Bee Campus USA Annual Report
Pollinator Conservation & Education
2019

Warren Wilson College
Swannanoa, North Carolina

EDUCATION & OUTREACH

Pointing out Drone Cells.

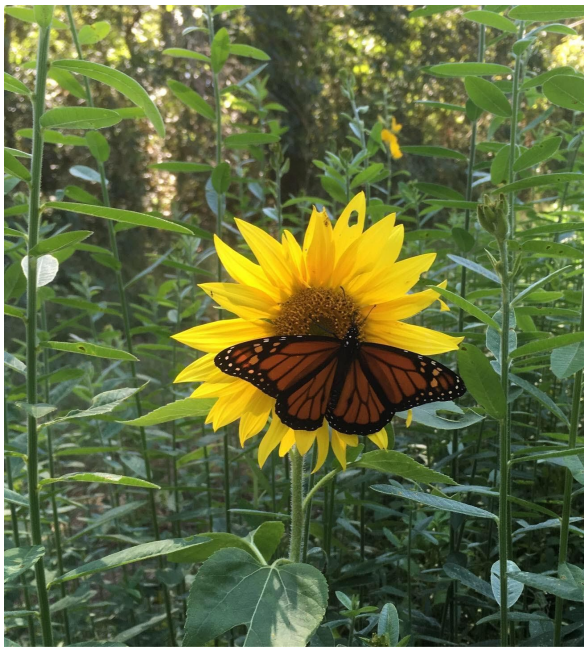
Pointing Out Queen Cells on a Poster.

Sugar shake mite count (5/7, 6/24, 7/22, 8/8, 8/30,) State Bee Inspector tests for European Foul Brood in a hive (7/22), hosted Beginner Beekeeping School (2/16-2/17, 11/2-11/3), Bee-ology Educational Workshop (9/26), Hive Tours (4/24, 4/26, 9/21, 10/8) Tabling with educational materials and bee hive products (5/10-5/12, 9/7), Native Plant Restoration Planting (4/24), Guided Plant Walk Tour (4/24), Bat Conservation Talk (4/25), Arbor Day Celebration and Tree Planting (4/26), Garden Market and Plant Sale (4/26), Environmental Impacts Affecting Bees and Pollinators (4/26), Free Pollinator Wildflower Plugs Giveaway (6/18), Garden Markets (every Friday from 3/15-12/13), CSA pickups (every Tuesday from 5/14-8/20 and 10/10, 11/25)

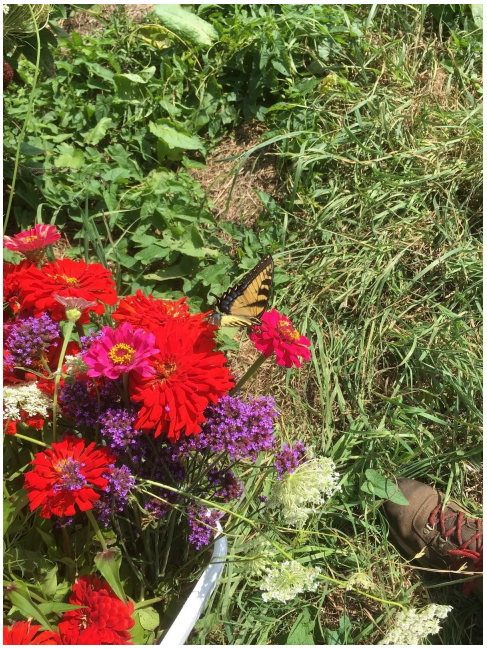
Education is a crucial component at Warren Wilson College. We invite community members to learn about native plants, pollinators, pollinator plants, honey bees, and factors impacting them negatively. We teach and invite community members to participate in projects supporting these crucial plants and animals.

POLLINATOR HEALTH & HABITAT

Cover Crop.



Monarch on Sunflower in Cover Crop.



Flowers in the Perennial Herb and Flower Plot.

We replanted the goat hill on campus, adding 6000+ native grasses and wildflowers, including both host plants and nectar sources for pollinators. This process involved first removing non-native invasive vegetation that offered far less benefits to native pollinators.

The Landscape Crew also re-planted the wetland area by the South Lane (Service Rd.) entrance to campus using a variety of native trees, shrubs, and flowering plants to provide better structure, habitat and nectar sources than were previously on that side.

Established a 1/4 acre perennial herb and flower plot. Established two fields of pollinator friendly cover crops, one field of 0.152 acres and 1.48 acres.

In January we finished creation of our pollinator hotel (roughly 4 by four feet) that we will put in our pollinator garden this year.

At Warren Wilson College we work hard to establish and support native plants and pollinators. We have minimal lawns which we work to reduce mowing and creating uninhabitable spaces. We incorporate native plants and pollinator friendly plants all over campus.

SERVICE LEARNING

Two professors and about ten botany and Freshman Year Seminar students volunteered last May-September with the Blue Ridge Parkway, collecting data on native pollinators at four locations between campus and Mt. Mitchell.

Fall 2019, Pete Erb's Freshman Year Seminar students did work on the Blue Ridge Parkway

maintaining some high elevation meadows to control shrub and tree encroachment of the grassy balds in Craggy Gardens. This maintenance of native meadow vegetation certainly benefits native pollinators.

The Conservation Biology club did a similar project clearing woody vegetation on Southern Appalachian Highlands Conservancy land last April near Roan Mountain.

Last spring, ENS 3100 class worked with Southern Appalachian Highlands Conservancy to help manage invasive plants on private land in Swannanoa under conservation easement. Fifteen students cleared invasives off this property that is full of beautiful ephemeral wildflowers!

Over summer 2019 a student collected data on monarch butterfly populations.

CURRICULUM & CONTINUING EDUCATION

Invertebrate Zoology (BIO 2410). There were 9 students in the course. The course was a taxonomic, morphological, and ecological overview of invertebrate groups, with additional emphasis on evolution and conservation. Students engaged in field collecting and identification of invertebrates, including pollinating insect species in one of the lab activities. We also visited with the Bee Crew to learn about honey bee biology, the role of bees on campus and had a hive tour.

In spring 2019, BIO 2020 (Ecology) students investigated the importance of bees and wasps as pollinators and the effects of climate change on these pollinator populations in a computer-based lab called "What the Bees Need." https://www.lessonsinlifescience.org/pollinator-phenology-1 We also visited the observation bee box that is next to Witherspoon and talked about solitary bee nesting habitats. There were 17 students in the class.

In fall 2019, Ecology (BIO 2020) discussed pollinators and their habitats in general terms and in the context of interspecific interactions such as mutualisms and symbioses.

In fall 2019 General Biology (BIO 1160) class talked about pollinators in the context of angiosperm and insect co-evolution.

In Plant Morphology and Anatomy there was a lecture on floral reproductive biology and pollination. (12 students)

In Evolutionary Biology we read several papers involving pollination biology and use various plant-pollinator systems as examples of various concepts in class. (15 students)

A class in Animal Science (BIO 2170) was dedicated to honeybees. The bee crew lead a lab around the bee yard, showed us how a hive is arranged, and demonstrated common beekeeper tools. (16 students)

The bee yard is a common stop for Perspective in Environmental Studies (ENS 1150). I taught three sections during 2019. Class size varied from 10-18

EDUCATIONAL & INTERPRETIVE SIGNAGE

No signs were installed this year, but we have plans for signage in our new pollinator garden that is being planted this spring. As well as a kiosk with informational pamphlets that correspond to the native plants in the garden and healthy planting principles.

POLICIES & PRACTICES

A 5 year crop rotation is our primary IPM strategy. The rotation breaks both weed and insect pest cycles and has been instrumental in our herbicide and pesticide free cropping system. The rotation is as follows.

- 3 years Legume based forage mix (Alfalfa, Clovers, Ryegrass, Fescue, Matua Bromegrass)
- 1 year Corn
- 1 year Barley

*The Corn and Barley fit into a 14th window virtually eliminating the amount of time soil has no cover. Riparian buffers adjacent to cropland with wildflowers and natural habitat for parasitic wasps, birds, and other organisms that eat insect pests.

Prevention is key to our IPM plan.

- We implement hand weeding with shovels, where we dig up noxious weeds right before they go to seed but after they have put the majority of their energy into reproduction.
- 240 of our 275 acres are always covered in forage preventing bare ground for weeds to take over
- Intensive grazing with high stocking densities keeps weeds down
- We spot mow with the rotary mower, large patches of weeds if they come up to prevent them from going to seed. We use the bush hog as a last resort but it can be a powerful tool when weed pressure is high or over too much ground to hand-weed.

Mitigation of Disease Pests in Livestock is achieved through a number of strategies

- Minimal use of synthetic wormers in our sheep is accomplished through the Famacha scoring of the eye color. Besides their annual worming schedule, we only worm when ewes or lambs fall below 3 on their famacha score.
- Frequent rotation of our grazing animals prevents them from grazing too low and ingesting parasites.
- Rotating sheep finishing fields on an annual basis to prevent parasite eggs from building up
- We spray Effective Microorganims (EM) from Teraganix. This product mitigates Ammonia and Hydrogen Sulfide and the EM out competes other harmful anaerobes and pathogens. This is particularly useful in our winter farrowing system for our swine

Recommended Locally Native Plant Species List —
https://www.ashevillegreenworks.org/native-pollinator-plants-and-nurseries.html

Regional Native Plant Supplier List — https://sowtrueseed.com/collections/flowers/flower-mixes

Pollinator Friendly Integrated Pest Management Plan —
https://docs.google.com/document/d/1b9wekla12xdZ--as4JYcu0_RsZh2bBTMJm2FH5ly_6k/edit

CONTACT US!

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