Table S5. Candidate models evaluating Ruffed Grouse over-winter survival used in an analysis exploring sensitivity to uncertainty in estimation of random slopes. Plasticity (i.e., change in probability of selection) and personality (i.e., mean probability of selection) covariates for each individual were derived from a resource selection function using a Bayesian approach. Random slopes were drawn from the 0.4 quantile (low), 0.5 quantile (median), and 0.6 quantile (high) of each individual’s posterior distribution of the random slope for each covariate. Exposure covariates are the median values across all roost sites used by an individual, and were not derived from random slopes. Models included in the low, median, and high rounds of the sensitivity analysis were candidate models evaluated in the survival analysis with a ∆AICc < 4 (Table S2). ∆SSE>15 = change in probability of selection between 15 cm and the maximum snow depth available to each individual. ∆SSE<15 = change in probability of selection between the minimum snow depth available to each individual and 14.9 cm. SSE>15M = mean probability of selection between 15 cm and the population-level maximum available snow depth. SSE<15M = mean probability of selection between the population-level minimum available snow depth and 14.9 cm. SEXP<15 = the median snow depth at an individual’s used roost sites for snow depths < 15 cm. SEXP>15 = the median snow depth at an individual’s used roost sites for snow depths ≥ 15 cm. ∆WTSE = change in probability of selection across winter minimum temperature conditions available to each individual. WTSEM = mean probability of selection across the range of winter minimum temperature conditions available to the population in a given year. WTEXP = the median winter minimum temperature at an individual’s used roost sites. k = number of parameters in the model, AICc = Akaike’s Information Criterion corrected for small sample sizes, ∆AICc = change in AICc from the top model, *wi* = Akaike weight.

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| --- | --- | --- | --- | --- | --- |
| Round | Model | k | AICc | ∆AICc | *wi* |
| **Low** | **SSE>15M + SEXP<15** | **3** | **99.42** | **0.00** | **0.20** |
| Low | SEXP<15 | 2 | 100.02 | 0.60 | 0.15 |
| Low | SSE<15M + SEXP<15 + ∆SSE>15 | 4 | 100.27 | 0.85 | 0.13 |
| Low | SSE>15M + SEXP<15 + SEXP>15 | 4 | 101.22 | 1.80 | 0.08 |
| Low | ∆SSE>15 + SEXP<15 + WTEXP | 4 | 101.32 | 1.90 | 0.08 |
| Low | SSE>15M + SEXP<15 + WTSEM | 4 | 101.41 | 1.99 | 0.07 |
| Low | SSE>15M + SEXP<15 + ∆WTSE | 4 | 101.42 | 2.00 | 0.07 |
| Low | SEXP<15 + SEXP>15 | 3 | 101.71 | 2.29 | 0.06 |
| Low | SSE<15M + SEXP<15 | 3 | 101.95 | 2.53 | 0.06 |
| Low | ∆SSE<15 + SEXP<15 + WTEXP | 4 | 102.29 | 2.87 | 0.05 |
| Low | SSE>15M + SEXP<15 + SEXP>15 + ∆WTSE | 5 | 103.24 | 3.82 | 0.03 |
| Low | SSE>15M + SEXP<15 + SEXP>15 + WTSEM | 5 | 103.24 | 3.82 | 0.03 |
| Low | SSE<15M + SEXP<15 + SEXP>15 + WTSEM | 5 | 105.42 | 6.01 | 0.01 |
| Low | Null | 1 | 115.07 | 15.65 | 0.00 |
| **Median** | **SSE>15M + SEXP<15** | **3** | **99.17** | **0.00** | **0.23** |
| Median | SEXP<15 | 2 | 100.02 | 0.84 | 0.15 |
| Median | SSE>15M + SEXP<15 + SEXP>15 | 4 | 101.00 | 1.80 | 0.10 |
| Median | SSE>15M + SEXP<15 + WTSEM | 4 | 101.20 | 1.99 | 0.09 |
| Median | SSE>15M + SEXP<15 + ∆WTSE | 4 | 101.20 | 2.00 | 0.09 |
| Median | SEXP<15 + SEXP>15 | 3 | 101.71 | 2.53 | 0.07 |
| Median | SSE<15M + SEXP<15 + ∆SSE>15 | 4 | 102.00 | 2.78 | 0.06 |
| Median | SSE<15M + SEXP<15 | 3 | 102.00 | 2.82 | 0.06 |
| Median | ∆SSE<15 + SEXP<15 + WTEXP | 4 | 102.30 | 3.12 | 0.05 |
| Median | ∆SSE>15 + SEXP<15 + WTEXP | 4 | 102.60 | 3.38 | 0.04 |
| Median | SSE>15M + SEXP<15 + SEXP>15 + ∆WTSE | 5 | 103.00 | 3.83 | 0.03 |
| Median | SSE>15M + SEXP<15 + SEXP>15 + WTSEM | 5 | 103.00 | 3.83 | 0.03 |
| Median | SSE<15M + SEXP<15 + SEXP>15 + WTSEM | 5 | 105.50 | 6.33 | 0.01 |
| Median | Null | 1 | 115.01 | 15.90 | 0.00 |
| **High** | **SSE>15M + SEXP<15** | **3** | **99.30** | **0.00** | **0.24** |
| High | SEXP<15 | 2 | 100.10 | 0.76 | 0.16 |
| High | SSE>15M + SEXP<15 + SEXP>15 | 4 | 101.13 | 1.88 | 0.09 |
| High | SSE>15M + SEXP<15 + WTSEM | 4 | 101.30 | 2.01 | 0.09 |
| High | SSE>15M + SEXP<15 + ∆WTSE | 4 | 101.30 | 2.02 | 0.09 |
| High | SEXP<15 + SEXP>15 | 3 | 101.71 | 2.45 | 0.07 |
| High | SSE<15M + SEXP<15 | 3 | 102.10 | 2.76 | 0.06 |
| High | ∆SSE<15 + SEXP<15 + WTEXP | 4 | 102.30 | 3.04 | 0.05 |
| High | SSE>15M + SEXP<15 + SEXP>15 + ∆WTSE | 5 | 103.16 | 3.90 | 0.03 |
| High | SSE>15M + SEXP<15 + SEXP>15 + WTSEM | 5 | 103.16 | 3.90 | 0.03 |
| High | ∆SSE>15 + SEXP<15 + WTEXP | 4 | 103.22 | 3.96 | 0.03 |
| High | SSE<15M + SEXP<15 + ∆SSE>15 | 4 | 103.40 | 4.14 | 0.03 |
| High | SSE<15M + SEXP<15 + SEXP>15 + WTSEM | 5 | 105.60 | 6.32 | 0.01 |
| High | Null | 1 | 115.10 | 15.82 | 0.00 |