1 Table S1. Summary of model selection results for the presence of the dawn song bout of

2 paired male Cerulean Warblers in south-central Indiana, USA in 2017 as a function of

3 seasonality, breeding stage, and weather. Models are ranked by ascending value of

4 Akaike's Information Criterion corrected for small sample sizes (AICc);  $w_i$  is the model

5 weight, and df is the number of parameters. All models also included a random effect

6 ("individual"). Models with  $\Delta AICc$  values of < 2.0 were considered equally plausible. 7

| Model  | ΔAICc | df | Wi      |
|--|-------|----|---------|
| Julian date  | 0.0   | 3  | 0.2655  |
| Julian date + temperature                                | 0.9   | 4  | 0.1658  |
| Julian date + wind                                       | 1.2   | 4  | 0.1458  |
| Julian date + rain                                       | 2.0   | 4  | 0.0970  |
| Julian date + temperature + wind                         | 3.0   | 5  | 0.0589  |
| Julian date + temperature + rain                         | 3.1   | 5  | 0.0550  |
| Julian date + wind + rain                                | 3.4   | 5  | 0.0482  |
| Julian date + breeding stage                             | 4.3   | 5  | 0.0306  |
| Julian date + temperature + wind + rain                  | 5.3   | 6  | 0.0190  |
| Julian date + breeding stage + temperature               | 5.3   | 6  | 0.0184  |
| Julian date + breeding stage + wind                      | 5.5   | 6  | 0.0166  |
| Julian date + breeding stage + rain                      | 6.4   | 6  | 0.0109  |
| Null model   | 6.5   | 2  | 0.0102  |
| Julian date + breeding stage + temperature + wind        | 7.5   | 7  | 0.0063  |
| Julian date + breeding stage + temperature + rain        | 7.6   | 7  | 0.0058  |
| Wind   | 7.7   | 3  | 0.0055  |
| Breeding stage   | 7.7   | 4  | 0.0055  |
| Julian date + breeding stage + wind + rain               | 7.9   | 7  | 0.0052  |
| Temperature  | 8.0   | 3  | 0.0049  |
| Rain   | 8.6   | 3  | 0.0036  |
| Breeding stage + temperature                             | 8.6   | 5  | 0.0036  |
| Breeding stage + wind                                    | 8.6   | 5  | 0.0035  |
| Temperature + wind                                       | 9.8   | 4  | 0.0019  |
| Julian date + breeding stage + temperature + wind + rain | 9.9   | 8  | 0.0019  |
| Wind + rain  | 9.9   | 4  | 0.0019  |
| Breeding stage + rain                                    | 9.9   | 5  | 0.0019  |
| Temperature + rain                                       | 10.2  | 4  | 0.0017  |
| Breeding stage + temperature + wind                      | 10.6  | 6  | 0.0013  |
| Breeding stage + wind + rain                             | 10.8  | 6  | 0.0012  |
| Breeding stage + temperature + rain                      | 10.9  | 6  | 0.0012  |
| Temperature + wind + rain                                | 12.0  | 5  | < 0.001 |
| Breeding stage + temperature + wind + rain               | 12.8  | 7  | < 0.001 |

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11 **Table S2.** Summary of model selection results for dawn song bout length of paired male

12 Cerulean Warblers in south-central Indiana, USA in 2017 as a function of seasonality,

13 breeding stage, and weather. Models are ranked by ascending value of Akaike's

14 Information Criterion corrected for small sample sizes (AICc);  $w_i$  is the model weight,

15 and df is the number of parameters. All models also included a random effect

16 ("individual"). Models with  $\Delta$ AICc values of < 2.0 were considered equally plausible. 17

| Model  | ΔAICc | df | Wi      |
|--|-------|----|---------|
| Julian date + breeding stage + rain                      | 0.0   | 7  | 0.2260  |
| Julian date + breeding stage                             | 0.7   | 6  | 0.1628  |
| Julian date + breeding stage + temperature + rain        | 2.3   | 8  | 0.0700  |
| Julian date + breeding stage + wind + rain               | 2.4   | 8  | 0.0693  |
| Julian date + breeding stage + wind                      | 2.4   | 7  | 0.0668  |
| Julian date + breeding stage + temperature               | 2.9   | 7  | 0.0543  |
| Julian date + temperature + rain                         | 3.5   | 6  | 0.0384  |
| Julian date  | 3.6   | 4  | 0.0365  |
| Julian date + wind + rain                                | 3.7   | 6  | 0.0358  |
| Julian date + breeding stage + temperature + wind + rain | 4.8   | 9  | 0.0209  |
| Julian date + breeding stage + temperature + wind        | 4.8   | 8  | 0.0205  |
| Julian date + temperature                                | 5.4   | 5  | 0.0155  |
| Julian date + wind                                       | 5.6   | 5  | 0.0138  |
| Julian date + temperature + wind + rain                  | 5.6   | 7  | 0.0134  |
| Null model   | 6.7   | 3  | 0.0078  |
| Rain   | 6.9   | 4  | 0.0073  |
| Breeding stage + rain                                    | 7.4   | 6  | 0.0056  |
| Julian date + temperature + wind                         | 7.6   | 6  | 0.0051  |
| Temperature  | 8.8   | 4  | 0.0027  |
| Wind   | 8.9   | 4  | 0.0027  |
| Wind + rain  | 9.0   | 5  | 0.0025  |
| Temperature + rain                                       | 9.1   | 5  | 0.0024  |
| Breeding stage + wind + rain                             | 9.2   | 7  | 0.0023  |
| Breeding stage   | 9.2   | 5  | 0.0023  |
| Breeding stage + temperature + rain                      | 9.7   | 7  | 0.0018  |
| Temperature + wind                                       | 11.0  | 5  | < 0.001 |
| Temperature + wind + rain                                | 11.2  | 6  | < 0.001 |
| Breeding stage + temperature                             | 11.4  | 6  | < 0.001 |
| Breeding stage + temperature + wind + rain               | 11.4  | 8  | < 0.001 |
| Breeding stage + wind                                    | 11.4  | 6  | < 0.001 |
| Breeding stage + temperature + wind                      | 13.7  | 7  | < 0.001 |
| Julian date + rain                                       | NA    | NA | NA      |

19 **Table S3.** Summary of model selection results for the starting time of the dawn song bout

20 of paired male Cerulean Warblers in south-central Indiana, USA in 2017 as a function of

21 seasonality, breeding stage, and weather. Models are ranked by ascending value of

22 Akaike's Information Criterion corrected for small sample sizes (AICc);  $w_i$  is the model

23 weight, and df is the number of parameters. All models also included a random effect

24 ("individual"). Models with  $\triangle$ AICc values of < 2.0 were considered equally plausible.

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| Model  | ΔAICc | df | Wi      |
|--|-------|----|---------|
| Wind + rain  | 0.0   | 5  | 0.2318  |
| Temperature + rain                                       | 1.3   | 5  | 0.1232  |
| Rain   | 1.5   | 4  | 0.1120  |
| Temperature + wind + rain                                | 1.8   | 6  | 0.0920  |
| Julian date + wind + rain                                | 2.1   | 6  | 0.0801  |
| Wind   | 2.5   | 4  | 0.0669  |
| Julian date + temperature + rain                         | 3.4   | 6  | 0.0434  |
| Julian date + rain                                       | 3.5   | 5  | 0.0401  |
| Julian date + temperature + wind + rain                  | 4.0   | 7  | 0.0312  |
| Breeding stage + wind + rain                             | 4.2   | 7  | 0.0281  |
| Temperature + wind                                       | 4.4   | 5  | 0.0254  |
| Julian date + wind                                       | 4.6   | 5  | 0.0234  |
| Breeding stage + temperature + rain                      | 5.3   | 7  | 0.0168  |
| Breeding stage + rain                                    | 5.5   | 6  | 0.0146  |
| Breeding stage + temperature + wind + rain               | 6.1   | 8  | 0.0110  |
| Julian date + breeding stage + wind + rain               | 6.3   | 8  | 0.0098  |
| Julian date + temperature + wind                         | 6.6   | 6  | 0.0087  |
| Breeding stage + wind                                    | 6.7   | 6  | 0.0081  |
| Julian date + breeding stage + temperature + rain        | 7.0   | 8  | 0.0070  |
| Julian date + breeding stage + rain                      | 7.4   | 7  | 0.0059  |
| Temperature  | 7.6   | 4  | 0.0052  |
| Julian date + breeding stage + temperature + wind + rain | 8.1   | 9  | 0.0040  |
| Breeding stage + temperature + wind                      | 8.8   | 7  | 0.0029  |
| Julian date + breeding stage + wind                      | 9.0   | 7  | 0.0026  |
| Julian date + temperature                                | 9.6   | 5  | 0.0019  |
| Null model   | 10.1  | 3  | 0.0015  |
| Julian date + breeding stage + temperature + wind        | 11.1  | 8  | < 0.001 |
| Breeding stage + temperature                             | 12.0  | 6  | < 0.001 |
| Julian date  | 12.1  | 4  | < 0.001 |
| Julian date + breeding stage + temperature               | 14.1  | 7  | < 0.001 |
| Breeding stage   | 14.4  | 5  | < 0.001 |
| Julian date + breeding stage                             | 16.6  | 6  | < 0.001 |

**Table S4.** Summary of model selection results for the ending time of the dawn song bout of paired male Cerulean Warblers in south-central Indiana, USA in 2017 as a function of seasonality, breeding stage, and weather. Models are ranked by ascending value of Akaike's Information Criterion corrected for small sample sizes (AICc);  $w_i$  is the model weight, and df is the number of parameters. All models also included a random effect ("individual"). Models with  $\Delta$ AICc values of < 2.0 were considered equally plausible.

| Model  | ΔAICc | df | Wi      |
|--|-------|----|---------|
| Julian date + breeding stage + temperature + wind + rain | 0.0   | 9  | 0.2889  |
| Julian date + breeding stage + wind + rain               | 1.0   | 8  | 0.1791  |
| Julian date + breeding stage + temperature + rain        | 1.1   | 8  | 0.1700  |
| Julian date + breeding stage + rain                      | 1.4   | 7  | 0.1427  |
| Julian date + breeding stage + temperature + wind        | 3.0   | 8  | 0.0645  |
| Julian date + breeding stage + temperature               | 3.8   | 7  | 0.0433  |
| Julian date + breeding stage + wind                      | 4.0   | 7  | 0.0398  |
| Julian date + breeding stage                             | 4.1   | 6  | 0.0369  |
| Julian date + temperature + wind + rain                  | 6.8   | 7  | 0.0094  |
| Julian date + wind + rain                                | 7.6   | 6  | 0.0066  |
| Julian date + temperature + rain                         | 7.6   | 6  | 0.0065  |
| Julian date + rain                                       | 8.0   | 5  | 0.0053  |
| Julian date + temperature + wind                         | 9.9   | 6  | 0.0021  |
| Julian date + temperature                                | 10.6  | 5  | 0.0014  |
| Julian date + wind                                       | 10.7  | 5  | 0.0014  |
| Julian date  | 10.9  | 4  | 0.0012  |
| Breeding stage + temperature + wind + rain               | 14.2  | 8  | < 0.001 |
| Breeding stage + temperature + rain                      | 15.0  | 7  | < 0.001 |
| Breeding stage + wind + rain                             | 15.3  | 7  | < 0.001 |
| Breeding stage + rain                                    | 15.8  | 6  | < 0.001 |
| Breeding stage + temperature + wind                      | 17.4  | 7  | < 0.001 |
| Breeding stage + temperature                             | 18.0  | 6  | < 0.001 |
| Breeding stage + wind                                    | 18.6  | 6  | < 0.001 |
| Breeding stage   | 18.7  | 5  | < 0.001 |
| Temperature + wind + rain                                | 21.2  | 6  | < 0.001 |
| Temperature + rain                                       | 22.2  | 5  | < 0.001 |
| Wind + rain  | 22.6  | 5  | < 0.001 |
| Rain   | 23.1  | 4  | < 0.001 |
| Temperature + wind                                       | 24.3  | 5  | < 0.001 |
| Temperature  | 25.0  | 4  | < 0.001 |
| Wind   | 25.7  | 4  | < 0.001 |
| Null model   | 26.0  | 3  | < 0.001 |

**Table S5.** Summary of model selection results for the average song rate during the dawn song bout of paired male Cerulean Warblers in south-central Indiana, USA in 2017 as a function of seasonality, breeding stage, and weather. Models are ranked by ascending value of Akaike's Information Criterion corrected for small sample sizes (AICc);  $w_i$  is the model weight, and df is the number of parameters. All models also included a random effect ("individual"). Models with  $\Delta$ AICc values of < 2.0 were considered equally plausible.

| Model  | ΔAICc | df | Wi     |
|--|-------|----|--------|
| Julian date + breeding stage                             | 0.0   | 6  | 0.1261 |
| Julian date + breeding stage + rain                      | 0.1   | 7  | 0.1191 |
| Julian date + rain                                       | 0.7   | 5  | 0.0882 |
| Julian date  | 1.0   | 4  | 0.0770 |
| Null model   | 1.6   | 3  | 0.0557 |
| Rain   | 1.7   | 4  | 0.0530 |
| Julian date + breeding stage + wind                      | 2.4   | 7  | 0.0380 |
| Julian date + breeding stage + wind + rain               | 2.5   | 8  | 0.0359 |
| Breeding stage + rain                                    | 2.6   | 6  | 0.0339 |
| Julian date + breeding stage + temperature + rain        | 2.7   | 8  | 0.0335 |
| Julian date + breeding stage + temperature               | 2.7   | 7  | 0.0326 |
| Breeding stage   | 2.8   | 5  | 0.0308 |
| Julian date + temperature + rain                         | 3.0   | 6  | 0.0281 |
| Julian date + wind + rain                                | 3.5   | 6  | 0.0224 |
| Julian date + temperature                                | 3.6   | 5  | 0.0210 |
| Julian date + wind                                       | 3.6   | 5  | 0.0206 |
| Temperature + rain                                       | 3.7   | 5  | 0.0200 |
| Julian date + breeding stage + temperature + wind        | 3.8   | 8  | 0.0191 |
| Temperature  | 3.9   | 4  | 0.0176 |
| Julian date + breeding stage + temperature + wind + rain | 4.0   | 9  | 0.0174 |
| Wind   | 4.4   | 4  | 0.0138 |
| Wind + rain  | 4.5   | 5  | 0.0133 |
| Breeding stage + temperature + rain                      | 4.7   | 7  | 0.0118 |
| Julian date + temperature + wind + rain                  | 4.9   | 7  | 0.0107 |
| Julian date + temperature + wind                         | 5.0   | 6  | 0.0105 |
| Temperature + wind                                       | 5.3   | 5  | 0.0090 |
| Breeding stage + temperature                             | 5.3   | 6  | 0.0088 |
| Temperature + wind + rain                                | 5.4   | 6  | 0.0083 |
| Breeding stage + wind + rain                             | 5.5   | 7  | 0.0081 |
| Breeding stage + wind                                    | 5.7   | 6  | 0.0074 |
| Breeding stage + temperature + wind + rain               | 6.8   | 8  | 0.0042 |
| Breeding stage + temperature + wind                      | 6.8   | 7  | 0.0041 |

**Table S6.** Summary of model selection results for the peak song rate during the dawn song bout of paired male Cerulean Warblers in south-central Indiana, USA in 2017 as a function of seasonality, breeding stage, and weather. Models are ranked by ascending value of Akaike's Information Criterion corrected for small sample sizes (AICc);  $w_i$  is the model weight, and df is the number of parameters. All models also included a random effect ("individual"). Models with  $\Delta$ AICc values of < 2.0 were considered equally plausible.

| Model  | ΔAICc | df | Wi      |
|--|-------|----|---------|
| Julian date + breeding stage                             | 0.0   | 6  | 0.1992  |
| Julian date + breeding stage + rain                      | 0.4   | 7  | 0.1660  |
| Julian date  | 1.5   | 4  | 0.0930  |
| Julian date + rain                                       | 1.7   | 5  | 0.0835  |
| Julian date + breeding stage + temperature               | 2.0   | 7  | 0.0740  |
| Julian date + breeding stage + temperature + rain        | 2.2   | 8  | 0.0663  |
| Julian date + breeding stage + wind                      | 3.1   | 7  | 0.0432  |
| Julian date + breeding stage + wind + rain               | 3.1   | 8  | 0.0413  |
| Julian date + temperature + rain                         | 3.4   | 6  | 0.0360  |
| Julian date + temperature                                | 3.5   | 5  | 0.0347  |
| Julian date + breeding stage + temperature + wind        | 4.2   | 8  | 0.0247  |
| Julian date + breeding stage + temperature + wind + rain | 4.3   | 9  | 0.0227  |
| Julian date + wind + rain                                | 4.4   | 6  | 0.0220  |
| Julian date + wind                                       | 4.5   | 5  | 0.0205  |
| Breeding stage   | 5.5   | 5  | 0.0126  |
| Breeding stage + rain                                    | 5.6   | 6  | 0.0119  |
| Julian date + temperature + wind + rain                  | 5.9   | 7  | 0.0105  |
| Julian date + temperature + wind                         | 5.9   | 6  | 0.0104  |
| Breeding stage + temperature + rain                      | 6.5   | 7  | 0.0077  |
| Breeding stage + temperature                             | 6.9   | 6  | 0.0063  |
| Breeding stage + wind + rain                             | 7.9   | 7  | 0.0039  |
| Breeding stage + wind                                    | 8.5   | 6  | 0.0028  |
| Breeding stage + temperature + wind + rain               | 9.1   | 8  | 0.0021  |
| Breeding stage + temperature + wind                      | 9.6   | 7  | 0.0017  |
| Null model   | 11.0  | 3  | < 0.001 |
| Rain   | 11.3  | 4  | < 0.001 |
| Temperature  | 12.0  | 4  | < 0.001 |
| Temperature + rain                                       | 12.3  | 5  | < 0.001 |
| Wind   | 13.8  | 4  | < 0.001 |
| Wind + rain  | 13.8  | 5  | < 0.001 |
| Temperature + wind                                       | 14.4  | 5  | < 0.001 |
| Temperature + wind + rain                                | 14.5  | 6  | < 0.001 |