

The Relationship between Public Approval and Ecosystem Services on Campus Greenspaces

Madison Neal¹, Isaac Nelson², Sami Villasana³, Fabel Yanez⁴

¹Agricultural Communications, ²Agronomy, ⁴Environmental Science, ³Geology



Introduction

This presentation examines the relationship between how public spaces are perceived, and what their impacts are on the surrounding ecosystem. This directly correlates to the master plan's three phases of understanding what needs to be addressed, exploring a variety of methods for enhancement, and realizing the outcomes of the project. Ecosystem services we are considering include water infiltration and arthropod diversity and abundance across our 4 sites.

Methods

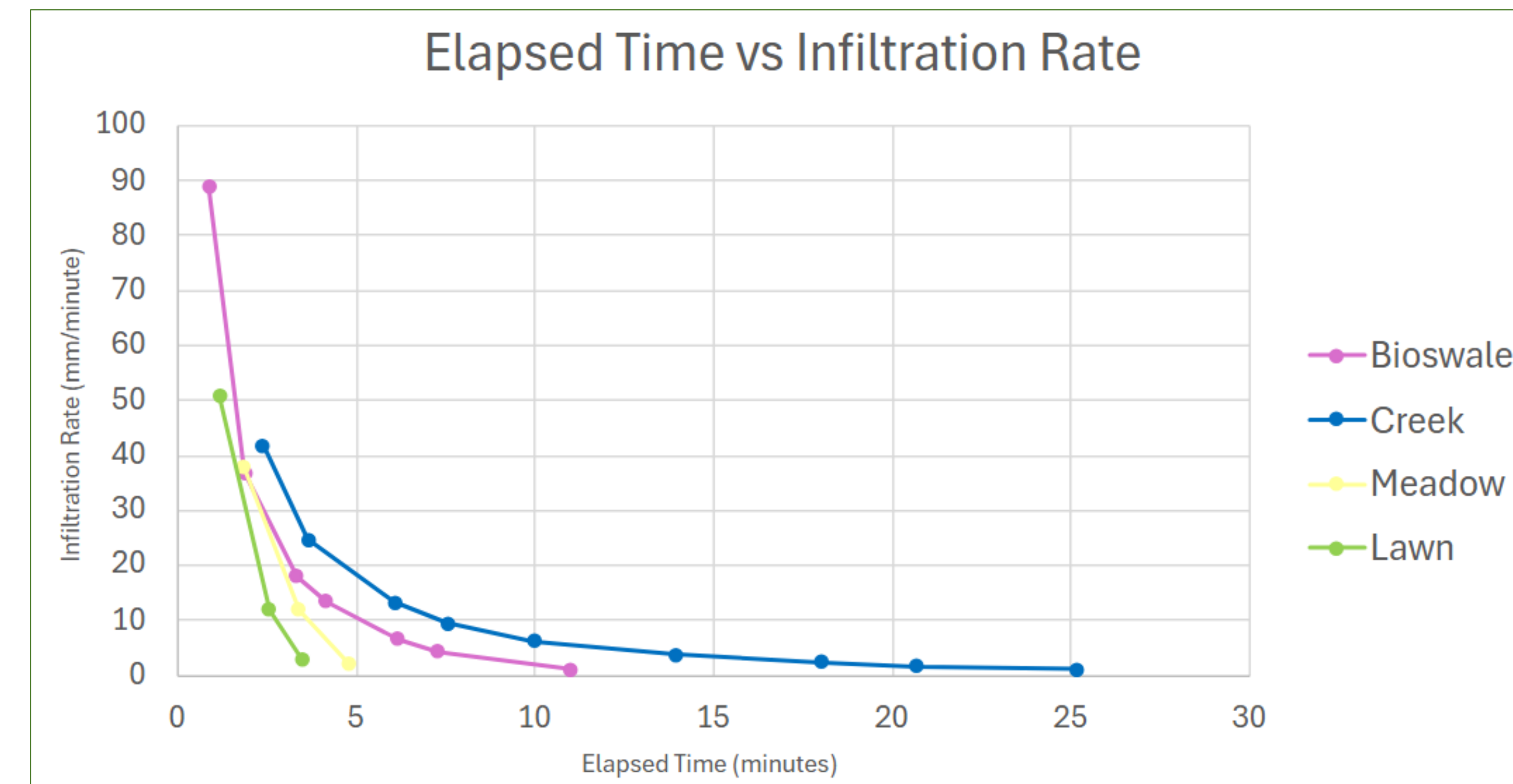
Survey: Conducted using a quantitative survey and administered to students, faculty/staff, and Manhattan residents. The survey was open for 15 days and distributed to campus clubs/organizations and email newsletters.

Infiltration: Single ring infiltrometer filled twice with 100 mm of water to saturate the sample site and calculate the infiltration rate (mm/min).

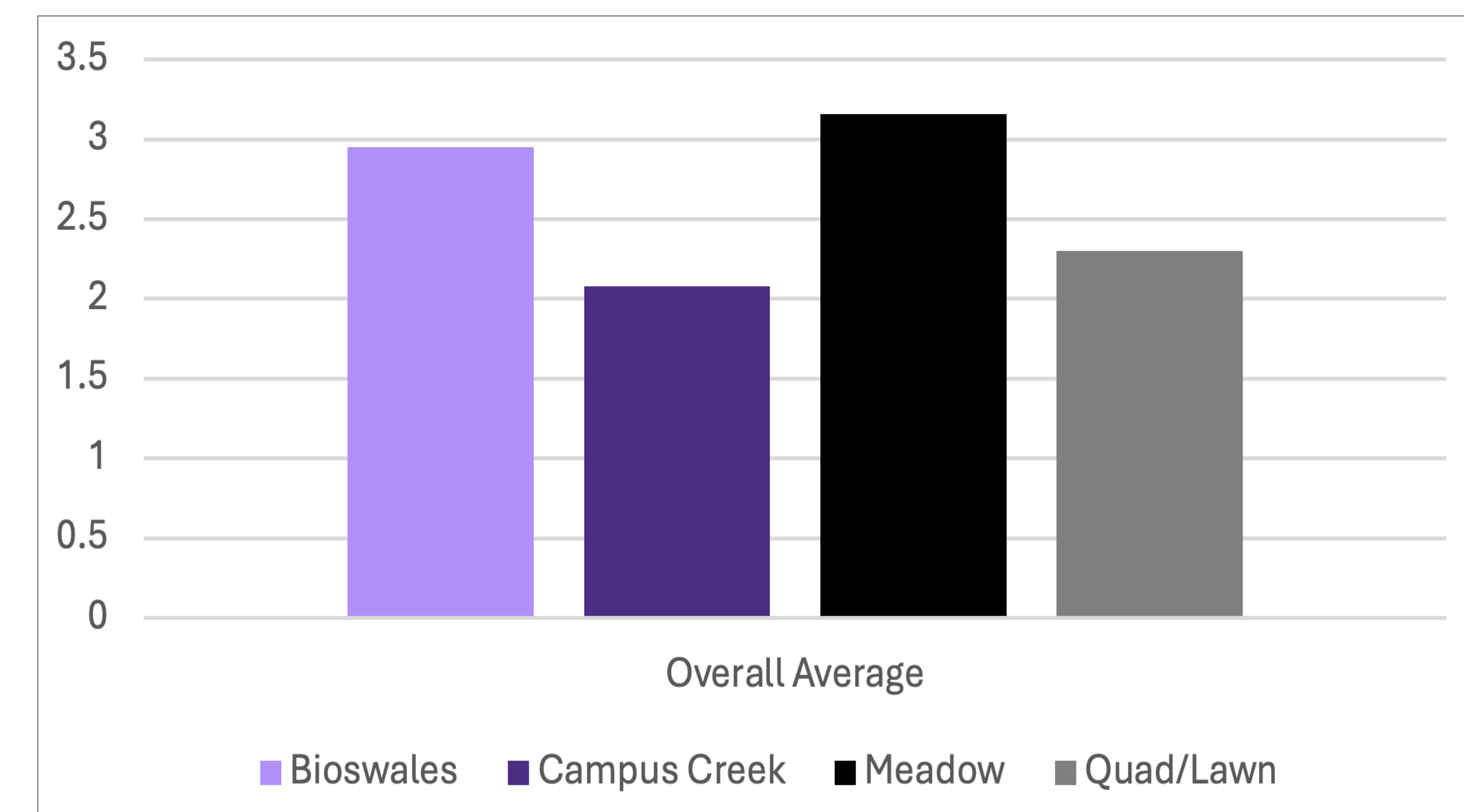
Arthropods: Pitfall traps have two plastic cups stacked together filled with a soapy water solution trapping any arthropod that falls in. Covered with a mesh wire and a plastic cover shielding it from precipitation and larger wildlife from entering. Pollinator observations were conducted using a modified hand vacuum to suck up insects, which are then stored in small tubes covered with mesh and plastic to ensure proper airflow and sample retention.



Results



- This graph shows the infiltration rates per minute with the quickest rates shown on the left (Quad & Meadow) and the slower rates on the right (Bioswale & Creek).



- This graph shows the overall average ratings for each green space. The Meadow had the highest rating of 3.16 while Campus Creek received the lowest rating of 2.08.

Site Name	Pollinator Totals	Pollinator Obs. Shannon Diversity Index	Pitfall Totals	Pitfall Traps Shannon Diversity Index
Anderson	0	NO VALUE	390	1.06
Meadow	44	1.830	190	1.469
Bioswale	29	1.713	116	1.417
Creek	17	1.507	532	1.703

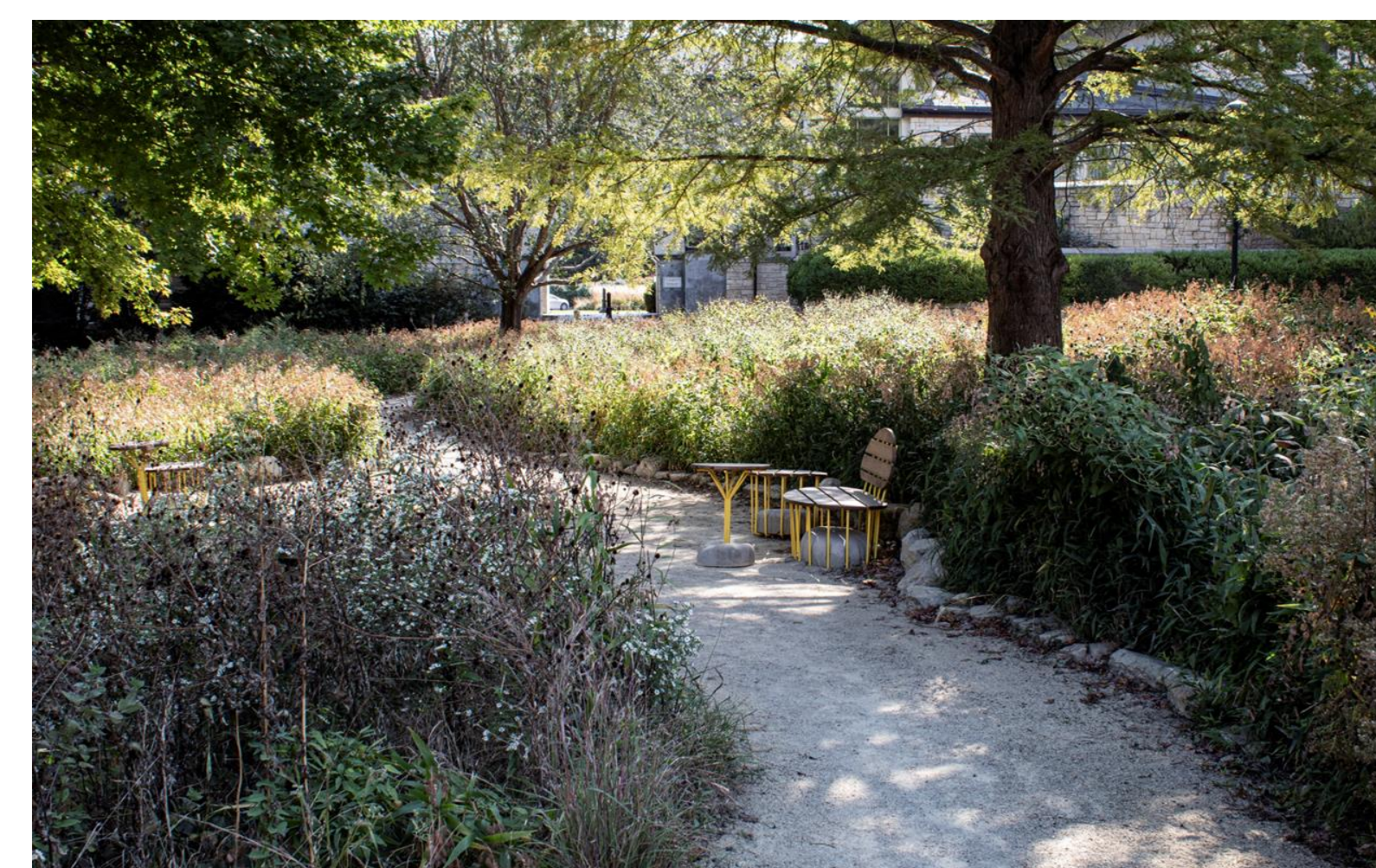
- On the left is the graph showing the abundance and diversity of arthropods found at each site. The higher the Shannon Diversity Index value, the greater diversity is found at the site. The Meadow has the highest diversity of pollinators, followed by the Seaton Bioswale, Campus Creek, and Anderson Lawn. Campus Creek has the highest diversity of ground-dwelling arthropods followed by the Meadow, Seaton's Bioswale, and Anderson Lawn.

Sample Locations

Sample sites were chosen based on the different greenspace categories used in the campus master plan; Quadrangles, Greenspace, and Woodland/ Riparian Zones. The Meadow represents a more native landscape however most of the landscaping is done with native plants.



-The Quad



-Meadow



-Bioswale



-Campus Creek

Discussion

Survey: The results indicate that demographics play a significant role in the perception of green spaces. The Meadow consistently received the highest rating across all groups indicating that the space is generally perceived as the most desirable on KSU's campus. This is likely due to the natural environment that represents surrounding areas like the Konza Prairie Natural Area. Campus Creek consistently scored low across almost all groups suggesting dissatisfaction with the space.

Arthropods: The data indicates having a range of grasses, trees, and forbs leads to a greater diversity and abundance of pollinators such as those found in the Meadow and Seaton Bioswale. Both sites had the highest diversity (1.830, 1.713) and abundance (44, 29) for tested pollinators. Campus Creek had a large amount of individuals (532) with a great diversity (1.703), which could be a result of the variety in ground cover, habitat, small selection of native plant species and running water. Unsurprisingly, Anderson Lawn had the lowest diversity of ground-dwelling arthropods (1.06) and pollinators (0) due to its short monoculture groundcover. The area lacked in a variety of habitat and flowering resources as well, which can be reflected in the data.

Conclusion: The results seem to point to Meadows and Bioswales being the most preferred by the public and having the highest environmental benefits. Bioswales and Meadows had high infiltration rates showing their ability to handle high precipitation events, and larger insect populations than the lawn. Devoting more resources to creating publicly favored and environmentally sustainable landscaping helps create a better campus for people and the environment.

Acknowledgment

- Mentor: Dr. Trisha Moore
- Kim Insect Ecology Lab: Arthropod collection supplies
- Department of Geography