

**Supporting Information** for *Survival rates of adult and juvenile gyrfalcons in Iceland: estimates and drivers* by Frédéric Barraquand and Ólafur K. Nielsen

**Supplementary tables**

Statistic	Prey abundance	Temperature	Log-precipitation
Mean	6.080	-0.897	3.671
SD	2.487	0.958	0.257

**Table S1.** Mean and SD of the three covariates.

Parameter	Mean	SE	SD	2.5%	25%	50%	75%	97.5%	$n_{\text{eff}}$	$\hat{R}$
$s_2$	0.834	0.000	0.018	0.797	0.822	0.834	0.846	0.868	3095	1.000
$\eta$	0.009	0.000	0.009	0.000	0.003	0.006	0.012	0.031	3702	0.999
$r$	0.139	0.000	0.009	0.123	0.134	0.139	0.145	0.157	3314	1.000
$p$	0.030	0.000	0.005	0.021	0.026	0.029	0.033	0.040	2382	0.999
$\beta_1$	0.281	0.003	0.134	0.022	0.190	0.283	0.370	0.542	1859	1.000
$\beta_2$	0.230	0.003	0.121	-0.007	0.151	0.230	0.310	0.474	2093	1.000
$\beta_3$	0.272	0.003	0.127	0.027	0.185	0.269	0.362	0.517	2082	1.000
$\mu_{s_1}$	-0.518	0.002	0.115	-0.741	-0.594	-0.517	-0.442	-0.293	2296	1.000

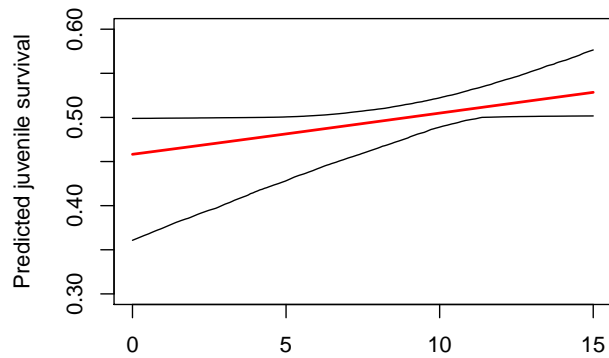
**Table S2.** Estimates of the Mark-Recovery-Recapture model with 3 covariates on the juvenile survival rate  $s_1$ . Parameters:  $s_2$  adult survival rate,  $\eta$  carcass survival rate,  $r$  recovery probability,  $p$  recapture/resighting probability,  $\beta_1$  effect of ptarmigan abundance,  $\beta_2$  effect of temperature,  $\beta_3$  effect of log-precipitation,  $\mu_{s_1}$  intercept in the logistic regression.

Priors	A	B	C	S
Uniform	0.00	-0.81	-0.16	-66.48
Beta	0.00	-0.95	-0.09	-66.56

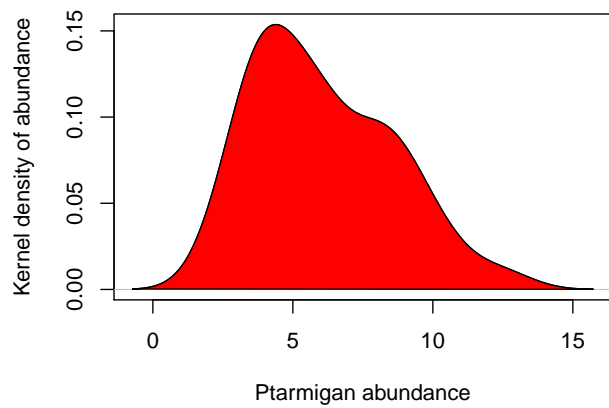
**Table S3.** Differences in expected predictive log-density according to PSIS-LOO.

## Supplementary figures

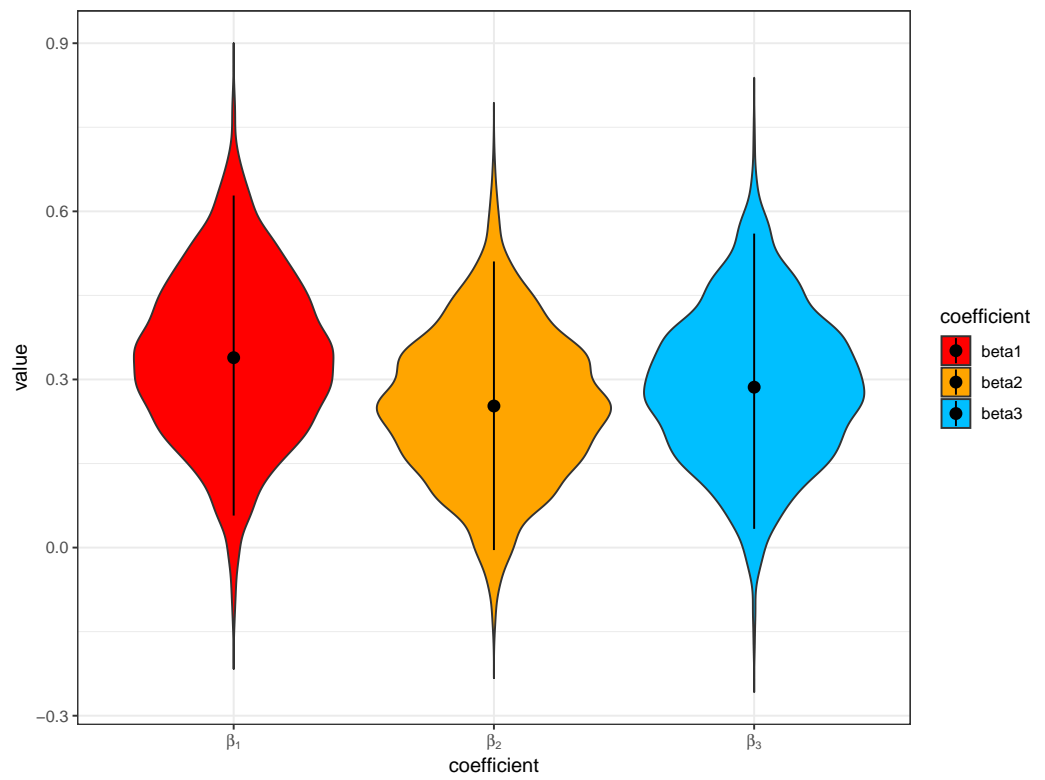
A



B



**Figure S1.** Ptarmigan density effect on juvenile survival with an informative prior (positivity constraint on the slope of the logistic regression). An a priori mean slope of 1/100 with exponential distribution is assumed; hence we assume ptarmigan effect to be weak before model fitting. The effect of this parameterization is to move up the juvenile survival values, which may be artefactual.



**Figure S2.** Violin plots for model C coefficient estimates.