Analyzing the Consistency of Flower Preference Among Generalist Pollinators in Montane Meadows of the Oregon Cascades

Andrew Guide

Ecoinformatics Summer Institute

Pollinator Team

Goals for this Project

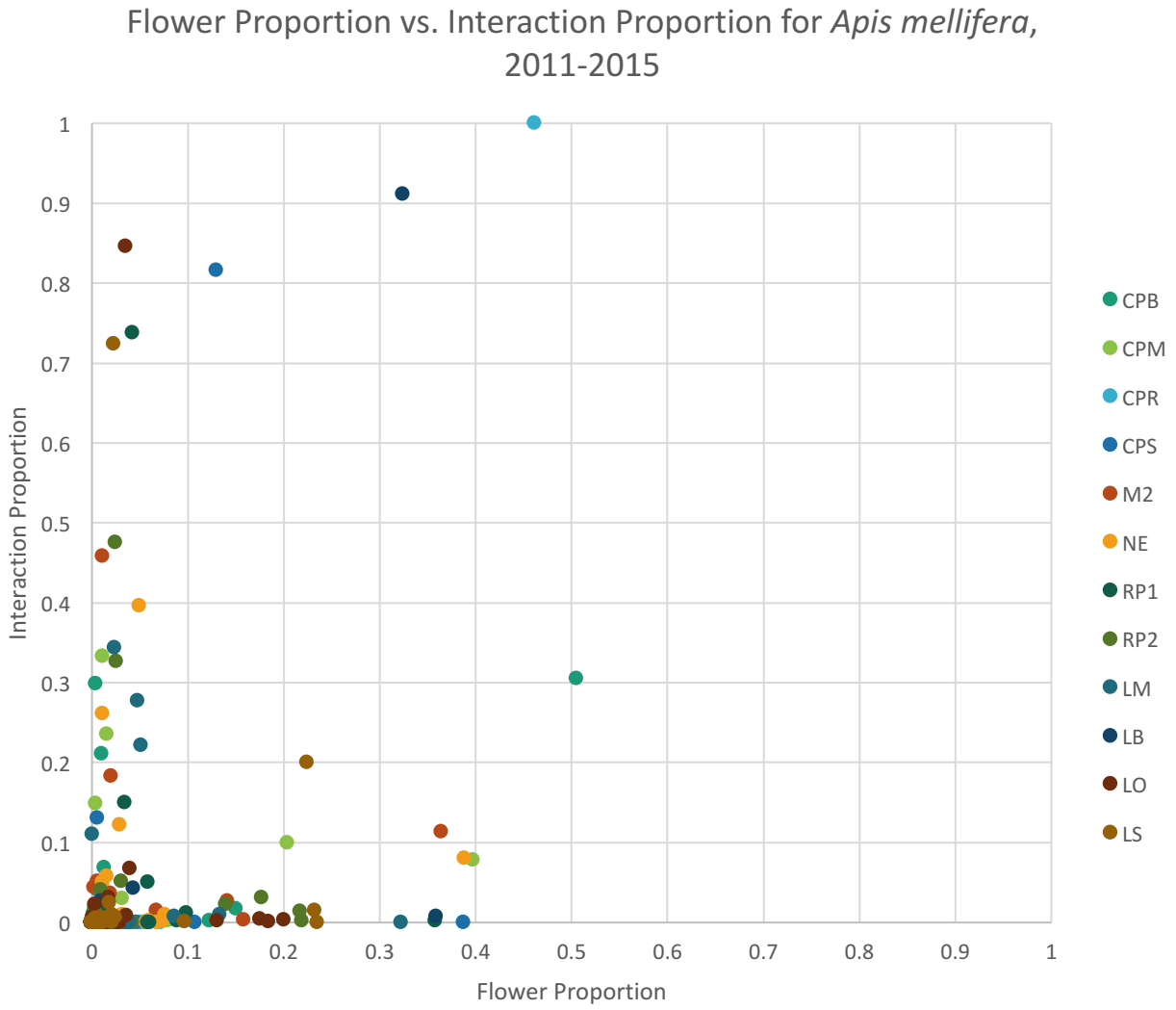
- Specialist pollinators – specific flowers they visit
  - Generalist pollinators – not exclusive
  - Truly random visitation?
- Do generalist pollinators have “favorite flowers” to visit?
- Goals:
  - Determine if generalist pollinators have an order of preference in flower visitation
  - Create a “preference list” for flowers per meadow for a pollinator
  - See if list is consistent across meadows
  - If consistent, try to explain preferences

Methods Utilized

- Compare flower proportions in meadow vs. pollinator interaction distribution
  - Pollinators: *Apis mellifera*, *Bombus mixtus*, *Bombylius major*, *Epicauta puncticollis, Eristalis hirtus*
- Create “preference scores”
  - Ratio of interactions/flower proportions
- Check for consistency across meadows
  - Spearman correlations: pairwise meadow comparison
  - Only for *Apis mellifera*

Flower Proportion vs. Interaction Distribution

- If proportions same, should form linear relationship
- Most data clustered around axes
- Conclusion: interaction distribution vastly different

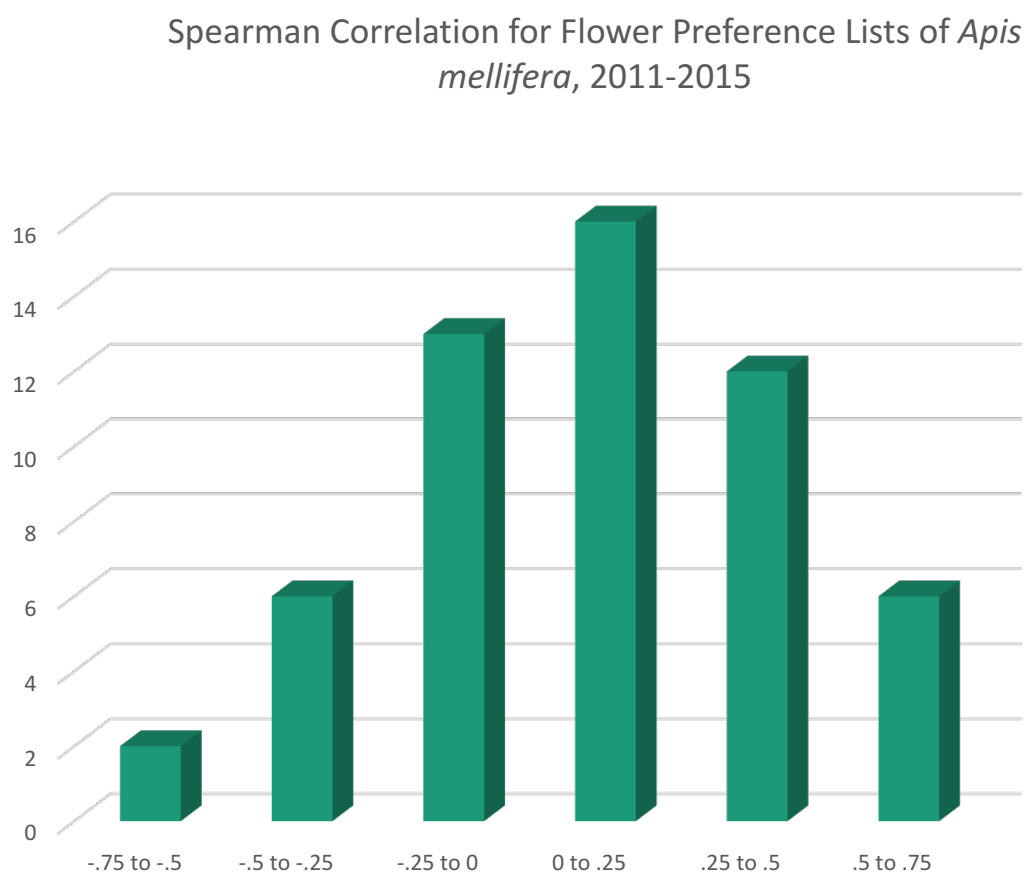


Preference Scores

- Wide variety of scores
- Shows interaction distribution not close to flower proportions
  - Otherwise all would be close to 1

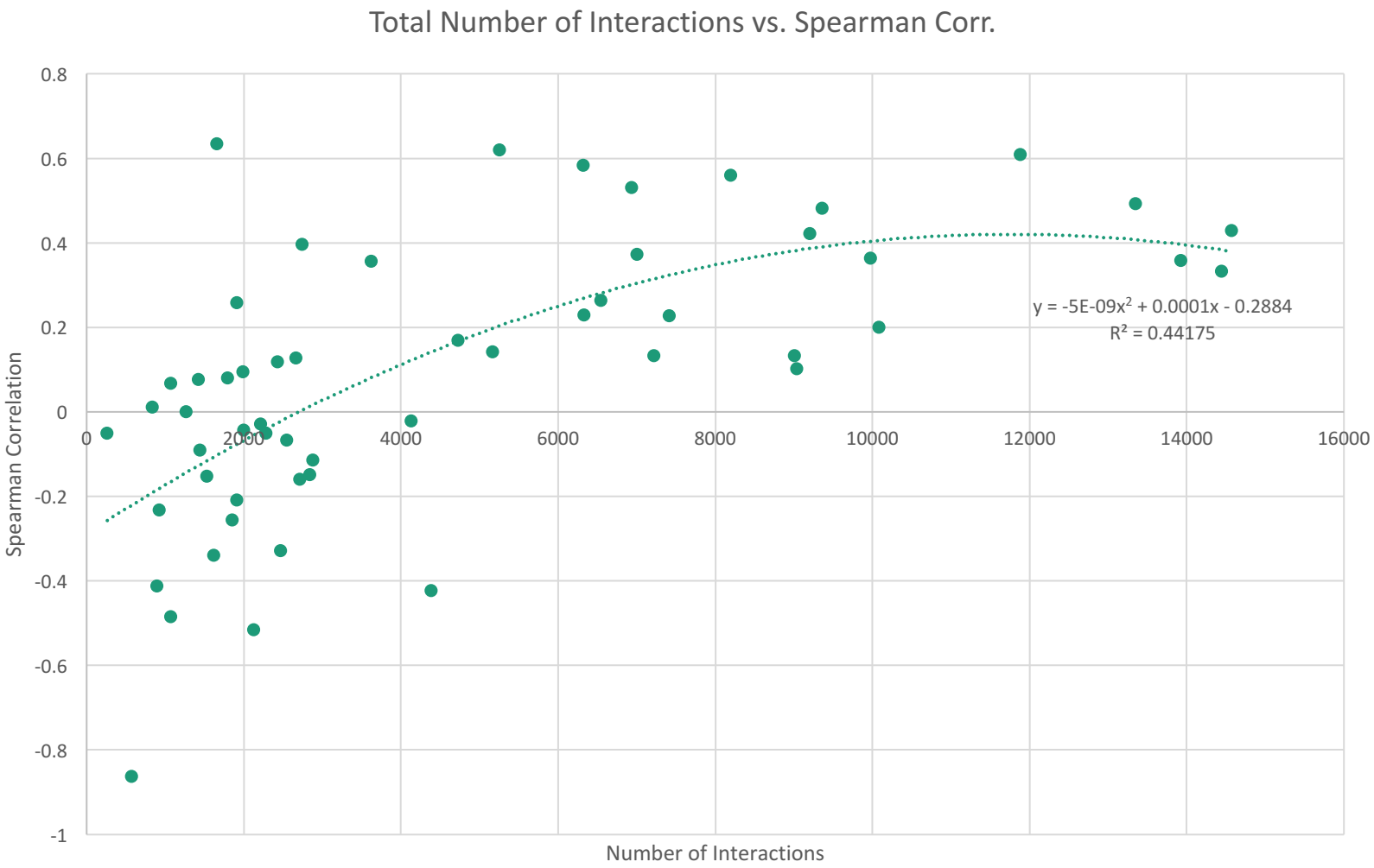
Flw Spp	Flw Prop	Int Prop	Pref Score
Eriophyllum lanatum	4.53E-03	0.149462	32.987
Erigeron aliceae & foliosus	1.09E-02	0.333122	30.701
Solidago canadensis	1.58E-02	0.236225	14.937
Rudbeckia occidentalis	2.46E-04	0.003167	12.871
Anaphalis margaritacea	1.16E-02	0.049398	4.277
Rainiera stricta	2.67E-03	0.0095	3.564
Rumex acetosella	3.18E-02	0.029766	0.937
Angelica arguta	2.04E-01	0.100063	0.491
Delphinium nuttalianum	8.35E-03	0.002533	0.303
Eriogonum umbellatum	1.75E-02	0.005066	0.289
Ligusticum grayi	3.98E-01	0.077897	0.196
Achillea millefolium	7.88E-02	0.002533	0.032
Orthocarpus imbricatus	2.25E-02	0.000633	0.028
Holodiscus dumosus	2.87E-02	0.000633	0.022
Agoseris heterophylla	2.26E-04	0	0
Aquilegia formosa	2.28E-03	0	0

Spearman Correlations

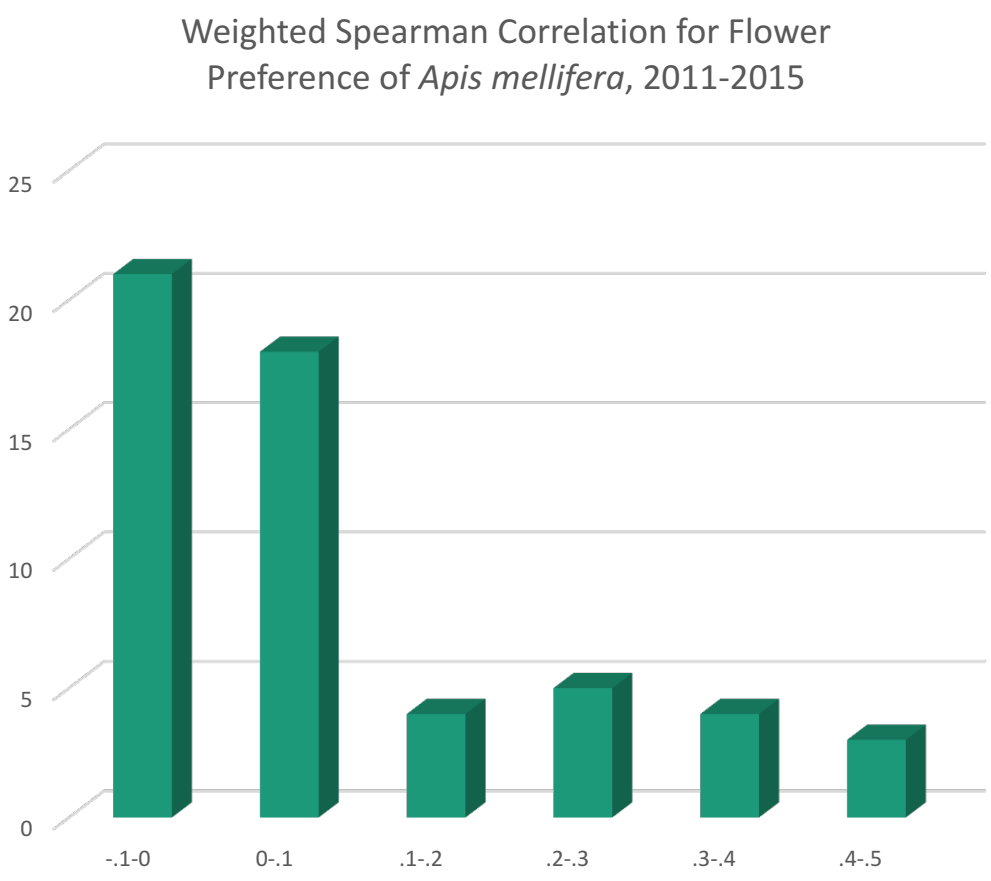


Meadow 1	Meadow 1	Spearman Corr.
M2	CPS	0.199
M2	LB	0.168
M2	LM	0.228
M2	LO	0.331
M2	LS	0.357
M2	RP1	0.429
M2	RP2	0.493
LO	LS	0.101
LM	LB	0.356
LM	LO	-0.154
LM	LS	-0.514
LB	LO	-0.051
LB	LS	-0.051

Number of Interactions vs. Correlation

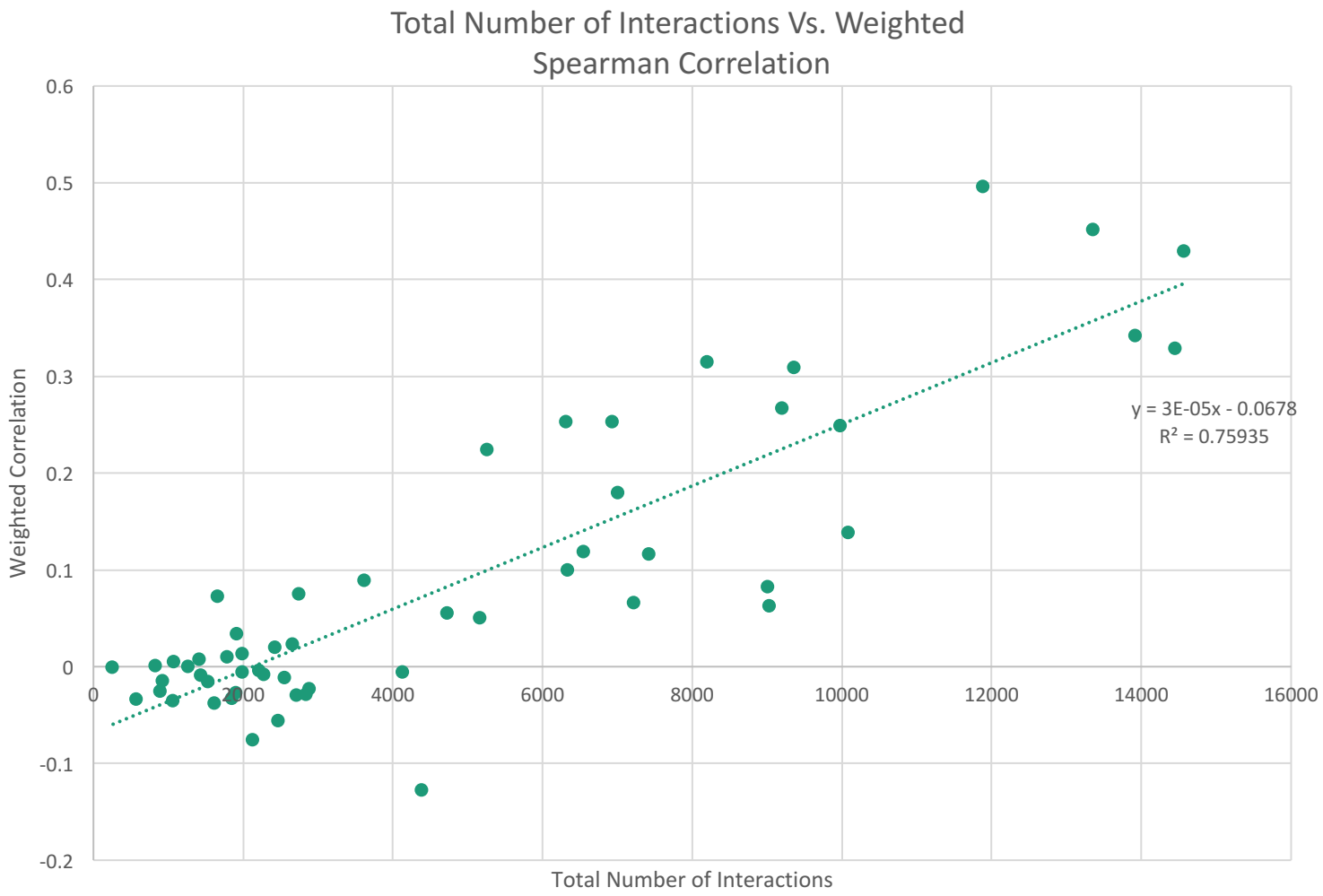


Weighted Spearman Correlations



Meadow 1	Meadow 2	Unweighted	Int Weight	Weighted
NE	M2	0.608	0.815	0.496
M2	RP2	0.493	0.917	0.452
M2	RP1	0.429	1	0.429
M2	LS	0.357	0.956	0.342
M2	LO	0.331	0.992	0.329
RP2	LS	0.559	0.563	0.314
RP1	RP2	0.480	0.643	0.309
RP1	LS	0.422	0.632	0.266
NE	RP2	0.584	0.434	0.253
NE	LO	0.531	0.476	0.253
RP1	LO	0.363	0.685	0.248
CPS	LO	0.619	0.361	0.244
M2	CPM	0.373	0.481	0.179

Weighted Spearman Correlations



Sources

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