

Additional File 8 Model rankings exploring factors affecting detection probability (p) and prevalence (ψ) of *Haemoproteus* parasites in Dark-eyed Juncos.

Model	K	$\Delta AICc$	w_i	Deviance
$\sigma(\cdot) + p(\cdot) + \psi(\cdot)$	3	0.00	0.35	70.94
$\sigma(\cdot) + p(\cdot) + \psi(\text{sex})$	4	1.32	0.18	69.61
$\sigma(\cdot) + p(\text{PCR run}) + \psi(\cdot)$	5	1.59	0.16	67.03
$\sigma(\cdot) + p(\cdot) + \psi(\text{BCI})$	4	2.65	0.09	70.94
$\sigma(\cdot) + p(\text{PCR run}) + \psi(\text{sex})$	6	3.36	0.07	65.69
$\sigma(\cdot) + p(\cdot) + \psi(\text{sex+BCI})$	5	3.96	0.05	69.39
$\sigma(\cdot) + p(\text{PCR run}) + \psi(\text{BCI})$	6	4.69	0.03	67.03
$\sigma(\cdot) + p(\text{PCR run}) + \psi(\text{age})$	6	6.21	0.02	68.54
$\sigma(\cdot) + p(\text{PCR run}) + \psi(\text{sex+BCI})$	7	6.51	0.01	65.47
$\sigma(\cdot) + p(\cdot) + \psi(\text{sex+age+BCI})$	7	7.26	0.01	66.22
$\sigma(\cdot) + p(\cdot) + \psi(\text{sex+age})$	7	8.43	0.01	67.39
$\sigma(\cdot) + p(\cdot) + \psi(\text{age+year+BCI})$	7	8.74	0.00	67.70
$\sigma(\cdot) + p(\cdot) + \psi(\text{age+BCI})$	7	9.30	0.00	68.26
$\sigma(\cdot) + p(\text{PCR run}) + \psi(\text{age})$	8	9.33	0.00	64.62
$\sigma(\cdot) + p(\cdot) + \psi(\text{sex+age+year+BCI})$	9	11.03	0.00	62.30
$\sigma(\cdot) + p(\text{PCR run}) + \psi(\text{sex+age})$	9	12.22	0.00	63.48
$\sigma(\cdot) + p(\text{PCR run}) + \psi(\text{age+BCI})$	9	13.08	0.00	64.34
$\sigma(\cdot) + p(\text{PCR run}) + \psi(\text{age+year})$	7	14.40	0.00	73.37
$\sigma(\cdot) + p(\text{PCR run}) + \psi(\text{sex+age+BCI})$	10	15.45	0.00	62.28
$\sigma(\cdot) + p(\text{PCR run}) + \psi(\text{sex+age+year})$	8	15.97	0.00	71.26
$\sigma(\cdot) + p(\text{PCR run}) + \psi(\text{sex+age+year+BCI})$	11	16.39	0.00	58.33
$\sigma(\cdot) + p(\text{PCR run}) + \psi(\text{year})$	4	16.46	0.00	84.76
$\sigma(\cdot) + p(\text{PCR run}) + \psi(\text{age+year+BCI})$	10	16.96	0.00	63.79
$\sigma(\cdot) + p(\text{PCR run}) + \psi(\text{sex+year})$	5	18.47	0.00	83.90

$\sigma(.) + p(\text{PCR run}) + \psi(\text{year+BCI})$	5	19.27	0.00	84.71
$\sigma(.) + p(\text{PCR run}) + \psi(\text{age+year})$	9	19.36	0.00	70.63
$\sigma(.) + p(\text{PCR run}) + \psi(\text{year})$	6	20.43	0.00	82.76
$\sigma(.) + p(\text{PCR run}) + \psi(\text{sex+year+BCI})$	6	21.57	0.00	83.90
$\sigma(.) + p(\text{PCR run}) + \psi(\text{sex+age+year})$	10	21.69	0.00	68.52
$\sigma(.) + p(\text{PCR run}) + \psi(\text{sex+year})$	7	22.95	0.00	81.91
$\sigma(.) + p(\text{PCR run}) + \psi(\text{year+BCI})$	7	23.75	0.00	82.71
$\sigma(.) + p(\text{PCR run}) + \psi(\text{sex+year+BCI})$	8	26.62	0.00	81.91

Model set and rankings exploring the importance of factors affecting the detection probability (p) and prevalence (ψ) of

Haemoproteus blood parasites in Dark-eyed Juncos captured and sampled at a high-elevation valley in northern Colorado

during 2017-2018. ‘PCR run’ indicates the 3 PCR replicates carried out for each sample. The number of parameters (K), model weights (w_i), and deviance are shown for each model and the models are ranked by their AICc differences relative to the best model in the set (ΔAICc_i). Sigma (σ) was a random effect included in every model to account for unmodeled heterogeneity.