Bee Campus USA - Dickinson College

Report on 2022

Pollinator Habitat Creation & Enhancement

Campus Pollinator Garden at Kaufman Hall, Dickinson College The beautiful 2,800 sq foot Kaufman Hall pollinator garden was first designed and planted by students and Penn State master gardeners in 2017. In 2021, in partnership with the Cumberland County, PA master gardener program, the garden was revitalized after the Covid-19 pandemic and became a county demonstration/teaching garden that continued to get improvement in 2022. Throughout the growing season, the garden is maintained by master gardeners, students, faculty and staff. Hands-on learning opportunities are available throughout the season through workshops, talks, and garden presentations. Goals of the garden include supporting pollinators and other wildlife with native plantings and other elements such as bee boxes and water features that make the garden inviting; enhancing the look of the campus landscape through design and monthly maintenance; and providing educational opportunities to learn about local pollinators and wildlife, sustainability and conservation, and science-based gardening techniques for campus personnel and the local community. During the 2022 growing season, three different milkweeds are grown in the garden: swamp milkweed, butterfly weed, and common milkweed to help attract Monarchs. Throughout the year, 74 volunteers helped master gardeners during garden maintenance and work days, and 81 campus and community people participated in three Lunch-and-Learn presentations, and a youth summer camp. Carlisle Green Street Project: Curb Extensions with Native Pollinator Plants Dickinson College partnered with the Borough of Carlisle to create and install and plant two new “curb bump outs” to collect and filter water that floods on a portion of our campus (on city-owned road). In 2022, these areas were enhanced and retested to make sure that each bump-out houses a rain garden to capture and treat stormwater runoff from the surrounding area before the runoff enters the Borough Stormwater conveyance piping. Each curb bump-out also has a series of flow-through tanks located below the rain garden to retain the water and slowly release it to downstream conveyance pipes. The rain gardens consist of bio-engineered soil, then a mulch-compost mix and a variety of native plantings focused on pollinators to absorb stormwater and mitigate erosion from the top layer of soil. The project is located on public streets adjacent to Dickinson College Campus. As such, Dickinson College Grounds Staff have agreed to maintain the BMPs. The BMP will be inspected after every major rain event, cleaned out, and replanted as necessary. Community Garden The Carlisle Community Garden continues to enhance pollinator habitat and is housed on Dickinson’s campus in 2022. The enclosed garden presently contains 37 raised beds; smaller 4’x10’ beds, or larger 10’x10’ beds for those who are more ambitious. Dickinson’s community garden prohibits the use of all synthetic chemicals as fertilizer, herbicides, pesticides or fungicides. Community members can reserve a space and tend to their area for a small fee annually. Dickinson College Community Garden: https://www.dickinson.edu/homepage/834/community_garden Campus Herb Garden, Dickinson A small campus garden space was planted with herb species that support pollinators such as sage, coneflower and lavender. The herbs and medicinal plants have 10 distinct signage with QR codes that educates people about the plant itself, how to grow it, how to use it, the benefits and properties, and recipes. In 2022, the garden was replanted and maintained by the Dickinson

College Farm Staff and student workers. Home Garden Research Project with Carlisle Community The Dickinson College Farm received a grant to work with Carlisle community members to create urban home gardens. The project included the installation of six raised beds on Dickinson's campus (next to campus pollinator garden) as a "Home Garden Research area". These raised beds are used by students and faculty to conduct research and collect data that can be used in advising community members about what to plant when in our area. The garden was planted and continues to be maintained by the Dickinson College Farm Staff and student workers in 2022. Integrated Pest Management at the Dickinson College Farm The Dickinson College Farm, managing over 80 acres of land for vegetable production and net zero energy goals has their own Integrated Pest Management plan and practices. They use this method for handling pests, diseases and insects on the farm with an end goal of reducing the overall number of pesticides needed and/or applied. The Integrated Pest Management at the Dickinson College Farm: https://www.youtube.com/watch?v=g0PtB3EF76Q&t=155s Native Pollinator Homes on Campus Members of The Hive Beekeeping Cooperative at Dickinson maintain five native pollinator homes that were first installed in 2018 and continue to be maintained in 2022. Using upcycled wood and paints to make the frame and filled with biodegradable tubes, these homes allow a safe place for our native pollinators to reproduce. These homes are checked and cleared once each semester. Penn State Extension Master Gardener Demonstration Gardens Dickinson has partnered with the Penn State Master Gardener program for Cumberland County in supporting their efforts to create demonstration garden throughout the county, one on Dickinson's campus. In 2022, they have contributed to some great educational workshops and will use Dickinson as a partner for classroom space and technology. In addition, the Master Gardeners conducted trail clean ups, annual plant sales and workshops to increase public awareness. Master Gardener Demonstration Gardens: https://extension.psu.edu/programs/master-gardener/counties/cumberland/demonstration-gardens

How many habitat projects did you help to create or enhance last year?
8

How many total square feet of habitat were created or enhanced?
12509

How many volunteers helped with those projects?
117

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
- Natural area with tree snags and stumps, and bare areas for ground nesting species
- Meadow

- Pollinator-friendly lawn (with flowering clover, dandelions...)
- Herb garden
- Native milkweed planting for monarchs and bees (where appropriate)
- Invasive/exotic plant species removal for habitat improvement
- Native pollinator-friendly tree planting
- Native pollinator-friendly shrub border/hedgerow planting
- Rain garden/bioswale
- Roadside/rights of way planting
- School garden

Pollinator Habitat: Six raised beds for the "Home Garden Research Area" located outside of Dickinson College's Kaufman Hall on campus. Created and managed by the Dickinson College Farm, they allow students and faculty members to conduct research on garden best practices.

Pollinator Habitat: One of the five native pollinator homes built by Dickinson students that are now across campus and maintained by student and staff volunteers.

Pollinator Habitat: Students and community volunteers worked together to improve pollinator habitat in our county-level demonstration garden during a workday on August 31, 2022.

Education & Outreach

Events hosted by Dickinson College's Center for Sustainability Education Hive Checks, Dickinson College Campus Hives Dickinson College's Center for Sustainability Education's (CSE) staff, Hive Intern and volunteers visit the campus beehives regularly for hive health checks and maintenance. We had two active hives throughout 2022. A hive check is where students, faculty, and/or Dickinson staff, after going through an online training, are able to visit our beehives and learn experientially about maintenance and beekeeping. Post-covid, we have been working collaboratively with local beekeepers

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to assist us in education and maintenance. After going to check on the bees, hive checkers log their observations in a shared dataset that keeps a record of all changes, consistencies, and recommendations. Hive checks are advertised broadly to the entire Dickinson community, and all are welcome. We have protective gear for eight people. EDUCATIONAL HIVE CHECKS (12 events in 2022): 3/10/22: Post-winter Hive opening (2 participants) 4/24/22: Two new Beehives installed on campus (5 participants) 5/3/22: Hive Check (4 participants) 5/30/22: Hive Check (4 participants) 6/7/22: Hive Check (2 participants) 7/14/22: Hive Check (2 participants) 9/8/22: Hive Check (2 participants) 9/29/22: Hive Check with campus volunteers (9 participants) 10/03/22: Hive Check, Mite Treatment (12 participants) 10/13/22: Hive Check (2 participants) 11/02/22: Hive Check (2 participants) 12/01/22: Hive Check, Winterizing the Hive (7 participants) OTHER EVENTS: 3/23/2022: Opening Garden Workday (8 participants) A volunteer workday of learning and action that invited students and volunteers to come learn from current master gardeners, ask questions, practice techniques etc. as we plant, work on design improvements and remove weeds from the campus pollinator space. Students and volunteers can come and go as they are able on this casual work day. Tools and gloves are provided and no experience is necessary. Dickinsonians, community members, neighbors and families are all welcomed, and no pre-registration is necessary. Sponsored by THE HIVE at Dickinson College and the Penn State Extension Master Gardeners of Cumberland County. 4/27/2022: Lunch and Learn: The Kaufman Garden, Then and Now & Workday (28 participants) Penn State Master Gardeners Ann Dailey and Bob MacGregor hosted a talk on the new partnership between Dickinson College and the Penn State Master Gardeners of Cumberland County on April 27 at 12 pm in Kaufman Hall Room 198. The talk centered around the evolution of the Kaufman Pollinator Garden, maintenance and upkeep of the garden, and future educational programs which would be offered to students and the college community on gardening and the environment. After the presentation, master gardeners were available for questions in the garden during our first “Ask the Master Gardener” maintenance day. The purpose of the event was to build a base of interest to pull volunteers from for the on-site workdays. 5/2/2022: Pollinator Garden Workday (8 participants) A volunteer workday of learning and action that invited students and volunteers to come learn from current master gardeners, ask questions, practice techniques etc. as we plant, work on design improvements and remove weeds from the campus pollinator space. Students and volunteers can come and go as they are able on this casual work day. Tools and gloves are provided and no experience is necessary. Dickinsonians, community members, neighbors and families are all welcomed, and no pre-registration is necessary. Sponsored by THE HIVE at Dickinson College and the Penn State Extension Master Gardeners of Cumberland County. 5/18/2022: Lunch and Learn: The Spotted Lanternfly and Garden Workday (12 participants) Jean Spears gave an important update on the Spotted Lanternfly as part of the new Lunch and Learn series of programs with the Penn State Master Gardeners of Cumberland County. Our county is one of 45 quarantined counties in Pennsylvania, and last year many landscapes and backyards were overwhelmed by these invasive pests. Jean gave a short history of these insects and how they arrived in PA, and showed the participants how to prepare for, and manage, the onslaught that was sure to continue that season. Following the talk, there was a master gardeners workday session in the Kaufman Garden as part of the “Ask the Master Gardener” maintenance day. 6/22/2022: Garden Workday with CONNECT Camp Local Youth (18 participants) A local camp visited to work in the Kaufman Garden with local Master Gardener Jane Shull. CONNECT serves middle school youth (finishing 6th grade through finishing 8th grade – 12-14 year olds) in the area. The students learned about local plants, butterflies and then had a chance to work on the

garden. 7/20/2022: Campus Pollinator Garden Workday (8 participants) A workday of service for students and volunteers to learn from the Cumberland County Master Gardener partners. This garden is specifically designed for pollinators and is being developed into a demonstration garden in partnership with the community. Participants came to weed, plant, mulch, water and learn as well as help the campus pollinators! All participants were welcome to come and go as long as they were able on this open house style day of learning and service. No pre-registration is necessary. 8/31/2022: Campus Pollinator Garden Workday (9 participants) A workday of service for students and volunteers to learn from our partners – the Penn State Master Gardeners of Cumberland County. This garden is specifically designed for pollinators and is being developed into a demonstration garden in partnership with the community. Participants came to weed, plant, mulch, water and learn as well as help the campus pollinators! All participants were welcome to come and go as long as they were able on this open house style day of learning and service. No pre-registration is necessary. 9/15/2022: The Hive Volunteer Meet-up (6 participants) The Hive Meet-Up allowed students who expressed interest in The Hive to be trained, informed, and involved in planning for the Open House, to brainstorm ideas for education and outreach activities for The Hive for the Fall 2022 semester. 9/19/2022: The Hive Cooperative Open House (47 participants) Open to students, employees and families, the Hive Open House allowed for people to meet the Hive volunteers, share their ideas, take part in honey tasting, check out our beekeeping gear and see the bees in action. This was a great way to get involved in Dickinson's beekeeping co-operative (The Hive) for those interested. The volunteers showcased a variety of things from an observational hive with the bees, the tools and suits we use for beekeeping and even some fun educational games and honey tasting organized at interactive outdoor stations. The event was also used as a recruiting tool to get people to sign up for the working groups of The Hive (pollinators and native bees, beekeeping, value-added products and honey harvesting). 9/21/2022: Lunch and Learn: Monarchs, Migration and Milkweed and Garden Work Day (26 participants) A workshop that invited students and volunteers to come learn about Monarchs, Migration, and Milkweed from Master Gardener, Jane Shull. After the Lunch and Learn session, participants headed to the garden for a workday of service with our partners from the Penn State Master Gardeners of Cumberland County. This garden is specifically designed for pollinators and is being developed into a demonstration garden in partnership with the community. Participants came to weed, plant, mulch, water and learn as well as help the campus pollinators! All participants were welcome to come and go as long as they were able on this open house style day of learning and service. No pre-registration is necessary. 10/23/2022: Value Added Products Event: Experimenting with Beeswax (11 participants) A workshop for students and volunteers to learn the process of collecting wax from the college beehives and making usable products from wax, such as candles, chapsticks, hand soaps and wax wraps. The students gathered in campus kitchen space to test DIY product making. 11/10/2022: Honey Harvesting Workshop (11 participants) A group of interested students learned the basics of harvesting honey from 10 frames of Dickinson beehives. This event was in partnership with local beekeeper Mary Moll, who donated 10 of her own frames for harvest. The honey was used as campus marketing, volunteer incentives and speaker gifts.

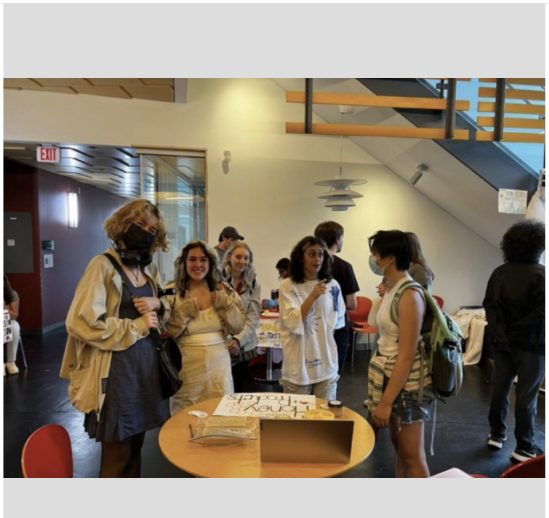
How many pollinator-related events did your affiliate host or help with last year (in total)?

24

How many people attended those events (in total)?

245

Education & Outreach: New hives were installed with student volunteers, April 24, 2022.



Education & Outreach: The Hive Cooperative Open House for the Dickinson campus, September 19, 2022.

Education & Outreach: Annual Honey Harvesting Workshop, November 14, 2022

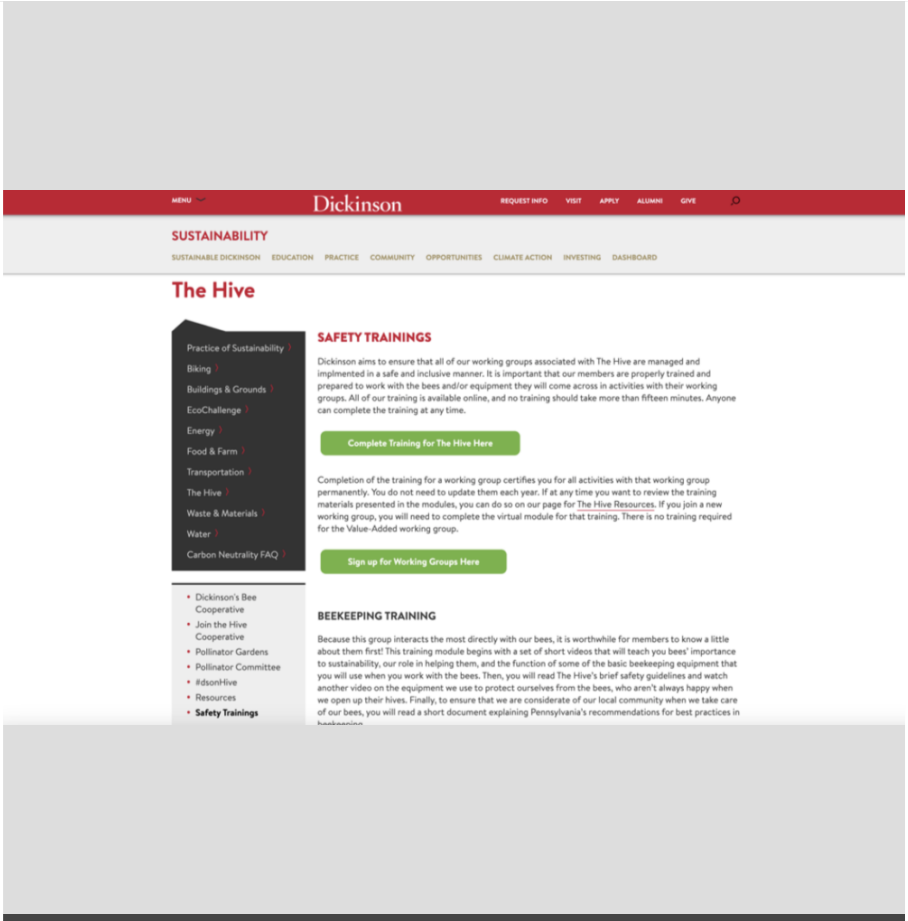
Courses & Continuing Education

5/3/22: ENST162 Lab Lecture and Site Visit (15 participants) Outdoor class sessions were conducted in three days to give Dickinson students enrolled in the ENST162 course a closer overview and practice of the college's beehives. Approximately 15 students per session joined and learn the basics of the hives through indoor lectures, completed a required online training module before putting on specialized bee suits to visit the hives with faculty guidance. 5/4/22: ENST162 Lab Lecture and Site Visit (15 participants) Outdoor class sessions were conducted in three days to give Dickinson students enrolled in the ENST162 course a closer overview and practice of the college's beehives. Approximately 15 students per session joined and learn the basics of the hives through indoor lectures, completed a required online training module before putting on specialized bee suits to visit the hives with faculty guidance. 5/5/22: ENST162 Lab Lecture and Site Visit (15 participants) Outdoor class sessions were conducted in three days to give Dickinson students enrolled in the ENST162 course a closer overview and practice of the college's beehives. Approximately 15 students per session joined and learn the basics of the hives through indoor lectures, completed a required online training module before putting on specialized bee suits to visit the hives with faculty guidance. Professor Maggie Douglas's Research on Relation between Dickinson College Farm's Pesticide Records and Pollinator Toxicity Mapping pesticide risk to pollinators in the Great Lakes region: In this project, professor Douglas collaborated with colleagues at the Fish & Wildlife Service, USGS, and several universities to improve the understanding of pesticide risk to pollinators across the landscape. The goal is to create a mapping tool that 10 federal agencies can use to identify locations for pollinator habitat that minimize pesticide risk in the Great Lakes Basin. Status of Butterflies in the United States: A

large collaborative research project that aims to synthesize existing data on butterfly populations to comprehensively determine which species are declining, increasing, or stable in the United States. Professor Douglas's main responsibility of this project is to supply pesticide data and associated expertise to make sure that pesticide use can be tested as a factor potentially driving butterfly population changes. Online Beekeeping/Food Safety and Equipment Training (Online Module) Continuing Education There is an online training module that was completed by over 100 participants at Dickinson College in 2022. The training includes beekeeping practices, food safety/honey harvesting modules and ground management safety modules. To do hive checks, a person must complete this training module as a requirement. Within the module, people can learn about the importance of bees, educational information about bees and their anatomy, the tools associated with bee keeping, and the whole process of honey making and harvesting.

How many of your for-credit courses included pollinator-related information last year?
3

How many students attended those for-credit courses?
45



Curriculum & Continuing Education: Online training module that must be completed by participants before going in the bee hives for regular checks.


Curriculum & Continuing Education: ENST162 Class Lecture and Site Visit on May 3, 2022 at Kaufman Hall and a visit to the hives.

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Service-Learning

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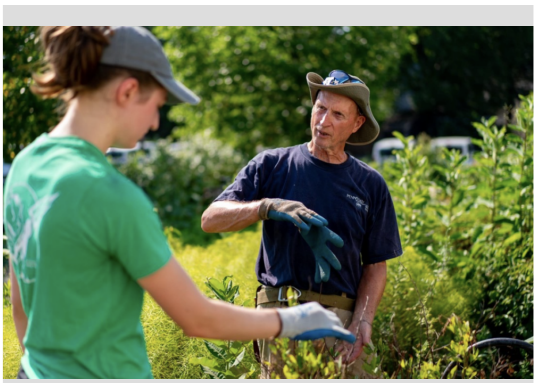
How many service-learning projects did your campus host and/or support to enhance pollinator habitat on and off-campus?
8

How many students participated in service-learning projects last year to enhance pollinator habitat on or off-campus?
117

Service Learning: The CONNECT Camp Local Youth participants weeding and trimming at the Kaufman Pollinator Garden Workday on June 22, 2022 during our service-learning Garden Workday.

Service Learning: Students weeding and trimming at the Kaufman Pollinator Garden on July 20, 2022 during our service-learning Garden Work Day.



Service Learning: Students learning about pollinator and weeds from campus staff at the Kaufman Pollinator Garden on July 20, 2022 during our service-learning workday.

Educational Signage

Bee Campus USA Recognition Signage We have a temporary signage at the Center for Sustainability Education office articulating the importance of pollinators and certificates that recognize Dickinson as an official member of Bee Campus USA. The signs are visible by students, faculty, staff and prospective families. We also highlight this certification when we have information tables on campus and in the community. Community Herb Garden Signage The Community Herb Garden, created and managed by student workers and farm interns, is located on Dickinson Ave in between Davidson-

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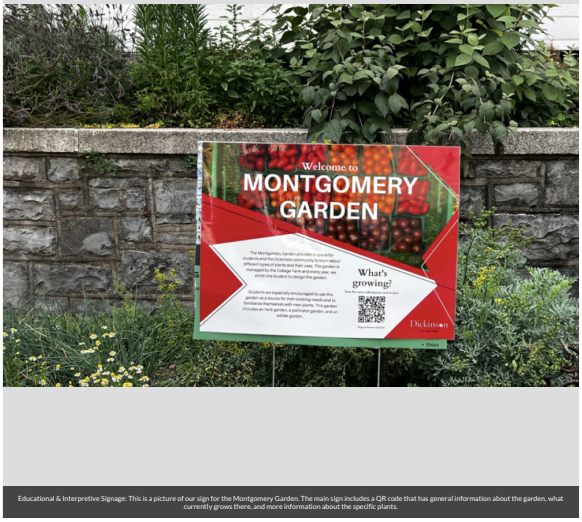
Wilson Hall and Kisner-Woodward Hall. Thanks to Hannah Grothusen (‘22), there are 10 permanent signs with QR codes on the plaques to educate people on general knowledge about the plant, how to grow it yourself, benefits and properties of the plant, and recipes you can make with the herbs. Some of the herbs and medicinal plants include sage, chives, lavender, and yarrow. Campus Herb Garden: https://blogs.dickinson.edu/farm/campus-herb-garden/ Visit Our Hives Signage In 2022, we implemented a permanent Visit Our Hives signage on campus to encourage students to learn about the Hives, as well as participate in regular hive checks and other events organized by The Hive at Dickinson College.

Number of permanent interpretive/educational/Bee Campus USA signs installed to date?
13

Number of temporary interpretive/educational/Bee Campus USA signs installed last year?
1

Educational & Interpretive Signage: This is a picture of the Herb Garden sign that introduces the purpose for the garden. Around there are specific signs with QR codes that tell you about the plant, its benefits and properties, and how to use them.



Educational & Interpretive Signage: This is a picture of our sign for the Montgomery Garden. The main sign includes a QR code that has general information about the garden, what currently grows there, and more information about the specific plants.

Education & Interpretive Signage: We implemented a new signage on campus in 2022 to encourage student and community engagement in learning about The Hives, including the QR code for easier event registration and safety module completion.

Policies & Practices

Community Garden The community garden, located on Dickinson’s campus, prohibits the use of all synthetic chemicals such as fertilizer, herbicides, pesticides or fungicides. It is asked that users respect this request as the garden is maintained as an organic garden in keeping with the college’s goals of sustainability and environmental stewardship. Kaufman Pollinator Garden This campus space is managed with minimal and cautious use of herbicides to make sure not to do more harm than good. The only time in the garden’s history where chemicals were used was at the first clearing of the garden area using Roundup because of years' worth of overgrown plants. Plants were introduced to the area a year later to make sure no chemicals would affect the plants or wildlife. Manual methods of removal include tilling, hand weeding, and using

shovels to dislodge root systems. Biological methods are used by planting specific desirable plants that combat the invasion of undesirable plants. Pollinator Friendly Integrated Pest Management Policy for Dickinson Campus During the past 10 years, Dickinson College's landscape has been changing to reflect important sustainability goals, which include a campus-wide dedication to hands-on sustainability education and stewardship. To reflect these goals, landscape design and management has focused not only on the health of plants, but on the areas that sustain them – from soil to water management, to insects and other wildlife, and to how the landscape is viewed. The Dickinson College landscape has become a living laboratory, enhancing what is taught in the classroom with a hands-on, real-world experience. This plan is updated annually. Dickinson College Grounds and Landscape Management Policies and Practices: https://www.dickinson.edu/download/downloads/id/12306/grounds_and_landscape_management_policies_and_practices.pdf Sustainable Buildings Dickinson has committed to constructing new buildings and major building renovations to a minimum standard of LEED (Leadership in Energy and Environmental Design) silver but has exceeded that in all new construction projects. Green building simply refers to a structure that is environmentally responsible and resource-efficient throughout a building's life cycle. These buildings incorporate resource saving technologies such as energy wheels that efficiently exchange heat between indoor and outdoor air, high efficiency HVAC systems, sensors to optimize air flow, temperature and lighting, passive solar designs, natural lighting, high efficiency fluorescent and LED lighting, waterless urinals, and grey water systems. Furniture and fixtures are made with sustainable materials with low volatile organic compounds (VOC). Simply put, these buildings use less energy, water and natural resources compared to a standard building of the same size. It is more efficient, and thus creates less waste. Leadership in Energy and Environmental Design: https://www.usgbc.org/?CategoryID=19 Sustainable Grounds Dickinson makes extensive use of native plants in its landscaping of the 200-acre main campus to limit water demand, provide habitat and food for wildlife, and avoid introduction of invasive species. Our methods include Integrated pest management, biological controls, natural meadows, edible landscapes, rain gardens and bioswales. Buildings & Grounds: https://www.dickinson.edu/info/20052/sustainability/2283/buildings_and_grounds Benchmarking Biodiversity on Farms Dickinson College Professor Maggie Douglas and campus farm Director Jenn Halpin worked together on a benchmarking project and presented the early phase of their work at the Pasa Sustainable Agriculture Conference. In this work, which is set to measure to the ecological health of the campus farm, Douglas and Halpin researched crop diversity, farm layout and management practices to develop a systematic and sustainable way to enhance the biodiversity aspect of the Dickinson College farm. Full article: https://growingformarket.com/articles/benchmarking-biodiversity-farms

What actions have you 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)
- Reduced the total area of city or campus-managed lands to which pesticides are applied

- Sourced plants for city or campus grounds that were not treated with neonicotinoids

In your city or campus, are any policy initiatives underway to further protect pollinators, people or waterways from pesticides?
The Alliance for Aquatic Resource Monitoring (ALLARM) envisions people who are empowered through science education to participate in decision making about water resources in their local community. ALLARM is a program of Dickinson College that achieves its mission by providing an enhanced educational experience for Dickinson students to learn fundamental environmental, community engagement, science education, and non-profit skills. ALLARM engages communities to use science as a tool to investigate the health of their streams and to use the data they generate for aquatic protection, policy and restoration efforts. Recent community workshops have helped community volunteers tackle this question.

Please describe actions by your affiliate to attend training on ecologically-based Integrated Pest Management and/or to review IPM plans and programs considered of high quality by Bee City USA?

Integrated Pest Management Plan:
https://www.dickinson.edu/download/downloads/id/12306/grounds_and_landscape_management_policies_and_practices.pdf
Recommended Native Plant List:
https://www.dcnr.pa.gov/Conservation/WildPlants/LandscapingwithNativePlants/Pages/default.aspx%20
Recommended Native Plant Supplier List:
https://www.izelplants.com/%20

Policy & Practice: Dickinson College's LEED Platinum High Street Residence Hall has opened its doors since 2019 and continued to be a model for sustainable policy and practice on campus. The sustainable grounds are managed for pollinators.

Learn More

https://www.dickinson.edu/info/20052/sustainability/3325/the_hive
thehive@dickinson.edu

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