

SUSTAINABILITY INITIATIVES BY STUDENT ORGANIZATIONS FUNDING PROPOSAL

Part I - General Information

Name of Student Organization	The Office of Sustainability Student Internship Program
Contact/Responsible Person	The Food Team
Contact Office Held/Title	Interns
Contact Email Address	sami3@vt.edu
Contact Telephone Number	(804) 432-1616

Part II - Project Cost Information

Estimate Cost of this Proposal	\$928	See Part III.C
Estimated Savings –		See Part III.D
Net Cost of this Proposal	\$928	

Part III - Supporting Information

A. Please describe your sustainability initiative and attach supporting documentation.
***See Section A on pages four and five**

B. How does this initiative help to achieve the goals of the Virginia Tech Climate Action Committee Resolution and Sustainability Plan?
***See Section B on page six**

C. What is the cost of your proposal? Please describe in adequate detail the basis for your cost estimate.

- Size of one plot:
 - 10 x 10 ft
 - \$105 for 300 seed packets
 - 2 x \$105 = \$210
 - Make a donation and get 300 seed packets for a \$105 donation: https://www.saveourmonarchs.org/store/p58/%24105_Donation_%28300_Seed_Packets%29.html
 - OR 15- 20 milkweed plants
 - \$74 for 1 flat = 34 plugs
 - <https://shop.milkweedmarket.org/syriaca221M-32>
 - 8 x 1 flat = 2 waystations; need extra plants for corridors = \$592
 - AND 24-32 nectar plants
 - 1 x 1 pound of Swamp Marigold (*Bidens aristosa*): \$90
 - <https://www.prairiemoon.com/bidens-aristosa-swamp-marigold-prairie-moon-nursery.html>
- Leaf mulch:
 - Approximately \$25/cubic yard
 - 10 square feet = 3.7037 cubic yards
 - 5 plots = 18.5185 cubic yards
 - Approximately \$463
 - https://xerces.org/sites/default/files/2018-06/18-003_01_Monarch-Nectar-Plants-for-Conservation-Plantings.pdf
 - Page 17 has best milkweed/ supporting plants for our region
- Educational signs:
 - 5 x \$16.00 = \$80 for waystation certification
 - 5 x \$17.00 = \$85 to be classified as a monarch waystation weatherproof sign
 - <https://shop.monarchwatch.org/product/Monarch-Waystation-Sign/125618>
- Estimated Costs
 - \$928 (includes seed packet price, not plugs)
 - \$1,310 (includes plugs, not seed packets)

D. Will your proposal produce cost savings for the University? If so, how much? Please describe in adequate detail the basis for your savings estimate.

With all prices considered, maintenance of milkweed and “wild gardens” in general is relatively low. Designating approximately 5 10 feet by 10 feet plots along the planting route (Figure 1) would produce cost savings for the University in the following ways:

- a. Wild gardens are designated “no mow” sites, meaning that there would be a reduction of labor costs to maintain these planting sites.
 - i. At least 500 square feet of land that previously needed to be maintained will no longer need any form of services.
- b. Milkweed is resilient and does not need extra landscape costs of watering and maintaining, as other gardens and flowering plants on campus do.
 - i. After initial planting and preparation of the land, done so by volunteers during the proposed planting event, no maintenance is required to keep up with the wild gardens. In fact, species that thrive and congregate to these areas prefer little disturbance.
 - ii. Milkweed is also a low maintenance plant itself; upon initial costs of planting, no additional costs need to be funded for aesthetic or upkeep of the areas.
- c. Milkweed is planted in the fall, which reduces watering costs, since soil moisture remains prevalent throughout the season.
 - i. Soil moisture coupled with natural rain fall is all the water maintenance these plants need in order to thrive.

E. Is this funding request an Ongoing or One-Time change **(please check one)**?

One-time

Ongoing

F. Is funding available for this request from another source? If yes, describe the funding (source, amount, etc.)

Not applicable.

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<u>Part IV- Requestors/Reviewers</u>	
The Food Team Interns for the Office of Sustainability	11/14/2019
Prepared By (Name of Contact for Student Organization)	Date
Melissa Philen Jack Rosenberger	10/21/2019
Reviewed By (Name of Appropriate University Official)	Date
Denny Cochrane	1/16/20
Reviewed By (Name of Office of Sustainability Representative)	Date

Section A.

A species once prevalent in North America has recently faced a devastating decline. The monarch butterfly provides immense cultural and aesthetic value; however, due to human intervention, this species that is celebrated by many is at risk of extinction. Monarch butterflies and milkweed plants exhibit a mutualistic relationship—one cannot exist without the other. A loss in milkweed has been the result of agricultural development and lack of conservation and valuation of important meadow and grassland habitats. This loss has since affected the monarch population and calls for necessary efforts to be put forth in order to conserve this species.

Monarch butterflies are unaffected by the toxic chemicals found in the milkweed plant; instead of avoiding the plant, they plant their eggs on it. As the larvae develop, they feed on the leaves of the milkweed plant. Instead of being poisoned by the cardiac glycosides, the caterpillars become toxic to predators themselves. The monarchs are benefited in the way that consumption of milkweed helps them stave off predators and increases their chances of survival. (Monarchs and Milkweed – The Precarious Cycle.) In return, the milkweed becomes pollinated to increase its chance of dispersal.

Due to habitat loss through industrial development, agricultural development, and herbicide use, monarch butterflies have struggled to find milkweed. This has caused a sharp decline in the monarch population, and they are at risk of extinction. In fact, “there has been a 58% decline in milkweeds on the Midwest landscape and an 81% decline in monarch production in the Midwest from 1999 to 2010” (Milkweed loss in agricultural fields because of herbicide use). Unfortunately, according to National Geographic, development and herbicide use is not the only reason that the monarch population has become endangered. Rising global temperatures have caused a chemical change in the milkweed plant: “rising carbon dioxide levels from the burning of fossil fuels sit at the heart of climate change, and this increase of carbon can alter how plants like milkweed build certain molecules (Murawski, D. A., & Taylor, M).”

Due to the monarchs’ extensive migration of over 3,000 miles, conservation efforts are needed in many parts of North America and Mexico, as well as in some parts of Canada. The US Department of Agriculture states that “many government agencies, organizations, and individuals across North America are working on projects to conserve monarch habitats and migration phenomenon.” (Conservation in North America). Here are some examples of different conservation projects:

- The Mariposa Monarca Biosphere Reserve was created by the Mexican government. It serves the purpose of protecting 62-square miles of forests, and in 2000 they increased the square mileage to 217 miles. “The high-altitude forests that provide winter habitat for hundreds of millions of monarch butterflies are on the borders of the states of Mexico and Michoacán” (Conservation in North America).
- The United States Fish and Wildlife Service began a grant program that funds projects related to the protection and restoration of monarch habitats. Since its foundation, they have provided over \$700,000 to various conservation efforts. “For example, the Service partners with Mexican authorities and ALTERNARE, A.C. to support a training program to develop the natural resource management capabilities of local communities” (Conservation in North America).

In order to contribute to these conservation efforts, we are proposing to plant a series of pollinator habitats on campus. **Each habitat would include milkweed plants native to Virginia, planted alongside an assortment of nectar flowers; these habitats are referred to as wild gardens. We are proposing to plant approximately five of these habitats, each with a minimum space of 10 feet by 10 feet, accompanied by corridor paths of milkweed between each wild garden. Our planting site is mapped out in Figure 1 below.**

- Along the proposed planting site, we hope to place garden is populated areas—alongside sidewalks, the back side of the duck pond—to attract students, faculty, residents, and visitors to Virginia Tech’s campus during migratory periods. The location of wild gardens helps to promoting environmental education and ensure that Virginia Tech can contribute to the conservation of monarchs.
- The proposed planting route (Figure 1) was decided upon a variety of factors, with the most influential consideration being the cohesiveness of wild gardens to Virginia Tech’s landscape

language. Wild gardens—suggested planting sites indicated by white points—would intermingle with the surrounding vegetation that exists in varying spots along this path.

- Species survival is dependent on the connectivity between and the size of wild garden patches. Offering corridors between patches minimized the risk of monarchs becoming susceptible to predation, starvation, and exhaustion.

- **Figure 1. Proposed Planting Site Outlined in Orange**



The Town of Blacksburg has recently been named an official Monarch City, recognized by the organization Monarch City USA. In the past, the town has successfully implemented a few conservation projects and programs, often during the month of September, which Mayor Leslie Hager-Smith recognizes as Monarch Butterfly Month. Because of the interest that Blacksburg already has, we are also proposing to partner with the Town of Blacksburg to plan a day during Sustainability Week 2020 where the community can join us, bring their children, and assist in planting the monarch habitats. By involving the community, we hope to further foster the good relationship Virginia Tech has with Blacksburg as well as educate those involved with the issues facing monarchs and the power an individual’s actions can have.

The monarch population may be declining, but North America has been responding. These habitats successfully attract and harbor monarch butterflies, providing them with a space to feed and reproduce. The implementation of wild gardens would also attract a plethora of other wildlife species and pollinators—honeybees, native bees, hummingbirds, and early successional, urban birds—which would increase species diversity on campus. Additionally, an increase in species diversity coincides with higher public engagement on campus. Recreationalists, students, and residents of Blacksburg will utilize the wild gardens for the variety of aesthetic, social, cultural, and environmental services that they have to offer. As a result, the university could potentially attract new students who value wildlife. In addition, this project may contribute to increasing Virginia Tech’s “Green College” ranking on The Princeton’s Review. Monarch conservation efforts put forth by people around the nation are quickly solving an issue created by human intervention. By completing this project, we would become a monarch friendly place. Virginia Tech would join communities, campuses, and cities in reviving this species.

Section B.

Virginia Tech has committed to becoming a leader in campus sustainability around the world. With this task comes potential sustainable programs and activities that can occur around campus and the Blacksburg community. **Growing milkweed and providing an educational component and community event with the planting helps achieve the outreach element of Point 12 in the Climate Action Commitment.** Having students maintain and monitor the monarch growth also helps achieve this goal of the commitment reliability. Our potential program may help Blacksburg’s initiative to become a Monarch City by planting several spots on campus—which can be considered monarch waystations. According to MonarchWatch.org, which is considered one of the leading organizations in the preservation of monarch butterflies, waystations are defined as “places that provide resources necessary for monarchs to produce successive generations and sustain their migration” (Monarch Watch). Monarch waystations and potential monarch habitats around campus will not only provide a home and safe space for this species, but they will also provide an educational aspect to the students of Virginia Tech, the faculty, and the members of the local Blacksburg community.

This implementation of the program would provide educational aspects that can be used by the local Blacksburg schools along with courses within our own Virginia Tech community. For example, certain signs, such as those found on the Monarch Watch website, can be posted near each of the fields designated for the monarch habitats (Figure 2). This project can not only help create an environment for monarch butterflies, which are considered endangered, but also can promote environmental stewardship by our educational aspects and the ability to protect them, **which coincides with Point 1 of the Climate Action Commitment.** Along with this environmental stewardship and educational aspect, there is also a component of community involvement. Blacksburg’s title as a Monarch City aids in the increase in population and habitats for monarch butterflies, and the proposed networking between Virginia Tech and the town of Blacksburg regarding monarch conservation will strengthen the community involvement and form a stronger relationship between the two entities. This connection can continue to be promoted for the following year with the event of planting of the milkweed to be conducted in the Sustainability Week 2020. This event could be open to Blacksburg residents, local students, and collegiate students hopes to pique local interest in the protection of monarch butterflies and initiate conservation movements.



Figure 2. Monarch Waystation Signage in

Finally, there is a form of outreach and education that can be brought into the proposed project. The potential use of milkweed will be a form of outreach because it targets conservation practices and the educational aspect of promoting monarch conservation and preservation. This proposed project can be beneficial to both the community of Virginia Tech and the local community of Blacksburg. Through this outreach and promotion of the planting, we would be able to provide both of these communities the ability to implement a sustainable practice first-hand with the planting and growth of these monarch habitats.

Supporting Material

Potential Resource and Help to get it registered as a Monarch Waystation:

- <https://www.monarchwatch.org/waystations/>
- https://www.monarchwatch.org/waystations/monarch_waystation_brochure.pdf

Potentially Free Milkweed for College Campus Grant Program:

- <https://monarchwatch.org/bring-back-the-monarchs/milkweed/free-milkweeds-schools-nonprofits/>

Garden Preparation

- Instructions from Loudoun Wildlife https://loudounwildlife.org/themencode-pdf-viewer/?file=https://loudounwildlife.org/wp-content/uploads/2017/03/Monarch_Waystation_Lasagna_Gardening.pdf
- Instructions for preparing and planting a monarch habitat, US Fish and Wildlife Service <https://www.fws.gov/midwest/news/PollinatorGarden.html>

Community Projects

- Sample garden from Loudoun Wildlife <https://loudounwildlife.org/2017/07/monarch-waystation-sample-plot/>
 - -recommends planting two nectar plants per milkweed plant
- Rooftop monarch garden: <https://monarchjointventure.org/news-events/news/fostering-young-conservationists-great-parks-of-hamilton-county>
- Small garden in Newport News, Virginia <https://monarchjointventure.org/success-stories/the-accidental-ecosystem>
- VA projects(use of roadsides) <http://www.virginiamasternaturalist.org/home/giving-monarchs-a-boost-in-virginia>
- Conservation Efforts Map <https://monarchjointventure.org/our-work/monarch-conservation-efforts-map>

Milkweed Variety

Plants: try to use perennials(they come back each year)

- Chart for determining what plants fit the area best: <https://monarchjointventure.org/images/uploads/documents/MilkweedFactSheetFINA L.pdf>

Information on the five varieties of milkweed that grow in the Northeast region

- **Common Milkweed:** <https://monarchwatch.org/bring-back-the-monarchs/milkweed/milkweed-profiles/asclepias-syriaca/>
- **Swamp Milkweed:** <https://monarchwatch.org/bring-back-the-monarchs/milkweed/milkweed-profiles/asclepias-incarnata/>
- **Butterfly Weed:** <https://monarchwatch.org/bring-back-the-monarchs/milkweed/milkweed-profiles/asclepias-tuberosa/>