

Electronic Supplementary Materials

Equation S1. We assessed the percent of sand, clay, and silt in five soil samples collected on each grid: the centrally located trap and the second trap in from each of the four corners. For each of the 44 trap locations (pixels) on a grid where we did not collect soil, we calculated the weighted distance from the center of each pixel (i) to each of the 5 soil sample points (j) using the equation

$$p_{ij} = \frac{(\frac{1}{d_{ij}})^2}{\sum_j (\frac{1}{d_{ij}})^2}$$

where $d_{ij} = \sqrt{[(x_i - x_j)^2 + (y_i - y_j)^2]}$ and x and y represent coordinates of each pixel. The weighted distance was then multiplied by the measured value for sand, clay, and silt for each censused point, resulting in a composite estimate for each of the remaining 44 points on the grid.

Table S1. Spatial activity pattern C-score results for all grid-seasons. Observed Index is the C-score value for the community present in each grid-season. Confidence intervals are the 95% two-tailed cut points for the null distribution generated from 5000 simulations. P-values indicate whether the observed index fell beyond the lower or upper confidence intervals. SES is the standard effect size, or the number of standard deviations the observed community C-score index is above or below the mean of the randomized distribution. Significant values are bolded.

Grid	Season	Observed Index	Lower 95% CI	Upper 95% CI	Lower-tail P	Upper-tail P	SES
1	Summer	93.70	82.30	90.80	0.99	0.00	3.73
1	Spring	92.20	89.60	97.80	0.44	0.58	-0.31
1	Winter	57.50	54.00	63.00	0.20	0.84	-0.65
1	Fall	65.50	61.90	71.60	0.48	0.54	-0.19
2	Summer	77.80	74.93	81.74	0.56	0.46	0.03
2	Spring	82.83	82.50	87.67	0.10	0.95	-1.24
2	Winter	48.33	46.50	57.17	0.31	0.70	-0.58
2	Fall	96.00	95.10	100.10	0.21	0.82	-0.88
3	Summer	43.00	40.33	51.00	0.73	0.39	0.18
3	Spring	64.67	64.00	76.00	0.38	0.89	-0.89
3	Winter	19.67	19.67	29.67	0.70	1.00	-0.42
3	Fall	46.33	46.33	51.00	0.39	1.00	-0.75
4	Summer	125.00	115.40	122.40	1.00	0.00	3.62
4	Spring	95.10	77.20	83.60	1.00	0.00	9.42
4	Winter	171.67	130.67	136.83	1.00	0.00	23.13
4	Fall	120.10	106.10	114.50	1.00	0.00	4.81
5	Summer	66.00	60.00	73.33	0.83	0.43	0.51
5	Spring	110.67	106.00	117.33	0.77	0.31	0.32
5	Winter	121.00	121.00	135.00	0.10	1.00	-1.23
5	Fall	67.83	66.83	75.00	0.16	0.84	-0.80
6	Summer	129.10	121.80	128.20	0.99	0.01	2.88
6	Spring	103.83	100.50	109.67	0.58	0.46	-0.01
6	Winter	142.00	122.67	128.00	1.00	0.00	12.57
6	Fall	80.07	74.13	78.20	1.00	0.00	4.24
7	Summer	108.00	106.67	118.67	0.20	0.89	-0.79
7	Spring	60.33	59.00	68.00	0.48	0.81	-0.66
7	Winter	41.33	39.00	44.67	0.83	0.33	0.91
7	Fall	30.83	30.50	36.00	0.35	0.74	-0.85
8	Summer	44.33	44.00	50.67	0.36	0.80	-0.84
8	Spring	37.33	37.33	37.33	1.00	1.00	0.00
8	Winter	66.00	60.67	69.00	0.93	0.10	1.45
8	Fall	18.00	18.00	23.33	0.57	1.00	-0.72

Table S2. Spatial activity pattern C-score results for all species pairs in grid-seasons with overall community SES scores outside of the 95% confidence interval of the null SES distribution indicating either spatial segregation (positive values) or aggregation (negative values). The species pairs with pairwise C-scores in the 95th percentile (largest 5%) of all pairwise combinations in each grid-season contributed most to the overall patterns of spatial activity and are bolded.

	Grid 4 Fall	Grid 6 Fall	Grid 4 Winter	Grid 6 Winter	Grid 4 Spring	Grid 1 Summer	Grid 4 Summer	Grid 6 Summer
Stephens' kangaroo rat - Dulzura kangaroo rat	64	N/A	351	N/A	276	N/A	116	N/A
Stephens' kangaroo rat - San Diego pocket mouse	190	289	348	399	273	N/A	297	308
Stephens' kangaroo rat - Los Angeles pocket mouse	132	289	N/A	N/A	44	N/A	114	108
Stephens' kangaroo rat - Deer mouse	160	140	252	165	273	N/A	196	50
Stephens' kangaroo rat - Cactus mouse	N/A	220	N/A	189	N/A	N/A	N/A	144
Dulzura kangaroo rat - San Diego pocket mouse	28	N/A	10	N/A	4	55	10	N/A
Dulzura kangaroo rat - Los Angeles pocket mouse	77				36	135	108	
Dulzura kangaroo rat - Deer mouse	217	N/A	39	N/A	0	70	0	N/A
Dulzura kangaroo rat - Cactus mouse	N/A	N/A	N/A	N/A	N/A	18	N/A	N/A
San Diego pocket mouse - Los Angeles pocket mouse	44	0	N/A	N/A	45	161	238	165
San Diego pocket mouse - Deer mouse	196	165	30	48	0	88	57	126
San Diego pocket mouse - Cactus mouse	N/A	13	N/A	15	N/A	42	N/A	33
Los Angeles pocket mouse - Deer mouse	93	165	N/A	N/A	0	92	114	60
Los Angeles pocket mouse - Cactus mouse	N/A	28	N/A	N/A	N/A	216	N/A	189
Deer mouse - Cactus mouse	N/A	128	N/A	36	N/A	60	N/A	108
<i>95th percentile</i>	<i>207.55</i>	<i>289</i>	<i>350.25</i>	<i>346.5</i>	<i>274.65</i>	<i>194</i>	<i>270.45</i>	<i>254.45</i>

Table S3. Temporal activity patterns by grid-season. Observed Index is the Czekanowski Index for the community present in each grid-season. Confidence intervals are the 95% two-tailed cut points for the null distribution generated from 1000 simulations. P-values indicate whether the observed index fell beyond the lower or upper confidence intervals. SES is the standard effect size, or the number of standard deviations the observed community C-score index is above or below the mean of the randomized distribution. Significant values are bolded.

Grid	Season	Observed Index	Lower 95% CI	Upper 95% CI	Lower-tail P	Upper-tail P	SES
1	Summer	0.96	0.89	0.94	1.00	0.00	4.11
1	Spring	0.87	0.86	0.91	0.34	0.67	-0.59
1	Winter	0.93	0.92	0.95	0.60	0.41	0.07
1	Fall	0.83	0.82	0.87	0.24	0.77	-0.87
2	Summer	0.92	0.86	0.91	1.00	0.00	3.56
2	Spring	0.83	0.77	0.82	0.99	0.02	2.95
2	Winter	0.95	0.93	0.96	0.94	0.07	1.81
2	Fall	0.91	0.90	0.93	0.54	0.47	-0.11
3	Summer	0.84	0.79	0.89	0.75	0.28	0.53
3	Spring	0.95	0.91	0.96	0.95	0.11	1.45
3	Winter	0.94	0.86	0.94	1.00	0.33	1.04
3	Fall	0.91	0.90	0.92	0.45	0.61	0.16
4	Summer	0.87	0.83	0.89	0.89	0.12	1.26
4	Spring	0.90	0.81	0.88	1.00	0.00	3.61
4	Winter	0.84	0.78	0.83	0.98	0.02	2.80
4	Fall	0.91	0.84	0.91	0.99	0.01	2.93
5	Summer	0.62	0.62	0.70	0.35	1.00	-1.25
5	Spring	0.92	0.72	0.92	1.00	0.06	1.40
5	Winter	0.93	0.88	0.94	0.90	0.14	1.24
5	Fall	0.63	0.60	0.66	0.82	0.22	0.75
6	Summer	0.92	0.88	0.94	0.93	0.07	1.72
6	Spring	0.70	0.61	0.73	0.89	0.12	1.33
6	Winter	0.92	0.87	0.92	0.99	0.01	2.64
6	Fall	0.82	0.80	0.85	0.61	0.39	-0.01
7	Summer	0.88	0.88	0.95	0.10	0.00	-1.32
7	Spring	0.77	0.76	0.85	0.28	0.83	-0.71
7	Winter	0.52	0.45	0.56	0.67	0.44	0.50
7	Fall	0.58	0.51	0.65	0.75	0.27	0.47
8	Summer	0.79	0.75	0.87	0.90	0.13	1.37
8	Spring	0.57	0.48	0.57	1.00	0.06	1.73
8	Winter	0.84	0.84	0.89	0.68	1.00	-0.69
8	Fall	0.78	0.71	0.80	0.90	0.16	1.22

Table S4. Temporal activity pattern results for all species pairs in grid-seasons with overall community SES scores outside of the 95% confidence interval of the null SES distribution indicating either temporal aggregation (positive values) or segregation (negative values). The species pairs with pairwise Czekanowski Index in the 95th percentile (largest 5%) of all pairwise combinations in each grid-season contributed most to the overall patterns of temporal activity and are bolded.

	Grid 4 Fall	Grid 4 Winter	Grid 6 Winter	Grid 2 Spring	Grid 4 Spring	Grid 1 Summer	Grid 2 Summer
Stephens' kangaroo rat - Dulzura kangaroo rat	0.872	0.941	N/A	N/A	0.966	N/A	N/A
Stephens' kangaroo rat - San Diego pocket mouse	0.986	0.92	0.948	N/A	0.93	N/A	N/A
Stephens' kangaroo rat - Los Angeles pocket mouse	0.924	N/A	N/A	N/A	0.885	N/A	N/A
Stephens' kangaroo rat - Deer mouse	0.962	0.933	0.952	N/A	0.931	N/A	N/A
Stephens' kangaroo rat - Cactus mouse	N/A	0.709	0.922	N/A	N/A	N/A	N/A
Dulzura kangaroo rat - San Diego pocket mouse	0.87	0.904	N/A	0.942	0.912	0.959	0.974
Dulzura kangaroo rat - Los Angeles pocket mouse	0.913	N/A	N/A	N/A	0.867	0.96	0.952
Dulzura kangaroo rat - Deer mouse	0.833	0.963	N/A	0.948	0.916	0.961	0.945
Dulzura kangaroo rat - Cactus mouse	N/A	0.726	N/A	0.733	N/A	0.964	0.882
San Diego pocket mouse - Los Angeles pocket mouse	0.91	N/A	N/A	N/A	0.923	0.992	0.957
San Diego pocket mouse - Deer mouse	0.961	0.867	0.909	0.977	0.868	0.966	0.945
San Diego pocket mouse - Cactus mouse	N/A	0.631	0.87	0.68	N/A	0.934	0.86
Los Angeles pocket mouse - Deer mouse	0.913	N/A	N/A	N/A	0.85	0.961	0.97
Los Angeles pocket mouse - Cactus mouse	N/A	N/A	N/A	N/A	N/A	0.941	0.841
Deer mouse - Cactus mouse	N/A	0.763	0.918	0.686	N/A	0.93	0.864
<i>95th percentile</i>	<i>0.9752</i>	<i>0.9531</i>	<i>0.951</i>	<i>0.96975</i>	<i>0.95025</i>	<i>0.9803</i>	<i>0.9722</i>

Table S5. Factors contributing to spatial segregation and temporal overlap in a Southern California rodent community. GLM results with standard effect size (SES) of spatial co-occurrence C-scores and temporal overlap Czekanowski indices as the dependent variables.

Model	Model term	Estimate	SE	t	P-value
Spatial segregation	Season (Spring-Fall)	0.52	1.89	0.27	0.99
	Season (Summer-Fall)	-0.09	1.79	-0.05	1
	Season (Winter-Fall)	1.49	2.31	0.65	0.92
	Season (Summer-Spring)	-0.6	1.88	-0.32	0.99
	Season (Winter-Spring)	0.98	2.08	0.47	0.97
	Season (Winter-Summer)	1.58	2.17	0.73	0.89
	Total captures	0.01	0.01	1.03	0.32
	Richness	-0.11	1.8	-0.06	0.95
	Stephens' kangaroo rat	15.35	4.93	3.11	0.01
	Dulzura kangaroo rat	9.04	4.14	2.18	0.04
	Cactus mouse	4.52	4.66	0.97	0.34
	Los Angeles pocket mouse	-3.08	2.7	-1.14	0.27
	San Diego pocket mouse	0.03	4.05	0.01	0.99
Temporal overlap	Season (Spring-Fall)	1.21	0.84	1.45	0.47
	Season (Summer-Fall)	0.63	0.79	0.8	0.85
	Season (Winter-Fall)	0.3	1.03	0.29	0.99
	Season (Summer-Spring)	-0.58	0.84	-0.69	0.9
	Season (Winter-Spring)	-0.91	0.92	-0.99	0.76
	Season (Winter-Summer)	-0.33	0.96	-0.34	0.99
	Total captures	0.002	0.003	0.8	0.43
	Richness	0.66	0.8	0.82	0.42
	Stephens' kangaroo rat	1.04	2.19	0.48	0.64
	Dulzura kangaroo rat	1	1.84	0.54	0.59
	Cactus mouse	-0.46	2.07	-0.22	0.83
	Los Angeles pocket mouse	-1.26	1.2	-1.05	0.31
	San Diego pocket mouse	-0.58	1.8	-0.32	0.75

Table S6. Vegetation cover and soil texture principal component loadings.

Cover	PC1	PC2	Soil	PC1
Shrubs	0.63	0.03	Sand	-0.60
Forbs	-0.63	-0.10	Clay	0.56
Open ground	0.24	-0.67	Silt	0.58
Leaf litter and woody debris	0.25	0.67		
Grass	-0.28	0.30		
Percent of variance	40.67	34.28		92.38