

## Supplementary material

Table S1. AIC-ranked dynamic occupancy models, corrected for the effects of relative bird abundance, used to describe settlement ( $\gamma$ ) and vacancy ( $\epsilon$ ) by black-throated blue warblers. In all models, parameters for  $\Psi$  and  $p$  were held constant (modeled as:  $\Psi$  = abundance (abund) + autocovariate + hobbleshob (hob), and  $p$  = abundance + hobbleshob + singing in the previous sample period (song  $p(t-1)$ ). The top model from analysis where we did not include abundance (elv<sup>2</sup> + vial; Table 3) is shown for comparison.

Model	AIC	$\Delta$ AIC	$w_i$	K
abundance + hob	1737.21	0	0.63	18
abundance + hob + t	1741.10	3.89	0.09	20
abundance	1741.20	3.99	0.09	16
abundance + elv <sup>2</sup>	1741.60	4.39	0.07	20
abundance + hob + elv <sup>2</sup>	1742.53	5.32	0.04	22
abundance + t	1742.90	5.69	0.04	18
abundance + elv <sup>2</sup> + t	1743.40	6.19	0.03	22
elv <sup>2</sup> + vial	1746.42	9.21	0.01	20
abundance + hob + elv <sup>2</sup> + t	1746.47	9.26	0.01	24
Null	1752.37	15.16	0.00	14