Bee Campus USA - University of Vermont

Report on 2021

Pollinator Habitat Creation & Enhancement

There were several activities and "workdays" that allowed for enhancement of the existing pollinator gardens on campus as well as the addition of a new garden. The existing pollinator gardens around Jeffords Hall were maintained by two summer interns as well as volunteers from the Vermont Master Gardeners. At this location, plants with long-lived flowers that are able to withstand adverse weather condition (heat and drought), were added. These plants included annuals such as: pink buckwheat, bee's friend, dill, sunflowers, zinnias, spiderflowers, and single-flowered marigolds. Perennials included: sage, lavender, oregano, mint, blazing stars, chives, coneflower, black-eyed Susan's, Queen Anne's lace, sneezeweed and sea holly. Additionally, a 50' long trellis garden was re-installed and on it was grown purple hyacinth bean and scarlet runner beans. These were to help to attract pollinators such as butterflies and hummingbirds. The UVM Beekeeping Club in conjunction with the UVM Horticulture Club held a joint "seed ball" making event. Seeds of pollinator-friendly annuals (sunflowers) and perennials (coneflower, black-eyed Susans, coreopsis, and beebalm) were distributed in the 1-acre meadow surrounding the apiary on campus. Two undergraduate students, Caitlyn Williams and Liza Bryan, received a grant from the APIS Fund at UVM to install a new pollinator garden behind Bittersweet House on campus. This new garden replaced existing turfgrass and invasive tree/shrub saplings with native shrubs and perennials. Here is a link to a time-lapse video of the installation of their garden: https://www.youtube.com/watch?v=GFGQ1ICLsNk



UVM Beekeepers Club President, Eric Coughlin, shows student volunteers how to mix the seeds with the clay/compost to make seed balls to toss in the 1acre meadow surrounding the apiary



UVM Horticulture Club President, Eli Wilson (L), and Lyman Wood Summer Intern, Connor Kepcher (M) were assisted by Plant & Soil Science graduate student, Maryam Nouri-Aiin (R) in weeding the pollinator gardens outside Jeffords Hall



Vermont Master Gardeners helping to maintain the perennial pollinator gardens outside Jeffords Hall





Education & Outreach

Despite the ongoing COVID-19 pandemic, members of The University of Vermont (UVM) community continued their pollinator research, education and outreach activities. The Gund Institute for Environment at UVM provided support from the "APIS Fund" for four research and conservation projects. These Apis Fund projects will create the first comprehensive online atlas of Vermont's bee species, develop a new pollinator garden at UVM, and evaluate how bee pollination improves coffee quality—and livelihoods—in Costa Rica and Mexico. For more details about these awards, visit their website: https://www.uvm.edu/news/gund/buzz-gund-institute-launches-four-apis-fund-projects Research from Gund Director, Taylor Ricketts and Gund Fellow, Charlie Nicholson was published in Ecological Applications (April, 2021) titled: "Corridors through time: Does resource continuity impact pollinator communities, populations, and individuals?". Research, conducted by Drs. Burnham, Alger and Brody, along with collaborators in the Vermont Complex Systems Center, was published in the Journal of Applied Ecology titled, "Flowers as dirty doorknobs: Deformed wing virus transmitted between Apis mellifera and Bombus impatiens through shared flowers". Additionally, Drs. Brody and Burnham published, "Feeding friend and foe: ample pollen mitigates the effects of pollen theft for a gynodioecious plant, Polemonium foliosissimum (Polemoniaceae)" in the Annals of Botany. Dr. Samantha Alger continues to direct the "Vermont Bee Lab" on campus. In 2021, she received a SARE Farmer Partnership Grant to support a bee breeding program to develop more disease/pest resistant bee stock in Vermont. Also, in 2021, Dr. Alger provided presentations about her research on bees and beekeeping around the state for the Vermont Beekeepers Association and their affiliates. Dr. Alger is program coordinator for the on-going USDA-APHIS National Honey Bee Survey for the State of Vermont. Two undergraduate students gave virtual presentations as part of the "Student Research Conference" at UVM. Gretchen Saveson presented her research on, "Linking mycorrhizal colonization to floral rewards and reproductive success in highbush blueberry" and Alexandra DeFoe presented her research on, "Understanding the Role of Flowers in Bee Virus Transmission". The Friends of the Horticulture Farm, (a UVM-affiliated group), hosted several remote talks open to the general public. The topics included: "Mini-Meadows: Grow a Patch of Colorful Flowers", "Spring Beauties - herbaceous perennials and shrubs to promote pollinators", and "Gardening with Native Perennials". The UVM Beekeepers Club offered several educational events in 2021. They hosted Dr. Potter (University of Kentucky), who spoke on "Bees, Pesticides, and Politics", along with two sessions on beekeeping basics, and provided weekly hive inspections during the month of September.







Courses & Continuing Education

In 2021 there were 20 courses that provided information on topics such as: native plant ecology, pollinator biology, pollinator biology, pollinator ecology, integrated pest management, pollinators and agriculture, and/or landscaping for pollinators. These courses included: Advanced Ecological Design, Agriculture and the Environment, Bees and Beekeeping, Biology, BioCore, Conservation Biology, Diversified Farm Operations, Diversified Farm Planning, Ecology & Evolution, Ecological Landscape Design, Ecology, Ecosystems & the Environment, Entomology & Pest Management, Field Zoology, Home & Garden Horticulture, Honeybee Culture, Landscape Ecology, Living Landscapes, Permaculture, Plant-Animal Interactions, and Pollinators & Perennials. Of these courses, only Biology and BioCore are dual-listed as Continuing Education (CE) courses, however, all courses at UVM are open to CE students once matriculated students have had a chance to enroll. "Pollinators and Perennials" is now being offered by Dr. Annie White and was oversubscribed in 2021 with an enrollment of 53! New additions to the curriculum in 2021 included the courses, "Hands-on Beekeeping" and "Honeybee Culture".







Dr. Samantha Alger's course in "Hands-on Beekeeping" utilizing hives in the apiary at the Horticultural Research and Education Center at UVM (https://www.uvm.edu/cals/hrec)



A BCOR (biology) lab group monitors pollinators in the gardens outside Jeffords Hall



A BCOR (biology) lab group monitors pollinators in the gardens outside Jeffords Hall

Service-Learning

Early in spring 2021, officers and members of the UVM Beekeepers Club collected reeds from a stand of invasive phragmites on campus. Since the plant does not seem to be able to be eradicated, the club felt that they might as well get some use from it. The lower 3 feet of the stems provide an excellent nesting site for solitary bees. Members of the club put the cut stems into food cans to take home with them and set up them up as nesting boxes in their own yard/garden. The UVM Horticulture Club President, Eli Wilson, and Lyman Wood Summer Intern, Connor Kepcher, sowed thousands of seeds of annuals and herbaceous perennials that were then grown on and planted in both the pollinator gardens on campus as well as at the gardens at City Hall (Burlington, VT). The gardens at City Hall are tended by volunteers from the Vermont Master Gardener Program under the direction of Jill Lamothe. This provides an opportunity to engage in conversations about pollinator-friendly plants with the local community in a highly visible off-campus location. During the summer, Audubon Vermont (https://vt.audubon.org/) partnered with students at UVM in the Environmental Studies Program under the direction of Dr. Amy Seidl to develop a bird sanctuary and pollinator-friendly space on campus. Two undergraduate students, Caitlyn Williams and Liza Bryan, received a grant from the APIS Fund at UVM to install this garden behind Bittersweet House on campus. Here is a link to a time-lapse video of the installation of their garden: https://www.youtube.com/watch?v=GFGQ1ICLsNk In fall, a service-learning project was conducted by students in the course, "Home and Garden Horticulture Lab". They added herbaceous perennials (Russian sage, oregano, hardy chrysanthemums and daffodil bulbs) to a garden that was previously only ornamental grasses. They also planted two native, pollinator-friendly trees on campus (a honeylocust and yellowwood). This project involved a total of 31 students and took place over two weeks in the month of October. It is anticipated that each year students in this course will install and/or maintain pollinator-friendly gardens on campus. Also, in October, officers and members of the UVM Horticulture Club volunteered to assist the Vermont Nursery and Landscape Association (https://vnlavt.org/) in their landscaping project at a local "Habitat for Humanity" house. There were 9 students who helped with this activity. Prior to the





landscaping project, there were only weeds and grass at the site. Plants incorporated into the new landscape were selected for their ease of maintenance, durability in the landscape and usefulness to pollinators. When possible, native plants were chosen. Plants included: Red maples, winterberry and inkberry, as well as an assortment of flowering perennials.



Educational Signage

Due to restrictions on campus, we are limited to the number of signs we can put up. The new pollinator garden behind Bittersweet House on campus is combining its use as both a pollinator-friendly garden as well as a "bird habitat" on campus and has been recognized by Audubon Vermont (https://vt.audubon.org/) as such. Our hope is to be able to create additional signage for our various pollinator gardens on campus in the coming years.







Policies & Practices

IPM is a comprehensive, ecosystem-based strategy that focuses on long-term prevention of pests or their damage, through a combination of properly timed techniques such as biological control, habitat manipulation, and modification of cultural practices and use of resistant varieties. This strategy also uses small amounts of organic and/or approved pesticides to minimized pest quantities only after monitoring indicates they are needed. Treatments are undertaken with the goal of controlling only target organisms to an acceptable level in specific areas. Pest control materials are selected and applied in a manner that minimizes risks to human health, beneficial non-targeted organisms and the environment while protecting landscape aesthetics preventing economic losses. 1. We base our pest management program on preventative, non-chemical and cultural measures for control. These controls begin with selecting healthy, zone hardy, pest resistant





species with a focus on proper planting techniques and maintenance practices. 2. When applicable, physical barriers are placed to prevent plant pests from doing repeated damage. Examples include bands around trees to discourage gypsy moth defoliation, wraps around trunks of young trees to prevent damage from rodents or other animals, and boulders or planting beds for turf protection. 3. UVM Grounds staff monitor for pests as they patrol and work on campus, reporting pest activity to Grounds Management. Environmentally friendly or target specific materials are chosen to bring the amount of pest to an acceptable level. 4. Dormant horticultural oils or insecticidal soaps may be applied to manage insects on ornamental plantings when the level of damage threatens plant health or aesthetics. 5. Trees and shrubs are mulched annually with cedar bark, which aids in water retention, blocks weeds, and acts as an insect repellent (through the natural oil and strong fragrance). Most weeds in tree and plant beds are manually pulled and discarded. 6. High quality lawns and athletic fields are aerated to relieve compaction with over seeding and mowing at their optimal heights to ensure health and vigor. Soil nutrient balance is maintained through the use of non-phosphorus, organic fertilizers. Irrigation is used in limited areas and monitored for correct water usage. Healthy turf lessens erosion and storm runoff. 7. Many annual flowerbeds are being replaced over time by more sustainable mulched perennial flower beds. 8. UVM maintains an inventory of all campus trees. This inventory, together with our knowledge of the University landscape is used to monitor for insects, disease and environmental stresses and aids us in our maintenance efforts.

Integrated Pest Management Plan:

Recommended Native Plant List:

Recommended Native Plant Supplier List:







Long-flowering, low maintenance herbaceous perennials are utilized in flower beds around campus in conjunction with pollinatorfriendly native shrubs such as ninebark and native trees like honeylocust

Learn More







UVM Beekeepers Club President, Eric Coughlin (L) and Dr. Mark Starrett (R) - Chair of the Committee. Not pictured are: Matthew Walker - UVM Grounds Manager and outside committee advisor, VJ Comai - Burlington Parks and Recreation Department



