The Canadian Field-Naturalist

Supplementary Material:

Dawn singing in Brown Creeper (*Certhia americana*)

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Table S1. Summary of recording dates from 11 autonomous recording units deployed 2015–2017 including recorder failures and the mean (± SE) length of post-sunrise recording.

Recorder ID	Year	First recording	Last recording	Recorder failures	Dates without recordings	Length of recording after sunrise (min ± SE (*n*))
PIN04	2015	2-Apr	20-Aug	26	12–15 Apr; 6, 21–22 May; 3–11, 13–22 June	41.1 ± 2.70 (104)
PIN09	2015	2-Apr	20-Aug	6	26–29 Apr; 6 May; 28 July	43.5 ± 2.17 (115)
PIN11	2015	2-Apr	20-Aug	0		55.8 ± 3.93 (123)
PIN14	2015	2-Apr	20-Aug	13	30 Apr–5 May; 15–20 Aug	54.8 ± 3.17 (111)
PIN03	2016	29-Mar	1-Sep	49	2–7 Apr ; 17 Apr–18 May; 13–17 June; 27 Aug–1 Sept	77.3 ± 3.50 (107)
PIN07	2016	29-Mar	1-Sep	36	31 Mar; 2–7 Apr; 23 Apr–18 May; 15–17 June	57.4 ± 5.23 (117)
PIN10	2016	29-Mar	1-Sep	26	1–7, 17–22 Apr; 11, 26–29 June; 6–9 Aug; 29 Aug–1 Sept	28.9 ± 2.00 (127)
PIN02	2017	31-Mar	31-Aug	15	7–19 May; 30–31 Aug	95.9 ± 2.40 (139)
PIN05	2017	31-Mar	31-Aug	6	16–19 May; 30–31 Aug	103.2 ± 2.66 (148)
PIN06	2017	31-Mar	31-Aug	7	7–13 Apr	109.3 ± 10.94 (147)
PIN12	2017	31-Mar	31-Aug	13	7–13 Apr; 26–31 Aug	102.5 ± 3.27 (140)

Table S2. Results of binomial generalized additive mixed models for the presence/absence i) of Brown Creeper (*Certhia americana*) songs (n = 1335) and ii) pre-dawn singing (n = 726), including the estimated degrees of freedom (edf) for the smooth term, total variance explained (adjusted r^2), SE, and F-, t-, and P-values. Model specifications listed in the form: response ~ predictors, with 's()' indicating the smooth term. All models contain location as a random effect.

Model	Smooth term				Fixed effects			
	edf	Adjusted r^2	F	P	Estimate	SE	t	P
i) Full model: Brown Creeper singing ~ s(date) + year (AIC = 6296.8)								
Date	3.12	0.234	26.93	< 0.0001				
Year (2016)					1.564	0.632	2.47	0.01
Year (2017)					1.160	0.582	1.99	0.05
Best model: Brown Creeper singing ~ s(date) (AIC = 6299.1)								
Date	3.11	0.163	26.87	< 0.0001				
ii) Full model: pre-dawn songs ~ s(date) + year (AIC = 3565.4)								
Date	5.42	0.307	14.14	< 0.0001				
Year (2016)					1.132	0.574	1.97	0.05
Year (2017)					0.882	0.527	1.67	0.09
Best model: pre-dawn songs ~ s(date) (AIC = 3556.9)								
Date	5.42	0.294	14.09	< 0.0001				

TABLE S3. Results of generalized additive mixed models for i) start time relative to sunrise and ii) total duration of Brown Creeper (*Certhia americana*) dawn chorus, including the estimated degrees of freedom (edf) for the smooth term, total variance explained (adjusted r^2), SE, and *F*-, *t*-, and *P*-values ($n = 466$). Model specifications listed in the form: response ~ predictors, with 's()' indicating the smooth term. All models contain location as a random effect.

Model	Smooth term				Fixed effects			
	edf	Adjusted r^2	*F*	*P*	Estimate	SE	*t*	*P*
i) Full model: start time ~ s(date) + year (AIC = 3426.7)								
Date	4.65	0.14	8.21	< 0.0001				
Year (2016)					0.428	1.29	0.33	0.74
Year (2017)					−0.760	1.19	−0.64	0.52
Best model: start time ~ s(date) (AIC = 3428.1)								
Date	4.70	0.14	8.51	< 0.0001				
ii) Full model*: total duration ~ s(date) + year (AIC = 3359.3)								
Date	3.96	0.17	5.17	< 0.0001				
Year (2016)					6.309	2.72	2.31	0.02
Year (2017)					4.881	2.54	1.92	0.05

*Indicates full model is also the best model.

TABLE S4. Results of generalized linear mixed models for Brown Creeper (*Certhia americana*) pre-sunrise song rate (songs/min; $n = 466$) and comparison of pre- and post-sunrise song rate (songs/min; $n = 808$). Model specifications listed in the form: response ~ predictors. All models contain location as a random effect.

Fixed effects	Estimate	SE	df	*t*	*P*
Pre-sunrise song rate					
Full model: pre-dawn song rate ~ year + date (AIC = 1791.8)					
Year (2016)	0.240	0.466	8.7	0.52	0.620
Year (2017)	0.050	0.438	9.0	0.10	0.920
Start time	0.012	0.007	455.0	1.62	0.105
Date	−0.030	0.002	460.4	−13.00	0.170
Pre-sunrise vs. post-sunrise song rate					
Full model: song rate ~ year + period of day + date (AIC = 3142)					
Year (2016)	−0.290	0.340	8.8	−0.85	0.934
Year (2017)	−0.201	0.317	9.1	−0.63	0.543
Period of day	0.316	0.122	803.0	2.60	0.009
Date	−0.002	0.002	803.0	−1.66	0.098
Best model: song rate ~ period of day (AIC = 3127)					
Period of day	0.654	1.119	805.5	2.98	0.003