SUPPLEMENT

Figure S1. Two example photos from camera trapping method representing insects of either different sizes or different distances from the camera.

Sensitivity Analysis for Count of Dense Insect Patches

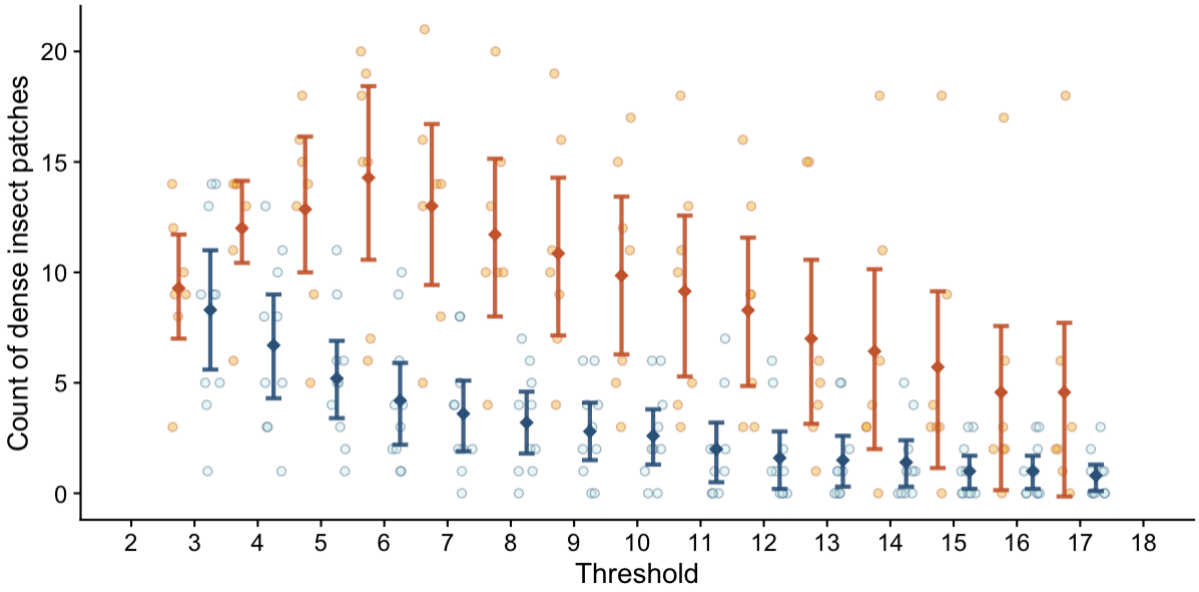

Figure S2. For most insect count threshold values (for signifying the occurrence of an insect patch or “swarm” in a single photo), the number of insect patches per monitoring night across all locations is significantly larger in the dry season, and this difference narrows steadily with

increasing thresholds values, so our choice of a threshold of ≥10 insects in our analyses represents a conservative approach.

Table S1. As the threshold value increases from 3 to 17, the difference between the dry and wet season means peaks at a threshold of 6 insects, and then decreases overall, with some fluctuations at certain threshold values. The largest fluctuations, however, do not occur at the threshold of ≥10 insects, so our results in number of patches per monitoring night across all locations are conservative.

	Dry-Wet Mean	**% Change in**	**# Observations**	
Threshold	**Difference**	**Difference**	**Dry Season**	**Wet Season**
3	0.99		7	10
4	5.30	437.14%	7	10
5	7.66	44.6%	7	10
6	10.09	31.7%	7	10
7	9.40	-6.8%	7	10
8	8.51	9.4%	7	10
9	8.06	-5.4%	7	10
10	7.26	-9.9%	7	10
11	7.14	-1.6%	7	10
12	6.69	-6.4%	7	10
13	5.50	-17.8%	7	10
14	5.03	-8.6%	7	10
15	4.71	-6.3%	7	10
16	3.57	-24.2%	7	10
17	3.77	5.6%	7	10

Sensitivity Analysis for Persistence of Dense Insect Patches

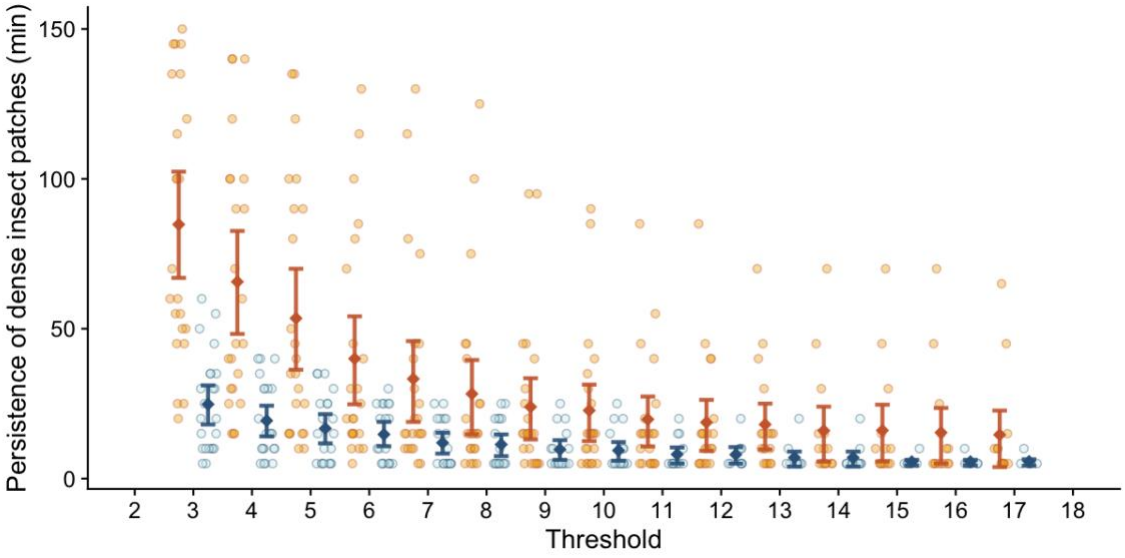

Figure S3. For most insect count threshold values (for signifying the occurrence of an insect patch or "swarm" in a single photo), the persistence or duration of the patch is significantly longer in the dry season, and this difference narrows with decreasing sample size at higher thresholds values, so our choice of a threshold of ≥10 insects in our analyses represents a conservative approach.

Table S2. As the threshold value increases from 3 to 17, the difference between the dry and wet season means decreases overall, with some fluctuations at certain threshold values. The largest fluctuations, however, do not occur at the threshold of ≥10 insects, so our results of persistence of insect patches are conservative.

	Dry-Wet Mean	% Change in	# Observations	
Threshold	**Difference**	**Difference**	**Dry Season**	**Wet Season**
3	60.00		23	23
4	46.33	-22.8%	23	22
5	36.73	-20.7%	23	20

6	25.26	-31.2%	23	19
7	21.32	-15.6%	23	18
8	16.87	-20.8%	23	18
9	14.23	-15.7%	23	16
10	13.35	-6.1%	22	16
11	11.68	-12.5%	21	13
12	10.75	-8.0%	20	10
13	11.06	2.9%	18	10
14	9.00	-18.5%	15	10
15	10.45	16.1%	14	8
16	9.73	-6.8%	14	8
17	8.90	-8.6%	13	7

NMDS for Insects

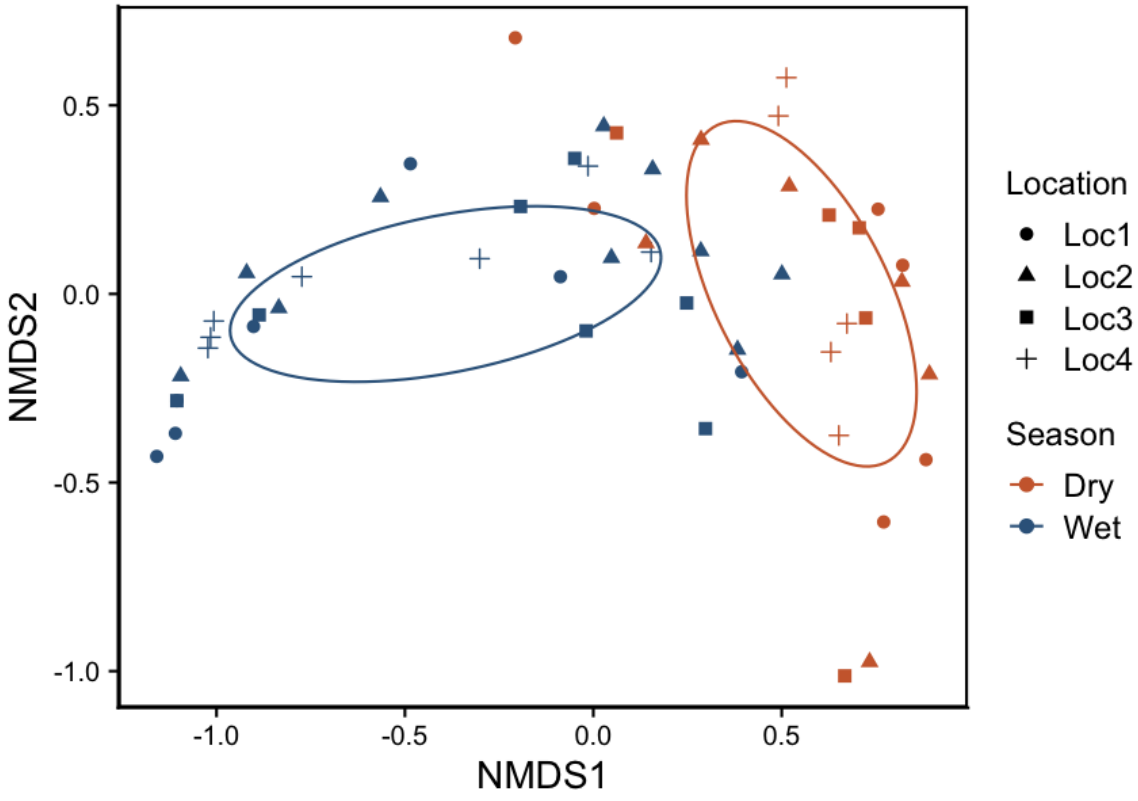

Figure S4. Insect location-monitoring nights cluster separately in Non-metric Multidimensional Scaling (NMDS) ordination space (stress = 0.06) along both axes according to season (color), indicating its strong effect on the variation in summary metrics, (1) mean and (2) maximum insects per photo per location-monitoring night, (3) number of photos with zero insects per location-monitoring night, (4) number of swarms per monitoring night across all locations, (5) persistence of swarms in single locations for photos. Location (point shape), however, do not cluster in ordination space, indicating its lack of effect on summary metrics. Ellipses are 95% confidence intervals of the standard deviation of the weighted averages of season. Permutation testing of season confirms that the factor of season is significant ($P < 0.001$; see Table S7).

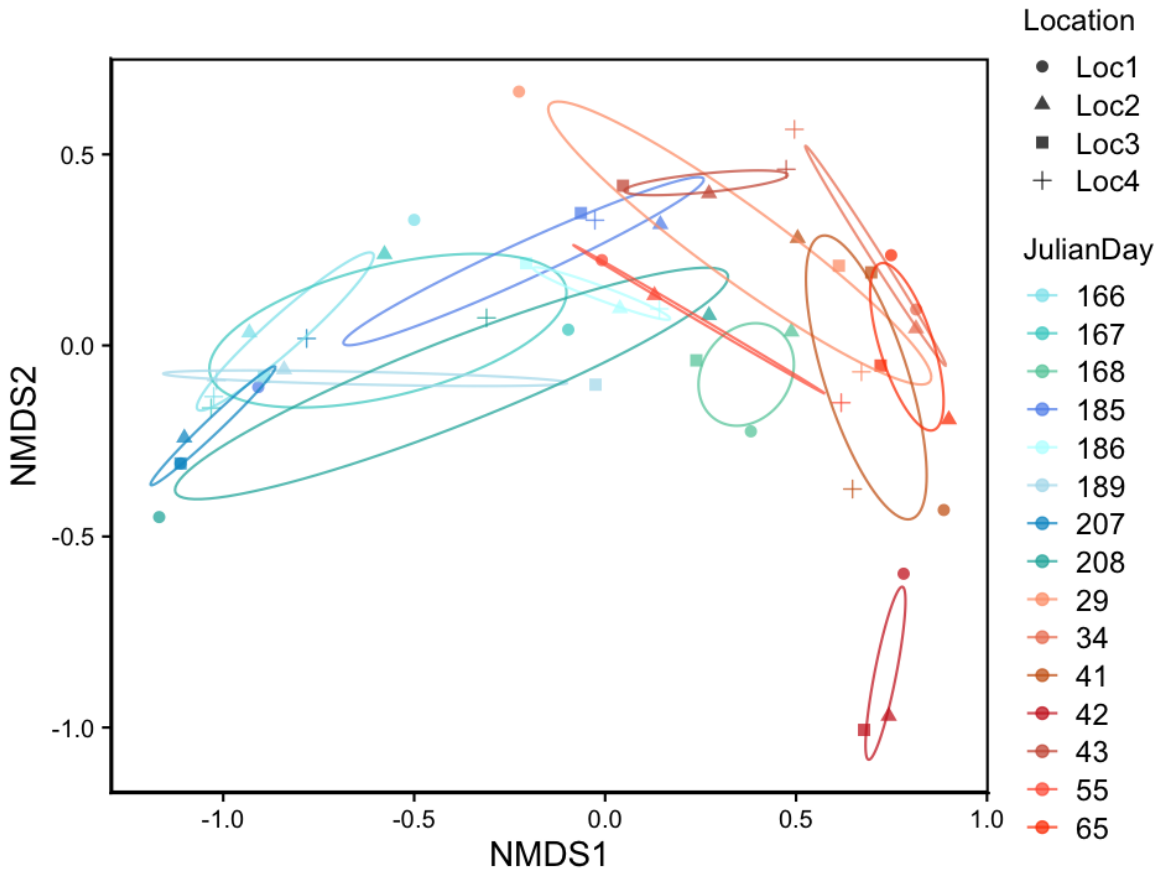

Figure S5. Insect location-monitoring nights cluster in NMDS ordination space (stress = 0.06) by season (color family; warm colors = dry, cool colors = wet) more strongly than monitoring night (individual color). Ellipses are 95% confidence intervals of the standard deviation of the weighted averages of monitoring night (factored sequentially within season). However, permutation testing of monitoring night shows that the factor is significant (P = 0.004; see Table S7).

Table S3. Results for NMDS of intrinsic variables for insect data.

Intrinsic variables	**NMDS1**	**NMDS2**	**r^2**	**P**
Mean	0.68	-0.74	0.84	0.001
Maximum	0.76	-0.65	0.79	0.001
Zero Count	-0.94	-0.34	0.94	0.001
Patch Count	0.39	-0.92	0.78	0.001
Patch Duration (min)	0.89	-0.46	0.66	0.001

Table S4. Results for NMDS of extrinsic variables for insect data.

Extrinsic variables	**NMDS1**	**NMDS2**	**r^2**	**P**
FACTORS				
Centroids				
Season				
Dry	0.55	0.00		
Wet	-0.39	-0.00		
Location				
Location 1	-0.11	-0.06		
Location 2	0.09	0.04		

Location 3	0.09	-0.04		
Location 4	-0.09	0.06		
Monitoring night				
(factored sequentially within season)				
Monitoring night 1	-0.32	0.15		
Monitoring night 2	0.08	0.14		
Monitoring night 3	0.56	0.08		
Monitoring night 4	0.22	-0.50		
Monitoring night 5	0.00	0.32		
Monitoring night 6	-0.13	-0.12		
Monitoring night 7	0.08	-0.04		
Monitoring night 8	0.34	-0.25		
Monitoring night 9	-1.02	-0.18		
Monitoring night 10	-0.39	-0.07		
Goodness of fit				
Season			0.39	0.001
Location			0.02	0.893
Monitoring night			0.37	0.007

NMDS for Bats

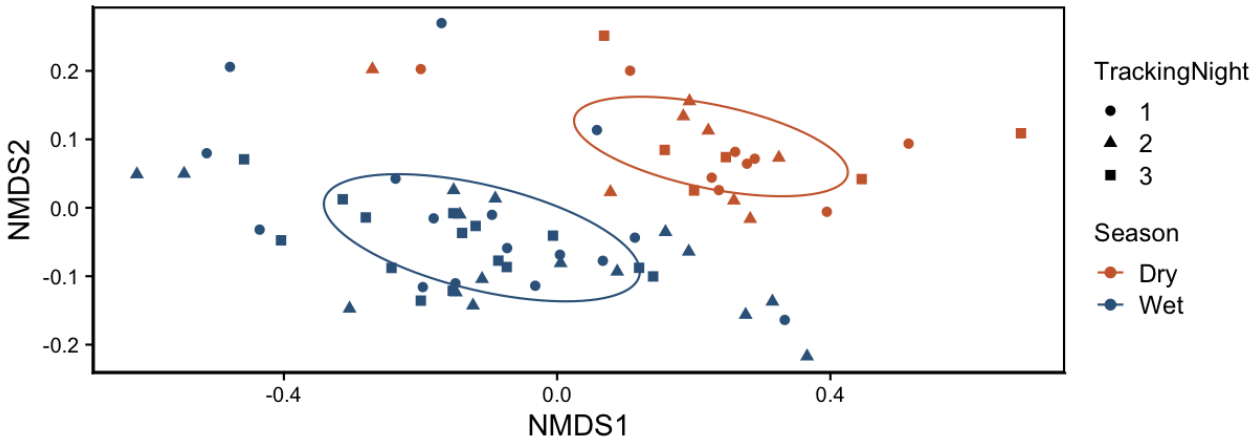

Figure S6a. Bat tracking nights cluster separately in NMDS ordination space (stress = 0.08) along both axes according to season (color), indicating its strong effect on the variation in summary metrics, (6) emergence time after sunset, (7) foraging bout duration, (8) duration of commuting-searching segments, (9) duration of ARS-feeding segments, (10) total commuting-searching duration per bout, (11) total ARS-feeding duration per bout, (12) proportion of foraging bout spent in ARS-feeding per bout, (13) maximum distance traveled from roost per bout, (14) total distance flown per bout, (15) minimum convex polygon around GPS points in ARS-feeding segments, and (16) number of patches visited per bout for each bat track. Consecutive tracking night (point shape), however, does not cluster in ordination space, indicating its lack of effect on summary metrics. Ellipses are 95% confidence intervals of the standard deviation of the weighted averages of season. Permutation testing of seasons shows that the factor is significant ($P < 0.001$; see Table S8).

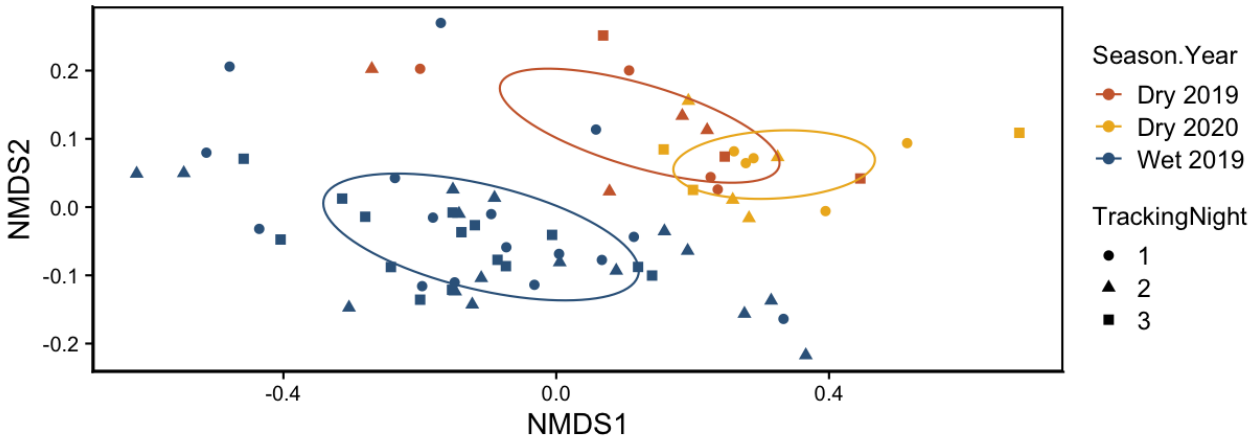

Figure S6b. Bat tracking nights cluster separately in NMDS ordination space (stress = 0.08) along both axes according to season but not year. The dry seasons from 2019 and 2020 overlap unlike the wet season from 2019. Ellipses are 95% confidence intervals of the standard deviation of the weighted averages of Season.Year. Permutation testing of Season.Year confirms that the factor is not significant (P = 0.061; see Table S8).

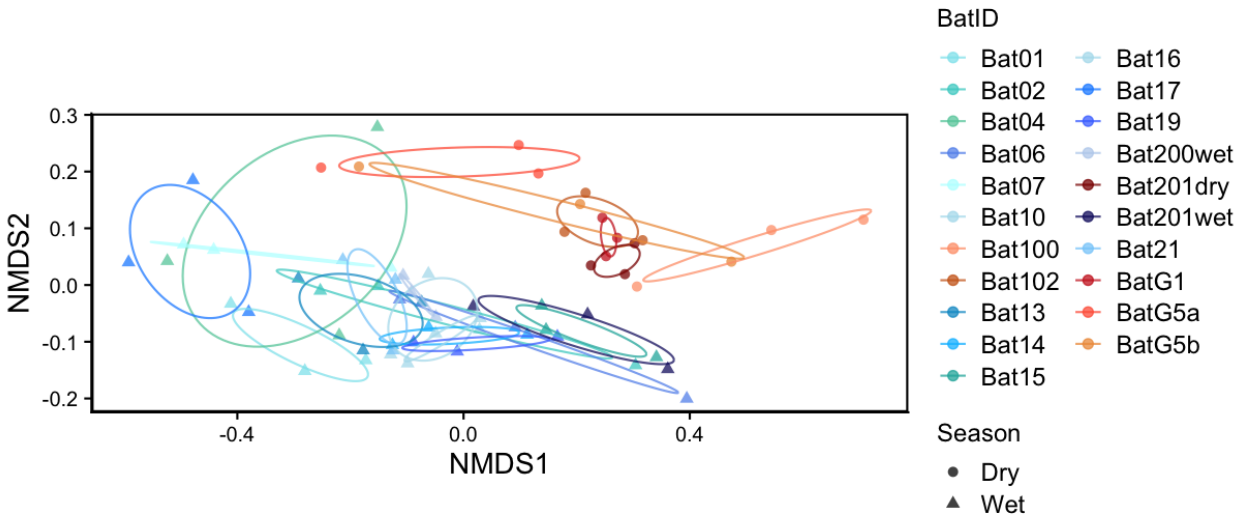

Figure S7. Bat individuals cluster in NMDS ordination space (stress = 0.08) according to the season in which they were tracked. Warm colors represent bats tracked in the dry season, and

cool colors, bats in the wet season. Bat201 was tracked in both seasons and its dry season data (dark red) clusters separately from its wet season data (dark blue). Ellipses could not be calculated for individuals with only 2 nights of tracking data and were excluded from this plot. Ellipses are 95% confidence intervals of the standard deviation of the weighted averages of bat ID. Permutation testing of bat ID, however, shows that the factor is significant ($P < 0.001$; see Table S8). Bat02 and Bat04 have the highest within and out-of-group disagreement in the wet season, and BatG5b in the dry season according to MRPP analysis (see Table S9 and S10).

Table S5. Results for NMDS of intrinsic variables for bat data.

Intrinsic variables	**NMDS1**	**NMDS2**	**r^2**	**P**
Emergence (min after sunset)	0.17	0.98	0.68	0.001
Foraging bout duration (min)	-0.96	0.29	0.97	0.001
Total time commuting-searching (min)	-0.98	-0.20	0.80	0.001
Total time ARS-feeding (min)	-0.55	0.84	0.54	0.001
Proportion of time ARS-feeding	0.74	0.67	0.65	0.001
Maximum distance travelled from roost (km)	-0.84	0.54	0.46	0.001
Total distance flown (km)	-0.97	0.25	0.88	0.001
N visited feeding patches	-0.97	-0.25	0.49	0.001

Table S6. Results for NMDS of extrinsic variables for bat data. Bat 200 and Bat 201 in red were tracked in both seasons.

Extrinsic variables	**NMDS1**	**NMDS2**	**r^2**	**P**
FACTORS				

Centroids			
Season			
	Dry	0.23	0.09
	Wet	-0.11	-0.04
Season-year			
	Dry 2019	0.12	0.12
	Dry 2020	0.32	0.06
	Wet 2019	-0.11	-0.04
Tracking night			
	Night 1	0.00	0.03
	Night 2	0.02	-0.02
	Night 3	-0.03	-0.01
Bat ID			
	Bat01	-0.31	-0.10
	Bat02	-0.06	-0.06
	Bat04	-0.32	0.08
	Bat06	0.10	-0.11
	Bat07	-0.37	0.06
	Bat09	0.11	0.04
	Bat10	-0.08	-0.07
	Bat13	-0.20	-0.03
	Bat14	-0.05	-0.09
	Bat15	0.18	-0.09
	Bat16	-0.06	-0.10
	Bat17	-0.50	0.07
	Bat19	-0.00	-0.11

Bat21	-0.18	-0.03
Bat200	-0.00	-0.01
Bat201	0.21	-0.03
Bat100	0.49	0.06
Bat102	0.21	0.10
Bat104	0.26	0.08
Bat105	0.36	0.03
BatG1	0.23	0.08
BatG5a	-0.03	0.22
BatG5b	0.14	0.13

Goodness of fit		
Season	0.34	0.001
Season-year	0.38	0.001
Tracking night	0.01	0.790
Bat ID	0.75	0.001

PERMANOVA Results

Insect data

Table S7. Permutation test for adonis under reduced model. Terms added sequentially (first to last). Permutation: free; number of permutations: 999.

adonis2(formula = dissimilarity_matrix.insects ~ Season + MonitoringNight + Location, data = insects)

	Degrees of freedom	Sum of squares	R^2	F	P
Season	1	1.07	0.44	55.80	0.001 ***

Monitoring night (factored sequentially within season)	9	0.57	0.23	3.30	0.004 **
Location	3	0.06	0.02	1.04	0.388
Residual	39	0.75	0.31		
Total	52	2.45	1.00		

Significance codes: 0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1

Bat data

Table S8. Permutation test for adonis under reduced model. Terms added sequentially (first to last). Permutation: free; number of permutations: 999.

adonis2(formula = dissimilarity_matrix ~ Season + Season-year + BatID, data = bats)

	Degrees of freedom	Sum of squares	R^2	F	P
Season	1	0.61	0.276	46.32	0.001 ***
Season-year	1	0.04	0.019	3.17	0.061
Bat ID	22	0.97	0.437	3.34	0.001 ***
Residual	45	0.60	0.268		
Total	69	2.22	1.000		

Significance codes: 0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1

MRPP Results

Dry season bat data

Call: mrpp(dat = bat.num.mrpp.dry, grouping = batid, distance = "bray")

Dissimilarity index: bray.

Weights for groups: n.

Table S9. Class means and counts.

	Bat100	Bat102	Bat104	Bat105	Bat200	Bat201	BatG1	BatG5a	BatG5b
Delta	0. 154	0.070	NaN	0. 117	0. 082	0. 053	0. 036	0. 171	0. 233
N	3	3	1	2	2	3	3	3	3

Chance corrected within-group agreement A: 0.191

Based on observed delta 0.1068 and expected delta 0.1433

Significance of delta: 0.023

Permutation: free

Number of permutations: 999

Wet season bat data

Call: mrpp(dat = bat.num.mrpp.wet, grouping = batid, distance = "bray")

Dissimilarity index: bray

Weights for groups: n

Table S10. Class means and counts.

	Bat01	Bat02	Bat04	Bat06	Bat07	Bat09	Bat10	Bat13	Bat14	Bat15	Bat16	Bat17
Delta	0.118	0.221	0.216	0.197	0.137	0.162	0.097	0.094	0.097	0.087	0.068	0.136

N	3	3	3	3	3	2	3	3	3	3	3	3

	Bat19	Bat200	Bat201	Bat21
Delta	0.105	0.050	0.139	0.092
N	3	3	3	3

Chance corrected within-group agreement A: 0.2758

Based on observed delta 0.1251 and expected delta 0.1728

Significance of delta: 0.001

Permutation: free

Number of permutations: 999

Table S11. We recaptured only a proportion of GPS-tagged bats. From these recaptures we calculated percent change in mass (g) to evaluate the effect of tagging. Percent change mean ± sd: -5.9 ± 4.2%.

Season	Bat PIT-tag ID	Final mass (g)	Mass change (g)	Percent change	Logger attachment duration (days)
dry	7B8103E	22.5	-1.0	-4.3%	9
dry	7B8E6E8	21.5	-3.0	-12.2%	10
dry	7B8E196	24.5	-2.0	-7.5%	fell off pre recapture
wet	7B8E0CB	24.5	-1.0	-3.9%	9
wet	7B8E196	25.5	1.0	4.1%	2
wet	7B97EF2	23.0	-3.5	-13.2%	18
wet	7BA3BD0	23.0	0.0	0.0%	10
wet	7B8E196	24.5	-2.0	-7.5%	9

wet	7B996D4	22.5	-2.5	-10.0%	fell off pre recapture
wet	7B98C6F	23.0	-2.0	-8.0%	fell off pre recapture
wet	7B8E34A	21.5	-2.5	-10.4%	fell off pre recapture
wet	7BC8129	23.5	-1.5	-6.0%	fell off pre recapture
wet	7B97CD6	24.0	-0.5	-2.0%	fell off pre recapture
wet	7B98F76	23.5	-1.5	-6.0%	fell off pre recapture
wet	7BA3625	23.5	-1.5	-6.0%	fell off pre recapture
wet	7B982AF	23.5	-1.5	-6.0%	fell off pre recapture
wet	7B8F063	22.0	-1.5	-6.4%	fell off pre recapture
wet	7BA37D8	23.5	-0.5	-2.1%	fell off pre recapture
wet	7B98277	25.5	-1.0	-3.8%	fell off pre recapture