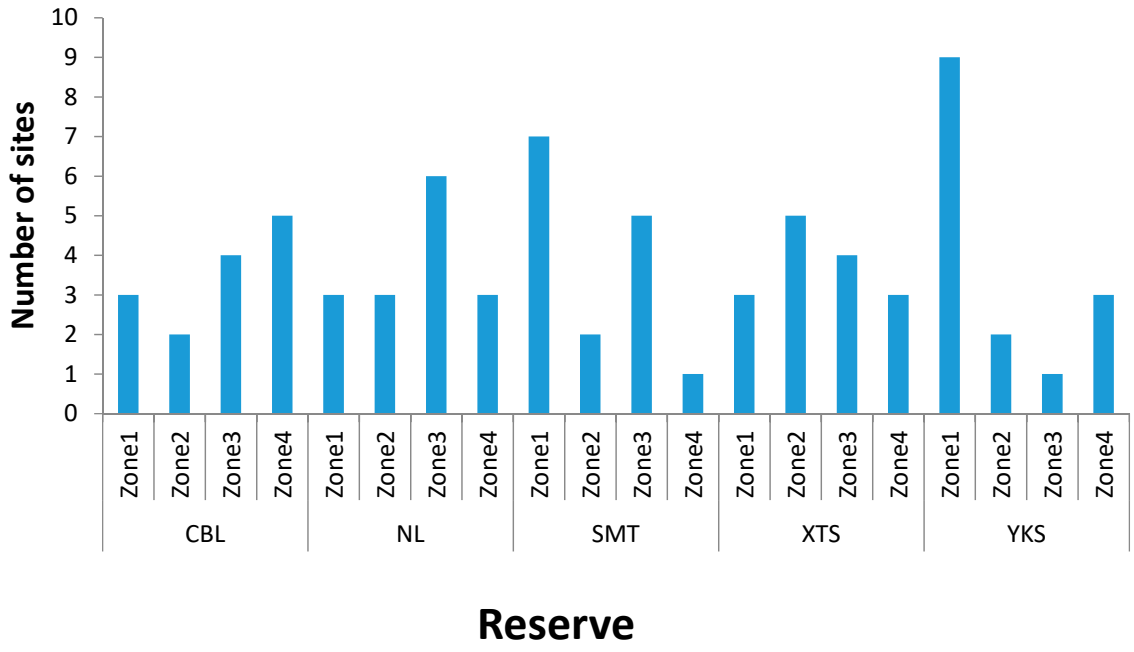
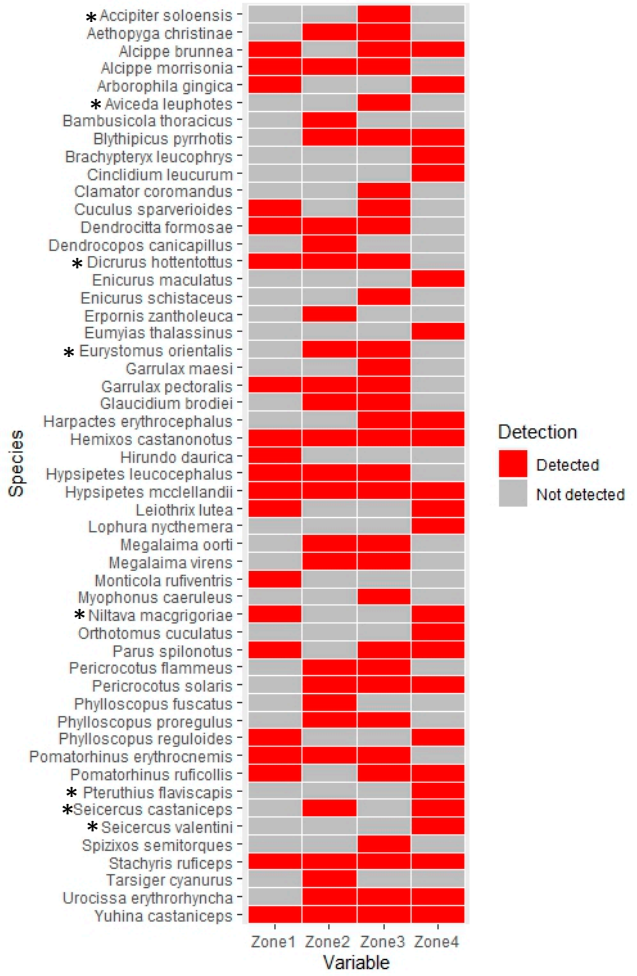
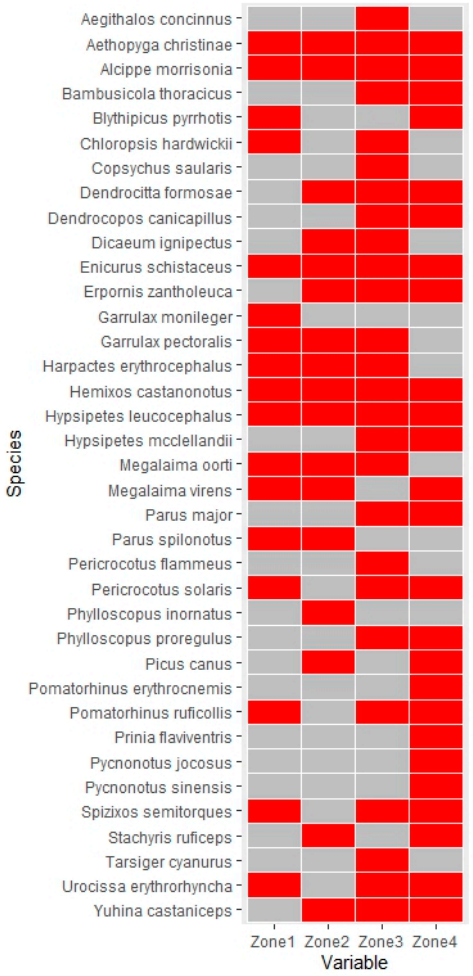


Figure S2. Matrix of species detection/non-detection at each zone and national nature reserve. Asterisk (*) indicates species detected only at the reserve during survey periods.

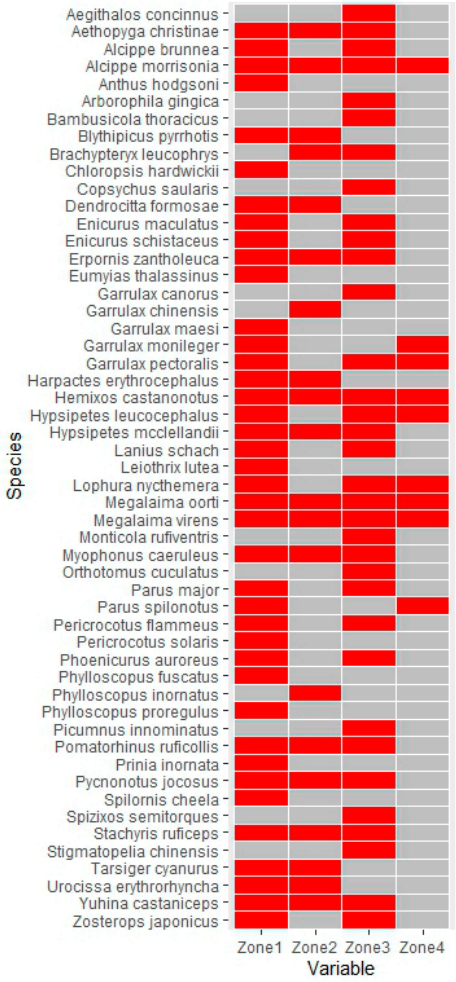
A. Nanling (NL)



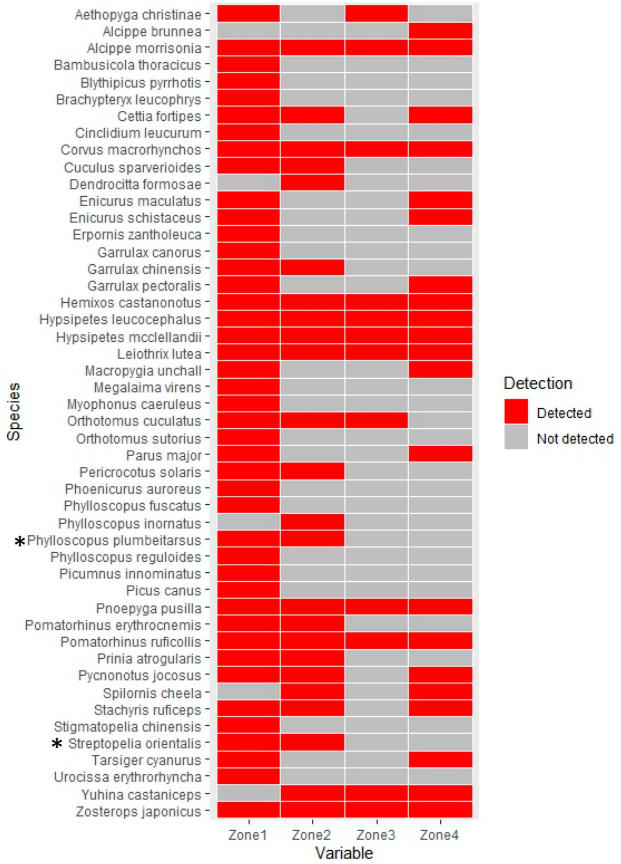
B. Chebaling (CBL)



C. Shimentai (SMT)



D. Yunkai Mountain (YKS)



E. Xiangtou (XTS)

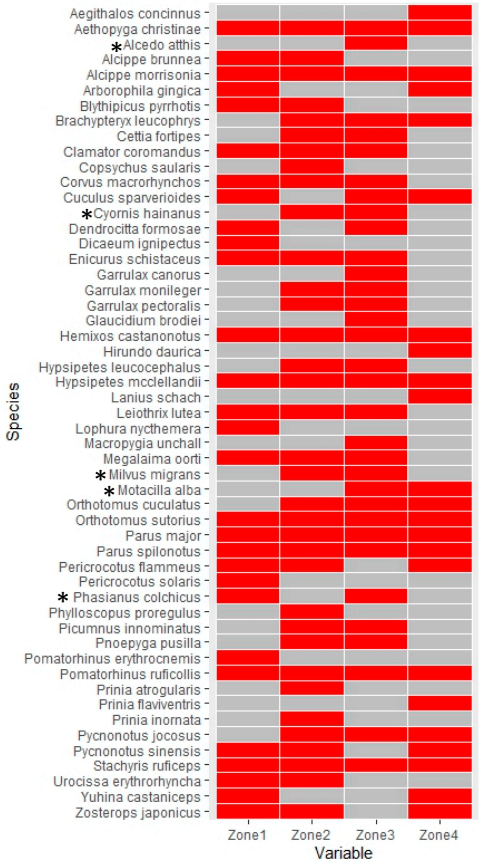


Figure S3. Effects of elevation on the community weighted mean values (CWMs) of frugivore/nectarivore trait (A) and the CWMs of low height foraging trait (B). Elevation of x-axis in A is standardized. Shaded areas on graphs represent 95% confidence intervals.

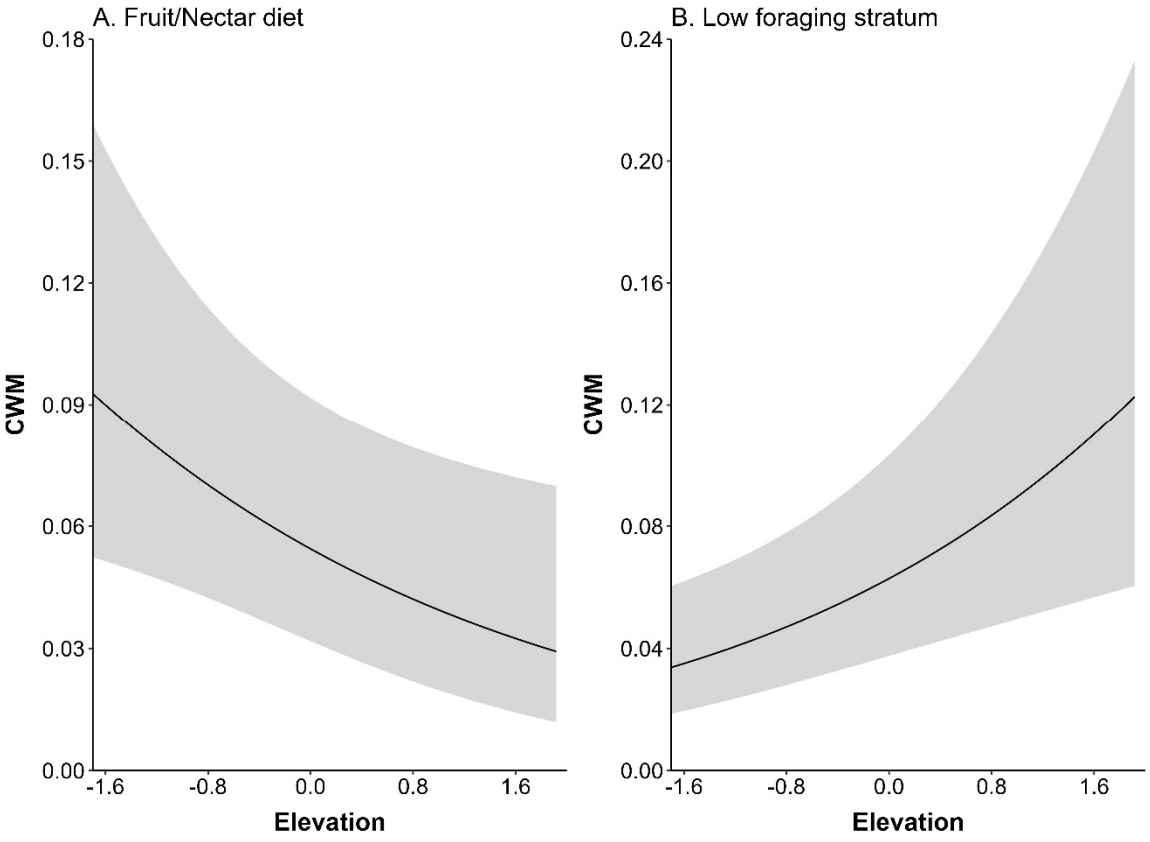


Figure S4. Effects of management zone on species traits (A-I and K) and species richness (J). Abbreviation: Zone1, core area; Zone2, buffer area; Zone3, experimental area; Zone4, reserve boundary area zone (outside of reserve).

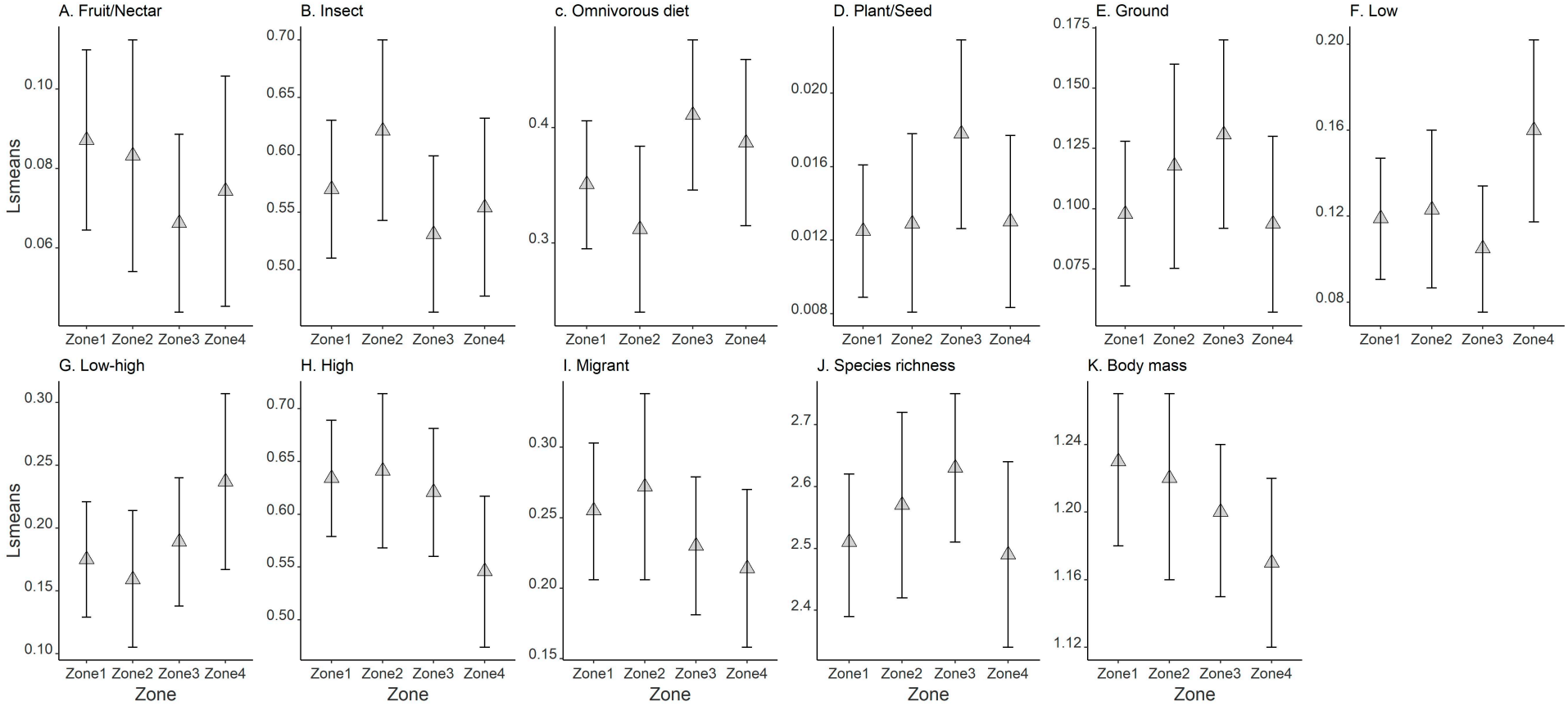


Figure S5. Biplot showing variations in species dissimilarity between reserves: A. dissimilarity matrix accounting for spatial turnover, measured as Jaccard (left) and Bray-Curtis (right) pair-wise dissimilarity (a monotonic transformation of beta diversity); B, dissimilarity matrix accounting for spatial nestedness, as Jaccard (left) and Bray-Curtis (right) pair-wise dissimilarity.