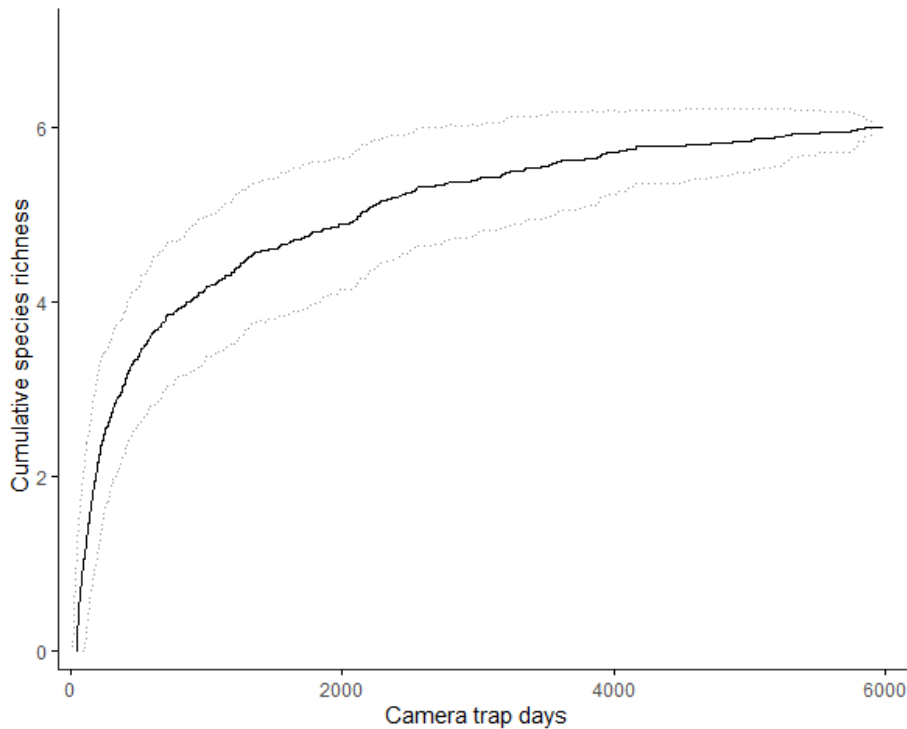**Figure S1. Accumulation of gamebird species richness with trapping effort.** Species accumulation curve for the community of gamebirds detected at 63 camera trapping stations in the Namha National Protected Area. Plot was generated by repeat sampling such that the order of detection of species was randomized 1000 times and results used to derive the 95% confidence intervals of the mean (Rovero et al. 2014).

Table S1. Thirty-one species recorded from 63 camera traps (April 2013 - June 2015 and May 2017 - September 2018) in Namha NPA, Luang Namtha Province, Lao PDR.

Common name	Latin name	# events
GameBirds	**Phasianidae**	
Rufous-throated Partridge	*Arborophila rufogularis*	1
Bar-backed Partridge	*Arborophila brunneopectus*	5
Scaly-breasted Partridge	*Arborophila chloropus*	4
Red Junglefowl	*Gallus gallus*	21
Silver Pheasant	*Lophura nycthemera*	84
Gray Peacock Pheasant	*Polyplectron bicalcaratum*	44
Kingfishers	**Alcedinidae**	
Ruddy Kingfisher	*Halcyon coromanda*	1
Bee-eaters	**Meropidae**	
Blue-bearded Bee-eater	*Nyctornis athertoni*	1
Owls	**Strigidae**	
Brown Fish Owl	*Ketupa zeylonensis*	17
Doves	**Columbidae**	
Emerald Dove	*Chalcophaps indica*	67
Pittas	**Pittidae**	
Rusty-naped Pitta	*Hydrornis oatesi*	1
Broadbills	**Eurylaimidae**	
Silver-breasted Broadbill	*Serilophus lunatus*	6
Magpies and Allies	**Corvidae**	
Common Green Magpie	*Cissa chinensis*	1
Monarch flycatchers	**Monarchidae**	
Black-naped Monarch	*Hypothmis azurea*	5
Japanese Paradise-flycatcher	*Terpsiphone atrocaudata*	1
Woodshrikes and Allies	**Vangidae**	
Large Woodshrike	*Tephrodornis virgatus*	1
Thrushes	**Turdidae**	
White's Thrush	*Zootheria aurea*	1
Old world flycatchers	**Musciacapidae**	
Blue Whistling Thrush	*Myophonus caeruleus*	1
Rufous-bellied Niltava	*Niltava sundava*	1
White-tailed Robin	*Myiomela cambodiana*	2
White-rumped Shama	*Copsychus malabaricus*	6
Bulbuls	**Pycnonotidae**	
Puff-throated Bulbul	*Alophoixus pallidus*	6
Old world warblers	**Phylloscopidae**	
Dusky Warbler	*Phylloscopus fuscatus*	1
Laughingthrushes and Allies	**Leiothrichidae**	
White-crested Laughingthrush	*Garrulax leucolophus*	7
Greater necklaced Laughingthrush	*Ianthocincla pectoralis*	2

Babblers	Timaliidae	
Red-billed Scimitar Babbler	*Pomatorhinus ochraceiceps*	2
Rufous-fronted Babbler	*Cyanoderma rufifrons*	2
Rufous-capped Babbler	*Cyanoderma ruficeps*	2
Chestnut-capped Babbler	*Timalia pileata*	1
Spot-necked Babbler	*Stachyris strialata*	2
Grey-throated Babbler	*Stachyris nigriceps*	1

Table S2. Availability (λ) and individual detectability (r) for three species of pheasants from 48 camera trap stations set in the Namha National Protected Area.
Mean of means, SD, Times Series Standard Error, Median, 95% Bayesian credible interval (BCI) and 95% Highest Probability Density Interval (HPDI) as estimated by a Royle Nichols hierarchical model of availability and detectability with 8 coefficients of association (see Methods, Supplementary A and Table S4 for details).

					BCI		95% HPDI	
Species	Mean of means	SD	Time-series SE	Median	2.50%	97.50%	HPDI lower	HPDI upper
Availability of individuals or groups, λ								
Gallus gallus	13.04	42.57	8.96	1.14	0.20	159.31	0.07	73.73
Lophura nycthemera	2.03	5.79	0.50	1.25	0.54	5.73	0.38	3.73
Polyplectron bicalcaratum	5.99	29.54	5.35	0.60	0.13	54.54	0.04	13.31
Probability of detection of each available individual or group in each 7 day occassion, r								
Gallus gallus	3.91%	4.15%	0.16%	2.57%	0.02%	14.35%	0.00%	12.00%
Lophura nycthemera	6.48%	2.90%	0.07%	6.24%	1.40%	12.94%	0.88%	12.30%
Polyplectron bicalcaratum	7.68%	5.99%	0.19%	6.47%	0.25%	22.47%	0.05%	19.22%

Table S3. Species specific beta coefficients of association of availability (β) and individual detectability (γ) for three species of pheasants from a model considering 11 environmental covariates for 48 camera trap stations in the Namha National Protected Area. Means of coefficients of association ($\widehat{\beta_{i,j}}$ and $\widehat{\gamma_{i,j}}$), SD, Times Series Standard Error, 95% Bayesian Credible Interval (BCI), 95% Highest Probability Density Interval (HPDI) and Bayesian posterior predicted probability (Bppp) of absolute value greater than 0.0 from a Royle Nichols hierarchical model of availability and detectability. * indicates Bayesian posterior predicted P < 0.05 that coefficient is less than or greater than 0. ** indicates 95% HPDI interval does not include 0. See Methods and Supplementary A for details.

				Time-series		BCI		95% HPDI				
Species	Covariate	Mean	SD	SE	Median	2.50%	97.50%	HPDI lower	HPDI upper	PPP of > 0	Bppp	
Posterior predicted β coefficients for association with availability												
Gallus gallus	is_2ndsession	0.604	1.054	0.048	0.477	-1.268	2.956	-1.394	2.812	0.719	0.281	
Lophura nycthemera	is_2ndsession	-0.076	0.790	0.021	-0.026	-1.802	1.345	-1.704	1.400	0.483	0.483	
Polyplectron bicalcaratum	is_2ndsession	0.114	1.246	0.027	0.111	-2.546	2.787	-2.216	3.055	0.554	0.446	
Gallus gallus	Logit cover	-0.170	0.462	0.017	-0.128	-1.156	0.647	-1.089	0.708	0.383	0.383	
Lophura nycthemera	Logit cover	0.310	0.303	0.004	0.287	-0.237	0.953	-0.250	0.928	0.851	0.149	
Polyplectron bicalcaratum	Logit cover	0.374	0.662	0.015	0.265	-0.690	2.046	-0.851	1.737	0.724	0.276	
Gallus gallus	Km to village	-0.132	0.479	0.013	-0.090	-1.179	0.685	-1.093	0.741	0.427	0.427	
Lophura nycthemera	Km to village	0.571	0.287	0.004	0.568	0.007	1.143	0.006	1.139	0.976	0.024	**
Polyplectron bicalcaratum	Km to village	0.441	0.470	0.013	0.423	-0.470	1.432	-0.422	1.465	0.839	0.161	
Gallus gallus	Altitude	-0.711	0.651	0.022	-0.604	-2.183	0.306	-2.070	0.384	0.103	0.103	
Lophura nycthemera	Altitude	-0.188	0.281	0.004	-0.188	-0.734	0.366	-0.746	0.352	0.250	0.250	

Polyplectron bicalcaratum	Altitude	0.016	0.758	0.013	-0.078	-1.292	1.857	-1.415	1.704	0.444	0.444	
Gallus gallus	altitude.sqrd	-0.381	0.730	0.023	-0.328	-1.981	0.950	-1.837	1.058	0.306	0.306	
Lophura nycthemera	altitude.sqrd	0.266	0.274	0.003	0.267	-0.281	0.797	-0.282	0.797	0.837	0.163	
Polyplectron bicalcaratum	altitude.sqrd	-3.531	2.411	0.064	-3.119	-9.603	-0.109	-8.309	0.260	0.016	0.016	*
Gallus gallus	Log roughness	-0.399	0.542	0.024	-0.385	-1.513	0.617	-1.392	0.731	0.222	0.222	
Lophura nycthemera	Log roughness	0.623	0.280	0.003	0.621	0.084	1.180	0.069	1.161	0.987	0.013	**
Polyplectron bicalcaratum	Log roughness	1.917	0.893	0.030	1.808	0.476	4.018	0.314	3.710	0.998	0.002	**
Gallus gallus	dryseason	0.374	0.490	0.018	0.312	-0.430	1.471	-0.486	1.374	0.782	0.218	
Lophura nycthemera	dryseason	-0.063	0.279	0.004	-0.057	-0.624	0.472	-0.616	0.478	0.420	0.420	
Polyplectron bicalcaratum	dryseason	-0.207	0.560	0.015	-0.132	-1.514	0.743	-1.476	0.774	0.381	0.381	
Gallus gallus	rainseason	0.275	0.398	0.010	0.268	-0.491	1.117	-0.534	1.061	0.771	0.229	
Lophura nycthemera	rainseason	0.267	0.267	0.003	0.266	-0.248	0.799	-0.272	0.771	0.845	0.155	
Polyplectron bicalcaratum	rainseason	0.416	0.402	0.009	0.382	-0.292	1.329	-0.345	1.259	0.872	0.128	
Gallus gallus	Log tourism	2.425	2.046	0.163	1.849	0.154	8.535	-0.229	6.681	0.989	0.011	*
Lophura nycthemera	Log tourism	0.249	0.346	0.004	0.228	-0.384	0.970	-0.428	0.923	0.756	0.244	
Polyplectron bicalcaratum	Log tourism	1.026	0.795	0.029	0.936	-0.306	2.851	-0.405	2.670	0.924	0.076	
Posterior predicted γ coefficients for association with detectability												

Gallus gallus	is_Aggressor	-0.089	1.043	0.037	-0.023	-2.364	1.867	-2.229	1.950	0.488	0.488
Lophura nycthemera	is_Aggressor	1.179	0.985	0.023	1.099	-0.505	3.312	-0.620	3.165	0.899	0.101
Polyplectron bicalcaratum	is_Aggressor	-0.631	1.629	0.027	-0.386	-4.426	2.133	-4.111	2.334	0.379	0.379
Gallus gallus	is_WideAngle	0.229	0.694	0.014	0.197	-1.115	1.724	-1.115	1.726	0.635	0.365
Lophura nycthemera	is_WideAngle	0.002	0.458	0.005	0.011	-0.927	0.902	-0.942	0.877	0.510	0.490
Polyplectron bicalcaratum	is_WideAngle	0.350	0.889	0.017	0.262	-1.258	2.386	-1.278	2.352	0.658	0.342
Gallus gallus	Ndvi	0.169	0.597	0.012	0.188	-1.111	1.344	-1.120	1.335	0.653	0.347
Lophura nycthemera	Ndvi	0.242	0.306	0.004	0.241	-0.348	0.855	-0.361	0.836	0.787	0.213
Polyplectron bicalcaratum	Ndvi	0.746	0.825	0.012	0.574	-0.433	2.778	-0.566	2.569	0.859	0.141
Gallus gallus	Northness	0.091	0.508	0.008	0.046	-0.782	1.214	-0.823	1.148	0.553	0.447
Lophura nycthemera	Northness	-0.066	0.251	0.003	-0.059	-0.562	0.420	-0.555	0.425	0.402	0.402
Polyplectron bicalcaratum	Northness	0.157	0.490	0.007	0.105	-0.729	1.278	-0.746	1.246	0.615	0.385
Gallus gallus	Eastness	-0.096	0.660	0.016	-0.041	-1.507	1.076	-1.442	1.117	0.470	0.470
Lophura nycthemera	Eastness	0.173	0.462	0.006	0.161	-0.723	1.128	-0.730	1.117	0.647	0.353
Polyplectron bicalcaratum	Eastness	0.696	0.962	0.015	0.524	-0.734	2.968	-0.863	2.797	0.797	0.203

Notes:

Table S4: Species specific beta coefficients of association of availability (β) and individual detectability (γ) for three species of pheasants from a model considering 6 environmental covariates for 48 camera trap stations in the Namha National Protected Area.

Means of coefficients of association ($\widehat{\beta_{ij}}$ and $\widehat{\gamma_{ij}}$), SD, Times Series Standard Error, 95% Bayesian Credible Interval (BCI), 95% Highest Probability Density Interval (HPDI) and Bayesian posterior predicted probability (Bppp) of greater or less than 0.0 from a Royle Nichols Hierarchical model of availability and detectability. Eight covariates were included in the model. * indicates significant at aggregate $p<0.05$ by the Holm-Bonferonni correction for multiple tests. See Methods and Supplementary A for detailed methods and R code.

Species	Covariate	Mean	SD	Time-series SE	Median	BCI 2.50%	97.50%	95% HPDI HPDI lower	HPDI upper	PPP of > 0	Bppp	
Posterior predicted β coefficients for association with availability												
Gallus gallus	Km village	-0.153	0.404	0.010	-0.122	-1.033	0.539	-0.930	0.636	0.383	0.383	
Lophura nycthemera	Km village	0.474	0.249	0.003	0.473	-0.015	0.960	-0.016	0.958	0.971	0.029	*
Polyplectron bicalcaratum	Km village	0.423	0.439	0.009	0.397	-0.408	1.374	-0.418	1.345	0.854	0.146	
Gallus gallus	Altitude	-0.733	0.669	0.022	-0.629	-2.377	0.224	-2.063	0.356	0.088	0.088	
Lophura nycthemera	Altitude	-0.179	0.263	0.003	-0.180	-0.701	0.347	-0.708	0.337	0.238	0.238	
Polyplectron bicalcaratum	Altitude	-0.037	0.708	0.012	-0.107	-1.289	1.623	-1.428	1.470	0.415	0.415	
Gallus gallus	altitude.sqrd	-0.139	0.723	0.034	-0.102	-1.654	1.215	-1.500	1.320	0.438	0.438	
Lophura nycthemera	altitude.sqrd	0.199	0.255	0.003	0.201	-0.318	0.684	-0.325	0.675	0.787	0.213	
Polyplectron bicalcaratum	altitude.sqrd	-3.980	2.685	0.119	-3.505	-10.679	-0.287	-9.183	0.184	0.008	0.008	*
Gallus gallus	Log roughness	-0.432	0.465	0.023	-0.437	-1.319	0.500	-1.317	0.501	0.174	0.174	
Lophura nycthemera	Log roughness	0.536	0.227	0.002	0.538	0.085	0.973	0.089	0.975	0.990	0.010	*

Polyplectron bicalcaratum	Log roughness	1.691	0.904	0.037	1.576	0.288	3.900	0.139	3.535	0.996	0.004	*
Gallus gallus	Log tourism	2.263	1.810	0.171	1.726	0.222	7.209	-0.077	6.457	0.996	0.004	*
Lophura nycthemera	Log tourism	0.365	0.287	0.003	0.356	-0.180	0.953	-0.204	0.923	0.903	0.097	
Polyplectron bicalcaratum	Log tourism	0.798	0.665	0.018	0.725	-0.335	2.306	-0.425	2.173	0.910	0.090	
Posterior predicted γ coefficients for association with detectability												
Gallus gallus	Ndvi	0.129	0.570	0.013	0.157	-1.117	1.211	-1.080	1.247	0.628	0.372	
Lophura nycthemera	Ndvi	0.285	0.287	0.003	0.288	-0.284	0.842	-0.257	0.861	0.842	0.158	
Polyplectron bicalcaratum	Ndvi	0.613	0.631	0.008	0.507	-0.416	2.128	-0.579	1.914	0.865	0.135	
Gallus gallus	Northness	-0.021	0.450	0.010	-0.048	-0.833	0.961	-0.885	0.893	0.442	0.442	
Lophura nycthemera	Northness	-0.176	0.224	0.002	-0.169	-0.630	0.249	-0.626	0.250	0.215	0.215	
Polyplectron bicalcaratum	Northness	0.224	0.453	0.008	0.172	-0.540	1.218	-0.566	1.177	0.661	0.339	
Gallus gallus	Eastness	0.009	0.579	0.011	0.012	-1.187	1.179	-1.225	1.134	0.509	0.491	
Lophura nycthemera	Eastness	-0.083	0.332	0.004	-0.067	-0.770	0.551	-0.765	0.554	0.412	0.412	
Polyplectron bicalcaratum	Eastness	0.655	0.785	0.010	0.531	-0.555	2.441	-0.588	2.403	0.818	0.182	

Table S5: Community coefficients of association of availability (β or mbeta) and individual detectability (γ or mpbeta) for three species of pheasants with 6 environmental covariates for 48 camera trap stations in the Namha National Protected Area. Means of coefficients of association ($\widehat{\beta_{oJ}}$ and $\widehat{\gamma_{oJ}}$), SD, Times Series Standard Error, 95% Bayesian Credible Interval (BCI), 95% Highest Probability Density Interval (HPDI) and Bayesian posterior predicted probability (Bppp) of greater or less than 0.0 from a Royle Nichols Hierarchical model of availability and detectability. Six covariates (eight coefficients) were included in the model, as in Table S4.

Covariate	Mean	SD	Time-series SE	Median	BCI 2.50%	BCI 97.50%	95% HPDI HPDI lower	95% HPDI HPDI upper	PPP of > 0	Bppp
Posterior predicted β coefficients for association with availability										
Km to village	0.167	0.452	0.005	0.169	-0.799	1.055	-0.836	1.001	0.704	0.296
Altitude	-0.188	0.489	0.005	-0.177	-1.218	0.826	-1.181	0.861	0.302	0.302
altitude.sqrd	-0.266	0.797	0.009	-0.191	-2.068	1.271	-2.038	1.291	0.358	0.358
Log roughness	0.233	0.650	0.007	0.222	-1.157	1.580	-1.062	1.647	0.678	0.322
Log tourism	0.426	0.700	0.007	0.407	-0.965	1.931	-0.946	1.940	0.767	0.233
Ndvi	0.227	0.481	0.005	0.219	-0.779	1.164	-0.771	1.169	0.729	0.271
Posterior predicted γ coefficient for association with individual detectability:										
Northness	-0.004	0.411	0.005	-0.019	-0.798	0.877	-0.802	0.872	0.471	0.471
Eastness	0.093	0.503	0.005	0.070	-0.904	1.179	-0.911	1.168	0.580	0.420