APPENDIX 4. Fine-scale perturbation analysis of input demographic rates and an Allee effect in a stochastic population viability analysis for large-bodied woodpeckers. See Appendix 1 for details on calculations.

Model inputs							Extinction rate (e_i)				Change in e_i (Δe_i)		
N_0[a]	β_a[b]	S[c]	σ^2_S	F[d]	σ_F	λ[e]	Orig.[f]	$N_0\uparrow$[g]	$S\uparrow$[g]	$\beta_a\downarrow$[g]	N_0[h]	S[h]	β_a[i]
5	1.50	0.7	0.002	1.06	0.1985	1.071	1.000	0.995	0.995	1.000	0.005	0.005	0.000
17	1.50	0.7	0.002	1.06	0.1985	1.071	0.630	0.680	0.595	0.675	-0.050	0.035	0.045
30	1.50	0.7	0.002	1.06	0.1985	1.071	0.565	0.505	0.420	0.615	0.060	0.145	0.050
5	3.25	0.7	0.002	1.06	0.1985	1.071	0.785	0.680	0.630	0.725	0.105	0.155	-0.060
17	3.25	0.7	0.002	1.06	0.1985	1.071	0.400	0.410	0.265	0.430	-0.010	0.135	0.030
30	3.25	0.7	0.002	1.06	0.1985	1.071	0.340	0.285	0.245	0.410	0.055	0.095	0.070
5	5.00	0.7	0.002	1.06	0.1985	1.071	0.700	0.520	0.535	0.740	0.180	0.165	0.040
17	5.00	0.7	0.002	1.06	0.1985	1.071	0.370	0.335	0.320	0.360	0.035	0.050	-0.010
30	5.00	0.7	0.002	1.06	0.1985	1.071	0.300	0.325	0.235	0.350	-0.025	0.065	0.050
5	1.50	0.8	0.016	1.06	0.1985	1.224	0.975	0.860	0.985	0.995	0.115	-0.010	0.020
17	1.50	0.8	0.016	1.06	0.1985	1.224	0.045	0.025	0.025	0.075	0.020	0.020	0.030
30	1.50	0.8	0.016	1.06	0.1985	1.224	0.035	0.010	0.025	0.040	0.025	0.010	0.005
5	3.25	0.8	0.016	1.06	0.1985	1.224	0.170	0.130	0.125	0.160	0.040	0.045	-0.010
17	3.25	0.8	0.016	1.06	0.1985	1.224	0.000	0.010	0.005	0.005	-0.010	-0.005	0.005
30	3.25	0.8	0.016	1.06	0.1985	1.224	0.000	0.000	0.000	0.005	0.000	0.000	0.005
5	5.00	0.8	0.016	1.06	0.1985	1.224	0.065	0.055	0.050	0.100	0.010	0.015	0.035
17	5.00	0.8	0.016	1.06	0.1985	1.224	0.000	0.010	0.005	0.010	-0.010	-0.005	0.010
30	5.00	0.8	0.016	1.06	0.1985	1.224	0.005	0.005	0.000	0.000	0.000	0.005	-0.005
5	1.50	0.9	0.051	1.06	0.1985	1.377	0.860	0.550	0.895	0.975	0.310	-0.035	0.115
17	1.50	0.9	0.051	1.06	0.1985	1.377	0.015	0.010	0.000	0.005	0.005	0.015	-0.010
30	1.50	0.9	0.051	1.06	0.1985	1.377	0.005	0.020	0.000	0.005	-0.015	0.005	0.000
5	3.25	0.9	0.051	1.06	0.1985	1.377	0.015	0.025	0.015	0.035	-0.010	0.000	0.020
17	3.25	0.9	0.051	1.06	0.1985	1.377	0.000	0.005	0.000	0.010	-0.005	0.000	0.010
30	3.25	0.9	0.051	1.06	0.1985	1.377	0.000	0.000	0.000	0.000	0.000	0.000	0.000
5	5.00	0.9	0.051	1.06	0.1985	1.377	0.045	0.015	0.025	0.035	0.030	0.020	-0.010
17	5.00	0.9	0.051	1.06	0.1985	1.377	0.000	0.000	0.000	0.005	0.000	0.000	0.005
30	5.00	0.9	0.051	1.06	0.1985	1.377	0.000	0.000	0.000	0.000	0.000	0.000	0.000

[a] Initial number of adult females.

[b] Slope of relationship between N_t and probability of breeding in year t; inverse of Allee effect strength.

[c] Annual adult survival rate.

[d] Fecundity; the number of juvenile females recruited per adult female.

[e] Deterministic population growth rate, assuming annual juvenile survival = 0.5; $\lambda = S + F * 0.5 * S$.

[f] Predicted extinction rate based on original set of input values.

[g] Predicted extinction rate based on augmented set of input values where one parameter changed by small, proportional amount and is expected to decrease extinction rate. Arrows indicate whether focal input parameter was increased (↑) or decreased (↓).

[h] Change in extinction rate calculated by subtracting the extinction rate based on an augmented set of input values (i.e., one input value increased by small, proportional amount and is expected to decrease extinction rate) from the extinction rate based on original set of input values.

[i] Change in extinction rate calculated by subtracting the extinction rate based on original set of input values from extinction rate based on an augmented set of input values (i.e., one input value increased by small, proportional amount and is expected to decrease extinction rate).