Bee House Proposal:

When thinking of bees, most people think of honeybees and bumblebees. In reality, honeybees and bumblebees (social bees) only make up 2% of MN's 400 species of bees and the other 98% is made of solitary, native bees (Bee Lab)[1]. All bees play a key role in plant/fruit-pollination, which is estimated at $3 billion yearly (Center of Biological Research, 2017). A study done by the Center of Biological Diversity (2017) estimates that more than half of bee species are declining; 1 in 4 species is imperilled and at a risk of extinction; and that the drive for these issues is due to climate change, urbanization; and pesticide use[2].

Bee population decline is alarming and a helping hand is needed now more than ever. A great step the UMD campus took this past year was adopting a pollinator-friendly operational standard, which touches on one of the factors driving bee decline. An additional step to support bees is to provide habitat on our urban campus where natural habitat is in limited supply. Flower diverse areas where food is easily accessible is a great location for bee houses. In 2002, the foraging distance of sixteen bees was studied. The traveling distance was about 150 to 600 meters (492 to 1968 feet) (Gathmann, Tscharntke)[3]. So selecting five gardens/nature areas (preferably with native flowers) and placing two bee houses would be a great start. This would be a supporting step for our Pollinator Pledge.

Benefits

Aside from the fact that this project supports our local ecology, university and community members could also benefit. Students benefit by getting involved in the beginning stages and learning about local bees and ecology. Students in the entomology club, and other courses, could take a closer look at the stages of bee life in real time. This could add a new perspective

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[1] Native Bees, Solitary Bees, and Wild Bees: What Are They?
[2] Pollinators in Peril: A Systematic Review of North American and Hawaiian Native Bees
[3] Foraging Ranges of Solitary Bees.

to their learning. In parallel, this would also help aid faculty teaching that relates to bees, pollinators, pollination, and more.

Being that our core values include *Engagement*: “collaborating with the greater community” (UMD Core Values)[4], involving the community is a must. Collaboration with local schools to build the houses, or taking them on tours of them would enhance their learning in a similar way that UMD students are enhanced; through hands-on education. Aid from community professionals and possible volunteers caring for the houses creates positive community traffic through campus.

Bee Houses

Bee houses can be very simple to make. The best technique for our University would be to leave old plant stems, which bees use by carving out and planting their eggs; example can be found here. If this technique is not aesthetically pleasing, building actual bee homes and displaying them is possible, though they require more attention (examples can be found in link 1). Around 60-70% of native bees nest in the ground[5]. To provide habitat for these bees, simply leaving untouched patches of dirt is enough.

There is no magic square footage of dirt, or number of stems. Rather, having many of them in many of our native gardens is key. Observing these areas and seeing what is being used, or not, will also guide us to a better number for our campus.

Bee Information:

[4] UMD Strategic Plan: 2017-2021
[5] Make Your Garden a Haven for Bees

- 60-70% of non-parasitic bees dig burrows in the ground.
    - Leaving patches of undisturbed soil around will allow bees to make nests.
- 30-40% use cavity-nesting techniques.
    - Beehouses will attract these bees.
- Solitary bees are able to sting, but rarely do.

Bee Safety:

- Again, solitary bees barely sting. Their houses are sometimes taken by solitary wasps, which are less aggressive than social wasps.
- Though taking the beehouses into sheds is encouraged, it is not necessary.
- Cleaning the beehouses every year or two is necessary. No gear needed, other than maybe gloves.

Bee houses:

Key points and tips:

- Ideal length: 5-8 inches.
- Ideal Width: ⅛-½ of an inch.
- No treated wood.
- Bright fluorescent blue might attract more bees.
- Painting the entrances colors will help bees differentiate their nests.

Cost of buying: $15-$25

Supplies to make our own: Wood; bamboo; paper straws; nails or screws; tools.
The wood must be untreated.

Could also leave plant stems untouched, making natural habitats for bees. Info here.

Bat House Proposal:

Vector borne diseases are diseases carried and passed on by insects or insect-like creatures (ticks, mosquitos, etc). Climate indirectly affects insect activity, making them more prone to action on hot and humid days. With the increase in global temperature, we continue to see more and more active vectorborne carriers and diseases (MN Dept. of Health)[6]. Given UMD has extensive green areas and areas near water, it is important to consider our options in stopping these diseases from spreading.

On any given night, a bat will eat an average of 60 medium-sized moths, or 1,000 mosquitos (National Wildlife Federation)[7]. Making them an easy (and comparatively cheap) option to naturally control pests. Placing bat houses around green areas and those near water is a great start. These bat houses, if bought, should strive to be Bat Conservation International (BCI) certified, for many retailed bat houses do not meet recommended criteria. If built, they should follow recommendations from BCI, as well.

Bat House Care

Regular checks (Monthly or more) should be done to make sure the house conditions are good for bats. This would include house temperature; possible predators; and number of bats living there. If no bats are inhabiting the house, this could be a signal for house errors. Every winter, maintenance actions should be taken. Checking for wasps and removing their nests; recaulking the house; and even repainting. Further assistance and houses for purchase can be found in Lonestar Woodcrafts website

Bat Information:

- Around 1% of bats have rabies, making them no more dangerous than other animals. When infected, bats do not act any more violent. Rabies may actually paralyze bats.
- A small brown bat eats 60 medium-size moths, or around 1,000 mosquitos every night.
- All MN bats migrate south in the winter.

[6] MN Dept. of Health.
[7] National Wildlife Federation.