

Bee Campus USA - James Madison University

Report on 2023

Pollinator Habitat Creation & Enhancement

Please describe pollinator habitat creation or enhancement projects in your community in 2023, and whether your committee hosted them or not.

The East Campus Hillside area of campus had two new areas of native meadows seeded in the spring of 2023. One new meadow area, called the Triangle Meadow, planted wildflowers and grasses, many of which are new species to the existing meadow on the East Campus (EC) Hillside and primarily pollinator friendly. The second new meadow area was planted within the newly expanded and updated solar facility. This meadow was planted with similar species to what was reported in last year's report and planted in the rows between the solar arrays. Additional pollinator friendly species were chosen using the Virginia Solar Native Plant Finder to ensure that every flowering season would provide potential food for pollinators. A 75 feet wide riparian herbaceous buffer was installed along 380 feet of the North River at a JMU property, called the JMU Farm. The JMU Farm is used for campus events, outdoor learning and research and has public launch access for non-motorized watercraft. At the EJC Arboretum on campus, a group of volunteers annually perform invasive plant management throughout the gardens and woods. They target multiflora rose, Tree of heaven, Euonymus, ligustrum, honeysuckle vines and shrubs, English ivy, Italian arum, Oriental bittersweet and more. At the EJC Arboretum, new plantings along the pond were installed to include many perennial plants that are pollinator friendly. One more native planting installed at the arboretum included converting turf grass to native meadow on a steep hillside along a major road. Student and community volunteers planted 165 trees on 1.1 acres of new riparian buffer along a wet weather stream. Many of the flowering tree species planted support pollinators. A campus community garden planted a summer cover crop in all of the beds for pollinators while students were away over summer break. The summer cover crop included mint species, comfrey, purple passionflower, sunflowers, buckwheat and sowpeas. The Bioscience building's pollinator gardens are maintained annually by students and faculty, this includes invasive plant management. Another campus community garden growing on the rooftop patio of the ISAT building on campus is maintained by students and faculty. The garden has been growing there for over a decade, there are many flowering plants and herbs that provide food and habitat for pollinators.

How many habitat projects did you help to create or enhance in 2023?

11

How many people (staff, volunteers, students, partners, etc.) helped with those projects?

247

How many projects benefit monarchs, milkweed, or nectar plantings?

How many total square feet of habitat were created or enhanced?

115345

Please check all that describe the habitats your affiliate helped to create or enhance last year with pollinator benefit in mind.

- Flower garden
- Vegetable garden
- Orchard
- Natural area with tree snags and stumps, and bare areas for ground nesting species
- Meadow
- Herb garden
- Native milkweed planting for monarchs and bees (where appropriate)
- Invasive/exotic plant species removal for habitat improvement
- Native pollinator-friendly tree planting
- School garden



Education & Outreach

Please describe pollinator conservation events or outreach activities in your community in 2023, indicating whether your

committee hosted them or not.

The EJC Arboretum on campus held numerous pollinator related education events: spring wildflower walks where pollination is discussed, Monarch butterfly tagging and release family friendly program, A Night Fliers Bug hunt focused on those pollinators that are active at night, Hosted a Big Bug Hunt to log, record and identify pollinators found in the gardens at the arboretum, a summer camp for elementary and middle school aged students had two days focused solely on pollinator education and the StoryWalk trail at the arboretum shared a bilingual children's book on the Monarch butterfly (Senorita Mariposa) for a month. The local Harrisonburg High School Earth Club visited JMU's East campus Hillside Meadow and Land Bridge Meadow to learn about native grasses and flowers of the meadows with JMU Bee Campus Advisory faculty members. A group of undergraduate students' research poster won an international award. The poster summarized seven years of butterfly survey data collected by JMU undergraduate geography students at 12 study sites within the City of Harrisonburg, Virginia. Seven of those sites are on JMU's campus. Students confirmed observations of 50 butterfly species on campus sites. Geography students, led by a Bee Campus Advisory Committee faculty member, participated in an Earth Day celebration at a local elementary school, the undergraduates led the elementary students in pollinator identification games and surveys of pollinators on the school grounds and gardens. Geography students, led by Bee Campus Advisory Committee faculty member, participated in iNaturalist citizen science and uploaded a total of 212 observations of 43 species on campus. Ten of those species were insect pollinators. The Harvest Fest at the Arboretum included the student Geography Club leading families and community members in a pollination and pollinator activity. Geography students, led by Bee Campus Advisory Committee faculty member, created and maintained an active learning station about birds and pollinators of Harrisonburg during a city public school annual STEM Day at the mall. The East Campus Hillside Meadow project on campus won a JMU President's Purple Star Award for Academic Quality- Transcending Boundaries. A Book for the 'Burg is a community-wide reading program launched in 2013 to engage our community in conversations around a thought-provoking theme. Community members are encouraged to explore the selected reading and attend a number of related events and activities. A Book for the 'Burg is organized by the Institute for Stewardship of the Natural World at JMU, and community partners include JMU Libraries, Eastern Mennonite University, Massanutten Regional Library and the Edith J. Carrier Arboretum. Additionally, a graduate student in the College of Visual and Performing Arts with a grant from the Virginia Commission for the Arts and matching funds from the ISNW presented programs as part of A Book for the 'Burg. Together, the partners organized eleven events and book displays at each partner library. The program was based on the 1962 book Silent Spring by Rachel Carson, and explored birdsong, environmental awareness and action for a sustainable future.

How many pollinator-related events or outreach activities did you host or help with in 2023 (in total)?

28

How many people attended those events (in total)?

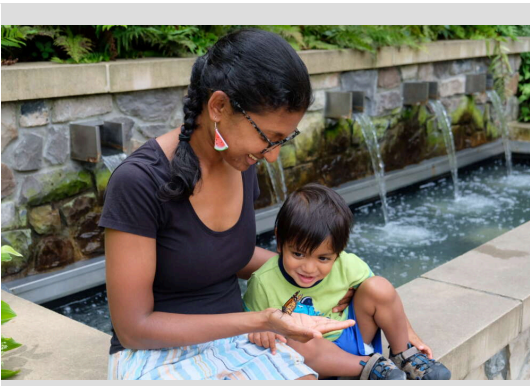
1623

Number of permanent interpretive/educational/Bee Campus USA signs installed to date?

15

Number of temporary interpretive/educational/Bee Campus USA signs installed in 2023?

2



Participants enjoy observing a monarch butterfly during the EJC Arboretum's Monarch Tagging Release event. (Photo: JMU/Shivam Saxena)



Geography Club student president, Sydney Jenkins, at the club's table during Harvest Fest at the EJC Arboretum where the club led hands-on activities about pollinators and pollination. (Photo: JMU/Sydney Jenkins)



JMU Faculty, Wayne Teel with HGS teacher, Trevor Chase and the HGS Earth Club learning about native grasses and wildflowers in a designated pollinator habitat area on campus. (Photo: JMU/Wayne Teel)



A new sign indicating pollinator conservation actions JMU has taken within the newly expanded solar facility on campus. (JMU/Dale Chestnut)



New signage installed at a new 75-foot wide meadow buffer planted along the North River at the JMU Farm property. (JMU/Dale Chestnut)



An existing Bee Campus sign in front of native meadow pollinator habitat on the East Campus Hillside of JMU. (JMU/Dale Chestnut)

Curriculum, Continuing Education, & Service Learning

Please describe the curriculum your campus engaged in 2023, indicating whether it was part of a for-credit course or continuing education.

Continuing education classes consisted of two lectures at the EJC Arboretum on campus as part of their summer lecture series: 1) Gardening with Native Plants and 2) The Importance of Pollinators for Biodiversity. The other continuing education offering was a seminar attended by student, faculty, staff and the community by T'ai Roulston (UVA Faculty), titled, "The evolutionary ecology of bumblebees and their fatal enemies: Is death costly?" GEOG 210 (Physical Geography – Spring): Students completed a service learning lab as part of this course that weeding and planting seeds in the pollinator beds at the bottom of the EC Hillside. GEOG 340 (Biogeography – Spring): This class

included a week-long module (lecture, lab, and field work) covering pollination and pollinator importance. Students were instructed about the pollinator habitats on campus. Conducted surveys of spring pollinators on the east campus hillside and EJC Arboretum. Observations were documented on iNaturalist. There was a total of 212 observations with 43 species observed. Ten of those species were insect pollinators (others were plants and birds). Pollinators included 3 species of butterfly, 1 moth species, 5 bee species, and a hover fly. GEOG 490 (Senior Research – Spring): A small group of students worked with 7 years of butterfly survey data collected by JMU undergraduate geography students at 12 study sites within the city of Harrisonburg, Virginia. The study included 7 survey sites on the JMU campus. The project included cleaning the database, statistical analyses, and spatial analyses with the use of remote sensing and GIS. GEOG 210 (Physical Geography – Fall): Students worked in the Keister Elementary Pollinator garden and vegetable garden and planted winter crops. Students also helped with Keister Elementary tree planting with Harrisonburg City Public Works. GEOG 440 (Advanced Biogeography – Fall): Harrisonburg Public Works Green Space Manager, Jeremy Harold, was invited to speak about Harrisonburg’s Pollinator programs and the use of iNaturalist for the Parks for Pollinators 2023: Harrisonburg VA competition. Each student participated and submitted photographs for the competition (BioBlitz). I created an iNaturalist Project (<https://www.inaturalist.org/projects/jmu-malta-biodiversity>) for submissions from GEOG 440 and ISAT 675 students to keep track of entries. The entries were also submitted to the City-wide Parks for Pollinators Project. Student Brooke Clethero won a “Species of the Week” city prize for her iNaturalist submission of Black-eyed Susan, taken in the Triangle Meadow of east campus. Four teams of students (4 students per team) each completed a semester-long Butterfly biodiversity project throughout the city of Harrisonburg. Surveys included 5 JMU study sites. A total of 23 butterfly species were documented on the JMU campus. GEOG 490 (Senior Research – Fall): A student further studied the temporal and spatial analysis of butterfly data collected in Harrisonburg. ISAT 675 (Biodiversity Conservation – Fall): Graduate students learned more about biodiversity through studying pollinators, especially butterflies, on the JMU East Campus habitats. Harrisonburg City Public Works staff were invited to speak about Harrisonburg’s Pollinator programs and the use of iNaturalist for the Parks for Pollinators 2023: Harrisonburg VA competition. ISAT/GEOG 429 (Sustainability: An Ecosystem Perspective): Students worked on restoration ecology themes utilizing the native meadow habitats on East Campus. ISAT 320 (Fundamentals of Environmental Science): Students did a series of labs on the EC Hillside meadow that included pollinator habitat data collection – plant and invertebrate species richness and diversity measures. This is part of a long-term project looking at the relationship between the naturalizing native species of forbs and grasses and overall habitat quality.

How many of your for-credit courses included pollinator-related information in 2023?

9

How many students attended those for-credit courses?

160

How many of your continuing education courses included pollinator-related information in 2023?

3

How many participants attended those courses?

130

How many service-learning projects did your campus host and/or support to enhance pollinator habitat on- and off- campus?

8

How many students participated in service-learning projects in 2023 to enhance pollinator habitat on or off-campus?

287

Please describe the service-learning projects your students were engaged in 2023, indicating which, if any, were associated with a course.

A community garden space on campus, Madison Gardens, had two service learning projects this year. There was a spring work day when compost was added to the beds and they were all seeded with a summer cover crop of sunflowers, buckwheat, sunhemp and cowpeas. Volunteers included high school and university students and community members and JMU staff. This project was initiated by a committee member. The second service-learning project in Madison Gardens was a fall work day. Student volunteers learned about cover crops and why it is okay to leave some plant material over the winter because some pollinators will use it as cover/protection over the winter months. Students weeded the garden plots and seeded a fall cover crop and laid straw mulch down over the seeded beds. The EJC Arboretum has many service learning projects throughout the year that involve enhancing and maintaining pollinator habitat on their grounds. Student and community volunteers planted 165 trees, many of which were native and several species important to pollinators along a wet weather stream on campus. Students completed a Service Learning (multiple options) lab including weeding and planting seeds in the pollinator beds on the JMU East Campus Hillside in a geography course. JMU students worked in the Keister Elementary School pollinator and vegetable garden and planted winter cover crops as part of a geography course and another time students completed service-learning at the Keister gardens as part of the City of Harrisonburg's Pollinator Month celebration. The Edible Forest Garden on the EC Hillside was maintained by students, including planting new understory herbs and flowering plants, replacing dead fruit trees and invasive plant management. The ISAT rooftop garden beds were student maintained and students, led by a JMU faculty member, created a Bugs and Blooms project where they developed an app to track the timing of blooms in the garden and the presence of pollinators. The goal is to compare the timing of the blooms and the arrival of the pollinators and address the effects of climate change.



Anna Maria Johnson, JMU lecturer, presents a talk during the EJC Arboretum's summer lecture series on Gardening with Native Plants. (Photo: JMU Todd Martin)



ESAT 220 (Fundamentals of Environmental Science) students completing pollinator habitat data collection on the East Campus Hillside meadow as part of a lab. (JMU/Jennifer Coffman)



Students in GEOG 440 (Advanced Biogeography) identifying grasses and wildflowers for pollinators on the Land Bridge native meadow habitat. (JMU/Amy Goodall)



GEOG 340 (Biogeography) students volunteering at a tree planting event in a newly created riparian buffer along a wet weather stream on campus. (JMU/Amy Goodall)



Students in GEOG 220 (Physical Geography) weeding and planting in the vegetable and pollinator beds this year. (JMU/Amy Goodall)



Students from ISAT 140 (Problem Solving Approaches in Science and Technology) volunteered at a Madison Garden work day to plant fall cover crops and weed the garden beds. (JMU/Nora Brown)

Policies & Practices

Please describe actions taken to make pest management more pollinator-friendly.

To make pest management practices more pollinator friendly, JMU implements an Integrated Pest Management (IPM) Plan that serves as a guideline for the following: (1) Outline the goals of pest management at JMU, (2) Identify the responsible parties for pest management, (3) Outline performance measurement, quality assurance and control strategies, (4) Outline steps to identify pests at JMU (5) Outline the practices and strategies used to enforce pest control at JMU, (6) Outline how pesticides are stored and applied on campus grounds, (7) Outline preventative strategies for pest infestation. The JMU IPM plan applies to all 770 acres of the university campus grounds. This includes JMU designated habitat areas. The university aims to protect habitat areas on campus using pesticide conservatively across campus and to minimize site management practices on habitat areas. The IPM promotes the use of a range of preventative and non-chemical approaches to control pest populations and stave off infestation. IF an infestation with unacceptable impacts occurs, thereby warranting additional treatment, IPM favors the use of least-toxic pesticides – such as Neem and horticultural oil for insect pests such as whiteflies, aphids and Japanese beetles. Chemicals and pesticides are used only in targeted locations and for targeted species. The targeted application of a toxic pesticide is allowed only after all other reasonable non-toxic options are exhausted. The type and quantity of all

pesticides used on campus are tracked and the location of each use is also documented. To reduce pesticide use, mechanical practices are also employed. Good housekeeping strategies are used as preventive measures, such as cleaning trash regularly, clearing debris and providing adequate drainage. In addition, new plantings are selected in habitat areas based on appropriate climatology. The IPM policies are executed by trained technicians who receive certification every two years and formal training.

In your city or campus, are any policy initiatives underway to further protect pollinators, people or waterways from pesticides?

This year the university received a Virginia Pollinator-Smart program certification for the solar facility and associated native meadow habitat within and around the facility. As part of this certification, the university has developed a vegetation management plan for the habitat and committed to eliminating any kind of insecticide use in that designated area. There are no official policy initiatives underway at the moment.

Did your committee participate in any continuing education on ecologically-based Integrated Pest Management planning?

Committee members from the EJC Arboretum attended two landscape symposiums where IPM was a topic of discussion. Committee members from the university's landscaping department attend IPM related training, and three staff from that department took a pesticide applicator recertification course this year, which includes an IPM refresher.

Please check actions you have taken to make pest management practices more pollinator-friendly.

- Implemented or maintained a written IPM plan
- Avoided use of pesticides in public sites containing designated pollinator habitat or other sensitive features (except when targeted use is deemed the best option for invasive or noxious weed, insect or disease management)
- Implemented non-chemical pest prevention and management methods on city or campus grounds

Any lessons learned you would like to share?

Be sure to have a maintenance plan in place before creating new pollinator habitat.

Learn More

Integrated Pest Management Plan: [ipm.pdf](#)

https://www.jmu.edu/facmgt/sustainability/Bee_Campus/jmu-pollination.shtml

Recommended Native Plant List: [habitat.pdf](#)

<https://svswcd.org/wp-content/uploads/2016/08/Native-Plants.pdf>

Recommended Native Plant Supplier List: [habitat.pdf](#)

https://www.jmu.edu/facmgt/sustainability/Bee_Campus/jmu-pollination.shtml

<https://www.jmu.edu/beecampus>

witmanad@jmu.edu