

Bee Campus USA - Tennessee Technological University

Report on 2021

Pollinator Habitat Creation & Enhancement

o 1. Putnam Proud: The Office of Sustainability at Tennessee Tech covered the entry fee for campus groups, organizations, and groups of friends to participate in the Annual Putnam Proud Countywide Cleanup. This was a week-long event from September 18-25 in which teams remove litter throughout Putnam County. Seven groups from Tennessee Tech participated and cleaned a wide variety of locations including roadsides, sinkholes, wetlands, and local parks. During this county-wide cleanup, volunteers assisted in improving and preserving the health of natural areas such as wooded-regions, wetlands, gardens, meadows, and pollinator-friendly lawns. This event was hosted by the Keep Putnam County Beautiful Committee. o 3. Bee Hive Revitalization: Students work together alongside professor, Dr. Greene, to help restore bee hives. This was hosted by Agriculture students and staff. o 4. In 2021, 110 new trees were planted on Tennessee Tech campus. In addition to that, many trees were uprooted from Sherlock Park (which is being used as a space for the new engineering building) and relocated to Walton Park. o 5 Native Plant Garden/Biology Greenhouse: Throughout the year of 2021, volunteers assisted in maintaining the student-designed and student-planted garden. The garden includes eight habitat types: prairie, cedar glade/bluff, high elevation acid woods/heath bald, wetlands, rocky outcrops, river/stream, roadside/pasture, mesic woodland, and edible/medicinal plants. All species are native to Tennessee. Furthermore, native plants are also grown and maintained in the TTU Greenhouse. Many plants are first maintained in the Greenhouse by students before being planted in the Native Plant Garden.



o Photo 1 Putnam Proud Event 2021: Members from the TN Tech African student Union are shown participating in the cleanup event. They are one of the many groups who volunteered to remove litter from county sinkholes, meadows, wetlands and other



o Photo 2 Plogging Clean-up Event: An activity that we hosted during Earth Week was "plogging," or picking up litter while jogging. During this clean-up student volunteers picked up trash along the mile of the community bike trail that runs through Tennessee Tech's campus.



o Photo 4 Trees Being Relocated to Walton Park: In 2021, it was decided that a new engineering building would be going up in Sherlock Park. Most of the trees that were located at Sherlock Park have been uprooted and relocated to Walton Park across campus. Any of the trees that were not able to be relocated will be used to make furniture for the new engineering building.



Education & Outreach

- o Earth Week, April 5-9, 2021
- o Caught Green Handed, April 5, 2021
- o Plants Rock!, April 6, 2021
- o Plogging (picking up litter while jogging), April 7, 2021
- o A Day Without Plants, April 22, 2021
- o Pollinator Packets, October 1, 2021
- o Sustainability Day Celebration, October 19, 2021



o Photo 1 Caught Green Handed: An activity we did for Earth Week this year was "Caught Green Handed." For this activity, we walked around campus and handed out stickers to any students we saw recycling or "being green." Pictured is a student who was caught recycling, and she happened to be drinking out of our Eco Eagles Nalgene water bottle.

o Photo 2 Plants Rock: For Plants Rock day, we set up a table on the Quad and had students paint encouraging messages on rocks to then place around campus.

o Photo 3 Sustainability Day Celebration: Our annual Sustainability Day Event on Centennial Plaza was a complete success! Last year, we were unable to do this due to COVID-19 restrictions, so it was such a treat to get back out on the Plaza to spread the word of sustainability to students. Not only did the Office of Sustainability set up a table at this event, but four other on and off-campus groups came out to join us in engaging students in sustainability efforts they can make or ones they may not have even knew they were making. The following groups joined us on this awesome day: Cookeville Clean Commission, Cookeville Electric, Housing and Design Association, and SMACS.

Courses & Continuing Education

The following courses were a part of for-credit curriculum. 1. AGHT 3030 Integrated Pest Management: Introduction to the aspects of integrated pest management. Identification of plant disease and insect pest problems. Fundamentals of



control: biological, cultural, and chemical. Plant disease concepts including etiology, ecology, and physiology. 2. AGHT 3400 Landscape Horticulture: Basic theory and principles of design for landscaping modern homes and businesses. Use of ornamental plants and special features. Installation, maintenance, and discussion of the effect of management on plant growth and health. Topics include pruning, fertilizer application, pest control, etc. 3. AGHT 3410 Plant Propagation: Asexual and sexual propagation of plants by cuttings, layers, division, special structures, grafting, budding, seeds, and tissue culture. 4. AGHT 3440 Floral Arrangement: Fundamentals and theory of floral design with emphasis on arrangements for the home and special occasions. 5. AGHT 3450 Dendrology: The study of trees and the identification of native species commonly found in the mid-South. Adaptability of the species to various ecological conditions of forest ecosystems and importance to wildlife will be discussed. 6. AGHT 4420 Greenhouse Management and Crop Production: Principles of greenhouse management and environmental controls; production, timing, harvesting, and marketing of commercial floricultural crops; pest control strategies; and nutrient film technique. Development of commercial production schedule required. 7. AGHT 4940 Horticulture Topics: Special study in an approved area of horticulture under the supervision of a member of the School of Agriculture faculty. 8. AGRN 1100 Plant Science: Introduction to the fundamentals of plant science as related to the ecological principles of agronomic and horticultural crops. 9. AGRN 1110 Plant Science Laboratory: Further the discussion of plant science in the laboratory setting. 10. AGRN 2000 Soil and the Environment: An introduction to soil physical and biological properties and their relationship to plant growth, land use, and environmental quality. 11. AGRN 3000 Soils: An introduction to soil physical and biological properties and their relationship to plant growth, land use, and environmental quality. 12. Soil and Water Conservation: Examination of soil health and water quality as impacted by natural and human influences. Emphasis on soil productivity conservation. 13. AGRN Weed Science: Plant and seed identification, and growth habits and dissemination of weeds. Biological, cultural, and chemical methods of control in the integrated pest management (IPM) concept. 14. AGRN 4210 Soil Fertility and Fertilizers: Properties of soils in relation to plant nutrition, and fertilizer materials and their relationship to soil fertility. 15. AGRN 4940 Agronomy Topics: Special study in an approved area of agronomy under the supervision of a member of the School of Agriculture faculty. 16. AGRN 4110 Forage Crops Production and Management: Botany and classification, soil and climatic requirements, species adaptation, establishment and management of grasses and legumes for silage, hay, and temporary, permanent, and rotational pastures for ruminants, swine, and horses. 17. ANS 4960 Animal Science Topics in Bee Production: Special study in an approved area of animal science under the supervision of a member of the School of Agriculture faculty. 18. BIOL 2310 General Botany: Introduction to principles of botany. 19. BIOL 3240 Field Botany: Survey of regional flora (herbs, shrubs, & trees) focusing on gymnosperms and angiosperms. Emphasis on nomenclature, structural characteristics, identification of species using a dichotomous key, and characteristics of plant families. 20. BIOL 3330 Entomology: Common harmful and beneficial insects of this region and their control. 21. BIOL 4330 Plant Ecology: Biotic and abiotic factors affecting the distribution and abundance of plant species and the role of plants in ecosystem structure and function.





o Photo 2, Students in Shipley Farm Greenhouse: Students from the School of Agriculture are pictured taking care of plants in Tennessee Tech's campus greenhouse at Shipley Farm (<10 minute drive from the main campus). Many agriculture and horticulture courses take place at this greenhouse.



o Photo 3, Professor Demonstrating Air Layering: In Dr. Airhart's Plant Propagation course, he is demonstrating to students how to air layer a tree. Air layering is a method used to propagate new trees from stems that are still attached to the parent plant. This method is used as a way to protect the parent plant while quickly creating new growth.



o Photo 4, Professor Demonstrating How to Harvest Honey: Agriculture professor, Dr. Greene, is demonstrating to his class how to properly harvest honey without causing damage to the hive or to the comb.

Service-Learning

CISE Grant Projects: During the summer of 2021, Abby Ramaker received a grant (Creative Inquiry Summer Experience) to paint a mural of native TN pollinators and wildlife on a wall in the Native Plant Garden situated between two buildings on TN Tech campus. This mural features wildlife such as bees, fireflies, and many native plants. Other CISE Grant projects that have to do with native pollinators and wildlife include a children's book called A Tour of Home with Myra and Felix. This book was written and illustrated by English student, Lydia Young, with the two main characters being an iris and a firefly who work on solving problems between members of their community. This book is on display in the English department office.

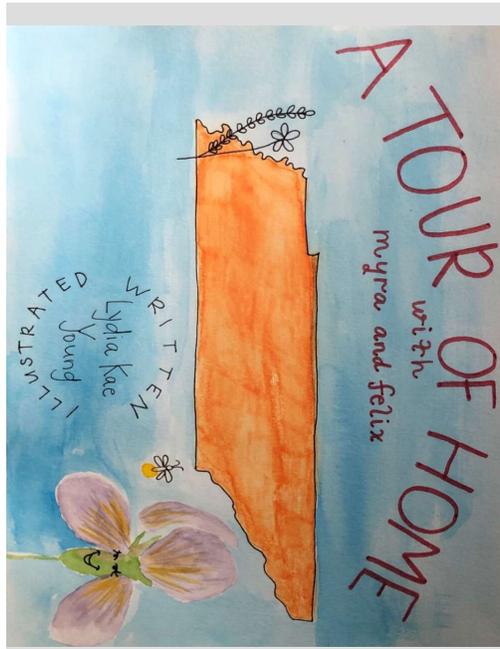
o 2. Putnam Proud: The Office of Sustainability at Tennessee Tech covered the entry fee for campus groups, organizations, and groups of friends to participate in the Annual Putnam Proud Countywide Cleanup. This was a week-long event from September 19-26 in which teams remove litter throughout Putnam County. Ten groups from Tennessee Tech participated and cleaned a wide variety of locations including roadsides, sinkholes, wetlands, and local parks. During this county-wide cleanup, volunteers assisted in improving and preserving the health of natural areas such as wooded-regions, wetlands, gardens, meadows, and pollinator-friendly lawns.

o 3. Bee Hive Revitalization: Students work together alongside professor, Dr. Greene, to help restore bee hives at TN Tech's campus farm, Shipley Farm. This was associated with a class.





o Photo 1, Native Plant Garden Mural: Over the summer of 2021, Tennessee Tech Student, Abby Ramaker, received a grant to paint a mural in the Native Plant Garden. This mural features native Tennessee wildlife and demonstrates things like pollination and other animal-plant interactions.



o Photo 2, Cover Page of student written book, A Tour of Home with Myra and Felix: This book demonstrates to children native TN animal-plant interactions.



o Photo 4, Student Group Participating in the Putnam Proud Event: TN Tech student group, Student Members of the American Chemical Society, are pictured participating in the annual Putnam Proud Clean-up Event. They focused their efforts on cleaning up Cedar Avenue in Cookeville.

Educational Signage

o Permanent signage includes the Pollinator Poster, the Pollinator Mural, the Native Plant Garden Mural, and the Native Plant Garden Prairie Habitat sign. Temporary signage includes the virtual flyers that we posted on our social media, digital signage televisions around campus, and the campus news page. While not every sign is displayed year round, they all are used to inform students and staff about our native pollinators and what we can do to protect them.

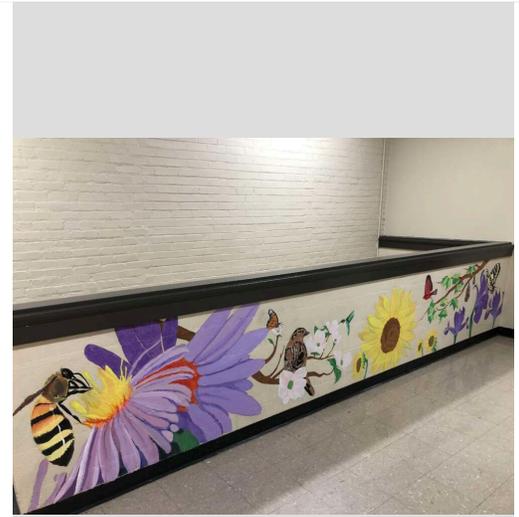




o Photo 2, Pollinator Packets: An activity we did for Sustainability Month was to hand out handmade "Pollinator Packets" to students on campus. These packets included: plantable pencils, seed paper bookmarks, eco eagles pins, crayons, bee stickers, and informational coloring sheets. Each bag was hand decorated by our student workers.



o Photo 3, Informational Sheet included in Pollinator Packets: The informational coloring sheet was printed off and included in our pollinator packets.



o Photo 5, Native Tennessee Pollinator Mural: This mural is located in the University Services building at TN Tech. It was painted by a student and features Tennessee's native pollinators including a hummingbird, bees, birds, bats, flowers, and butterflies

Policies & Practices

The Tennessee Tech Bee Campus USA Committee is a subcommittee comprised of members from the both the Sustainable Campus Committee and the Building and Grounds Committee. Members include Tennessee Tech's Landscaping & Grounds Manager, Sustainability Manager, faculty from the Departments of Biology and Agriculture, and students. By representing many areas of the university, members of this group are able to bring their own perspectives and knowledge to meetings. Collectively, they work together to discuss and plan campus outreach events and discuss pollinator habitat protection and conservation efforts.

Integrated Pest Management Plan:

Recommended Native Plant List:

Recommended Native Plant Supplier List:





This photo was taken during the summer of 2021 in our Native Plant Garden.

[Learn More](#)





A photo of our committee.

