

Dear Friends of the Herbarium,

It seems I am overdue in describing the many exciting goings-on at the UNC Herbarium—so let me remedy that situation with this letter! As I write, on May 12th, the Herbarium has had one of its busiest days ever, with 18 people actively working in the collection: 2 volunteers mounting and databasing specimens, 3 graduate students (Biology, Ecology, and Anthropology) conducting research, the Mary McKee Felton Intern (UNC-CH 2016) conducting research, 8 part-time employees imaging specimens for National Science Foundation grants, a visiting researcher from USDA Plants, and of course, the 3 regular full-time Herbarium employees.

Now more than ever, herbaria like ours are vital centers of research, education, and conservation. I'd like to highlight for you some of our recent activities...

Floras and Flora Apps

Published floras have traditionally been the main means of synthesizing information on the species of plants in an area—their habitats, phenology, classification, common names, and practical identification. The Herbarium has **published two comprehensive floras**: the *Flora of Virginia*, coauthored with Chris Ludwig and Johnny Townsend, and the *Flora of the Southern and Mid-Atlantic States*. The *Flora of Virginia* has won several awards, including the Thomas Jefferson Award for Conservation.

Through these and other major accomplishments, the Herbarium and allied researchers are today viewed as primary sources for information on southeastern U.S. plants—information that is a foundational tool used by botanists, foresters, horticulturists, conservationists, and students throughout the U.S. With help from UNC's



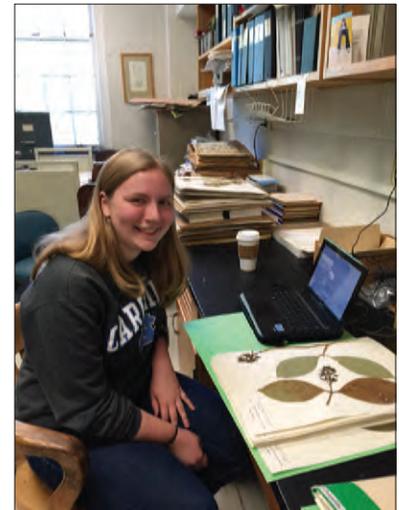
Carolina Apps Program, the *Flora of the Southern and Mid-Atlantic States*, issued annually in print and digital formats, was recently transformed into an

iPhone/iPad application, known as **FloraQuest**. The app allows mobile identification of over 7,000 plant species in a 14-state region through an interactive interface. One of its most innovative features is “geographic filtering” of the keys at all levels, whereby one has the option to collapse/simplify the keys based on one's location (for example, palm trees

can be “grayed out” for a user in West Virginia; fir trees for someone in Alabama). Our floristics work has been supported by private giving, notably from the **Flora of Virginia Foundation** and Herbarium friend and botanist **Janice Swab**, who created the Edward C. Swab Fund for Floristic Botany in memory of her husband Ed, also a botanist. **Robert Wyatt and Ann Stoneburner** recently established an endowment to support botanical field research in recognition of the contributions made by Robert's professors, Albert E. Radford and C. Ritchie Bell.

A New Wildflower Guide!

While floras provide authoritative information on the identification, features, and habitats of plants in an area, they can be intimidating to use for some folks with interests in the native and naturalized plants of our area. The



Mohr Intern Ellie Kravets examining an herbarium specimen. The Charles T. Mohr Internship has been endowed by Mohr descendants Betty Heston and Barbara Safford, and the Burch-Safford Foundation.

floras described above strive to be accessible, with keys that use non-flowering and non-fruiting features, geography, and habitat as much as possible; introductory chapters on habitats and places to see native plants; and reference to other useful resources. The FloraQuest app also strives to broaden the user community with its visual keys, key-filtering, line drawings, and photographs. But the southeastern U.S. has long needed a suite of sophisticated yet easy to use wildflower guides, like those available in the northeastern and western states. As Herbarium Curator Carol Ann McCormick says: we need to “put the hay where the horses can get it”! In these days of “nature deficit disorder” and “plant blindness,” we must engage people at all levels and in all ways to increase knowledge of and appreciation for our remarkable native plants. So my coauthors Garden Director Damon Waitt, Laura Cotterman, and I have accepted the challenge of developing **a wildflower guide** for the mid-Atlantic and southeastern states (New Jersey south to Georgia), to be published in 2018 by Timber Press.

Research

As long as they have existed, herbaria have been valued centers for research. The UNC Herbarium’s employees, students, and formal associates have **published more than 100 peer-reviewed articles** in recent years, on subjects as diverse as marine red algae of the Pacific Ocean, lichens of the North Carolina Piedmont, the early (Devonian) evolution of vascular plants, the southeastern U.S. Coastal Plain as a “biodiversity hotspot,” a classification of world vegetation formations, taxonomic revisions of various genera of southeastern U.S. flowering plants, and descriptions of new species. Private support from Herbarium friends like **Paul Gabrielson and Mary Love May** has enabled us to make use of the modern tool of DNA sequencing in systematics research on red algae and vascular plants, and to train graduate and undergraduate students in these important skills.

New Species

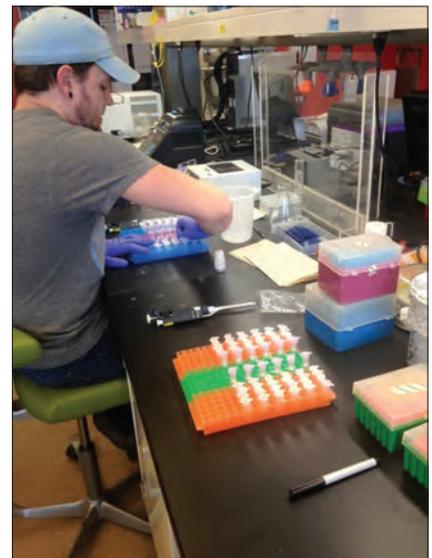
Some might anticipate that, with a geographic focus in the southeastern United States (where there is a long history of botanical exploration), we are unlikely to discover new plants. But access to new areas, along with new molecular and other tools for evaluating distinctiveness of populations, and a generation of south-



Photo by David Blevins

eastern botanists with a deep understanding of the landscape, have enabled an astonishing series of discoveries: **more than 400 new species of flowering plants** already—or soon to be—named in the southeastern United States! *Marshallia legrandii* (pictured) is a perfect example of this kind of discovery. First collected in the early 1960s but misidentified, a specimen was deposited at the UNC Herbarium. Several decades later, field biologist Harry LeGrand Jr. of the North Carolina Natural Heritage Program discovered a population of what appeared to be a new species of *Marshallia*. The putative new

species was included in the *Flora of the Southern and Mid-Atlantic States*, resulting in the discovery of small populations of the same plant in Virginia. Careful morphological study of the extant populations and historic herbarium specimens allowed UNC Biology graduate student Derick Poindexter and me to formally name the



Graduate student Derick Poindexter, whose innovative research on *Carex* has been facilitated by the Mohr Internship, the Molecular Systematics Fund, and the Edward C. Swab Fund for Floristic Botany.

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species, a conclusion confirmed by DNA analyses. Today *Marshallia legrandii* is considered one of the rarest native plants and is of the highest priority for conservation in North Carolina and Virginia.

Digitization

We are currently digitizing most of the Herbarium collection (more than 600,000 specimens) with support from **three separate National Science Foundation grants**. Digitization involves taking high-quality digital images of specimens and associating these with searchable databases, including geo-referenced locations where a specimen was collected. This process greatly enhances the scientific and educational values of herbarium collections by allowing users to search across many collections. It also minimizes specimen wear and loss by de-emphasizing the handling (and loan) of specimens. In effect it “daylights” the collection by inviting its use by professional and amateur researchers around the world.

Planning a New Home

I am pleased to announce that we have initiated a renewed feasibility and planning process—one that builds on years of preparation and fundraising and a recent generous gift from **the Soo Foundation**—to design, fund, and construct a new research building to house the UNC Herbarium and other conservation-related components of the Garden. This facility will allow the collection to grow and to receive the best of modern archival curation. Furthermore, it will be a home for innovative research, public outreach, and citizen science programs.

Maintaining the Tradition, Enhancing the Future

The University of North Carolina can proudly claim **two centuries as a center** (some would say *the center*) **of Southeastern Botany**. Think of Elisha Mitchell, Drs. Coker and Couch, Radford and Bell, Totten and Duke. Think of the *Manual*, the *Southeastern Flora*, the North Carolina Botanical Garden, and hundreds of professionals trained and thousands of amateurs inspired. Our role today honors that tradition—indeed, builds on and elevates it. We will continue to accomplish the urgent goals of curation, scientific research, education, and conservation at the UNC Herbarium.

With only the very limited resources provided by state budgets, we would accomplish a mere fraction of what is possible with your added support. **Grants and gifts from people like you allow us to stretch beyond the basics—to innovate and lead.**

Thank you so much for your support!



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Cassandra Karlsson taking a break in Coker Arboretum during ginkgo leaf fall. Karlsson, Mary McKee Felton Herbarium Intern, conducted morphological and molecular research on the systematics of southeastern U.S. *Eryngium* species, with the result that we will likely recognize three species of “Rattlesnake Master” rather than one. One of these, “Moccasin Master,” is a newly recognized, rare endemic plant of flatwoods streams in eastern Louisiana and southern Mississippi. The Felton Internship has been endowed by friends, relatives, and classmates of Mary McKee Felton, longtime assistant curator at the Herbarium.

