Supplementary Material

Final Report: Does habitat restoration in agroecosystems contribute to bat conservation? An assessment for Townsend's big-eared bat (Corynorhinus townsendii) in Eastern Washington

Contract Number: 24-25349

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Table S1: Summary of GLMM for total bat detections with climate predictors

Model: total_detections ~ mean_temp_night + point_tmin_10_years + point_tmin_30_days + (1 | site_id) + (1 | year) + (1 | site_id:week_of_year)					
Distribution: nbinom2 (log link)					
Zero-inflation: none					
Fixed effects	Estimate	SE	z	P	95% CI
(Intercept)	1.57	0.25	6.24	<0.001	[1.08, 2.07]
mean_temp_night	0.73	0.07	9.83	<0.001	[0.59, 0.88]
point_tmin_10_years	0.86	0.21	4.1	<0.001	[0.45, 1.27]
point_tmin_30_days	0.35	0.24	1.48	0.14	[-0.12, 0.82]
Random effects	Variance	SD	n		
Site	0.325	0.57	9		
Year	0.036	0.19	2		
Site:Week	0.902	0.95	216		
Model fit	R^2c = 0.85	R^2m = 0.52	AIC = 6035.8		

Table S2: Summary of GLMM for bat species richness and 5km landscape predictors

Model: total_hill0 ~ cdl_prop_insect_pollinated_5000 + (1 | site_id) + (1 | year) + (1 | site_id:week_of_year)					
Distribution: poisson (log link)					
Zero-inflation: none					
Fixed effects	Estimate	SE	z	P	95% CI
(Intercept)	0.47	0.5	0.94	0.348	[-0.51, 1.44]
cdl_prop_insect_pollinated_5000	0.39	0.13	2.93	0.003	[0.13, 0.65]
Random effects	Variance	SD	n		
Site	0.137	0.37	9		
Year	0.462	0.68	2		
Site:Week	0.36	0.6	225		
Model fit	R^2c = 0.79	R^2m = 0.11	AIC = 4511.4		

Table S3: Summary of GLMM for bat species richness and 20km landscape predictors

Model: total_hill0 ~ cdl_prop_wind_pollinated_20000 + (1 | site_id) + (1 | year) + (1 | site_id:week_of_year)					
Distribution: poisson (log link)					
Zero-inflation: none					
Fixed effects	Estimate	SE	z	P	95% CI
(Intercept)	0.47	0.49	0.96	0.339	[-0.49, 1.43]
cdl_prop_wind_pollinated_20000	-0.45	0.1	-4.41	<0.001	[-0.65, -0.25]
Random effects	Variance	SD	n		
Site	0.073	0.27	9		
Year	0.462	0.68	2		
Site:Week	0.36	0.6	225		
Model fit	R^2c = 0.78	R^2m = 0.14	AIC = 4507.6		

Table S4: Summary of GLMM for total bat detections and 10km landscape predictors

Model: total_detections ~ crp_mean_prop_all_10000 + nhd_count_all.features_10000 + (1 | site_id) + (1 | year) + (1 | site_id:week_of_year)					
Distribution: nbinom2 (log link)					
Zero-inflation: none					
Fixed effects	Estimate	SE	z	P	95% CI
(Intercept)	1.59	0.74	2.16	0.031	[0.14, 3.04]
crp_mean_prop_all_10000	-0.6	0.21	-2.8	0.005	[-1.02, -0.18]
nhd_count_all.features_10000	0.49	0.21	2.3	0.021	[0.07, 0.91]
Random effects	Variance	SD	n		
Site	0.25	0.5	9		
Year	1.02	1.01	2		
Site:Week	1.322	1.15	225		
Model fit	R^2c = 0.83	R^2m = 0.21	AIC = 8287.4		

Table S5: Summary of GLMM for bat Shannon diversity and 10km landscape predictors

Model: total_hill1 ~ pad_prop_gap4_10000 + (1 | site_id) + (1 | year) + (1 | site_id:week_of_year)					
Distribution: gaussian (identity link)					
Zero-inflation: ~1					
Fixed effects	Estimate	SE	z	P	95% CI
(Intercept)	1.68	0.5	3.33	<0.001	[0.69, 2.67]
pad_prop_gap4_10000	0.52	0.12	4.55	<0.001	[0.3, 0.75]
(Intercept)	-2.03	0.16	-13	<0.001	[-2.34, -1.72]
Random effects	Variance	SD	n		
Site	0.102	0.32	9		
Year	0.476	0.69	2		
Site:Week	0.325	0.57	225		
Model fit	R^2c = 0.58	R^2m = 0.13	AIC = 3882.2		

Table S6: Summary of GLMM for bat feeding buzzes and insect abundance predictor

Model: total_buzzSum ~ logTotalInsectCount + (1 | site_id) + (1 | year) + (1 | site_id:week_of_year)					
Distribution: nbinom2 (log link)					
Zero-inflation: ~1					
Fixed effects	Estimate	SE	z	P	95% CI
(Intercept)	-2.9	1.07	-2.7	0.007	[-5.01, -0.79]
logTotalInsectCount	0.36	0.13	2.75	0.006	[0.1, 0.62]
Random effects	Variance	SD	n		
Site	2.56	1.6	9		
Year	0.689	0.83	2		
Site:Week	3.276	1.81	216		
Model fit	R^2c = 0.99	R^2m = 0.02	AIC = 2595		

Table S7: Summary of GLMM for *C. townsendii* presence and 20km landscape predictors

Model: n_COTO_binary ~ pad_prop_gap2_20000 + (1 | site_id) + (1 | year) + (1 | site_id:week_of_year)					
Distribution: binomial (logit link)					
Zero-inflation: none					
Fixed effects	Estimate	SE	z	P	95% CI
(Intercept)	-4.9	1.24	-3.97	<0.001	[-7.32, -2.48]
pad_prop_gap2_20000	0.63	0.25	2.53	0.011	[0.14, 1.12]
Random effects	Variance	SD	n		
Site	0	0	9		
Year	2.756	1.66	2		
Site:Week	0.212	0.46	225		
Model fit	R^2c = NA	R^2m = NA	AIC = 184.5		

Table S8: Summary of GLMM for *C. townsendii* presence and 10km landscape predictors

Model: n_COTO_binary ~ cdl_crop_sdi_10000 + (1 | site_id) + (1 | year) + (1 | site_id:week_of_year)					
Distribution: binomial (logit link)					
Zero-inflation: none					
Fixed effects	Estimate	SE	z	P	95% CI
(Intercept)	-4.89	1.23	-3.97	<0.001	[-7.31, -2.48]
cdl_crop_sdi_10000	0.62	0.25	2.54	0.011	[0.14, 1.11]
Random effects	Variance	SD	n		
Site	0	0	9		
Year	2.756	1.66	2		
Site:Week	0.26	0.51	225		
Model fit	R^2c = NA	R^2m = NA	AIC = 184.5		

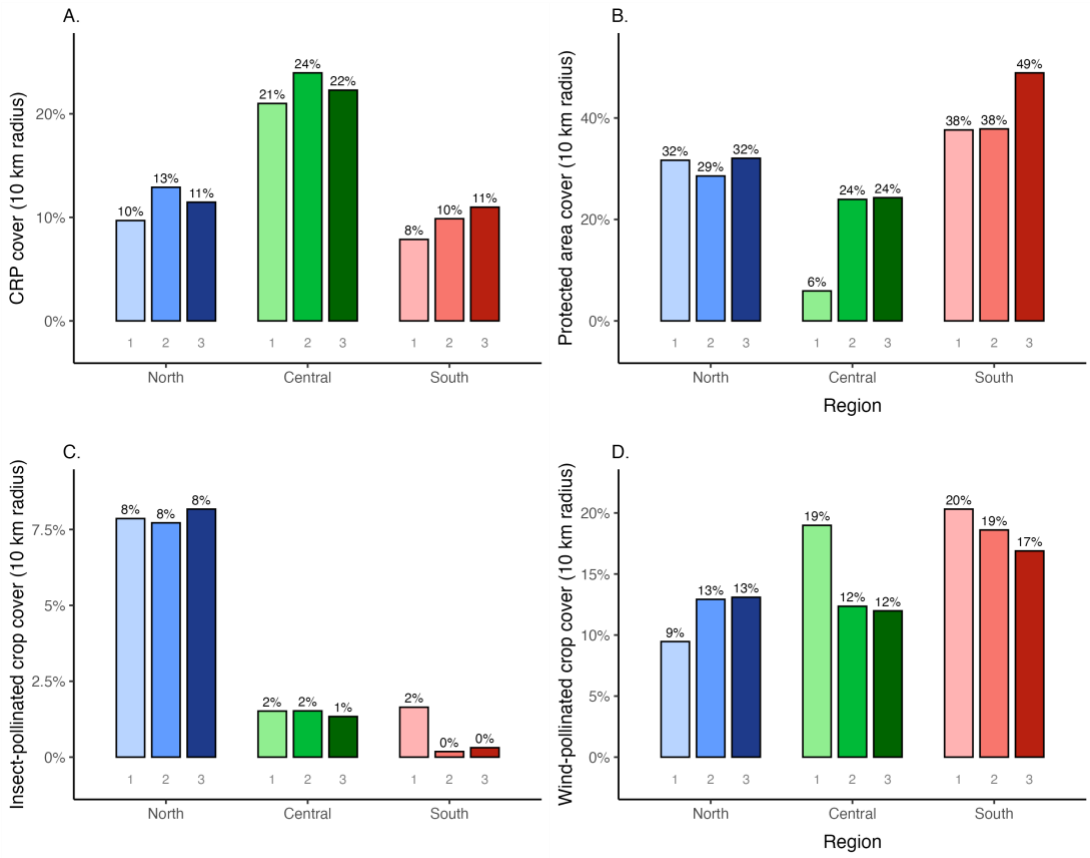

Figure S1. The percent of (A) CRP land cover, (B) Protected area cover, (C) Insect-pollinated crop cover, and (D) Wind-pollinated crop cover in a 10 km buffer around each of the nine monitoring sites, arranged and colored by region.

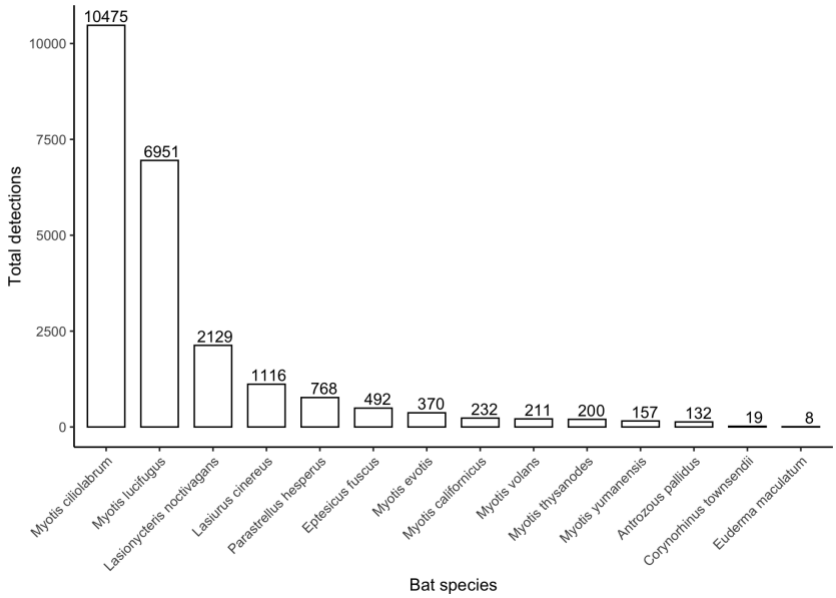

Figure S2. The total number of detections per bat species across all sites and the full monitoring period.

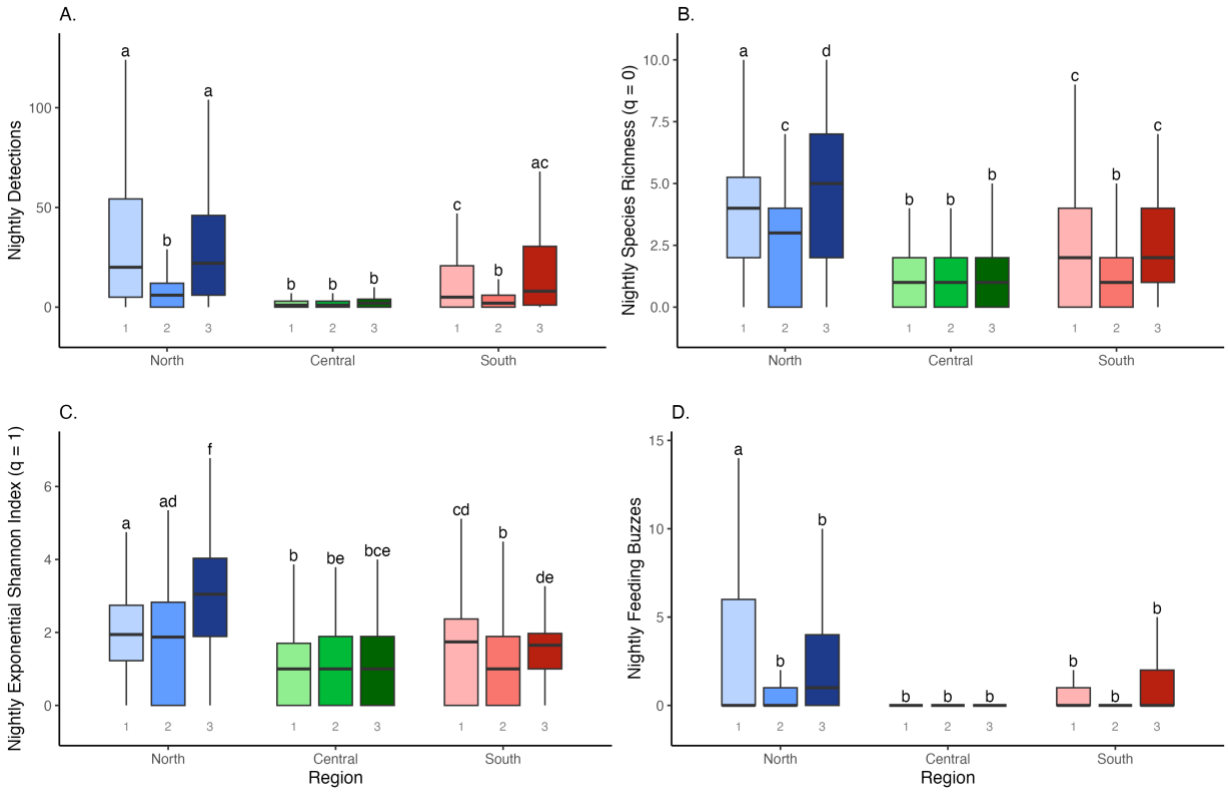

Figure S3. Boxplot displaying variation in the number of (A) nightly bat detections, (B) species richness, (C) Shannon diversity, and (D) feeding buzzes across regions and sites, with sites colored by region. Groups sharing the same letter are not significantly different (Tukey's HSD, $p < 0.05$)

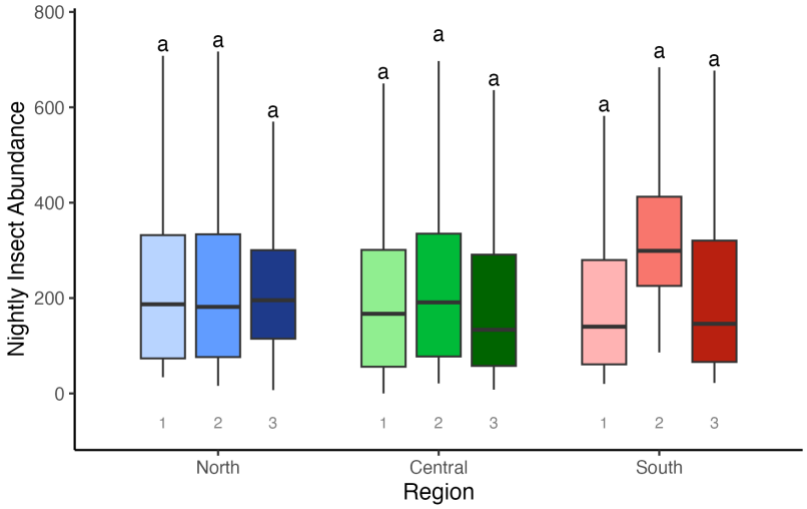

Figure S4. Boxplot displaying variation in nightly insect abundance across regions and sites, with sites colored by region. Groups sharing the same letter are not significantly different (Tukey's HSD, $p < 0.05$)

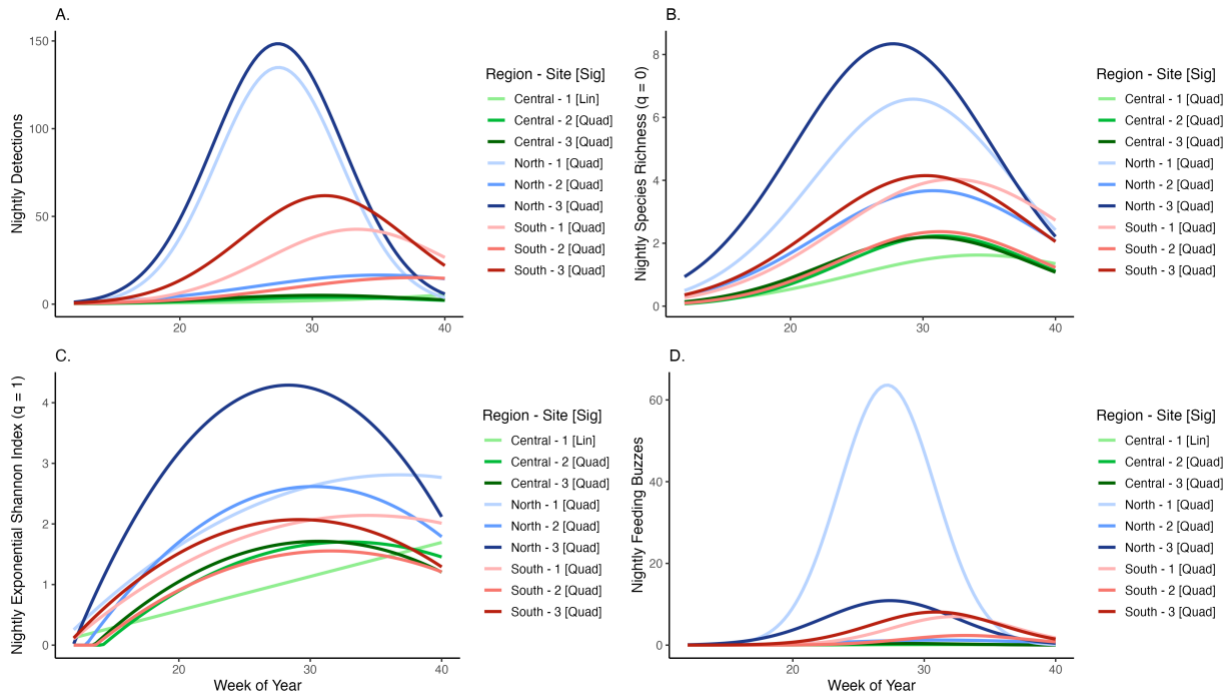

Figure S5. Temporal variation in (A) nightly bat detections, (B) species richness, (C) Shannon diversity, and (D) feeding buzzes across regions and sites, with sites colored by region. The legend portion in brackets indicates whether a linear or quadratic relationship was significant for each Region – Site combination.

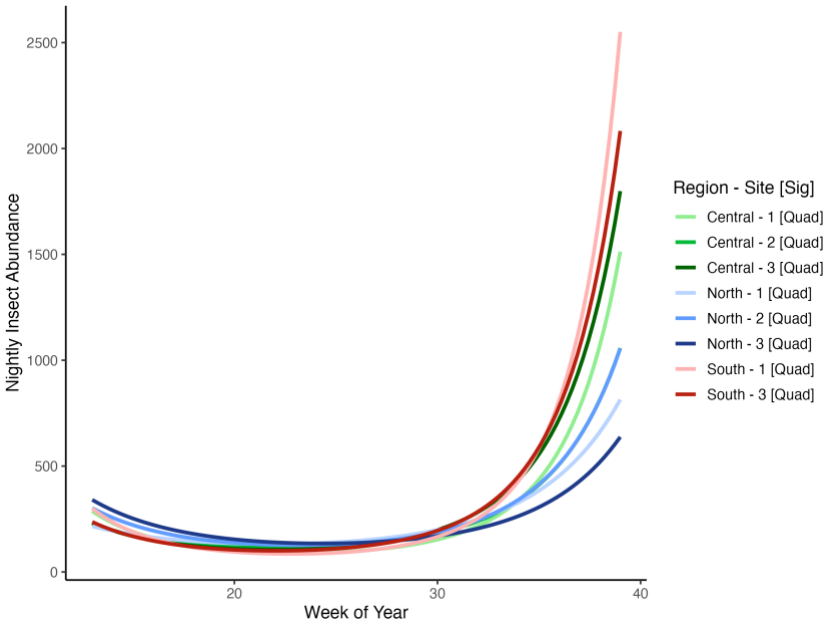

Figure S6. Temporal variation in nightly insect abundance across regions and sites, with sites colored by region. The legend portion in brackets indicates whether a linear or quadratic relationship was significant for each Region – Site combination.