

Supplementary material

Appendix 1

Figure A1. Photos of the experimental set-up showing the extent and strength of the light treatment during a lighted night (on the right), and zooming in on the illuminated feeder and some of the spotlights (on the left). Photos were taken on 21 January 2015.

Table A1. Model selection using ΔAIC_c for the linear mixed models used at dawn.

| Species | Candidate models | AIC_c^a | ΔAIC_c^b |
|-----------|--|-----------|------------------|
| Blackbird | light + date + weather + temperature | 570.5 | 0.00 |
| | light*date + weather + temperature | 572.0 | 1.46 |
| | light*weather + date + temperature | 572.2 | 1.70 |
| | light*temperature + date + weather | 573.1 | 2.56 |
| | light*date + light*weather + light*temperature | 576.6 | 6.05 |
| Blue tit | light + date + weather + temperature | 814.8 | 0.00 |
| | light*weather + date + temperature | 815.8 | 1.01 |
| | light*temperature + date + weather | 816.3 | 1.54 |
| | light*date + weather + temperature | 816.9 | 2.07 |
| | light*date + light*weather + light*temperature | 818.2 | 3.43 |
| Great tit | light*weather + date + temperature | 1002.5 | 0.00 |
| | light*date + light*weather + light*temperature | 1004.8 | 2.32 |
| | light + date + weather + temperature | 1006.1 | 3.61 |
| | light*date + weather + temperature | 1007.2 | 4.71 |
| | light*temperature + date + weather | 1008.2 | 5.75 |
| Nuthatch | light + date + weather + temperature | 335.5 | 0.00 |
| | light*date + weather + temperature | 336.4 | 0.90 |
| | light*weather + date + temperature | 338.7 | 3.21 |
| | light*temperature + date + weather | 339.0 | 3.53 |
| | light*date + light*weather + light*temperature | 343.5 | 7.96 |
| Jay | light + date + weather + temperature | 384.2 | 0.00 |

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|--------------------|--|-------|------|
| | light*temperature + date + weather | 386.2 | 1.95 |
| | light*date + weather + temperature | 386.5 | 2.31 |
| | light*weather + date + temperature | 387.0 | 2.79 |
| | light*date + light*weather + light*temperature | 392.7 | 8.46 |
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| <i>Poecile sp.</i> | light + date + weather + temperature | 340.2 | 0.00 |
| | light*temperature + date + temperature | 341.3 | 1.11 |
| | light*weather + date + temperature | 342.9 | 2.71 |
| | light*date + weather + temperature | 343.8 | 3.65 |
| | light*date + light*weather + light*temperature | 349.1 | 8.89 |

^a The AIC_c measures the relative quality of a candidate model, adjusted for sample size, and is considered to be more relevant than AIC for temporal series

^b ΔAIC_c is defined as the AIC_c differences between two competing models. When $\Delta AIC_c > 2.0$, the difference between the two competing models is substantial (Burnham and Anderson 2002). When $\Delta AIC_c < 2.0$, the most parsimonious model is selected (final models are indicated in bold). Note that the same final models are obtained when we use backwards model selection (keeping interactions for which $P < 0.10$).

Table A2. Model selection using ΔAIC_c for the linear mixed models used at dusk.

| Species | Candidate models | AIC_c^a | ΔAIC_c^b |
|--------------------|--|-----------|------------------|
| Blue tit | light*temperature + date + weather | 856.5 | 0.00 |
| | light + date + weather + temperature | 857.6 | 1.02 |
| | light*date + weather + temperature | 858.7 | 2.16 |
| | light*weather + date + temperature | 859.7 | 3.17 |
| | light*date + light*weather + light*temperature | 860.4 | 3.86 |
| <i>Poecile sp.</i> | light + date + weather + temperature | 283.7 | 0.00 |
| | light*weather + date + temperature | 286.5 | 2.84 |
| | light*date + weather + temperature | 287.1 | 3.37 |
| | light*temperature + date + weather | 287.4 | 3.69 |
| | light*date + light*weather + light*temperature | 294.1 | 10.44 |
| Great tit | light + date + weather + temperature | 934.5 | 0.00 |
| | light*temperature + date + weather | 935.5 | 1.00 |
| | light*weather + date + temperature | 936.7 | 2.27 |
| | light*date + weather + temperature | 936.8 | 2.36 |
| | light*date + light*weather + light*temperature | 939.2 | 4.68 |
| Nuthatch | light + date + weather + temperature | 241.4 | 0.00 |
| | light*temperature + date + weather | 241.7 | 0.30 |
| | light*weather + date + temperature | 244.7 | 3.35 |
| | light*date + weather + temperature | 244.8 | 3.40 |
| | light*date + light*weather + light*temperature | 249.0 | 7.64 |
| Blackbird | light + date + weather + temperature | 463.5 | 0.00 |

| | | |
|--|-------|------|
| light*weather + date + temperature | 466.2 | 2.69 |
| light*date + weather + temperature | 466.6 | 3.13 |
| light*temperature + date + weather | 466.7 | 3.14 |
| light*date + light*weather + light*temperature | 473.0 | 9.47 |