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Appendix 1

Table A1. Description of time of activity estimates for the lizard *Tropidurus torquatus* across known occurrence points. Sinusoidal method measured hours above or between temperature thresholds by simulating daily temperature variation from macroclimate data. Operative temperature method used on site measures of daily temperature variation at different microhabitats and then extrapolated those measures to areas not sampled. Microclim used the microclimate surfaces developed by Kearney et al. (2014), which simulate temperature variation at different shade levels. Each method counted the number of hours spent at specific body temperature ranges, obtained either from laboratory gradient experiments or field observations: above preferred temperature (lab: $T_{pref}=31.51^{\circ}\text{C}$, field: $T_{pref}=32.65^{\circ}\text{C}$), between interquartile temperatures (lab: $T_{50_lwr}=26.68^{\circ}\text{C}$, $T_{50_upr}=36.6^{\circ}\text{C}$, field: $T_{50_lwr}=30.9^{\circ}\text{C}$, $T_{50_upr}=34.6^{\circ}\text{C}$) or between 90th quantile temperatures (lab: $T_{90_lwr}=20.8^{\circ}\text{C}$, $T_{90_upr}=38.67^{\circ}\text{C}$, field: $T_{90_lwr}=28^{\circ}\text{C}$, $T_{90_upr}=36.4^{\circ}\text{C}$). For the operative and microclim methods, we also created versions of the variables that simulate thermoregulation, by choosing whichever microhabitat allowed the most time of activity at each time step, instead of averaging across microhabitats.

Name	Method	Temperature range	Origin	Thermoregulation
<i>sin_tp_lab</i>	Sinusoid	$T_b > T_{pref}$	lab pooled	no
<i>sin_tp_lab_ind</i>	Sinusoid	$T_b > T_{pref}$	lab individual	no
<i>sin_tp_field</i>	Sinusoid	$T_b > T_{pref}$	field	no
<i>sin_t50_lwr_lab</i>	Sinusoid	$T_b > T_{50_lwr}$	lab pooled	no

<i>sin_t50_lwr_lab_ind</i>	Sinusoid	$T_b > T_{50_lwr}$	lab individual	no
<i>sin_t50_lwr_field</i>	Sinusoid	$T_b > T_{50_lwr}$	field	no
<i>sin_t90_lwr_lab</i>	Sinusoid	$T_b > T_{90_lwr}$	lab pooled	no
<i>sin_t90_lwr_lab_ind</i>	Sinusoid	$T_b > T_{90_lwr}$	lab individual	no
<i>sin_t90_lwr_field</i>	Sinusoid	$T_b > T_{90_lwr}$	field	no
<i>sin_t50_upr_lab</i>	Sinusoid	$T_b > T_{50_upr}$	lab pooled	no
<i>sin_t50_upr_lab_ind</i>	Sinusoid	$T_b > T_{50_upr}$	lab individual	no
<i>sin_t50_upr_field</i>	Sinusoid	$T_b > T_{50_upr}$	field	no
<i>sin_t90_upr_lab</i>	Sinusoid	$T_b > T_{90_upr}$	lab pooled	no
<i>sin_t90_upr_lab_ind</i>	Sinusoid	$T_b > T_{90_upr}$	lab individual	no
<i>sin_t90_upr_field</i>	Sinusoid	$T_b > T_{90_upr}$	field	no
<i>sin_t50_lab</i>	Sinusoid	$T_{50_lwr} < T_b < T_{50_upr}$	lab pooled	no
<i>sin_t50_lab_ind</i>	Sinusoid	$T_{50_lwr} < T_b < T_{50_upr}$	lab individual	no
<i>sin_t50_field</i>	Sinusoid	$T_{50_lwr} < T_b < T_{50_upr}$	field	no
<i>sin_t90_lab</i>	Sinusoid	$T_{90_lwr} < T_b < T_{90_upr}$	lab pooled	no
<i>sin_t90_lab_ind</i>	Sinusoid	$T_{90_lwr} < T_b < T_{90_upr}$	lab individual	no
<i>sin_t90_field</i>	Sinusoid	$T_{90_lwr} < T_b < T_{90_upr}$	field	no
<i>op_tp_lab_avg</i>	Operative	$T_b > T_{pref}$	lab pooled	no
<i>op_tp_lab_ind_avg</i>	Operative	$T_b > T_{pref}$	lab individual	no

<i>op_tp_field_avg</i>	Operative	$T_b > T_{pref}$	field	no
<i>op_t50_lwr_lab_avg</i>	Operative	$T_b > T_{50_lwr}$	lab pooled	no
<i>op_t50_lwr_lab_ind_avg</i>	Operative	$T_b > T_{50_lwr}$	lab individual	no
<i>op_t50_lwr_field_avg</i>	Operative	$T_b > T_{50_lwr}$	field	no
<i>op_t90_lwr_lab_avg</i>	Operative	$T_b > T_{90_lwr}$	lab pooled	no
<i>op_t90_lwr_lab_ind_avg</i>	Operative	$T_b > T_{90_lwr}$	lab individual	no
<i>op_t90_lwr_field_avg</i>	Operative	$T_b > T_{90_lwr}$	field	no
<i>op_t50_upr_lab_avg</i>	Operative	$T_b > T_{50_upr}$	lab pooled	no
<i>op_t50_upr_lab_ind_avg</i>	Operative	$T_b > T_{50_upr}$	lab individual	no
<i>op_t50_upr_field_avg</i>	Operative	$T_b > T_{50_upr}$	field	no
<i>op_t90_upr_lab_avg</i>	Operative	$T_b > T_{90_upr}$	lab pooled	no
<i>op_t90_upr_lab_ind_avg</i>	Operative	$T_b > T_{90_upr}$	lab individual	no
<i>op_t90_upr_field_avg</i>	Operative	$T_b > T_{90_upr}$	field	no
<i>op_t50_lab_avg</i>	Operative	$T_{50_lwr} < T_b < T_{50_upr}$	lab pooled	no
<i>op_t50_lab_ind_avg</i>	Operative	$T_{50_lwr} < T_b < T_{50_upr}$	lab individual	no
<i>op_t50_field_avg</i>	Operative	$T_{50_lwr} < T_b < T_{50_upr}$	field	no
<i>op_t90_lab_avg</i>	Operative	$T_{90_lwr} < T_b < T_{90_upr}$	lab pooled	no
<i>op_t90_lab_ind_avg</i>	Operative	$T_{90_lwr} < T_b < T_{90_upr}$	lab individual	no
<i>op_t90_field_avg</i>	Operative	$T_{90_lwr} < T_b < T_{90_upr}$	field	no

<i>op_tp_lab_min</i>	Operative	$T_b > T_{pref}$	lab pooled	yes
<i>op_tp_lab_ind_min</i>	Operative	$T_b > T_{pref}$	lab individual	yes
<i>op_tp_field_min</i>	Operative	$T_b > T_{pref}$	field	yes
<i>op_t50_lwr_lab_max</i>	Operative	$T_b > T_{50_lwr}$	lab pooled	yes
<i>op_t50_lwr_lab_ind_max</i>	Operative	$T_b > T_{50_lwr}$	lab individual	yes
<i>op_t50_lwr_field_max</i>	Operative	$T_b > T_{50_lwr}$	field	yes
<i>op_t90_lwr_lab_max</i>	Operative	$T_b > T_{90_lwr}$	lab pooled	yes
<i>op_t90_lwr_lab_ind_max</i>	Operative	$T_b > T_{90_lwr}$	lab individual	yes
<i>op_t90_lwr_field_max</i>	Operative	$T_b > T_{90_lwr}$	field	yes
<i>op_t50_upr_lab_min</i>	Operative	$T_b > T_{50_upr}$	lab pooled	yes
<i>op_t50_upr_lab_ind_min</i>	Operative	$T_b > T_{50_upr}$	lab individual	yes
<i>op_t50_upr_field_min</i>	Operative	$T_b > T_{50_upr}$	field	yes
<i>op_t90_upr_lab_min</i>	Operative	$T_b > T_{90_upr}$	lab pooled	yes
<i>op_t90_upr_lab_ind_min</i>	Operative	$T_b > T_{90_upr}$	lab individual	yes
<i>op_t90_upr_field_min</i>	Operative	$T_b > T_{90_upr}$	field	yes
<i>op_t50_lab_max</i>	Operative	$T_{50_lwr} < T_b < T_{50_upr}$	lab pooled	yes
<i>op_t50_lab_ind_max</i>	Operative	$T_{50_lwr} < T_b < T_{50_upr}$	lab individual	yes
<i>op_t50_field_max</i>	Operative	$T_{50_lwr} < T_b < T_{50_upr}$	field	yes
<i>op_t90_lab_max</i>	Operative	$T_{90_lwr} < T_b < T_{90_upr}$	lab pooled	yes

<i>op_t90_lab_ind_max</i>	Operative	$T_{90_lwr} < T_b < T_{90_upr}$	lab individual	yes
<i>op_t90_field_max</i>	Operative	$T_{90_lwr} < T_b < T_{90_upr}$	field	yes
<i>mc_tp_lab_avg</i>	Microclim	$T_b > T_{pref}$	lab pooled	no
<i>mc_tp_lab_ind_avg</i>	Microclim	$T_b > T_{pref}$	lab individual	no
<i>mc_tp_field_avg</i>	Microclim	$T_b > T_{pref}$	field	no
<i>mc_t50_lwr_lab_avg</i>	Microclim	$T_b > T_{50_lwr}$	lab pooled	no
<i>mc_t50_lwr_lab_ind_avg</i>	Microclim	$T_b > T_{50_lwr}$	lab individual	no
<i>mc_t50_lwr_field_avg</i>	Microclim	$T_b > T_{50_lwr}$	field	no
<i>mc_t90_lwr_lab_avg</i>	Microclim	$T_b > T_{90_lwr}$	lab pooled	no
<i>mc_t90_lwr_lab_ind_avg</i>	Microclim	$T_b > T_{90_lwr}$	lab individual	no
<i>mc_t90_lwr_field_avg</i>	Microclim	$T_b > T_{90_lwr}$	field	no
<i>mc_t50_upr_lab_avg</i>	Microclim	$T_b > T_{50_upr}$	lab pooled	no
<i>mc_t50_upr_lab_ind_avg</i>	Microclim	$T_b > T_{50_upr}$	lab individual	no
<i>mc_t50_upr_field_avg</i>	Microclim	$T_b > T_{50_upr}$	field	no
<i>mc_t90_upr_lab_avg</i>	Microclim	$T_b > T_{90_upr}$	lab pooled	no
<i>mc_t90_upr_lab_ind_avg</i>	Microclim	$T_b > T_{90_upr}$	lab individual	no
<i>mc_t90_upr_field_avg</i>	Microclim	$T_b > T_{90_upr}$	field	no
<i>mc_t50_lab_avg</i>	Microclim	$T_{50_lwr} < T_b < T_{50_upr}$	lab pooled	no
<i>mc_t50_lab_ind_avg</i>	Microclim	$T_{50_lwr} < T_b < T_{50_upr}$	lab individual	no

<i>mc_t50_field_avg</i>	Microclim	$T_{50_lwr} < T_b < T_{50_upr}$	field	no
<i>mc_t90_lab_avg</i>	Microclim	$T_{90_lwr} < T_b < T_{90_upr}$	lab pooled	no
<i>mc_t90_lab_ind_avg</i>	Microclim	$T_{90_lwr} < T_b < T_{90_upr}$	lab individual	no
<i>mc_t90_field_avg</i>	Microclim	$T_{90_lwr} < T_b < T_{90_upr}$	field	no
<i>mc_tp_lab_min</i>	Microclim	$T_b > T_{pref}$	lab pooled	yes
<i>mc_tp_lab_ind_min</i>	Microclim	$T_b > T_{pref}$	lab individual	yes
<i>mc_tp_field_min</i>	Microclim	$T_b > T_{pref}$	field	yes
<i>mc_t50_lwr_lab_max</i>	Microclim	$T_b > T_{50_lwr}$	lab pooled	yes
<i>mc_t50_lwr_lab_ind_max</i>	Microclim	$T_b > T_{50_lwr}$	lab individual	yes
<i>mc_t50_lwr_field_max</i>	Microclim	$T_b > T_{50_lwr}$	field	yes
<i>mc_t90_lwr_lab_max</i>	Microclim	$T_b > T_{90_lwr}$	lab pooled	yes
<i>mc_t90_lwr_lab_ind_max</i>	Microclim	$T_b > T_{90_lwr}$	lab individual	yes
<i>mc_t90_lwr_field_max</i>	Microclim	$T_b > T_{90_lwr}$	field	yes
<i>mc_t50_upr_lab_min</i>	Microclim	$T_b > T_{50_upr}$	lab pooled	yes
<i>mc_t50_upr_lab_ind_min</i>	Microclim	$T_b > T_{50_upr}$	lab individual	yes
<i>mc_t50_upr_field_min</i>	Microclim	$T_b > T_{50_upr}$	field	yes
<i>mc_t90_upr_lab_min</i>	Microclim	$T_b > T_{90_upr}$	lab pooled	yes
<i>mc_t90_upr_lab_ind_min</i>	Microclim	$T_b > T_{90_upr}$	lab individual	yes
<i>mc_t90_upr_field_min</i>	Microclim	$T_b > T_{90_upr}$	field	yes

<i>mc_t50_lab_max</i>	Microclim	$T_{50_lwr} < T_b < T_{50_upr}$	lab pooled	yes
<i>mc_t50_lab_ind_max</i>	Microclim	$T_{50_lwr} < T_b < T_{50_upr}$	lab individual	yes
<i>mc_t50_field_max</i>	Microclim	$T_{50_lwr} < T_b < T_{50_upr}$	field	yes
<i>mc_t90_lab_max</i>	Microclim	$T_{90_lwr} < T_b < T_{90_upr}$	lab pooled	yes
<i>mc_t90_lab_ind_max</i>	Microclim	$T_{90_lwr} < T_b < T_{90_upr}$	lab individual	yes
<i>mc_t90_field_max</i>	Microclim	$T_{90_lwr} < T_b < T_{90_upr}$	field	yes

Table A2. Median, standard deviation (SD) and importance indexes of each estimate of time of activity to predict distribution of *Tropidurus torquatus*, under Random Forest (RF) and Gradient Boosting (GB) algorithms. The importance index used for RF was mean decrease in accuracy and for GB was relative influence. Variables ranked above environmental temperatures, are in bold and include their ranks on parenthesis. Precipitation was included as a covariate. Detailed description of variables can be found on Table A1.

Variable	Median	SD	RF (rank)	GB (rank)
sin_t90_lwr_lab	11.553	1.202	0.041 (1)	0.141 (2)
sin_t90_lab	11.553	1.202	0.040 (2)	0.000
prec	119.601	20.909	0.036 (3)	0.212 (1)
mc_t50_lab_avg	4.882	0.777	0.026 (4)	0.076 (3)
mc_t50_lab_ind_avg	1.661	0.348	0.023 (5)	0.005
mc_t90_lab_ind_avg	3.485	0.653	0.022 (6)	0.008 (20)
mc_t90_field_avg	3.983	0.752	0.022 (7)	0.016 (11)
mc_t50_field_avg	1.641	0.360	0.018 (8)	0.032 (6)
mc_tp_lab_min	0.239	0.450	0.017 (9)	0.008 (19)
mc_tp_lab_ind_min	0.203	0.388	0.017 (10)	0.040 (5)
mc_t90_lab_avg	8.905	0.931	0.015 (11)	0.024 (8)
mc_t50_upr_lab_avg	1.677	1.004	0.013 (12)	0.000
mc_t90_upr_field_avg	1.735	1.016	0.013 (13)	0.017 (10)
mc_t90_lab_max	10.409	0.814	0.013 (14)	0.000
mc_t90_lwr_lab_max	10.409	0.814	0.012 (15)	0.012 (14)

mc_t50_lab_max	8.563	1.019	0.012 (16)	0.000
mc_t90_upr_lab_avg	1.138	0.842	0.011 (17)	0.000
mc_t90_lwr_lab_avg	9.816	1.186	0.011 (18)	0.010 (16)
mc_t50_lwr_lab_max	8.563	1.019	0.011 (19)	0.000
mc_tp_lab_avg	3.644	1.403	0.010 (20)	0.000
mc_t50_upr_field_avg	2.330	1.161	0.010 (21)	0.000
mc_tp_lab_ind_avg	3.568	1.386	0.010 (22)	0.003
mc_t90_lwr_field_max	8.111	1.148	0.010 (23)	0.000
mc_t50_lwr_field_avg	3.972	1.467	0.010 (24)	0.000
mc_t90_field_max	8.111	1.148	0.010 (25)	0.000
mc_tp_field_min	0.065	0.150	0.010 (26)	0.013 (13)
mc_t90_upr_lab_ind_avg	2.125	1.113	0.009 (27)	0.000
mc_t50_lwr_lab_avg	6.559	1.588	0.009 (28)	0.000
mc_t90_lwr_field_avg	5.717	1.636	0.009 (29)	0.000
op_t90_lab_max	9.339	0.415	0.009 (30)	0.000
mc_t90_lwr_lab_ind_avg	5.610	1.636	0.008 (31)	0.000
tavg	22.892	2.150	0.008	0.007
sin_t90_field	4.252	2.975	0.008	0.000
mc_tp_field_avg	3.111	1.302	0.008	0.006
mc_t50_field_max	6.904	1.369	0.008	0.021 (9)

sin_t90_lwr_field	4.252	2.975	0.008	0.000
mc_t50_lwr_field_max	6.904	1.369	0.008	0.001
mc_t90_lab_ind_max	8.048	1.171	0.008	0.000
mc_t50_lwr_lab_ind_avg	4.483	1.543	0.008	0.000
mc_t90_lwr_lab_ind_max	8.048	1.171	0.008	0.000
mc_t50_upr_lab_ind_avg	2.822	1.257	0.007	0.002
sin_t50_lab	6.072	3.119	0.007	0.000
sin_t50_lwr_lab	6.072	3.119	0.007	0.005
op_t90_field_max	3.703	1.297	0.007	0.000
sin_t90_lwr_lab_ind	4.028	2.950	0.007	0.027 (7)
sin_t90_lab_ind	4.028	2.950	0.007	0.000
op_t90_lwr_lab_avg	8.005	0.987	0.007	0.054 (4)
op_t90_lab_avg	7.793	0.773	0.007	0.011 (15)
op_t90_upr_field_avg	0.400	0.446	0.007	0.000
tmax	28.678	2.396	0.007	0.009 (18)
op_t50_field_avg	0.450	0.504	0.007	0.000
op_t50_upr_lab_avg	0.399	0.437	0.007	0.000
op_t90_lwr_lab_max	9.343	0.420	0.006	0.007 (21)
op_t90_lwr_field_max	3.715	1.323	0.006	0.000
op_t90_lab_ind_max	3.596	1.262	0.006	0.004

sin_t50_lwr_lab_ind	2.043	2.334	0.006	0.000
sin_tp_lab	0.858	1.437	0.006	0.004
op_t50_field_max	1.645	1.336	0.006	0.003
mc_t50_lab_ind_max	7.281	1.284	0.006	0.019 (10)
op_t50_lwr_field_avg	0.909	1.094	0.006	0.000
op_t50_lwr_field_max	1.693	1.428	0.006	0.009 (17)
op_tp_lab_ind_avg	0.840	1.007	0.006	0.000
sin_tp_lab_ind	0.767	1.358	0.006	0.000
op_t50_lab_ind_avg	0.414	0.452	0.006	0.000
sin_t50_field	1.249	1.801	0.006	0.000
op_t90_lab_ind_avg	1.318	0.871	0.005	0.000
op_t50_lwr_lab_ind_avg	1.084	1.220	0.005	0.002
op_t50_lwr_lab_ind_max	2.366	1.363	0.005	0.014 (12)
op_t90_upr_lab_ind_avg	0.448	0.569	0.005	0.000
sin_t50_lwr_field	1.256	1.821	0.005	0.001
op_t90_lwr_lab_ind_avg	1.766	1.419	0.005	0.000
op_tp_lab_avg	0.856	1.021	0.005	0.000
op_t50_upr_field_avg	0.458	0.602	0.005	0.000
op_t50_lab_max	4.498	1.213	0.005	0.000
op_t90_lwr_field_avg	1.924	1.443	0.005	0.006

op_t50_lab_ind_max	2.256	1.179	0.005	0.000
op_tp_lab_ind_min	0.325	0.540	0.005	0.000
op_tp_lab_min	0.331	0.554	0.005	0.000
op_t50_upr_lab_ind_avg	0.670	0.779	0.005	0.000
op_t50_lwr_lab_avg	2.935	1.396	0.005	0.000
op_t50_lab_avg	2.536	0.984	0.005	0.000
op_t90_field_avg	1.524	1.013	0.005	0.000
op_tp_field_avg	0.718	0.849	0.005	0.000
sin_t50_lab_ind	1.928	2.107	0.005	0.004
op_t90_lwr_lab_ind_max	3.628	1.322	0.005	0.000
mc_t50_upr_lab_ind_min	0.024	0.069	0.005	0.001
op_tp_field_min	0.163	0.323	0.005	0.000
op_t50_lwr_lab_max	4.512	1.240	0.004	0.000
mc_t50_lwr_lab_ind_max	7.305	1.314	0.004	0.000
sin_tp_field	0.301	0.744	0.004	0.000
op_t90_upr_lab_avg	0.212	0.296	0.004	0.005
sin_t50_upr_lab_ind	0.115	0.408	0.003	0.000
op_t50_upr_lab_ind_min	0.109	0.237	0.003	0.000
op_t50_upr_lab_min	0.014	0.064	0.002	0.000
op_t90_upr_lab_ind_min	0.032	0.110	0.002	0.000

op_t50_upr_field_min	0.049	0.138	0.002	0.000
op_t90_upr_field_min	0.012	0.058	0.002	0.000
mc_t50_upr_field_min	0.000	0.000	0.001	0.000
sin_t90_upr_lab_ind	0.000	0.000	0.000	0.000
mc_t90_upr_lab_ind_min	0.000	0.000	0.000	0.000
sin_t50_upr_lab	0.000	0.000	0.000	0.000
sin_t90_upr_lab	0.000	0.000	0.000	0.000
sin_t90_upr_field	0.000	0.000	0.000	0.000
mc_t50_upr_lab_min	0.000	0.000	0.000	0.000
mc_t90_upr_lab_min	0.000	0.000	0.000	0.000
mc_t90_upr_field_min	0.000	0.000	0.000	0.000
op_t90_upr_lab_min	0.003	0.026	0.000	0.000
sin_t50_upr_field	0.007	0.054	0.000	0.000