

CRITTER OF THE WEEK



Dr. Feldman shows leaf miners to Jerica Bozio and other BIO 307 students

Photo by Dr. Bonnie Draper

By Dr. Tracy Feldman

BEING A FIELD ECOLOGIST IS NOT EASY

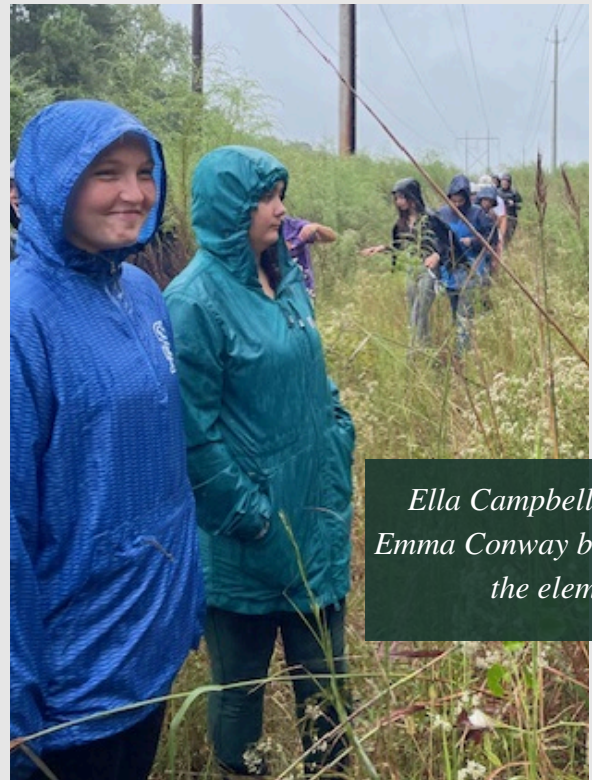
If you want to know about the world around you, you have to be out in it. This means being out in rain, mosquitoes, chiggers, or what might seem like plagues of frogs. And due to the other demands of life, one cannot always wait for ideal conditions. When I have the chance to go in the field, sometimes I just have to go outside, whatever the weather (and sometimes I just hide inside). Yet less-than-ideal conditions for me might be ideal conditions for something else... and if I feel adventurous enough, I might even see something miraculous in those less-than-ideal conditions.

THE CONDITIONS WERE FAR FROM PERFECT

When I went to St. Andrews to take Dr. Draper's class out to the Carolina Bay, the hot and humid air was spitting misty rain and threatened worse. Both mosquitoes and fire ants were out in force. These are conditions that might make a field ecologist think twice before heading out. But still, head out we did; through misty and then drenching rain, dodging fire ant mounds and swatting hoards of mosquitoes. I tried to stay as cheerful as I could, pointing out interesting things along the way. As we rounded the corner into the agricultural field, I saw people take a breath—another difficulty presented itself... leaving the road and heading off along the edge of the field.

THE FIELD WAS HOPPING

Huge numbers of tiny frogs were moving around in the sandy soil of the field, making it difficult to walk without stepping on them. At first, I thought they were Southern Toads (*Anaxyrus terrestris*), the most common amphibian we could see out there, but something about them did not look right. Waves of rain were coming—we had to keep moving if we were going to get to the Carolina Bay. Most of us got there (some turned back), and got to see the profusion of flowers there for at least a few minutes. It was still not flooded after all that rain, the Loblolly pines planted there sucking up all of the water as the rain comes down... We walked back, and I said my goodbyes and went home. The intrepid ecology students went home to shower and dry off.



Ella Campbell and Emma Conway brave the elements

Photo by Dr. Bonnie Draper

I REALIZED WE HAD SEEN SOMETHING MIRACULOUS AND UNEXPECTED



A swamp sunflower doing better in the rain than we were

Photo by Dr. Bonnie Draper

When I got home and processed my photos, I saw that the hundreds or thousands of small frogs were in fact Eastern Spadefoot Toads (*Scaphiopus holbrookii*; see photo). These incredible critters are endemic to the Eastern United States, and are pretty rare in the northern states. They spend most of their time buried usually a foot deep (but sometimes 8-feet deep) in loose sandy soil, waiting for the perfect conditions. They can wait for as many as 8 months, absorbing water from the soil through their skin and secreting fluid that hardens the soil around them to prevent water loss, then emerging to feed as necessary in rainy conditions. During and after very heavy rains at any time of year, they emerge from the soil to sing, mate, and then lay eggs (in fish-free ponds). The tadpoles (toadpoles!) mature very quickly (2-4 weeks!) and the babies hop onto land. About 3 weeks later they can burrow in the soil with special spurred back feet (it only takes them seconds to dig down below the surface) to join their elders. Burrowing in soil helps them avoid drying out or starving/freezing during winter. These frogs can be toxic (allergenic), so it is best to wash your hands after handling them.

SOMETIMES A MIRACLE ONLY COMES TO LIGHT LATER

What we saw in those difficult field conditions is a biological event that most people have never seen (not even many biologists)—the baby spadefoot toads that were a product of an explosive breeding event. It is certainly an event we never would have seen under “ideal” weather conditions. I recall seeing them only about two times during my nine years at St. Andrews. Field ecology is difficult—yet it gives us the chance to witness miraculous, secret events right around us.

Select sources:

Ruibal R., Tevis L., and Roig V. 1969. The Terrestrial Ecology of the Spadefoot Toad Scaphiopus hammondi; Copeia 1969(3): 571-584. <https://www.jstor.org/stable/1441937>

North Carolina Wildlife Resources Commission. Eastern Spadefoot <https://www.ncwildlife.org/species/eastern-spadefoot>

Virginia Herpetological Society <https://www.virginiaherpetologicalsociety.com/amphibians/frogsandtoads/eastern-spadefoot/>

CT government. Eastern Spadefoot Fact Sheet https://portal.ct.gov/-/media/deep/wildlife/pdf_files/outreach/fact_sheets/spadefootpdf.pdf



Baby Eastern Spadefoot Toad hiding under a leaf

Photo by Dr. Tracy Feldman