The Sewanee PLANT PRESS

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A Summer in Sewanee with the Herbarium Fellows

Lillian Fulgham, C'21, and I worked in Sewanee this summer as part of our herbarium fellowships through internships funded by the Sewanee Undergraduate Research Fund program. We primarily conducted research projects in Dr. Evans's lab and secondarily engaged with conservation efforts around the Southern Cumberland Plateau.

We were lucky enough to get to work a Tennessee Department of Environment and Conservation (TDEC) project assessing populations of large-flowered skullcap (*Scutellaria montana*), a federally threatened wildflower, in the Tennessee River Gorge. We met up with TDEC employees Caitlin Elam, C'03, and Stephanie Williams and hiked to several survey points on the western slope of the gorge. We systematically counted and catalogued the individual skullcap plants at each site. The collected information will be compared to previous data to determine the best management plan for this population.

We also followed up on Sinking Pond research, a population persistence study begun in 2001 on the seasonally flooded karst wetland with an ancient population of overcup oaks (*Quercus lyrata*) on Arnold Air Force Base near Tullahoma. It took quite some time to transfer the data for all 5,700 two by two meter plots in the study area from field data sheets into the computer database. We compared the data collected in 2001 with what we collected ourselves last fall to see how much each individual tree in the 2.3 hectare area grew across the 17-year interval as well as the change in density of seedlings and saplings. The comparative information will be mapped using a Geographic Information System (GIS) computer application to create an image of how the forest has changed across the years. Our results will determine which areas can sustain growth now and predict future development.

The Sinking Pond data complete, we teamed with genetics interns Cade Sterling, C'22, and Andrew Hanissian, C'20, on Dr. Evans's and Dr. Palagi's collaborative study on a sassafras (*Sassafras albidum)* population on the Sewanee Domain. Because sassafras is a clonal plant, it is impossible to differentiate between genetically different individuals except by DNA analysis. Dr. Evans's lab is handling the fieldwork side of the project, and Dr. Palagi's lab is preparing the genetic samples to be sent to Yale where they will be analyzed. With those data, we intend to map out where each clonal plant lies within a 100 by 100 meter plot near Dick Cove.

To collect the samples, we hiked to the plot every morning and mapped each sassafras that was taller than half a meter (about 250 individuals) as well as 200 tiny sassafras seedlings throughout the plot. We took a leaf from each plant and dessicated it in a dehydrator, making sure that its unique code was matched to its location. The combination of genetic information with GIS mapping should help us determine whether the sassafras population consists of one or multiple genetically separate organisms.

We especially enjoyed our work identifying and collecting diverse plant species in and around the Domain, such as the airport meadow and Lake Finney, We used the *Guide to the Vascular Flora of Tennessee* (University of Tennessee Press, 2015) to identify them to species.

The opportunities we were afforded this summer were twofold: valuable research experience and unforgettable community engagement. We moved several large projects forward in the lab and got a glimpse of how conservation research is conducted at the state level with TDEC. And we were able to help raise awareness of plant conservation around the local area in assisting with a pollinator and wildflower education program for students at Decherd Elementary School and consulting with Tennessee Department of Transportation personnel to better conserve roadside milkweed habitat (see related article). We look forward to continuing the work we began this summer and are grateful for the experience.

— Angus Pritchard, C'22

Saving the Milkweeds, Supporting the Pollinators
New Partnership with the TN Department of Transportation

The Herbarium, the University Farm, and the state's Department of Transportation (TDOT) have devised a plan for preserving and relocating two populations of common milkweed (*Asclepias syriaca*) from the edge of the state highway that runs through Sewanee. Members of Sewanee's Natural History Society and interns with the University Farm will dig plants this fall for relocation to other places on the Domain, including two areas on TDOT highway right-of-way that are not mowed annually. They will also collect seed to germinate. The resulting seedlings will be planted at the University Farm.

It started this past summer with this writer making a call to TDOT to request that they refrain from mowing the two populations until the plants had gone to seed. Aaron Hawkins, TDOT's district operations supervisor met me and herbarium fellows, Lillian Fulgham and Angus Pritchard, on location to mark the populations and discuss possible courses of action. The fellows, who are both active in the Natural History Society, volunteered the society's involvement in moving plants.

Then followed a second meeting with Hawkins, along with TDOT District Manager Jeremy Price and Operations District Assistant Sam Penny. Penny had identified two seldom-mowed areas where plants could be relocated. Meanwhile, University Farm Manager Carolyn Hoagland expressed interest in plants and seeds, and a plan was born: no mowing this year to give us time to relocate plants, some of which will remain on the highway right-of-way.

But why all the fuss? After all, milkweed is just a weed, right?

Hardly! Sure, the plants have "weed" in their name, but milkweeds are valued native wildflowers. We have at least

seven species growing on the Domain. Monarch butterflies lay their eggs on milkweed, which is the required food source for their caterpillars. The plants also provide abundant nectar for the adult monarchs, as well as other butterflies and insect pollinators.

In recent years, milkweeds and other native plant species have been disappearing nationwide, largely because of increasingly intense agricultural practices and development of more and more land for residential and other purposes. The decrease in native plants has in turn contributed to the overall decline of bees and other pollinators, including a dramatic decrease in monarch butterflies, which migrate each year between Central and North America.

As more grasslands are converted to crop production or other types of development, concerns about the decline in native plant diversity and the pollinators that depend on these plants has prompted calls for conservation measures like ours. For more information see these web resources: TDOT's Pollinator Habitat Program, the Xerxes Society's Project Milkweed, and the Southeast Grasslands Initiative.

—Mary Priestley

As we go to press ...

An article titled "Tennessee Makes Way for Monarchs" has just appeared in the *New York Times.* Written by Margaret Renkl, it documents efforts on the part of the Tennessee Department of Transportation (TDOT) to allow flowering plants along rural highways to bloom and go to seed before being mowed. The strategy, dubbed "swath mowing," limits mowing to the 16-foot-wide area next to the road. This provides clear lines of sight for motorists while allowing herbaceous plants to grow and mature in the "deep margins" farther from the road. We commend TDOT for this program. —MPP

Friends of the Sewanee Herbarium

The Friends of the Sewanee Herbarium support the work of the herbarium: education, research, and conservation. A $10 annual contribution would be very much appreciated. The date of your most recent contribution is printed on your address label.

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Autumn Calendar of Events

Abbo's Alley
Saturday, Sept. 21, 7:45 a.m., Mary Priestley
A Family Weekend tradition! Meet at the corner of University and Georgia Avenues (at the flashing light) near the arboretum kiosk for this one-hour easy walk in the Abbott Cotten Martin Ravine Garden. The garden is a lovely mix of native and cultivated plants, and the ravine is steeped in Sewanee history. There are a surprising number of things to see and learn on this familiar trail. All are welcome to join in the walk.

Workshop on iNaturalist App
Saturday, Sept. 28, 10 a.m., Angus Pritchard
Join Herbarium Fellow Angus Pritchard, C'22, on for an introductory workshop on how to use an incredible new identification tool, the iNaturalist app! Meet at the Lake Cheston pavilion for a botanical and entomological walk and some tips about using the app's photo-recognition system. Just make sure you have the iNaturalist app downloaded to your smartphone before the walk. Please RSVP to pritcaj0@sewanee.edu.

Meadow Trail
(South Cumberland State Park)
Saturday, Oct. 5, 10 a.m., Yolande Gottfried
Meet at the South Cumberland State Park Visitor's Center to walk this easy trail behind the center. Tall native grasses and numerous asters, goldenrods, thoroughworts, and many other wildflowers should still be in bloom.

Lake Dimmick (Day Lake)
Sunday, Oct. 6, 2 p.m., Mary Priestley
Meet at St. James Church, Midway. We'll see wetland plants and have an optional hike up "Little Mountain" to see the renovated log cabin. Some of the last wildflowers to bloom are found around our lake shores. In any case, fall color should be starting to reflect in the water.. This walk may be wet, so wear suitable foot wear.

Looking ahead, the herbarium-sponsored nature journaling group will have its annual All Things Bright and Beautiful exhibit in Stirling's in January. This display will be in celebration of the 50th anniversary of Earth Day.

Nature Journaling
A group meets for nature journaling Thursday mornings 9–11 a.m. Come try it out—stick with it if you like. Bring an unlined journal (or a few sheets of unlined paper) and a pen or pencil. No experience needed. As the seasons transition, we gather in different places, so contact mpriestley0150@gmail.com for info on the meeting place.

All times are CST or CDT. Wear appropriate shoes on all of these walks. Risks involved in hiking include physical exertion, rough terrain, forces of nature, and other hazards not present in everyday life. Picking flowers and digging plants are prohibited in all of the above-mentioned natural areas.

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Drawings by Mary Priestley are of monarch butterfly; sassafras and overcup oak seedlings; milkweed plant and pod; and composite flowerhead dissection

HERBARIUM PUBLICATIONS

Fiery Gizzard: Voices from the Wilderness
What If Trees Could Walk?
Trail Guide to Shakerag Hollow
Sewanee Wildflowers in Watercolor

FOLLOW US ON FACEBOOK (Sewanee Herbarium) AND INSTAGRAM (@sewanee_herbarium).

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Composites—a Closer Look

It's autumn, and composites—sunflowers, coneflowers, and their relatives—are blooming in abundance. A lot goes on in a composite "flower," as savvy pollinators are well aware. First, each "flower" is a whole bouquet of several to many tiny flowers, sometimes dubbed "florets," of which there are two kinds: disk florets compose the central "eye" of sunflowers and daisies; ray florets the "petals." Some composites—dandelions and chicory are examples—have only ray florets. Others—thistles are a great example—have only disk flowers. The disk flowers around the outside mature first, functioning initially as pollen-bearing males, then as pollen-receptive females. So the eye of a maturing flowerhead will consist of female florets around the outside encircling a ring of male florets, which in turn surround immature floret buds in the center.

And here's the thing: pollinators figure this out. Watch a bee on a developing sunflower: it will land on the edge of the head, collecting nectar from the female florets and dusting them with pollen from previously-visited flowers. Then she moves to the male florets, where she collects pollen before flying off to the next flowerhead. Bees learn where nectar and pollen are located in one flower type at a time, so they will consistently visit flowers of that one species while it is in bloom, before moving on to figure out a different flower scheme. If you get the chance, this is a fascinating thing to observe.

— Mary Priestley