University of Minnesota Twin Cities Campus Arboretum: Special Plant Communities

Spring 2020

University Arboretum Final Report

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Introduction

The development of the University of Minnesota (UMN) Twin Cities campus arboretum is a multi-year project that combines the efforts of students, staff, and the UMN community. Green spaces have historically been one of the greatest places for human connection and the UMN is no exception. At the heart of these green spaces lie special plant communities that carry significance, whether it is through ecological, social, or developmental value. The 2019-2020 students of the Urban Forest Management class at the UMN were led by Professor Gary Johnson, continuing the efforts of last year's class and laying groundwork for the years after them. This report is the culmination of the Special Plant Communities group's work and is designed to give both a summary of our findings and to provide resources for further work on the project. This semester-long project has been condensed into a palatable resource for anyone who wishes to get involved with the development of the Twin Cities arboretum and as a tool for gauging opinions about special plant communities within the UMN Community.

Goals

Our team's primary efforts were centered around creating a large net of stakeholders in order to figure out what the community finds valuable in special plant communities. Our goal was to apply these findings to plant communities in the arboretum in order to make it as inclusive and representative of the community as possible. We also wanted to determine if there were any plant communities on campus that respondents reported to be significant, as these could serve as reference points and templates for what kinds of plants to include in the arboretum. Most of all, we wanted to be able to lay down groundwork that expanded on the effort's of last year's team

and to provide a helpful starting point for the efforts of those who take over this project in the coming years.

Methods

In order to accomplish our goals, we needed to find an efficient way of getting input from as many stakeholders within the UMN community as possible. We ended up deciding on using a Qualtrics survey in order to gather our data. Qualtrics was chosen because it was a resource made possible through the university, allowed for simple electronic survey distribution, and allowed us to easily create graphs and compare our data. We did, however, import the data into Statistical Package for the Social Sciences (SPSS) for ease of analysis and data gathering. This survey was designed to have as little bias as possible and to have a balance between multiple choice and open-ended questions in order to avoid overwhelming the survey taker, ensuring more complete responses. To reduce the ambiguity associated with the term "special plant communities", we asked survey respondents to use the definition that we came up with as a team: "An interconnected group of plants that interact not only with each other, but with the biological and physical environments around them".

We sent this email out to as many stakeholders as we could reasonably contact (Figure 1 and Figure 2) through various methods including email, head-of-organization leaderheads, and Facebook pages. Our survey outreach list, format, and content, were informed by a combination of last year's arboretum report overview as well as collaboration with the Sacred/Special Places team. We hoped that these resources would produce opinions that were representative of the

cohesive community. Our on-campus participants included respondents from student groups such as environmental clubs and general student groups (i.e. Greek life, UMN Reddit page, etc.). We also sought feedback from groups outside campus but in the surrounding community (Cedar River, Marcy Holmes, Dinkytown, Como). Within these surrounding communities, we reached out to neighborhood associations, local businesses, and public spaces. Together, these groups represent a diverse audience in terms of demographics and relationships to plants and the UMN. Some have obvious interest in plant communities, such as the Environmental Student Association, while others have backgrounds more akin to the typical person who might have an alternative perspective on what constitutes a special plant community, such as the Asian American Student Union. The most important factor in choosing our target audiences was the inclusion of a diverse audience that would be representative of the comprehensive voice of the Twin Cities campus and its surrounding communities.

Once our survey was finalized, we sent out the introductory email around March 27th, 2020 and a reminder email around April 13, 2020 before the survey closed. The survey consisted of nine questions (Figure 3 and Figure 4) with one open-ended question at the end where participants were invited to share any project feedback or questions they might have. We created the survey questions with the intention of gaining a better understanding about what the community finds significant in plant communities: Is it ecological services? The presence of native species? Perhaps it is pollinator species? Our goal was to narrow down the most prominent responses in order to make a conclusion about the general consensus within the community. We also designed our questions with the intention of finding out if there were any plant communities already on

campus that respondents regarded as significant. In doing so, we hoped to identify model plant communities that could serve as reference points for what to include in the arboretum and to ascertain what kinds of aspects the community most values in plant communities.

The goals of the survey questions were three-fold: 1) To understand the frequency with which plant communities are used, how they are used (i.e. recreation, relaxation, meditation etc), which ones are being used, and who is using them (i.e. demographics, relationship to the UMN etc) 2) To determine feelings and opinions about what makes plant communities significant to their users, and 3) Why/if people feel it is important to have plant communities (i.e. environmental benefits, to highlight plant species, personal peace, etc.). We harvested a mix of quantitative and quantitative data. The quantitative data reflected which plant communities are being used and, if so, how they are being used. The qualitative data reflected the feelings and opinions of respondents regarding the significance of plant communities. In total, we reached 87 complete responses from those contacted.

In planning the campus-specific sites we wanted to include in the survey, we used the "Surface Type" ArcGIS maps available through the Landcare program in UMN's Facilities Management Department. With our plant communities definition in mind, we used the filters listed in figure 5 to create a map of existing plant communities on the Twin Cities campuses. We omitted filters that primarily consisted of impervious surfaces as we felt this surface type was less likely to contribute to a meaningful plant community. As a result, we were able to use these maps to

create a survey with targeted locations based on the data presented in our findings. Figure 5 is the East-West Bank Campus. We utilized the same feature for the Saint Paul campus in figure 6.

Survey Results

One aspect we wanted to focus on as a group was bringing in a diverse range of stakeholders and members of the community, such that our data pool is reflective of the community as a whole. We found the most common type of participant to be undergraduate Caucasian (white) students (Figure 7, Figure 8, and Figure 9). This data shows that more effort needs to be directed toward including the voices of diverse stakeholders. While each stakeholder who responded to the survey has a valuable point of view, the importance of getting perspectives that differ from the norm must be kept at the forefront of this project's goals. Another thing to consider is the fact that, while this was the mode of our respondant's data, it does not reflect the norm of the actual racial demographics found on and around campus. It is important to consider the findings of our survey in this context as it would be inappropriate to assume that our survey data reflects the cohesive voice of the UMN community. We aimed to gather a data pool that would fairly represent the opinions of each of the diverse racial groups on campus, however, we failed to do so.

Figure 10 reflects our data on important aspects of plant communities. Participants were able to select as many responses as they would like for this question. The two options chosen with the high frequency were a "place for peace and quiet" (92% of respondents chose this answer) and "aesthetically pleasing" (87% of respondents chose this answer). It is also notable that 57% of

respondents chose “for recreation” and 55% of respondents chose “accessible.” Other responses include mention of the benefits of trees for the environment, benefits that green spaces have on mental health, and the inclusion of native plants. We wanted to apply these characteristics to the UMN community and asked our participants to do so (Figure 11). Respondents were able to choose three responses for this question. “Environmental benefits” was chosen with the highest frequency with 72% of respondents selecting this option. “Native plants” was selected by 52% of respondents, making it the option with the second highest frequency. “Flowering bushes”, “pollinator plants”, and “shade trees” were all chosen at around 35% each.
Other responses included representation of indigenous plants, and recreational uses (i.e. bike paths, spaces for sports,etc.).

We also wanted to narrow down the actual features of plant communities that participants wanted to see on the campus (Figure 12). Respondents were able to choose more than one response for this question and, while they were mostly all chosen with similar frequency, rain gardens were chosen with the highest frequency with 57% of the respondents. While this data was useful in determining characteristics and features of these communities, the utility of these areas to stakeholders was called into question. We asked our participants how important access to these areas was to them (Figure 13) and we found 90% of respondents reported access as moderately to extremely important. While our participants mostly agreed on the importance of access, the next question we asked demonstrated an interesting disparity when it came to actual usage of these communities (Figure 14). The two responses with the highest frequencies were “once a month” and “once or twice a semester”. Other responses included when they were able

to, yearly, never, and not knowing that there were plant communities on campus. Some explanations of the seeming lack of usage can be attributed to lack of access or lack of knowledge of these communities. This bolsters the argument that accessibility and public awareness to the arboretum are crucial if it is to be used frequently.

Many plant communities that we have flagged as a result of our findings include the ones flanking lawns or paths that students traverse almost everyday. Attention should be called to the smaller pool of participants who identified lesser known areas, such as gardens and meadows, as these areas still contain inherent value despite their infrequent use. If a system-wide survey was implemented, the data might look entirely different than our findings. Again, the lack of diversity within our respondents brings attention to the necessity of focusing future efforts on reaching a representative data pool rather than a skewed one.

Finally, we wanted to be able to evaluate the favorite and most utilized communities on campus. Respondents were able to choose their top three plant communities on campus, with the option of writing in their own choice. Despite being able to write-in, respondents selected Northrop mall with the highest frequency as one of their favorite options. Respondents also selected McNamara alumni center lawn, the Knoll, and St. Paul Lawn with the next highest frequencies. Photos, site-specific details, and further elaboration of the common characteristics found among these locations can be found in the final presentation PowerPoint of the Special Plant Communities team. However, we will elaborate on the biggest commonalities between these areas below.

Favorite Locations on Campus Commonalities

The top four most cited locations on campus as being favorites all had the commonality of being open lawns. We attribute this trend to the following reasons: Open areas available for football, frisbee-throwing, and other athletic pastimes are appealing qualities to the majority group of Caucasian students that participated in our survey. An additional characteristic to note is that these lawns are some of the most common images found in UMN branding toward the public and incoming students. These areas are highly advertised as destinations for UMN students and that may be linked to why they are the most used. We infer that advertising the lesser known green spaces on campus, such as the Native American Medicine Garden and Horticulture Garden, could result in increased awareness and use of these areas.

Recommendations and Future Considerations

Based on our findings, we would conclude that UMN students feel plant communities are most meaningful when they bolster three main qualities: 1) Open lawn, 2) An opportunity for peace and quiet, and 3) Access to environmental benefits. The intersection of these three qualities will undoubtedly lead to increased value in and use of the UMN Twin Cities Campus Arboretum. Design examples could include embellishment of open green space with plantings that not only encourage pollinators but also can help to manage stormwater. Incorporating green and gray infrastructure can further manage runoff, mitigate urban heat island effect, and encourage peace and quiet by providing a sound barrier. Another recommendation would be to work with the Landcare program in order to add the Native American Medicine Garden and the Horticulture Display Garden into the ArcGIS surface type map. These areas would be considered

"planting areas" so it is unknown as to why they do not appear to be included when those filters are applied. This would help increase visibility to students and faculty members alike, and thus garner more foot traffic and management in these areas.

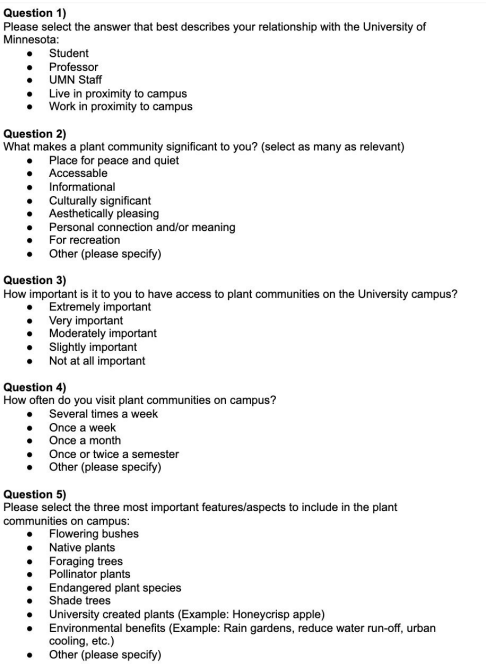
The global pandemic, which has continued to escalate throughout the Spring 2020 semester, created a barrier for outreach but also highlighted potential priorities. Similarly, rapid climatic changes have offered some additional perspective. We would recommend taking into consideration the need for local resilience in the event of natural disaster. This could include creating more edible spaces, integrating more medicinal plants, focusing on increasing biodiversity, and creating habitats for migrating wildlife. It is important to note that much can be learned from Indigenous knowledge about food and medicine as a local resource. Generating and preserving this knowledge throughout the arboretum could also provide educational opportunities regarding native landscapes. Because our survey population was largely limited to young Caucasian UMN students, we would encourage a greater effort to increase diversity in feedback and participation. This will not only ensure everyone's needs are being met but also encourage community-wide buy-in and, in turn, generate a large-scale sense of pride. It will also be important to ensure access is maintained for all populations. Commuters may have less access to the plant communities as parking options are limited on campuses. This may be something to take into account during future planning phases of this project.

Appendix

Figure 1. Survey contacts

Figure 2. Survey contacts continued

Figure 3. Survey questions



Question 1)
Please select the answer that best describes your relationship with the University of Minnesota:

- Student
- Professor
- UMN Staff
- Live in proximity to campus
- Work in proximity to campus

Question 2)
What makes a plant community significant to you? (select as many as relevant)

- Place for peace and quiet
- Accessable
- Informational
- Culturally significant
- Aesthetically pleasing
- Personal connection and/or meaning
- For recreation
- Other (please specify)

Question 3)
How important is it to you to have access to plant communities on the University campus?

- Extremely important
- Very important
- Moderately important
- Slightly important
- Not at all important

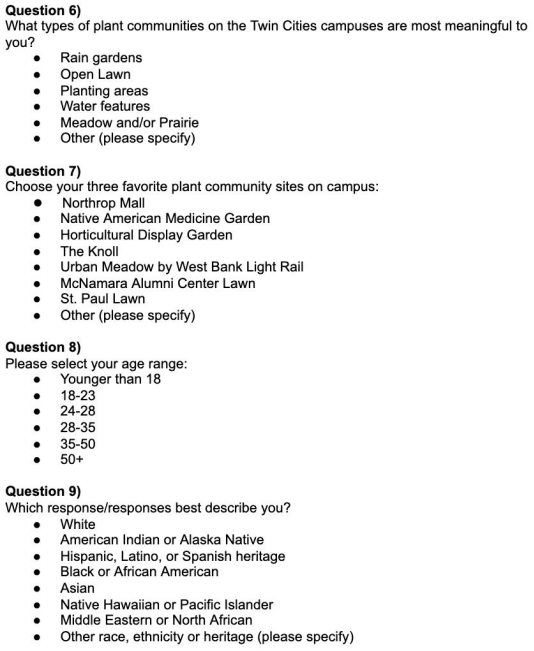
Question 4)
How often do you visit plant communities on campus?

- Several times a week
- Once a week
- Once a month
- Once or twice a semester
- Other (please specify)

Question 5)
Please select the three most important features/aspects to include in the plant communities on campus:

- Flowering bushes
- Native plants
- Foraging trees
- Pollinator plants
- Endangered plant species
- Shade trees
- University created plants (Example: Honeycrisp apple)
- Environmental benefits (Example: Rain gardens, reduce water run-off, urban cooling, etc.)
- Other (please specify)

Figure 4. Survey questions continued



Question 6)
What types of plant communities on the Twin Cities campuses are most meaningful to you?

- Rain gardens
- Open Lawn
- Planting areas
- Water features
- Meadow and/or Prairie
- Other (please specify)

Question 7)
Choose your three favorite plant community sites on campus:

- Northrop Mall
- Native American Medicine Garden
- Horticultural Display Garden
- The Knoll
- Urban Meadow by West Bank Light Rail
- McNamara Alumni Center Lawn
- St. Paul Lawn
- Other (please specify)

Question 8)
Please select your age range:

- Younger than 18
- 18-23
- 24-28
- 28-35
- 35-50
- 50+

Question 9)
Which response/responses best describe you?

- White
- American Indian or Alaska Native
- Hispanic, Latino, or Spanish heritage
- Black or African American
- Asian
- Native Hawaiian or Pacific Islander
- Middle Eastern or North African
- Other race, ethnicity or heritage (please specify)

Figure 5. East-West bank campus map with appropriate filters

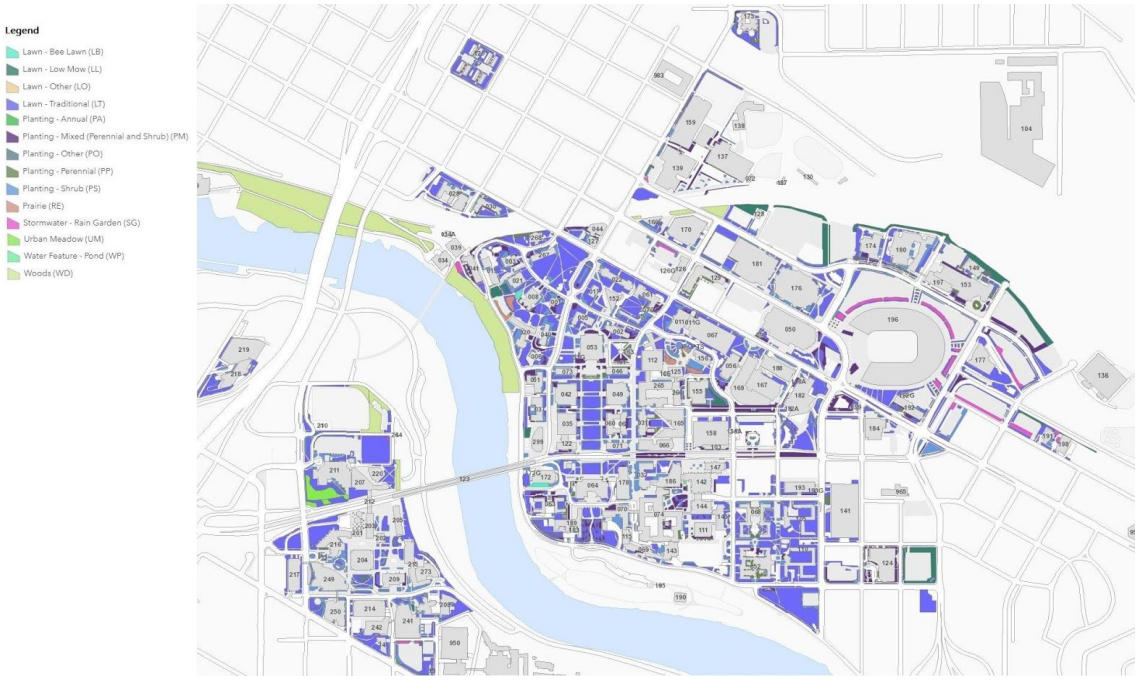


Figure 6. Saint Paul campus with appropriate filters

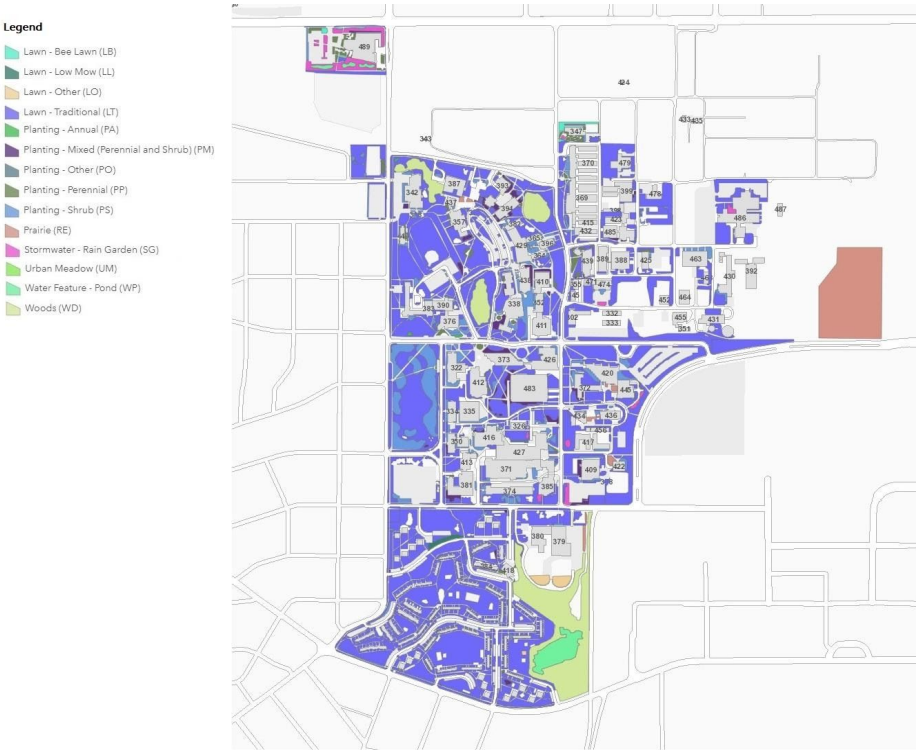


Figure 7. Age range of participants

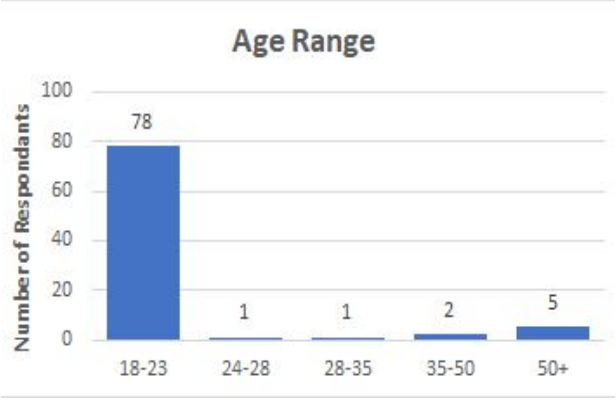


Figure 8. Relationship of participants

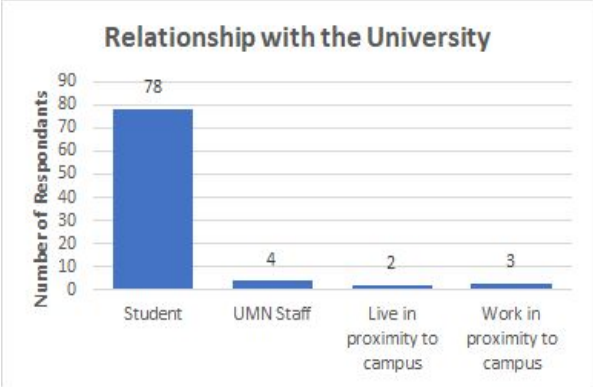


Figure 9. Demographic of participants

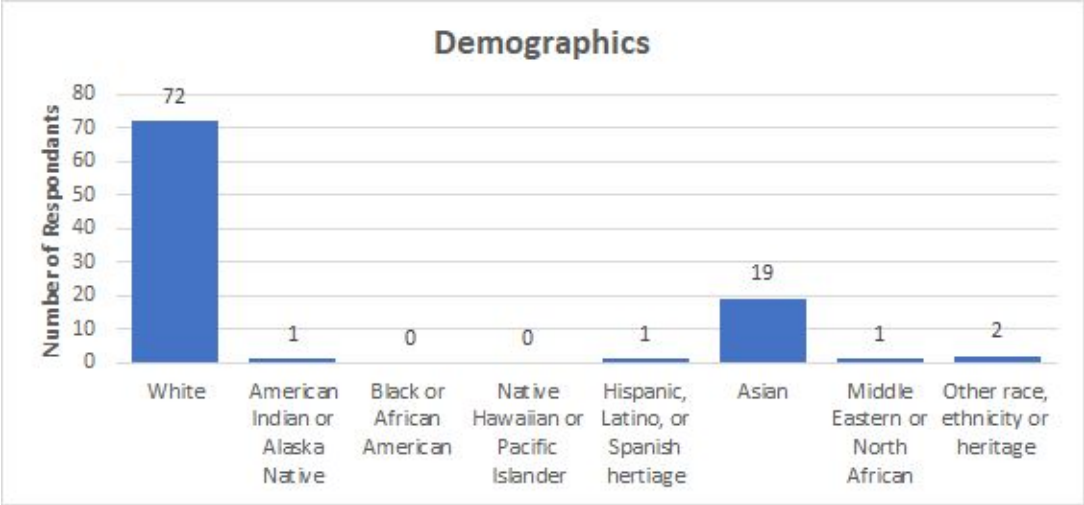


Figure 10. Important features according to survey participants

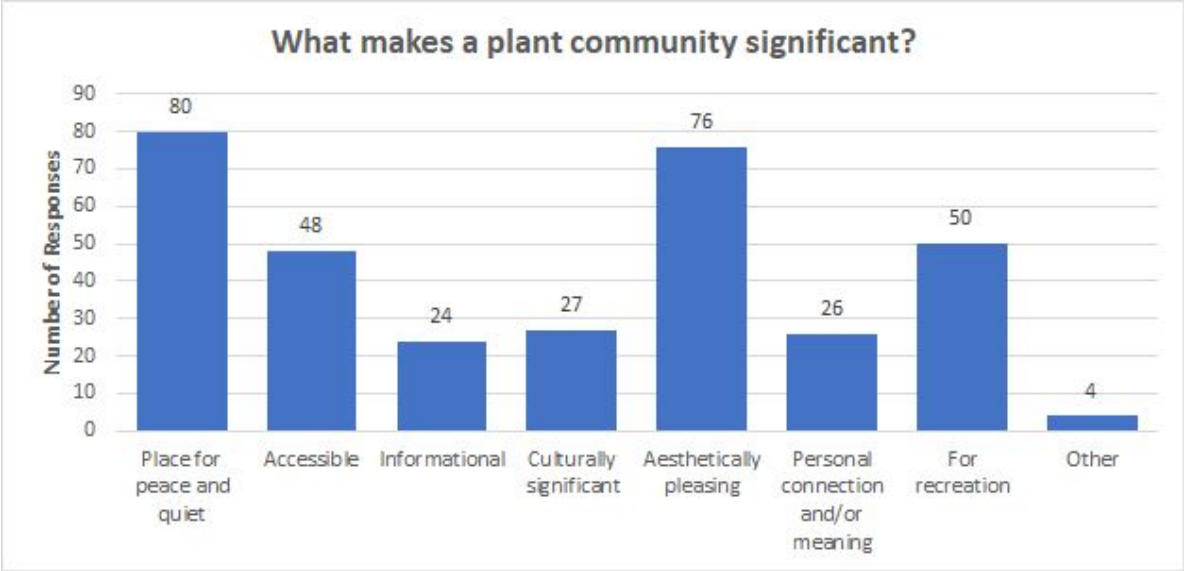


Figure 11. Important benefits to consider according to participants

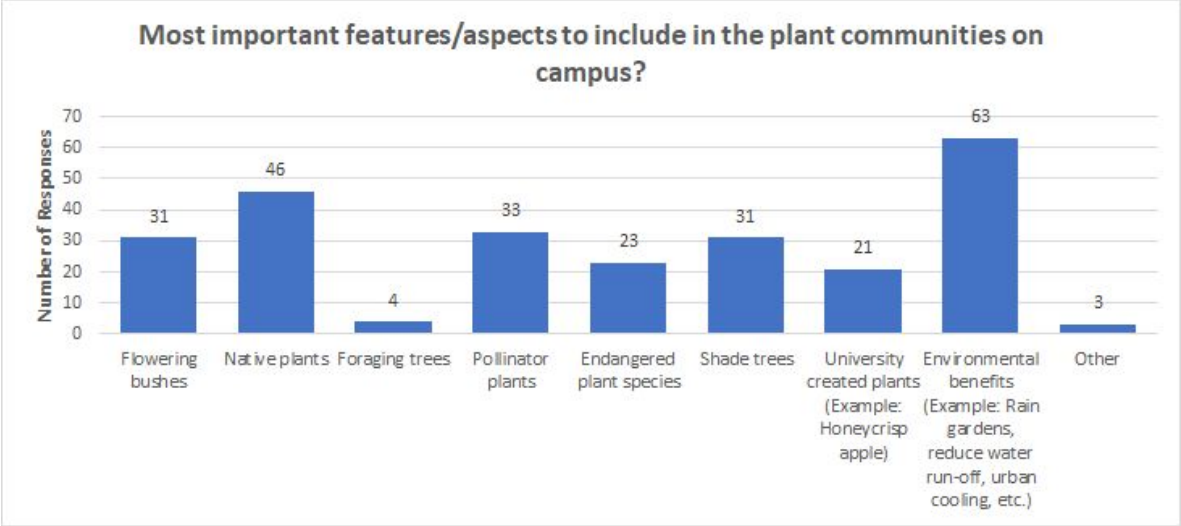


Figure 12. Important features to consider according to participants

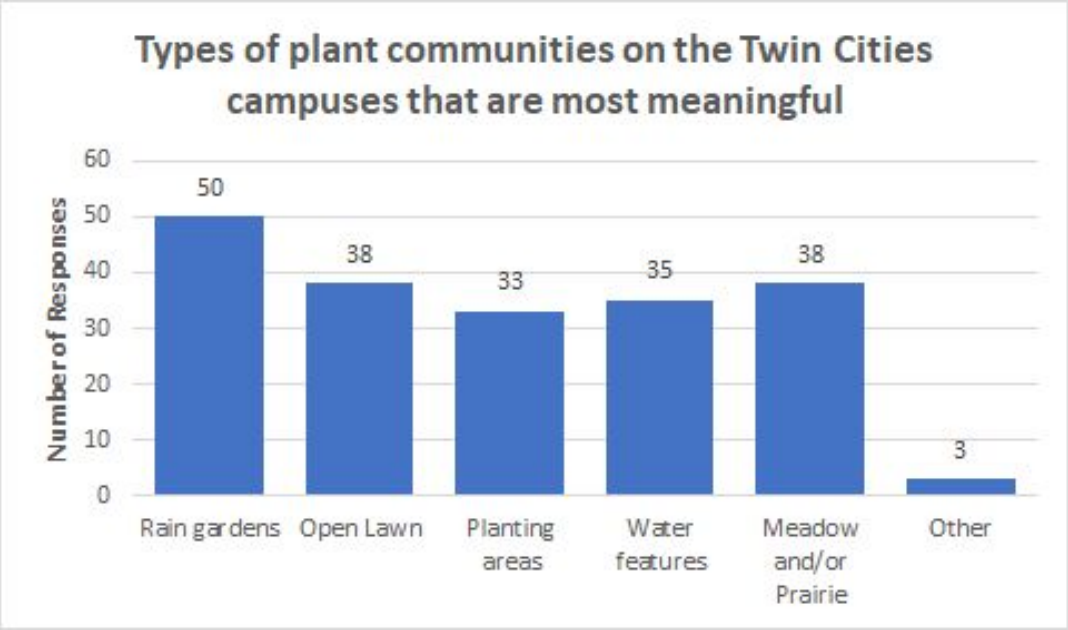


Figure 13. Importance of access according to participants

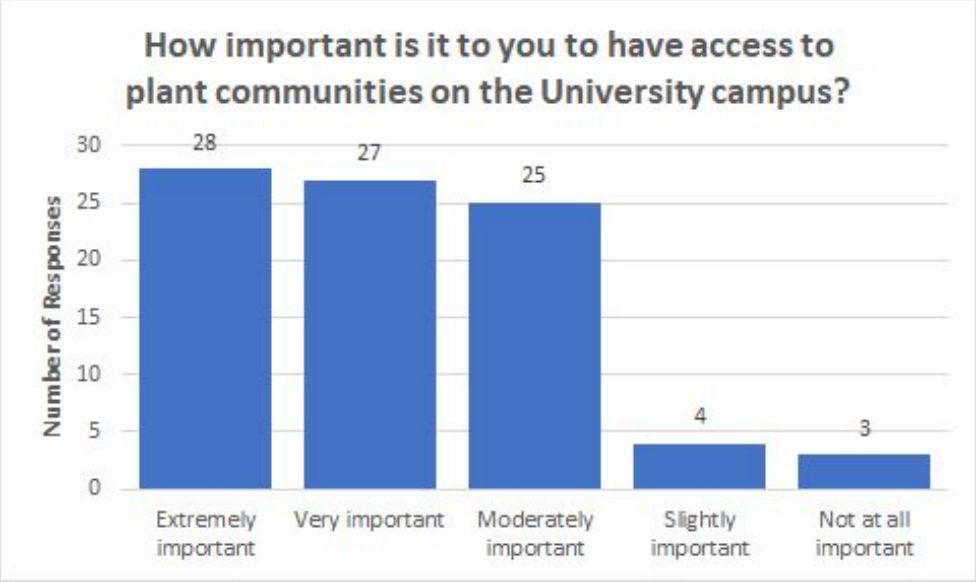


Figure 14. Frequency of visitation of plant communities according to participants

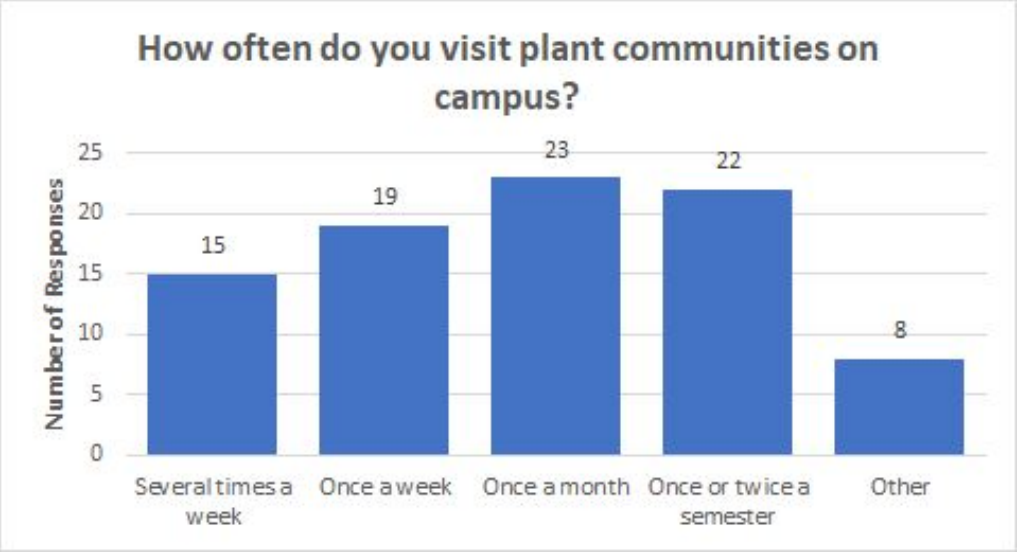


Figure 15. Favorite plant communities according to participants