Supplementary Materials

The effects of urbanization and floral resources on butterfly biodiversity at stormwater ponds

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This supplementary information file contains (1) variable descriptions, (2) descriptive statistics for each study site, (3) summary tables of each model, (4) an abundance histogram of all species found, (5) a figure showing the interaction effect of niche breadth for butterfly abundance as explained by number of native flowering species. All associated code can be found at the paper's associated GitHub repository, here.

Variables

Table S1. Variable names, acronym (used in R code), and descriptions.

Variable	Acronym	Description
Stormwater Pond ID	SWP	ID number provided by the City of Ottawa for each stormwater pond
Urbanization	anthroper	Percent cover of roads and built-up area surrounding each pond
Abundance	Abund/ab	Butterfly abundance that has been rarified to account for sampling effort
Species Richness	Richness/sr	Butterfly species richness
Shannon Diversity	Shannon/sh	Butterfly Shannon diversity
Plant species richness	nspecies	Total number of plant species richness per site
Native Plant Species Richness	nnative	Species richness of native plants in bloom

Variable	Acronym	Description
Average cover of plants in bloom	avgbloom	Average cover of plants in bloom
Average cover of native plants in bloom	avgnatbloom	Average cover of native plants in bloom

Descriptive Statistics

Table S2. Descriptive statistics of butterfly abundance, species richness, and Shannon diversity, and plant species richness and % bloom for all flowering plants and native flowering plants. Variable acronyms/shortforms can be found in Table S1.

SWP	Abund	Richness	Shannon	nspecies	nnative	avgbloom	avgnatbloom
1127	39	6.02	5.10	11	3	5.50	0.67
1133	51	1.00	1.00	12	6	12.82	10.27
1134	40	3.76	3.26	15	7	5.80	2.78
1204	69	7.57	6.53	20	8	9.10	2.82
1206	34	2.10	1.89	25	10	13.23	3.37
1209	46	4.16	3.55	27	8	15.00	6.43
1220	56	9.30	6.95	27	8	5.73	0.95
1227	27	6.65	5.49	24	5	9.58	1.20
1236	130	2.88	2.53	19	8	20.08	7.17
1306	80	4.09	3.50	22	5	15.98	7.22
1310	121	4.37	3.68	34	13	15.00	8.03
1314	18	2.94	2.29	18	3	5.60	0.92
1347	38	6.32	4.80	26	11	9.53	5.68
1352	84	5.21	4.19	25	6	23.25	2.18
1428	82	4.02	3.31	23	10	16.77	5.10
1501	107	4.61	3.89	23	14	10.92	3.23
1610	11	4.00	2.42	15	4	2.35	1.00
1616	40	5.69	4.73	22	7	8.13	4.80
1622	18	1.00	1.00	18	3	12.98	0.82
1809	76	6.72	5.50	24	10	16.60	12.68
1914	53	5.39	4.63	24	6	9.68	3.62

Species Abundance

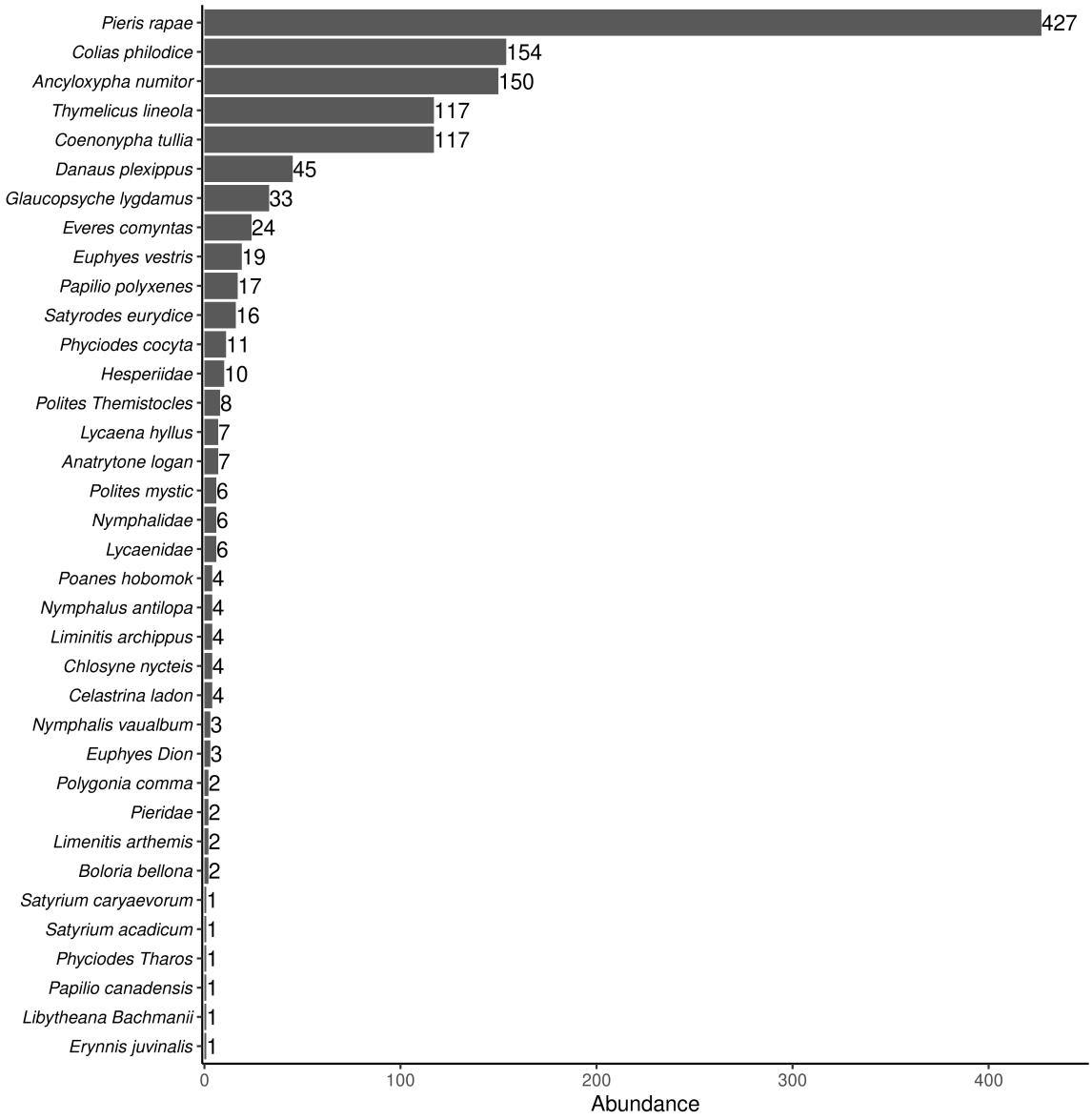

Figure S1. Raw abundance counts for each species identified and counted for this study. If a species level identification was not possible, we used genus level. If a genus level identification was not possible, we used family.

Butterfly Abundance and Number of Native Flowering Species

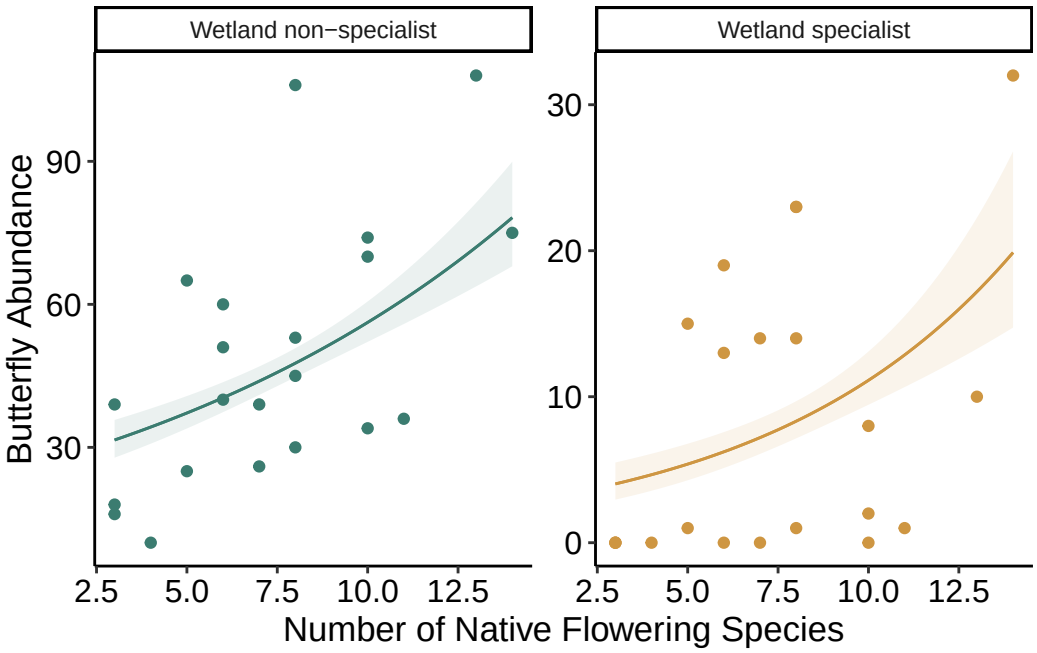

Figure S2. Native plant community models showing the the interaction between number of native flowering species and niche breadth. IRR = 1.06 +/ 1.03, p-value = 0.02, R2 = 0.69. Here we are reporting the IRR value from the interaction where the value represents the effect size of the wetland specialist group interacting with number of native flowering species and average native bloom cover compared to the effect size of the generalist group. Points are raw data from individual stormwater pond sites. Plots made using the marginaleffects package and ggplot2 (Arel-Bundock et al., 2024; Wickham et al., 2016).