

George Safford Torrey Herbarium (CONN)

Strategic plan 2022-2027

Lobariaceae

Lopadiaceae

Massalongiaceae

Megalosporaceae

Proposed by 2021 Herbarium committee
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Biology

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1. EXECUTIVE SUMMARY

The George Safford Torrey Herbarium (CONN; biodiversity.uconn.edu/herbarium) was founded in April of 1898 as the Herbarium of Storrs Agricultural College. From its initial 121 specimens contributed by Henry Ballou's botany students, it has grown to more than 225,000 specimens, doubling in size in the last 25 years.

The "extended specimen" concept recognizes that herbarium specimens are more than mere physical objects and their data per se. The preserved **physical specimen** serves multiple extensions, fueling morphological, anatomical, reproductive, chemical, genetic, evolutionary and ecological studies, as the well curated specimens maintain their traits, genomes and associated species. The **information**, or data, linked to the specimen, is an equally critical resource, central to reconstructing, modelling and predicting distributions, to the development of conservation strategies, or to assessing ecological functions of traits.

Both preservation of physical specimens and digitization of their associated information are critical to capitalize fully on the extensive research and educational potential of these largely untapped resources. A massive digitization effort supported in 2009 by a \$476,000 grant from the National Science Foundation trained fifty undergraduate students to produce our "digital herbarium" by creating a high-resolution image of each specimen and entering corresponding collection data into relational database records.

With a collection that spans the last two hundred years and continues to grow with contemporary additions, that holds a wide diversity of plants with unique strength for particular lineages, and that uniquely reflects the diversity of plants in Connecticut, the G.S. Torrey Herbarium is ideally positioned to pursue and contribute to four fundamental missions: curation/preservation, research/scholarship, education/teaching, and outreach/public engagement. Our major emphases in the next five years will be:

- Maintaining exemplary curatorial standards to preserve our historical records and strengthening our collection documented plants diversity in Connecticut and beyond.
- Providing accessible, high-quality data and images to local and global audiences to enable and facilitate innovative specimen-based research.
- Designing and implementing engaging, experiential learning opportunities that attract students from across the UConn community while inspiring them to apply new skills to graduate study or careers in collections management, biodiversity research, and museum studies.
- Promoting public understanding of the importance of herbaria in general, awareness of resources available at the Torrey Herbarium in particular, and curiosity about our local wild flora.

The strategic plan includes a roadmap for evaluating progress by identifying concrete steps to achieve success, measures for quantifying outputs, and outcomes resulting from our activities. The plan also describes a sustainability agenda that applies our existing strengths – our strong position in online data availability, our extensive collection of Connecticut and New England floras, and our expertise in specimen curation and dedication in student engagement – to meeting future challenges and capitalizing on opportunities.

2. OVERVIEW

2.1 Mission

Our mission is to preserve and digitize botanical specimens, catalyze research and discovery, support classroom and individual learning, and empower people to explore and appreciate plants.

2.2 Vision

The George Safford Torrey Herbarium is an indispensable local and global botanical biodiversity resource that is **expanding** specimen and data collection to document our changing world, **facilitating** cutting-edge studies at the intersection of past and future, **engaging** students in innovative, creative instruction in natural history collections, and **inspiring** the people of Connecticut to explore our shared botanical heritage through meaningful collaboration, outreach, and service.

What is a herbarium?

(her·bar·i·um /,(h)ər'berēəm/)

A **herbarium** is a collection of dried plants and fungi with labels that include collection date, location, habitat, and collector.

Each specimen has **two parts**: the physical plant (or fungus) with its label, and its associated data. Both parts are required for a sample to be scientifically useful! We preserve physical specimens in archival cabinets and record their information in globally-shared databases.

We use specimens to describe new species, investigate plant responses to climate change, study evolutionary relationships, and more. Herbaria facilitate exciting new avenues of inquiry beyond the imagination of historic plant collectors.

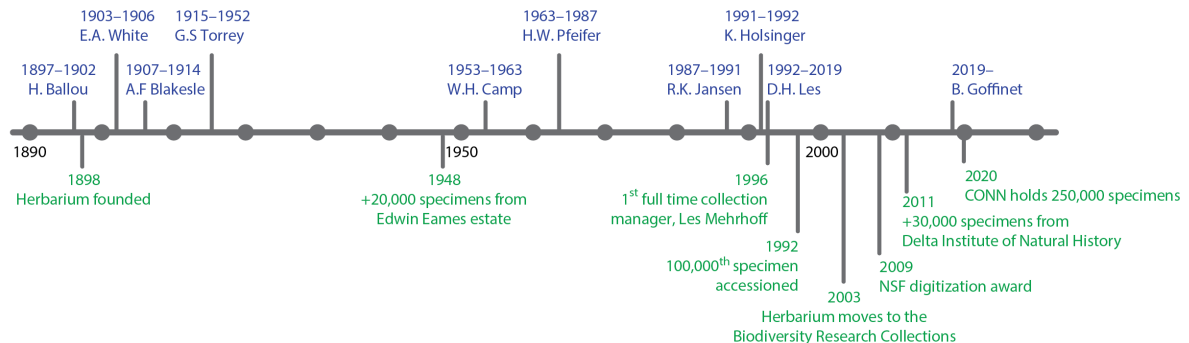


3. ORGANIZATION

Strategic Planning Partners: the preserved plant collections is overseen by Dr. B. Goffinet (director of the herbarium, curator of bryophytes and lichens), Dr. C. Jones (director of the paleobotanical collection), Dr. S. Taylor (collections manager), Dr. L. Lewis (curator of algae) and Dr. Y. Yuan.

3.1 Description of the Herbarium

Dr. Henry Arthur Ballou founded The University of Connecticut's herbarium (acronym: CONN) in April of 1898 as the "Herbarium of Storrs Agricultural College." In 1979, the herbarium was named for Dr. George Safford Torrey, who joined the Agricultural College in 1915 and significantly expanded the collection over the next 40 years. The collection of preserved plants has steadily grown, primarily through the activities of faculty in the Department of Biology (until 1985) and subsequently in the Department of Ecology and Evolutionary Biology. In the early 21st century, the herbarium grew significantly through the Invasive Plant Atlas of New England project headed by Drs. John Silander and Les Mehrhof, acquisitions from various institutions, and the more recent development of research focused on moss and lichen diversity. Dr. Henry Andrews, member of the National Academy of Sciences, established the paleobotanical collection in 1964. Historically, fungi were considered plant-like and hence herbaria typically included a mycological collection. The CONN herbarium holds a small number of mushrooms and rusts, reflecting the institution's early status as an agricultural college, and a more extensive collection of lichenized fungi (and their associated algae and cyanobacteria). A small collection of alcohol-preserved flowers and fruits, as well as an extensive collection of dried seeds, hold value as scientific and teaching specimens.



The herbarium holds more than 225,000 specimens, distributed along three dimensions of diversity:

- **Phylogenetic diversity:** the herbarium comprises collections of extant lineages from across the Plant Tree of Life, from algae to flowering plants, as well as a broad representation of lichen-forming fungi. This diversity is spread across 710 families: 333 angiosperm families, 130 algal and cyanobacteria families, 123 bryophyte families, 79 families of lichen-forming fungi, 34 families of ferns and their allies, and 11 gymnosperm families.
- **Geographic diversity:** the herbarium holds specimens from around 130 countries across all continents. The geographic emphasis is on North America, with 70% of vascular plants representing the flora of New England, and, in particular, of the state of Connecticut.
- **Historical diversity:** the 8,000 specimens in the paleobotany collection span the full geologic range of plant fossils from cyanobacteria-like microfossils from the Precambrian Gunflint Chert (1.8 Gy) to Pleistocene (<2.6 My) silicified wood. Our herbarium spans the period 1820—present, with peaks in accession activity at the turn of the 20th century, the lead-up to the 1950s, and the 1990s-2000s.

Our physical collections are preserved in 174 modern herbarium cabinets, representing approximately 35% of the storage capacity of the Biodiversity Research Collections (BRC). A \$476,000 award from the National Science Foundation allowed for the digitization of approximately 185,000 vascular plant specimens (i.e., ferns and seed plants). A high-resolution image of each specimen, together with its associated data, is publicly available through our [website](#) and multiple on-line databases ([Global Biodiversity Information Facility](#); [Integrated Digitized Biocollections](#); [Consortium of Northeastern Herbaria](#)). Almost 20,000 algal and North American bryophyte and lichen collections are also databased and available online ([Macroalgal Herbarium Portal](#); [Consortium of North American Bryophyte Herbaria](#); [Consortium of North American Lichen Herbaria](#)).

3.2 Academic, Scholarly and Service Roles

The herbarium contributes significantly to the three main missions of the University of Connecticut.

- Academic:** The herbarium and paleobotany collections support courses in Ecology and Evolutionary Biology, across the College of Liberal Arts and Sciences (CLAS), and beyond. Within EEB these collections provide critical reference material for organismal and plant evolutionary biology courses. Furthermore, the herbarium offers unique opportunities to directly introduce students to the role of natural history collections through tours or the Natural History Collections course, to engage in the curation of these valuable collections through work study and internships, and to explore these historical collections through learning activities (e.g., impact of climate change on plant behavior (e.g., flowering)).
- Scholarly:** The herbarium holds a tremendous reservoir of information, from the geographic and ecological distribution of regional, national and global plant diversity, the signatures of species interactions, to their genomes, epiphytic and endophytic microbiomes or pollutants preserved with the plant specimen. While this bank of data is largely untapped, it has already fueled and will further catalyze scholarly endeavors aimed at unravelling the biology and evolution of plants on earth. Within the last five years, our specimens have been used in research investigating changes in plant phenology (the timing of flowering and fruiting), documenting the diversity of orchids in southern New England, and examining oak (*Quercus*) leaf miners.
- Service** to the State and citizens: The herbarium is the prime public infrastructure documenting the botanical history of Connecticut, holding evidence of past and current, native and exotic plant diversity of the state. Herbarium staff serve on the CT Department of Energy and Environmental Protection’s Rare Plants Committee and the New England Plant Conservation Program’s Connecticut Task Force, which seek to document and protect state-listed plants and monitor at-risk species. Its staff also participates in Skype a Scientist, an initiative founded by UConn alumna Sarah McAnulty that matches K-12 classrooms with scientists to introduce students to careers in science, support science literacy, and increase trust in scientists.



Trends in Ecology & Evolution CellPress

Review
Old Plants, New Tricks:
Phenological Research Using Herbarium Specimens

Charles G. Willis,^{1*} Elizabeth R. Ellwood,^{2*} Richard B. Primack,³ Charles C. Davis,⁴ Kaitlin D. Pierson,² Amanda S. Gallinat,⁵ Jenn M. Yost,⁶ Gil Nelson,⁷ Susan J. Mazer,⁸ Natalie L. Rossington,⁹ Tim H. Sparks,^{6,10} and Pamela S. Soltis¹¹

The timing of phenological events, such as leaf-out and flowering, strongly influence plant success and their study is vital to understanding how plants will respond to climate change. Phenological records, however, do not lend themselves to the temporal, geographic, or phylogenetic scope of available data. Hundreds of millions of plant specimens in herbaria worldwide offer a potential solution to this problem, especially as digitization efforts gradually improve access to collections. Herbarium specimens represent a repository of phenological events and have been reliably used to characterize phenological responses to climate. We review the current state of herbarium-based phenological research, identify potential biases and limitations in the collection, digitization, and interpretation of specimen data, and discuss future opportunities for phenological investigations using herbarium specimens.

The Potential for Herbarium Specimens to Expand Phenological Research
 Herbarium-based phenological research is the recording of discrete events such as flowering and leaf-out as a key determinant of plant success and ecosystem productivity. Furthermore, an ecological event is often triggered by environmental cues, especially changes in the date of phenology, a variable that is poorly understood. Climate change, and the associated shifts in the timing of these events, has been a major focus of research in recent years. The use of herbarium specimens to study phenology has been a long-standing tradition, but the field has not been as well-served as it deserves. Phenological data, including the onset and duration of individual phenological events, the end-to-end length and duration of the phenological season, the number of flowering and fruiting events, and the timing of these events, are all available in herbarium specimens. The use of herbarium specimens to study phenology has been a long-standing tradition, but the field has not been as well-served as it deserves. Phenological data, including the onset and duration of individual phenological events, the end-to-end length and duration of the phenological season, the number of flowering and fruiting events, and the timing of these events, are all available in herbarium specimens.

To address the gap, herbaria have recently turned to the vast collections of plant specimens in the world's herbaria for phenological information (11–15). Herbarium specimens can be used as records of the phenological status of an individual, population, or species at a

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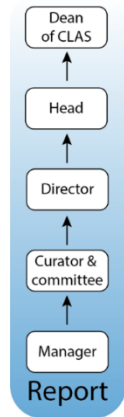
Tuesday, January 12, 2021

University of Connecticut George Safford Torrey Herbarium

Native Plant Trust has partnered with staff at university herbaria throughout New England to offer a special inside look at the region's most impressive plant specimen collections. All programs will be conducted virtually.

3.3 University Position

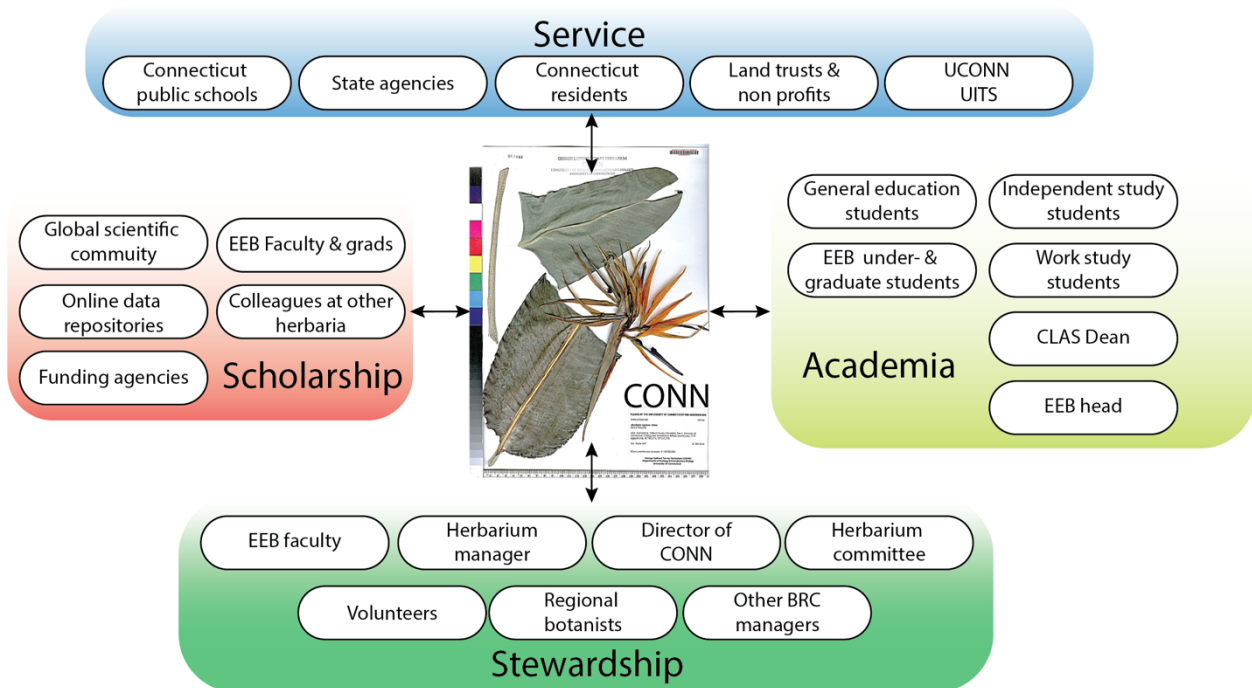
Our herbarium is integrated in the Biodiversity Research Collections within the Department of Ecology and Evolutionary Biology in CLAS. It is housed in the BRC, an 8,000 square foot purpose-built facility in the Biology-Physics Building (BPB), with separate dry collection and spirit collection rooms, preparation areas, offices, and walk-in cold room and freezer. The collection is curated by a full-time collection manager under the supervision of the herbarium director (faculty position in EEB) in consultation with the herbarium committee, reporting to the department head and CLAS. Its annual operational budget is provided by the Department of Ecology and Evolutionary Biology and complemented by funds from collection endowments and ad hoc extramural funding sources.



3.4 Stakeholders

The herbarium serves, and is supported by, a diverse suite of stakeholders distributed among four major constituencies that align with our four foundational concepts. The **stewardship** group of stakeholders includes those who contribute to the herbarium’s collections, assist with planning and decision-making, and perform curatorial duties. Stakeholders in the **scholarship** group share data and specimens with us (and vice versa), use our collections for research, and provide financial support for specimen collection and digitization. Those in the **academia** group are people within UConn who engage with the herbarium’s educational activities. Stakeholders in the **service** group have an interest in the Torrey Herbarium that is outreach-based, either as groups and people on the receiving end of our endeavors, or through assisting us with disseminating information.

Stakeholders with the greatest interest in, and impact on, the day-to-day activities of the herbarium include the Collections Manager and the Director, Work Study students, Independent Study students, EEB faculty, online data repositories, and UConn IT personnel.

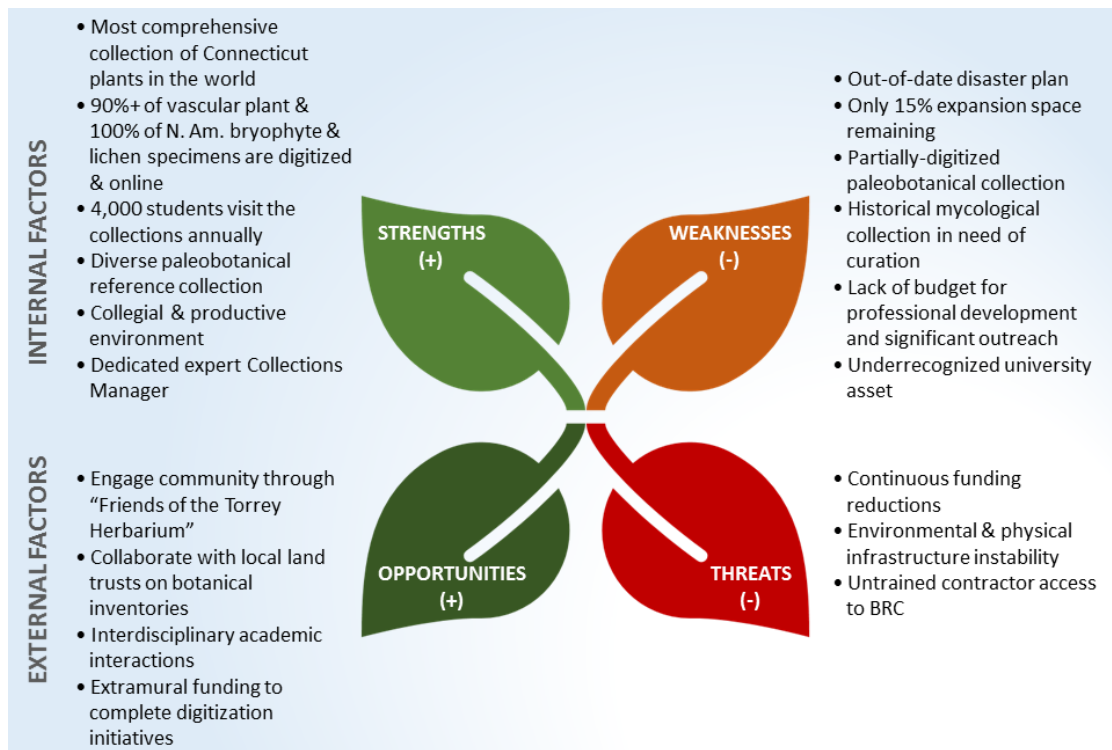


4. ENVIRONMENTAL ANALYSIS: ADVANTAGES AND CHALLENGES

Assessing our strengths, weaknesses, opportunities, and threats provide a framework for prioritizing goals and objectives that draw on our advantages to meet current and future challenges (see Section 6).

Internal weaknesses and external threats may put constraints on or pose danger to the herbarium’s progress. Unreliable climate controls and infrastructure, access to the collections by untrained contractors unfamiliar with the value of the herbarium, and an out-of-date disaster response plan are three factors that contribute to an elevated chance that some incident will lead to the loss of specimens and/or equipment. We have only partly digitized the paleobotanical collection, while our historical mycology collection (dating from the early days of the Storrs Agricultural School) is completely uncurated - leaving these resources unable to reach their full research potential. With the continued beneficial growth of the herbarium comes the hard truth that, with only 15% of our compactor capacity empty, we must implement selection criteria for new accessions, especially large gifts of older material. Finally, our small budget does not allow for professional development or innovations in education and outreach and is potentially at risk of future reductions.

The herbarium’s strengths and opportunities provide a platform to catalyze the advancement of our goals and may insulate it from some effects of our disadvantages. Our collections are unsurpassed among similar herbaria, with the most comprehensive collection of plants collected from Connecticut in the world, more than 90% of all of our vascular plants digitized, and all North American bryophytes and lichens databased. The paleobotanical collection is diverse and well-curated, which will expedite future digitization efforts. Thousands of students visit the collections each year with a variety of courses, expanding community awareness of the herbarium; our community also includes supportive EEB faculty, passionate BRC colleagues, and professional and amateur botanists from around Connecticut. This friendly community is a valuable resource for organizing research collaborations, recruiting student workers and volunteers, and eliciting support for the herbarium.



5. SUSTAINABILITY

5.1 Internal: Maintaining strengths and addressing weaknesses

One of the major strengths of the herbarium is its commitment to outstanding curation of its physical specimens and stewardship of its digital records. Our facility is a major asset in this regard, with details engineered for specimen protection such as supplemental climate control, state-of-the-art fire suppression systems, sealed compactor cabinets, and Integrated Pest Management implementation. The BRC is also optimized for specimen preparation and digitization with a large plant drier, spacious prep area, and three combined computer/scanner stations. To fulfill our commitment to growing the collection, maintaining high curatorial standards, and disseminating associated data requires ongoing vigilance in data quality and facilitating staff opportunities to pursue continuing education. Digitizing our paleobotany collection and making the data available online would enhance the visibility of the collection among paleobotanists, provide hands-on training opportunities for students, and potentially attract outside funding.

Our outdated Disaster Plan is a major weakness that leaves the herbarium and the BRC vulnerable to potentially avoidable losses in the event of a major catastrophe, and mitigating this oversight is a major short-term priority. We will continue to engage with colleagues in Facilities Management and the Fire Marshall's office to assist us in developing and finalizing this process. Personnel in both of those departments are already familiar with the collections and aware of its value thanks to our ongoing initiative to offer tours to personnel at all levels of the University. Now that we have consciously identified risks to the collections, we have the opportunity to thoughtfully and comprehensively update this critical document and create a path forward that will help protect our collections for future generations.

5.2 External: Capitalizing on opportunities, minimizing threats

The Biodiversity Research Collections facility was designed as part of the UConn 2000 initiative and purpose-built to minimize (but not eliminate) potential threats to the collections. In the past several years we have struggled with pollutants (de-icer in the wintertime) and intermittent HVAC instability. While these challenges are not acute disasters to be addressed in the formal Disaster Plan, they have the potential to damage specimens if plans to mitigate them are not implemented. Investigation and implementation of facilities-based solutions to these thorny complications and administrative controls over contractor access will better protect the herbarium and the other BRC collections.

The Covid-19 pandemic has had major impacts on the Torrey Herbarium and the Biodiversity Research Collections. Its potential long-term financial impacts are as yet unknown, and may have effects ranging from small (e.g., reducing our operating budget) to large (e.g., indefinitely postponing the hiring of a tenure-track vascular plant systematist to serve as a permanent director of the herbarium). As we look ahead to reopening fully, we can strengthen our existing connections with students and cross-disciplinary faculty and forge new relationships with incoming administrators, land trusts, and local botanists. Cultivating a complex network through education and service will help us capitalize on available opportunities to collaborate with Connecticut botanists and nonprofits, achieve our goals of raising our profile and establishing a welcoming reputation, and may help to insulate us from the most severe financial repercussions that may come.

6. GOALS & OBJECTIVES

It is an exciting, dynamic time for herbaria around the world as we support innovation at the forefront of biodiversity and climate research and simultaneously broaden and enhance the traditional concepts of natural history collections. Our herbarium is engaged in global discussions planning the future of collections, particularly pertaining to the developing idea of the “Extended Specimen,” linking individual herbarium specimens to corresponding genomic data (GenBank), phylogenetic trees (TreeBase), and other natural history specimens (e.g., eDNA, entomology collections) to develop comprehensive resources integrating all data associated with individual plant specimens.

The herbarium constitutes a flagship botanical resource for the State of Connecticut and a distinguishing asset of the University of Connecticut. To maintain and further develop its significance, we have developed goals that align with four foundational pillars. Our fundamental purpose is to secure the long-term preservation of our biological specimens by adhering to the highest **curatorial** standards. Excellent quality of the physical and digital specimens is essential to our **scholarly** drive to promote intra- and extramural use of this outstanding resource. Our **academic** pillar develops the herbarium as a pedagogical resource for UConn’s biology programs, provides opportunities for out-of-the-classroom experiential learning, and inspires students to pursue careers in natural history. Our **outreach** goals anticipate developing awareness of our resource beyond the university perimeter and engaging the people of Connecticut in exploring and protecting the botanical heritage of our state.

1. SPECIMEN CURATION: The herbarium employs the highest standards of specimen preservation and collections care, maximizing the research and educational value of every specimen.

1.1. GOAL: *The herbarium prioritizes the collection and accession of plants representing the flora of Connecticut and the northeastern United States.*

1.1.1. Focus collecting resources on local regions that have been historically overlooked by botanists (portions of Middlesex and Windham Counties).

1.1.2. Collect plants that occur in Connecticut, but that are not yet represented in our herbarium.

1.1.3. Eliminate existing specimen backlog to make space available for new collections.

1.2. GOAL: *The herbarium and paleobotanical collections are protected by a comprehensive, up to date disaster response plan.*

1.2.1. Review old disaster planning documents, identify gaps, and update each section.

1.2.2. Consult with UConn Fire Marshall to understand existing infrastructure and to learn about disaster response best practices.

1.2.3. Design and implement a training module for all incoming staff, students, and volunteers.

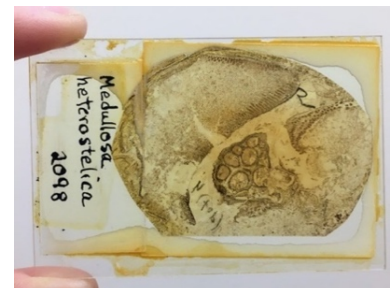
1.2.4. Maintain well-marked inventory of disaster response materials.

1.3. GOAL: *The fossil plants collection is digitized and available online.*

1.3.1. Develop a rigorous and competitive grant application to submit to the National Science Foundation Infrastructure Capacity for Biological Research program in support of digitizing the 4,700 macrofossils and 3,300 glass microscope slides of the Paleobotany Collection.

1.3.2. Design digitization workflows for macrofossils, slides, and associated documentation.

1.3.3. Recruit and train students to complete workflow tasks.



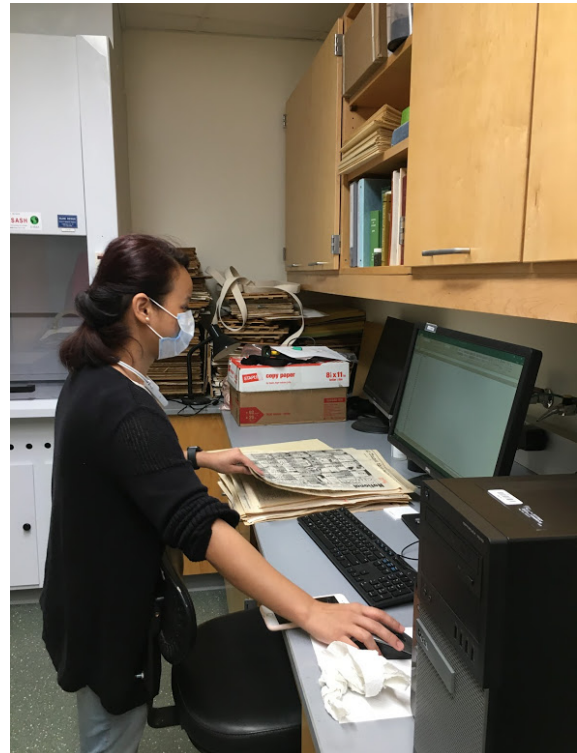
2. SCHOLARSHIP & DATA ACCESSIBILITY: The herbarium facilitates specimen-based botanical research at UCONN and beyond through access to the highest-quality physical and digital specimens.

2.1. GOAL: *All herbarium vascular plant records are available online.*

- 2.1.1. Digitize Hadwen Botanical Club (ca. 15,000) and Jesup Herbarium (ca. 7,000) specimens and remaining collections from Mehrhoff, Eames, and Torrey herbaria (ca. 1,000).
- 2.1.2. Update data snapshots on GBIF, iDigBio, and Consortium of Northeastern Herbaria websites.

2.2. GOAL: *The herbarium is an efficiently-run, user-friendly facility.*

- 2.2.1. Develop and implement an organized strategy for compiling a list of publications each year that have used CONN specimens, including those that result from data/images collected by aggregators.
- 2.2.2. Reallocate herbarium cabinet space to more efficiently use space and to prioritize growing collections (e.g., bryophytes).
- 2.2.3. Develop a printed reference guide to the herbarium that includes information on organization, folder colors, layout map, location of special collections (exsiccate, types), availability and use of equipment, and database instructions.
- 2.2.4. Assess the contents and condition of the Mycology Collection with respect to scientific value to assist in a decision-making process regarding the future of the specimens.



3. ACADEMIC EXCELLENCE: The herbarium serves students from across the UConn community by enhancing our existing foundation of engaging, experiential learning opportunities.

3.1. GOAL: *The herbarium maintains a suite of up-to-date, innovative educational activities suitable for high school and undergraduate students.*

- 3.1.1. Update and revise content for Introduction to Natural History Collections course, using developments in the field and student reviews as a guide.
- 3.1.2. Prioritize plant collecting targets to maximize data collection for existing climate change activity used in Introductory Biology courses and available to high school teachers online.
- 3.1.3. Develop herbarium-based modules for a planned BRC-wide tiered apprenticeship program in natural history collections management for undergraduates.
- 3.1.4. Create one 10–15-minute video per year covering herbarium-based topics appropriate for use in upper-level high school and undergraduate courses (both in person and remote).

3.2. GOAL: *Herbarium staff publicize EEB 5500 and attract students for available independent study, research, and work opportunities.*

- 3.2.1. Boost Independent Study and course marketing efforts within the department (EEB) and college (CLAS) as well as engaging students from a variety of majors and backgrounds .
- 3.2.2. Continue to participate in the annual Research Connections, organized by UConn’s First Year Programs & Learning Communities and the Office of Undergraduate Research
- 3.2.3. Invite student organizations to tour the herbarium, and publicize tours and plant walks at on-campus Cultural Centers
- 3.2.4. Maintain a webpage of current student opportunities. and publicize on social media and by posting QR codes in building.

4. OUTREACH: The herbarium participates in community-based activities to raise awareness of the flora of Connecticut and to share the scientific and cultural importance of plants.

4.1. GOAL: *The herbarium has a vibrant, diverse community of supporters.*

- 4.1.1. Rekindle the “Friends of the Torrey Herbarium” group.
- 4.1.2. Increase volunteer roster & recruiting.
- 4.1.3. Invite regional governmental and nonprofit stakeholders for a guided tour of the herbarium



4.2. GOAL: *The herbarium brings plant-based content to the UConn community and beyond.*

- 4.2.1. Collaborate with the arboretum committee on tree and botany walks.
- 4.2.2. Host a public open house at the beginning of each fall semester, etc.
- 4.2.3. Organize a booth at area Farmer’s Markets once or twice per season.

4.3. GOAL: *The herbarium has informative, entertaining materials to pass out at events.*

- 4.3.1. Design and print promotional brochures for admissions/alumni offices and to include in loan packages, give to visitors, distribute at events, etc.
- 4.3.2. Obtain student- and kid-appealing ecofriendly buttons, stickers, and coloring postcards.

7. ASSESSMENT AND EVALUATION

Assessing our progress and evaluating successes is a key part of maintaining momentum and achieving our goals. For each of the goals outlined in section 4, we have developed a model that includes expected outputs and outcomes, quantifiable metrics of success, and a list of milestones and benchmarks for each activity. We include the evaluation model for Goal 1.1 (p. 10) as an example below; for the full set of models, please see Appendix A.

1.1. **GOAL:** *The herbarium prioritizes the collection and accession of plants representing the flora of Connecticut and the northeastern United States.*

Activities	Output	Output Metrics, Benchmarks, Milestones	Outcome	Target Date
Focusing collecting resources on local regions that have been historically overlooked by botanists (portions of Middlesex and Windham Counties).	Herbarium specimens	Metric: # of specimens accessioned into herbarium Benchmark: 100 specimens per year Milestone: each 100 specimens newly collected and entered into database	Increased understanding of botanically overlooked environments	Ongoing
Collecting plants that are known to grow in Connecticut, but that are not yet represented in our herbarium.	Herbarium specimens	Metrics: # of specimens collected from list Benchmarks: 15 specimens per year Milestones: end of field season	Clear guidance from a "wish list" of collections	Ongoing
Eliminating existing specimen backlog to make space available for new collections.	Empty space within herbarium cabinets (by sending superfluous material to other herbaria)	Metrics: # of empty herbarium cabinets Benchmarks: Seven herbarium cabinets Milestones: each half-cabinet cleared and cleaned	Increased available space for new accessions and/or reorganizing existing specimens	2022

8. ACKNOWLEDGEMENTS

This strategic plan was initially drafted as part of coursework for Strategic Planning for Herbaria, a course provided by the Society of Herbarium Curators and iDigBio in Spring 2020. Instructors Austin Mast (FSU) and David Jennings (iDigBio) provided clear guidance, excellent resources, and abundant assistance. Course participants representing herbaria from around the world provided thoughtful comments and inspiration through their own work and group discussions. The University of Connecticut Biodiversity Research Collections staff and the members of the Strategic Planning Committee were generous with ideas, constructive criticism, time, and passion.