

**Additional File 11** Model rankings exploring factors affecting detection probability ( $p$ ) and prevalence ( $\psi$ ) of *Haemoproteus* parasites in Wilson's Warblers.

<b>Model</b>	<b>K</b>	<b><math>\Delta</math>AICc</b>	<b><math>w_i</math></b>	<b>Deviance</b>
$\sigma(\cdot) + p(\cdot) + \psi(\text{sex+year})$	5	0.01	0.19	101.85
$\sigma(\cdot) + p(\cdot) + \psi(\text{sex})$	4	0.59	0.15	104.98
$\sigma(\cdot) + p(\cdot) + \psi(\text{year})$	4	1.57	0.09	105.97
$\sigma(\cdot) + p(\cdot) + \psi(\text{BCI})$	4	1.66	0.08	106.06
$\sigma(\cdot) + p(\cdot) + \psi(\cdot)$	3	2.10	0.07	108.92
$\sigma(\cdot) + p(\cdot) + \psi(\text{sex+year+BCI})$	6	2.69	0.05	101.84
$\sigma(\cdot) + p(\cdot) + \psi(\text{year+BCI})$	5	4.09	0.03	105.93
$\sigma(\cdot) + p(\text{PCR run}) + \psi(\text{sex+BCI})$	7	4.89	0.02	101.20
$\sigma(\cdot) + p(\text{PCR run}) + \psi(\text{sex+year})$	7	4.90	0.02	101.21
$\sigma(\cdot) + p(\text{PCR run}) + \psi(\text{sex})$	6	5.19	0.01	104.35
$\sigma(\cdot) + p(\cdot) + \psi(\text{sex+age+BCI})$	7	5.35	0.01	101.66
$\sigma(\cdot) + p(\cdot) + \psi(\text{sex+age+year})$	7	5.38	0.01	101.69
$\sigma(\cdot) + p(\cdot) + \psi(\text{sex+age})$	6	5.65	0.01	104.80
$\sigma(\cdot) + p(\text{PCR run}) + \psi(\text{year})$	6	6.18	0.01	105.33
$\sigma(\cdot) + p(\text{PCR run}) + \psi(\text{BCI})$	6	6.27	0.01	105.42
$\sigma(\cdot) + p(\text{PCR run}) + \psi(\cdot)$	5	6.44	0.01	108.28
$\sigma(\cdot) + p(\cdot) + \psi(\text{age+year})$	6	6.77	0.01	105.92
$\sigma(\cdot) + p(\cdot) + \psi(\text{age+BCI})$	6	6.85	0.01	106.01
$\sigma(\cdot) + p(\cdot) + \psi(\text{age})$	5	6.94	0.01	108.78
$\sigma(\cdot) + p(\text{PCR run}) + \psi(\text{sex+year+BCI})$	8	7.89	0.00	101.19
$\sigma(\cdot) + p(\cdot) + \psi(\text{sex+age+year+BCI})$	8	8.35	0.00	101.66
$\sigma(\cdot) + p(\text{PCR run}) + \psi(\text{year+BCI})$	7	8.98	0.00	105.29
$\sigma(\cdot) + p(\cdot) + \psi(\text{age+year+BCI})$	7	9.59	0.00	105.90
$\sigma(\cdot) + p(\text{PCR run}) + \psi(\text{sex+age})$	7	10.85	0.00	104.16

$\sigma(\cdot) + p(\text{PCR run}) + \psi(\text{sex+age+BCI})$	9	10.88	0.00	101.01
$\sigma(\cdot) + p(\text{PCR run}) + \psi(\text{sex+age+year})$	9	10.92	0.00	101.05
$\sigma(\cdot) + p(\text{PCR run}) + \psi(\text{age})$	7	11.83	0.00	108.14
$\sigma(\cdot) + p(\text{PCR run}) + \psi(\text{age+year})$	8	11.97	0.00	105.28
$\sigma(\cdot) + p(\text{PCR run}) + \psi(\text{age+BCI})$	8	12.06	0.00	105.37
$\sigma(\cdot) + p(\text{PCR run}) + \psi(\text{sex+age+year+BCI})$	10	14.26	0.00	101.01
<u><math>\sigma(\cdot) + p(\text{PCR run}) + \psi(\text{age+year+BCI})</math></u>	<u>9</u>	<u>15.13</u>	<u>0.00</u>	<u>105.26</u>

Model set and rankings exploring the importance of factors affecting the detection probability ( $p$ ) and prevalence ( $\psi$ ) of *Haemoproteus* blood parasites in Wilson's Warblers 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 ( $\Delta\text{AICc}_i$ ). Sigma ( $\sigma$ ) was a random effect included in every model to account for unmodeled heterogeneity.