2024
ANNUAL REPORT

SCHOOL OF
NATURAL RESOURCES

In memory of
Professor David Buckley
1963 – 2025

CONTENTS

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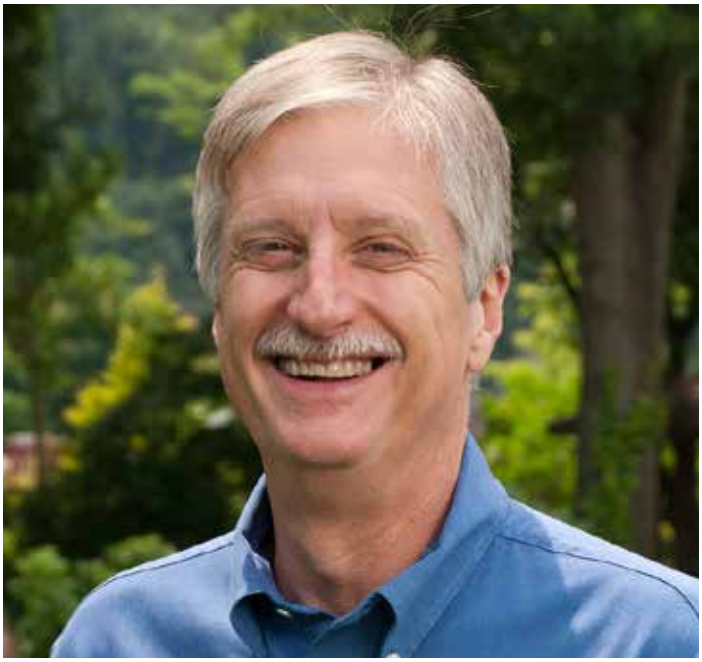
NATURAL RESOURCES
2024 ANNUAL REPORT

The School of Natural Resources is located in the Herbert College of Agriculture at the University of Tennessee Institute of Agriculture.

snr.tennessee.edu



Message from **School Director**

We continue seeing significant growth and success in the School of Natural Resources. We awarded 101 degrees including 81 undergraduate degrees and 20 graduate degrees in 2024. Faculty members received more than $7.2 million in external grants and contracts, and Extension specialists and agents reached more than 102,000 people through educational programs and events. Faculty and students also received multiple honors including numerous university and professional society awards.

We now offer courses for the newly named Outdoor Recreation and Park Management concentration. We also added new positions including a Lecturer for the new concentration, an Outdoor Recreation Extension Specialist, and a Fisheries Lab Manager.

The state of Tennessee's economy benefits greatly from the natural resource industry. In 2024, forestry and forest products generated more than $21 billion and provided 85,500 jobs. Outdoor recreation generated $13 billion and provided more than 109,000 jobs in Tennessee. Hunting provided an economic impact of almost $3 billion. Fishing produced $1.2 billion and supports almost 8,000 jobs.

Tennesseans also use natural resources for recreation, mental and physical health, socializing, and other benefits. Our School's teaching programs, research, and Extension play a vital role in making our state and world a better place to live.

I look forward to sharing our current and future accomplishments. Thank you for your support.

Don Hodges
School of Natural Resources Director

SNR By The Numbers

PEOPLE

313
Undergraduates enrolled

28
Graduate students enrolled

101
Degrees awarded in 2024

36
Faculty

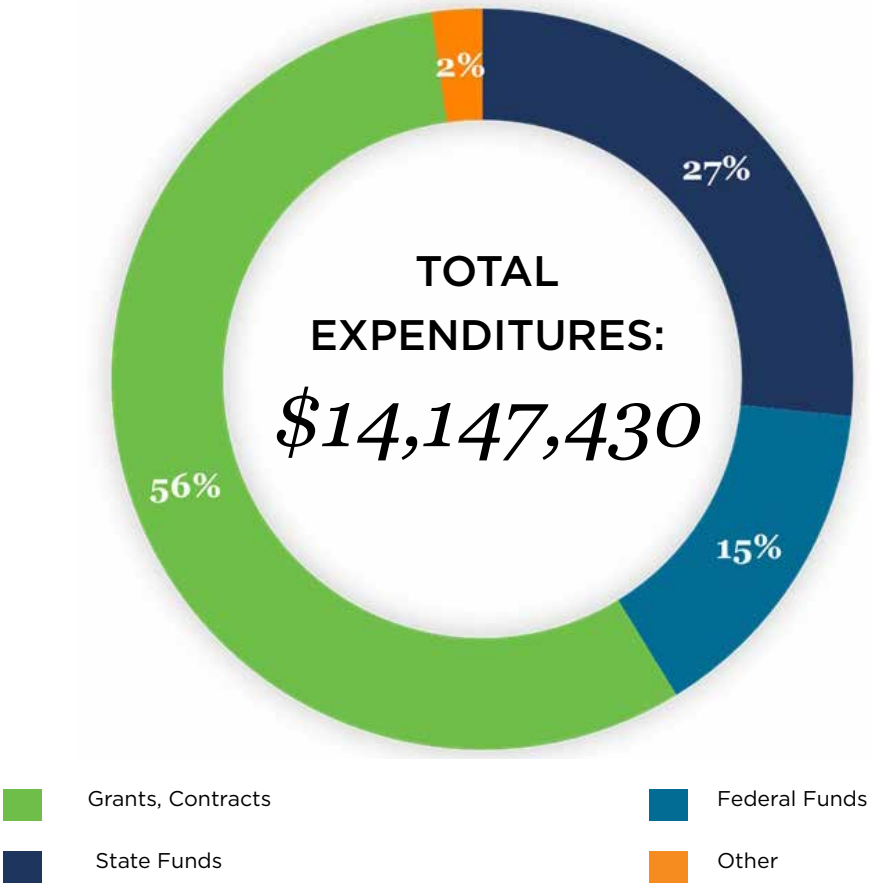
RESEARCH PROJECTS

74
Active Projects

99
Refereed publications

$7.2 million
SNR Grants Awarded in 2024

SCHOOL OF NATURAL RESOURCES



CENTER FOR RENEWABLE CARBON

Find a breakdown of School Research & Extension expenditures in the Grant Awards section.

Extension Summary

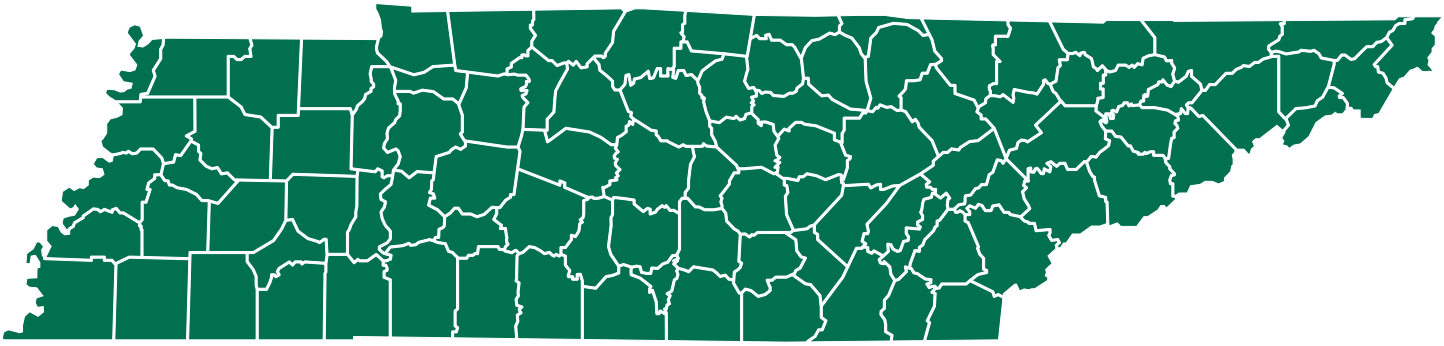
102,794
contacts reached

14,679
activities

2,967
hours

Includes:

- Public meetings
- Zooms & Facebook Lives
- Trainings
- Educational Videos
- On-site visits
- Phone calls and emails



SAMPLE OF 2024 EXTENSION PROGRAMS

Hurricane Helene Flood Response

Pond Management

Fish Sampling

Hunter's Harvest Class

Dove Hunting Trip

Classifying Hardwoods for Harvest Purposes

Prescribed Fire for Wildlife

Quality Deer Management

Wild Turkey Ecology and Management

UT Firewood Bank

Wildlife Health in Tennessee

EXTENSION FACULTY AND AGENTS

Ronnie Cowan

Chris Graves

Dan Grove

Craig Harper

Sharon Jean-Philippe

Pat Keyser

David Mercker

Stephen Peairs

Ryan Sharp

Adam Taylor

REGIONAL FISHERIES EXTENSION AGENTS

Mannie Bedwell
Hamblen County

Joshua Daugherty
Morgan County

Justin Hargrove
Benton County

Wayne Key
Putnam County

Creig Kimbro
Grundy County

Jeff Via
Fayette County

SNR moves into new Agriculture and Natural Resources Building

The School of Natural Resources moved to the fourth floor of the new Agriculture and Natural Resources Building in May 2024.

The building replaced the old Ellington Building at 2431 Joe Johnson Drive at the intersection of E. J. Chapman Drive. The construction was years in the making, and many faculty moved into the new facility.

The fourth floor also boasts classrooms and labs for wildlife health and wood products. The ground floor includes labs for fisheries and wildlife necropsy.

Ashlyn Smith (Wildlife and Fisheries Science '24) works in the Amphibian Disease Lab.

The School of Natural Resources suite sits across from the fourth floor elevators.

FORESTRY AND FOREST PRODUCTS

UNDERGRADUATE MAJOR CONCENTRATIONS

- Forest Resources Management
- Outdoor Recreation and Park Management
- Restoration and Conservation Science
- Urban Forestry

GRADUATE AREAS OF STUDY

- Ecosystem function and structure
- Natural resources economics and policy
- Human dimensions of natural resource management
- Wood Sciences
- Multidisciplinary natural resource management

FACULTY

Perceval Assogba
Assistant Professor

David S. Buckley
Professor

Jennifer Anne Franklin
Professor

Tyler Gifford
Assistant Professor

David Harper
Professor

Don Hodges
School Director and Professor

Allan E. Houston
Research Professor

Matt Hudson
Lecturer

Sharon Jean-Philippe
Professor

Niki Labbé
Professor and Center for Renewable Carbon Director

Mi Li
Assistant Professor

David C. Mercker
Extension Specialist

Stephen Peairs
Assistant Professor

Neelam Poudyal
Professor

Scott Schlarbaum
Professor and UT Tree Improvement Program Director

Ryan L. Sharp
Associate Professor

Adam Taylor
Professor

Lu Wang
Assistant Professor

Siqun Wang
Professor

SNR hosts International Oak Symposium

Extension specialist David Mercker leads a tour for the International Oak Symposium.

More than 200 people traveled to Knoxville from across the U.S. and 11 countries for the International Oak Symposium from October 7–10, 2024. The University of Tennessee School of Natural Resources and the U.S. Department of Agriculture Forest Service co-hosted the event at the Knoxville Hilton. The symposium agenda focused on current issues and research on the management and ecology of oak species and forests—from pervasive insect pests to uses as whiskey barrels and other industrial applications.

"Oaks are one of the key species for a wide variety of forest products, wildlife habitat and other ecosystem services in Tennessee and around the world," School Director Don Hodges said. "We hope this symposium encourages collaboration between managers and researchers to restore and sustain these vital oak ecosystems."

The symposium featured three days of invited speakers, discussion panels, socials, and presentations from an open submission process. Participants also selected between the Great Smoky Mountains National Park, Catoosa Wildlife Management Area near Crossville or the UT Forest Resources AgResearch and Education Center in Oak Ridge for a field tour day.

Student and career development were a primary goal of the event. The symposium offered a 'speed networking' event and social mixer for students and early career professionals as well as a mentor program for 24 attendees. Continuing Education Credits were provided for members of the Society of American Foresters, The Wildlife Society, and the International Society of Arboriculture.

The symposium also featured local artists. Former Knoxville Poet Laureate and long-time local singer-songwriter R.B. Morris provided poetry and music during the opening session. Other local acts included Jeff Barbra and Sarah Pirkle and UT alum Jay Clark. The Bearded, a traditional bluegrass band, also performed at an evening reception and social.

Students register for Outdoor Recreation and Park Management courses

Students hoping to work for national or state parks can now take courses under the new University of Tennessee Outdoor Recreation and Park Management concentration. Courses in this new undergraduate forestry major concentration rolled out in fall 2024.

The curriculum includes recreation ecology, visitor use management, natural and cultural interpretation, and outdoor leadership courses. The university takes advantage of nearby natural areas such as the Great Smoky Mountains National Park, Big South Fork National River and Recreation Area, Cherokee National Forest, state parks, and outdoor recreation spaces within the city of Knoxville.

"Given the proximity to so many recreation resources such as the Great Smoky Mountains, strong connections to outdoor recreation agencies and private companies, and our new recreation faculty, we are well equipped to provide a strong education that incorporates the foundations of recreation in the classroom coupled with outstanding practical field experience," School Director Don Hodges said about the new concentration.

Faculty members say it prepares students for careers in natural resource management agencies, non-profit organizations, and small business operations. It also provides entrepreneurial training allowing students to be part of the growing outdoor recreation economy, which accounts for $1.1 trillion in economic output.

"These numbers point to the immense popularity of recreating in the outdoors, which comes with a certain responsibility. The Outdoor Recreation and Park Management concentration will prepare students to be leaders in protecting our natural and cultural heritage and ensuring high quality opportunities for future generations of outdoor enthusiasts," Ryan Sharp, ORPM associate professor, said.

You can learn about the new concentration and its courses on the School of Natural Resources website and the academic catalog.

Lecturer Matt Hudson teaches about rappelling for an ORPM course.

National Champion Tree Program finds new home on Rocky Top

Abies magnifica California Red Fir National Champion in Yosemite National Park. Photo by Brian Kelley, Gathering Growth Foundation, with permission from American Forests

The National Champion Tree Program started 83 years ago at American Forests to discover the largest, living trees in the United States. The program moved from the organization's headquarters to a new home in the School of Natural Resources at the University of Tennessee Institute of Agriculture.

American Forests launched the Champion Tree Program in 1940. Its vision included establishing a nationwide laboratory for the study of forestry and trees. Being housed at Tennessee's 1862 public land-grant university will advance the program's understanding of big trees. "The National Champion Tree Program moving to UTIA means it can continue protecting some of the largest living organisms in the U.S. while expanding the science of these trees through research," Keith Carver, senior vice chancellor and senior vice president of the UT Institute of Agriculture said.

"We could not be happier that the University of Tennessee's School of Natural Resources will honor the rich legacy of the National Champion Tree Program and introduce innovative new ideas, energy and science," said Jad Daley, president and CEO of American Forests. "We also honor the thousands of tree seekers, coordinators and others nationwide who have passionately supported this program and will help it embark on a new era embedded in one of America's leading research institutions." American Forests is providing $200,000 through April 2025 to support the program's transition to the School.

Former Tennessee Champion Tree Program Director and UT graduate Jaq Payne leads the national program as the newly appointed director. He believes UTIA is uniquely positioned to be a hub for Champion Tree research. "Through the university's exceptional research capabilities, we'll learn more about these gentle giants, how best to preserve their majesty for future generations and how to help our newly planted trees become future champions," Payne said.

National Champion Tree Director Jaq Payne. Photo by Taryn Ferro of Aw, Snap Photography

The School also directs the state Champion Tree Program. Payne took it over in 2021. The Tennessee Department of Agriculture Division of Forestry managed the program until 2016, when it was transferred to the School. "I could not be prouder of where the amazing individuals in the School of Natural Resources at UTIA have taken the state Champion Tree Program, "Tennessee State Forester Heather Slayton said. "Countless young professionals have learned valuable skills to improve their careers while putting Tennessee on the map for our majestic trees and well-run program. That the school now has the honor of managing the National Champion Tree Program continues Tennessee's legacy of protecting, conserving, and enhancing our state's forests."

Urban Forestry Professor Sharon Jean-Philippe advises the Tennessee Champion Tree Program and helped with moving the national program to UT. She said it is an honor for the School to host both programs and to have Payne be the national director. Jean-Philippe added, "Developing opportunities for students to apply what they have learned in the classroom to real-life situations is an important part of the high-impact educational practices we provide through academic internships."

The national program started publishing a list of Champion Trees in 1945. The tradition of finding and monitoring these large organisms will continue. "We're excited to advance the legacy of the Champion Tree Program and administer this important and historical program for the entire country," School Director Don Hodges said.

The program identifies Champion Trees based on a point system. The trunk circumference, height and average crown spread make up the total points for a Champion Tree. The current register was published in late 2024. The first round of public nominations for new Champion Trees opened in the spring of 2025. You can find a full breakdown of the timeline on the program's website: nationalchampiontree.org.

Frémont's Cottonwood National Champion in Arizona. Photo by Brian Kelley, Gathering Growth Foundation, with permission from American Forests.

Data Science Institute holds inaugural fall conference

Data Science Institute members attend its inaugural fall conference.

The new Data Science Institute in the UTIA School of Natural Resources held its inaugural fall conference from Sept. 12-13, 2024 in Knoxville. More than 25 people from member companies and potential member organizations attended.

The conference featured keynote speakers from UT, Minitab, JMP, and R Software along with workshops on software applications.

The Data Science Institute was established in the School in January 2024. It has five member companies: Egger Wood Products, Hexion Chemical, Huber Engineered Woods, Louisiana-Pacific Corp., and Roseburg Forest Products.

The Institute aims to promote and advance the education and research of data science, machine learning, and AI for companies engaged in forest management, cellulosic fiber utilization for forest products manufacturing, and biomaterials processing. It operates as an expansion of a company's innovation group by providing access to the most current technologies in the evolving fields of data science, machine learning, and AI.

Member benefits include weekly webinars, direct support by email, discounts on ongoing in-person training programs, and the annual fall conference.

SNR team receives grant to remove 'forever' chemicals' from water

Mi Li, assistant professor in the CRC and SNR, received a $75,000 research grant from the EPA for a two-year project using a cellulose-functionalized adsorbent to remove per- and polyfluoroalkyl substances (PFAS) from water. Li has built a student team to work on this project including Kailong Zhang, a Ph.D. student in the School of Natural Resources, and Ryan Baskette, an undergraduate student in the Department of Biochemistry and Cellular and Molecular Biology.

The grant comes from the EPA's People, Prosperity, and the Planet Program, which provided almost $1.2 million to 16 college student teams across the U.S. to develop solutions for environmental and public health challenges. The team plans to create a cellulose-metal organic frameworks (Cello-MOFs) hybrid adsorbent to remove PFAS from water. PFAS are synthetic chemicals that resist heat, oil, stains, grease, and water. "They're forever chemicals. They're applied almost everywhere from firefighting foams to nonstick cooking utensils to textiles and cosmetics. After leaching, they accumulate in the soil, water, and environment, and they've been there for a long time, harming the environment, wildlife, and humans," Li said.

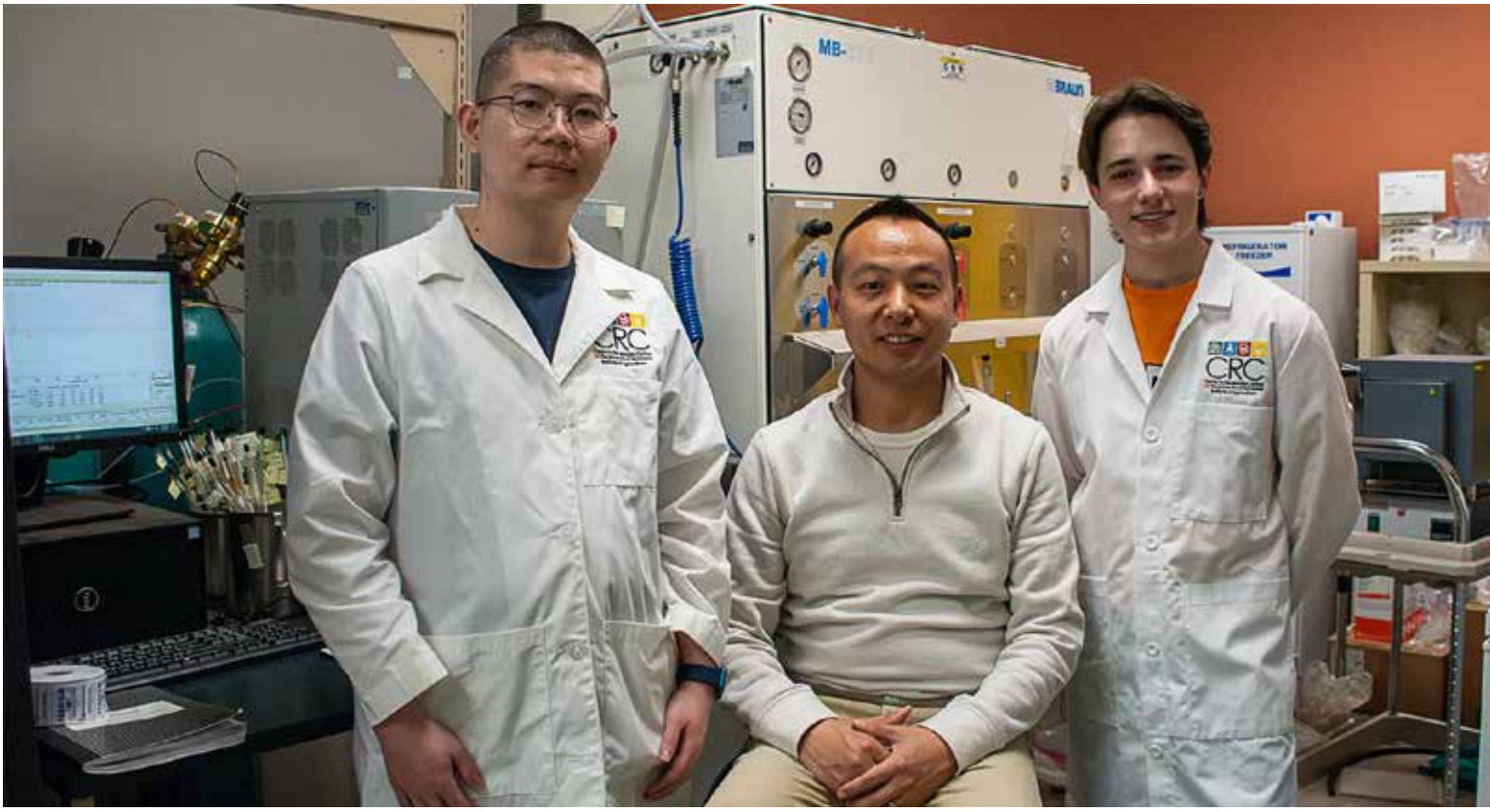
The team will demonstrate how their judiciously designed adsorbent cleans water contaminated with PFAS at the EPA's National Student Design Expo in 2025. Li said the showing could lead to additional funding for the project or its commercialization. The team also plans to put the project's results in a technical manuscript for a peer-reviewed journal.

"I am thrilled to be a part of the U.S. EPA P3 project as a graduate student team member. This project offers more than just an opportunity for my academic research exploration. It is a valuable hands-on learning experience crucial for my future academic pursuits," Zhang said.

"As an undergraduate, the lab skills and research experience I have gained as part of this team will be invaluable to my future endeavors. Working on sustainable solutions to environmental and health issues, like PFAS pollution, has been fulfilling and impactful," Baskette said.

The project will continue through December 2025.

Assistant professor Mi Li with PhD student Kailong Zhang (left), and undergraduate student Ryan Baskette (right).



UT Firewood Bank delivers warmth for winter

UT Firewood Bank volunteers prepped and delivered wood to people in Anderson County.

The UT Firewood Bank works to keep people warm and safe during the cold months by giving away free firewood in 2024.

“We forget that firewood was the way that most of human history and much of current human society heats itself and cooks its food,” Adam Taylor, firewood bank organizer and Extension forestry specialist, said.

Taylor teamed up with Anderson County Community Action, taking recipients from their food bank system and offering them free firewood.

“For people who heat with wood, they need that, and it is expensive, potentially, or physically challenging to get yourself. So, some people need a little assistance with that just like they need some assistance getting some food,” Taylor said.

The firewood bank got its start several months ago. Some wood is donated, but it’s also coming from UT AgResearch land and its Oak Ridge Arboretum. Taylor and his son spent time cutting wood and stockpiling it for future deliveries in the summer. Taylor says the bank clients are getting high quality firewood.

“This part of the country has an excellent firewood resource naturally. Just the species that grow here are relatively dense, and once you dry them – like all firewood needs to be dry – once it’s dry, provides a good, dense source of heat,” Taylor said.

Another goal is to learn what it takes to create and maintain a firewood bank and use that information to serve more people in other counties.

This effort is supported by “The Alliance for Green Heat,” an organization partnering with the USDA Forest Service to promote firewood banks. A number of volunteers, including students at the UT Herbert College of Agriculture, are delivering the firewood.

UT Tree Improvement Program lifts white oak seedlings

The program lifted two-year-old white oak seedlings from the East Tennessee Nursery for a U.S. Forest Service research project in Virginia in February 2024. Program Director and septuagenarian Professor Scott Schlarbaum led the operation with research associates and specialists and the crew of USDA Forest Service Research Forester Stacy Clark.

The seedlings came from the program's seed orchard on Jack Daniel Distillery's property in Lynchburg. Clark planned to take some of the white oak seedlings to Virginia to see how the two-year-old seedlings perform compared to one-year-old seedlings from the same tree family. It's a cooperative study with the Tree Improvement Program, the Virginia Division of Forestry, and Virginia Tech.

"This will be a very practical look at what managers should be planting in terms of age of the seedlings and size of the seedlings," Clark said. She added the recommendations are important because of the decline of white oak across the eastern U.S.

The seedlings not going to that study will be measured by the Tree Improvement Program. Other spare seedlings went to the U.S. Forest Service or the Tennessee Wildlife Resources Agency.

Schlarbaum said the seedlings were planted as part of an experiment with the East Tennessee Nursery. Reforestation Unit Leader Gina Sowders says the nursery has partnered with the Tree Improvement Program for years.

Schlarbaum said this is the last seedling lift for his career. He added, "I'm not going to grow any more seedlings. This is the last lift that I'm going to do because it interferes with our grafting. I'm trying to start new and complete orchards that we've already started, so when I do retire, whoever comes in after me doesn't have to do the rest of my stuff."

Schlarbaum said he doesn't plan on retiring for a few more years.

From left: USDA Research Forester Stacy Clark, UT TIP Research Specialist John Johnson, and UT TIP Director Scott Schlarbaum discuss lifting white oak seedlings at the East Tennessee Nursery.

WILDLIFE AND FISHERIES

UNDERGRADUATE MAJOR CONCENTRATIONS

- Fisheries management
- Wildlife management
- Wildlife Health

GRADUATE AREAS OF STUDY

- Wildlife and fisheries biology
- Ecosystem function and structure
- Natural resource economics and policy
- Human dimensions of natural resource management
- Multidisciplinary natural resource management

FACULTY

David Buehler
Professor

Shigetoshi Eda
Professor

Augustin Engman
Assistant Professor

Chris Graves
Extension Specialist

Matt Gray
Professor

Dan Grove
Extension Assistant Professor

Craig A. Harper
Professor and Extension Wildlife Specialist

Lisa Izzo
Assistant Professor

Pat Keyser
Professor and Center for Native Grasslands Director

Charles Kwit
Associate Professor

Deb Miller
Professor and Center for Wildlife Health Director

Alejandro Molina-Moctezuma
Assistant Professor of Teaching

Lisa Muller
Professor and Assistant Director

Lindsey Phillips
Lecturer

Mark Q. Wilber
Assistant Professor

Adam Willcox
Research Associate Professor

Emma Willcox
Professor

SNR faculty collaborate with TWRA, others on elk reproduction study

The UT School of Natural Resources worked with the Tennessee Wildlife Resources Agency, the Rocky Mountain Elk Foundation (RMEF), and the Kentucky Department of Fish and Wildlife Resources to capture elk with a helicopter crew in February 2024 for a collaborative study looking at elk reproduction rates and the survival of their calves into adulthood in East Tennessee.

"Historically, the reproductive rate has been low, but this year was incredible because all the cows we captured were pregnant," said Professor Lisa Muller, who helped lead the study with Assistant Professor and Extension Wildlife Health Specialist Dan Grove.

The captures took place in the North Cumberland Wildlife Management Area. Similar to a deer monitoring study conducted in West Tennessee, the helicopter crew caught the elk with a net gun and then put hobbles and eye coverings on them before carrying the elk to ground crews.

Once back on the ground, researchers injected the elk with a sedative and monitored their heart rate, respiratory rate and temperature. They then collected samples and tagged and collared the elk. Ultrasound was used on all elk to assess for pregnancy, and vaginal implant transmitters (VITs) were placed in pregnant cows. They captured 15 pregnant females and placed 10 collars and VITs. The VITs come out once the elk gives birth, and it communicates with the collar on the cow, signaling a possible birth event with the GPS location via a text message. They're also using the collars to collect movement and habitat use data.

Assistant Professor Dan Grove added, "We are doing basic disease surveillance in conjunction with the study to contribute to the long-term disease screening of this population." Parasitology Associate Professor Rick Gerhold's group with the UT College of Veterinary Medicine (UTCVM) performed the disease screening with funding from TWRA.

A helicopter crew lowers an elk to the ground for researchers to collect samples and tag and collar the elk.

UT faculty, staff and students assisted with taking samples, tagging and collaring, and assessing the elk.

"TWRA has been dedicated to working with partners to restore the elk population that once roamed in Tennessee, and today we have more than 400 in the herd," said TWRA Director of Communications Emily Buck. "In addition to the benefits of restoring biodiversity to the landscape, the elk herd also provides exciting wildlife viewing opportunities for Tennesseans and visitors who come to hear elk bugle in the fall or visit the Hatfield Knob Elk Viewing Tower for a chance to see elk at North Cumberland Wildlife Management Area."

RMEF paid for the helicopter crews and provided volunteers. RMEF Certified Biologist Will Bowling said, "This research will help fill any gaps in our knowledge about the Volunteer State's elk herd. Information from this study will help wildlife managers refine strategies to sustain this elk herd into the future while also providing a better understanding of elk population dynamics across the broader Appalachian region."

UTCVM Clinical Assistant Professor Julie Sheldon's group joined the study along with several other UT SNR wildlife and fisheries students. Grove called the study a "great learning opportunity and life experience for all involved."

UT students take part in first-ever dove hunt

The UT Wildlife and Fisheries Society and Delta Waterfowl held a dove hunt for 16 students to learn about gun safety and hunting techniques. Photo Courtesy: R. Cowan

Sixteen students with no prior hunting experience got the opportunity to participate in their first dove hunt in a safe and educational environment on September 8, 2024. The Wildlife and Fisheries Society student chapter worked with Delta Waterfowl to hold the dove hunt. Students received hands-on instruction on gun safety and hunting techniques under the guidance of Wildlife and Fisheries Advisor Lindsey Phillips and Outdoor Recreation Extension Specialist Ronnie Cowan.

To ensure they were well-prepared, participants engaged in trap shooting the day before the hunt to hone their skills. The event culminated in a successful hunt and a shared meal featuring grilled dove "poppers." The students described the experience as unforgettable and eagerly anticipate future hunting opportunities.

This event highlighted the importance of hunting as a recreational activity and a critical component of wildlife conservation. Hunting plays a significant role in funding conservation efforts as hunters contribute license fees and excise taxes that support wildlife management and habitat restoration. Hunting also fosters a connection to nature, provides an ethical, sustainable source of food, preserves cultural traditions, and instills a sense of stewardship for our natural resources.

Organizers say they are proud to have been a part of this meaningful experience and look forward to offering other opportunities that promote outdoor recreation, conservation, and the responsible management of wildlife.

Two SNR faculty organize global disease conference

Drs. Matt Gray and Deb Miller combined forces with Ghent University in Belgium to co-host the second Global Amphibian and Reptile Disease (GARD) Conference in Kuching, Malaysia in August 2024.

The conference brought together more than 120 scientists and students from over 25 countries to discuss emerging infectious diseases in reptiles and amphibians. Travel for 25 students and early career professionals was made possible from funding provided by UT AgResearch and five other organizations.

Recordings of presentations can be viewed on the GARD conference website.

Gray and Miller have been conducting herpetofaunal disease research as a team for more than 20 years and are currently supported by two National Science Foundation Ecology and Evolution of Infectious Diseases grants.

Scientists and students from around the world attended the conference. Photo courtesy: Matt Gray

Helping introduce students to hunting at Feather to Fork

Extension Specialist Ronnie Cowan instructing students.

Several UT representatives attended Feather to Fork.

Outdoor Recreation Extension specialist Ronnie Cowan and lecturer Matt Hudson represented the UT School of Natural Resources at the Feather to Fork event held by The Sawbriar at Big South Fork in Fentress County.

The October event pairs hunters, like former UT athletic director and football coach Phillip Fulmer, with Alvin C. York Institute students for morning and afternoon hunts to raise money for the school's farm. The event also brings together partners to provide information on careers in agriculture.

"They were great and have officially harvested more pheasants and quail than I have at the age of 38," Cowan said about the students. He added he looks forward to partnering with them to build the next generation of conservationists.

Cowan (left) with former UT Athletic Director and Football Coach Phillip Fulmer.

Researchers study disease transmission among white-tailed deer

White-tailed deer are one of Tennessee's most populous native species. SNR, in partnership with TWRA, began its second year of a study on disease transmission among local deer in 2024.

After using helicopters to capture deer at the Ames AgResearch and Education Center, researchers conducted SARS-CoV-2 tests and collected DNA samples. Teams also installed tracking collars that provide updates of an animal's location every 30 minutes. While bucks had their collars installed in the field and were immediately returned to the wild, does were airlifted to camp.

"We conduct pregnancy tests on does, installing both GPS collars and internal implant transmitters if they are confirmed to be expecting," says Lisa Muller, one of the project's leads and a professor. "The implant transmits a signal when the animal gives birth, allowing us to locate and put collars on their young. The data we collect will help us understand how diseases impact our next generations of wildlife."

SARS-CoV-2 is a highly transmittable virus that has recently been identified in white-tailed deer. Although the virus currently causes few symptoms in animals, researchers are concerned deer might act as a reservoir.

"A reservoir is a population of animals that has a disease cycling within them that may or may not be harmful to the host," says Dan Grove, Extension assistant professor and wildlife veterinarian with TWRA. "SARS-CoV-2 might be mutating and evolving which could then jump back to humans. We could potentially experience a totally new variant that is either better or worse than the original."

"By combining the work we are doing here in Tennessee with similar studies happening across the country, we can robustly identify the ability of SARS-CoV-2 to persist in white-tailed deer and mitigate the risk of spillback into the human population," says Mark Wilber, assistant professor.

Unlike SARS-CoV-2, chronic wasting disease has reduced deer populations in many areas of Tennessee. The disease has a 100% mortality rate and kills an infected animal within 12 to 18 months. Chronic wasting disease can remain on surfaces for years, potentially causing multiple outbreaks over long periods of time.

Researchers monitor a deer during the disease transmission study.

"Deer serve an important role both economically and ecologically," says Justin Kosiewska, graduate research assistant in the School of Natural Resources. "Understanding the impact of disease is vital to the conservation of deer populations and everything that relies on them."

Using the collected data, researchers will develop management strategies for chronic wasting disease and improve our understanding of whether SARS-CoV-2 poses a health risk to local communities. The project is made possible thanks to partners including TWRA, USDA and the Animal and Plant Health Inspection Service.

Publications

Alphabetical order by author

Adam, H. C., K. Markham, M. Madden, **M. J. Gray**, F. Bolaños Vives, and S. M. Hernandez. 2024. Geographic risk assessment of Batrachochytrium salamandrivorans invasion in Costa Rica as a means of informing emergence management and mitigation. PLOS ONE, e0293779.

Adhikari, R. K., and **N. C. Poudyal**. 2024. An analysis of sportsperson's intention to access wildlife management areas in Tennessee. Human Dimensions of Wildlife.

Ahmed, M. S., B. J. Hanley, C. I. Mitchell, R.C. Abbot, N. A. Hollingshead, J. G. Booth, J. Guiness, J. C. Jenelle, F. H. Hodell, C. Gonzalez-Crespo, C. R. Middaugh, J. R. Ballard, B. Clemmons, **D. M. Grove**, and K. L. Schuler. 2024. Predicting chronic wasting disease in white-tailed deer at the county scale using machine learning. Scientific Reports.

Asare-Bediako, B. B., **M. Li**, A. Houston, P. Vilmercati, N. Mannella, **N. Labbé**, and N. Abdoulmoumine. 2024. Boosting Dimethyl Carbonate Production from CO2 and Methanol using Ceria-Ionic Liquid Catalyst. ChemSusChem, 17(12).

Assogba, N. P. 2024. COVID-19-related Export Restrictions and Rice Market in Benin Republic. Journal of Food Security.

Bhattarai, S., R. K. Grala, **N. C. Poudyal**, S. M. Tanger, and R. K. Adhikari. 2024. Where we stand on chronic wasting disease: A systematic literature review of its prevalence patterns, impacts, and management interventions. Heliyon, 10(11):e31951.

Bisangwa, E., J. Richwine, **P. D. Keyser**, F. R. Walker, and A. Ashworth. 2024. Native Warm-Season Grass Forage Response to Nitrogen Fertilization. Agronomy.

Boyer, C., **K. Cavasos**, J. A. Greig, and **S. M. Schexnayder**. 2024. Influence of Risk and Trust on Beef Producers' Adoption of Precision Livestock Farming. Computers and Electronics in Agriculture.

Brischke, C., H. Stolze, T. Koddenberg, V. Vek, C. M. C. Caesar, B. Steffen, **A. M. Taylor**, and M. Humar. 2024. Origin-specific differences in the durability of black locust (*Robinia pseudoacacia*) wood against wood-destroying basidiomycetes. Wood Science and Technology, Volume 58, pages 1427–1449.

Buck, E. J., and **D. A. Buehler**. 2024. Monitoring American woodcock abundance in Tennessee using automated recording units. Wildlife Society Bulletin.

Buehler, D. A., and **C. A. Harper**. 2024. Tennessee Cooperative Wild Turkey Project: Summary of key results and recommendations. University of Tennessee Institute of Agriculture Extension Publication, W 1250. tiny.utk.edu/W1250.

Butler, R.A., **L. I. Muller**, **D. M. Grove**, and R. T. Trout Fryxell. 2024. Ecological relationships of Haemaphysalis longicornis Neumann with other tick species on wildlife hosts at cow–calf farms implementing integrated pest management in eastern Tennessee. Parasitology, 151(9): 1001-1011.

Cable, A. B., and **E. V. Willcox**. 2024. Summer habitat for the female tricolored bat in Tennessee, USA. Journal of Mammalogy.

Cable, A. B., Kinsella, M., R. W. Gerhold, Hammrick, E., Holliday, C., Ogle, C., Stinson, R., Thames, D., and **E. V. Willcox**. 2024. Prevalence and severity of alopecia lesions on gray bats, Myotis grisescens, peaks during lactation. PLOS ONE.

Cao, Q. C., J. Wu, H. Qi, and **S. Eda**. 2024. Blockchain-based Runtime Attestation against Physical Fault Injection Attacks on Edge Devices. Proceedings of the Eighth ACM/IEEE Symposium on Edge Computing.

Carter, E. D., J. DeMarchi, **M. Q. Wilber**, **D. L. Miller**, and **M. J. Gray**. 2024. Batrachochytrium salamandrivorans is necronotic: Carcasses may play a role in Bsal transmission. Frontiers in Amphibian and Reptile Science.

Cavasos, K., and **N. C. Poudyal**. 2024. Local residents' willingness to allow deer herd reduction and other CWD operations on their property. Human Dimensions of Wildlife, 1-5.

Chen, C., **L. Wang**, S. Shams Es-haghi, M. Tajvidi, J. Wang, and D. J. Gardner. 2024. Biodegradable and recyclable bio-based laminated films of poly (lactic acid) and cellulose nanocrystals for food barrier packaging. Food Packaging and Shelf Life, 42:101244.

Chen, L.-D., E. D. Carter, A. J. Kouba, **M. J. Gray**, **D. L. Miller**, and C.K. Kouba. 2024. Near-infrared spectroscopy (NIRS) as a diagnostic screening tool for lethal chytrid fungus (*Batrachochytrium salamandrivorans*) in eastern newts (*Notophthalmus viridescens*). Nature Communications.

Chowdhury, M. M., **M. J. Gray**, E. D. Carter, D. C. Woodhams, J. McCartney, J. Surles, M. Nelms, H. Gan, and A. Peace. 2024. Fungal Pathogen Transmission Dynamics in North American Salamanders: Mathematical Insights for Disease Management. Ecological Modeling. (in press)

Christoph, E., L. Yu, S. D. Newby, M. Rivera Orsini, J. Scroggins, D. J. Keffer, **D. P. Harper**, and M. Dhar. 2024. Novel Kraft Softwood Lignin-Derived Carbon Quantum Dots: Synthesis, Characterization, and In Vitro Cytocompatibility. Nanomaterials, 14(12):1029.

Clark, S. L., T. Keyser, **S. E. Schlarbaum**, and A. M. Saxton. 2024. Planted white oak (*Quercus alba*) response to spacing density and orientation in gap openings in the Blue Ridge Mountains of North Carolina. PROCEEDINGS OF THE 22ND BIENNIAL SOUTHERN SILVICULTURAL RESEARCH CONFERENCE.

Clatterbuck, W. K., and **S. E. Peairs**. 2024. Oak Regeneration Practices. UT Extension, University of Tennessee Extension publication PB1921.

Copenhaver, K., B. Bista, **L. Wang**, S. Bhagia, M. Lamm, X. Zhao, M. Tajvidi, W. M. Gramlich, A. M. Hubbard, C. Clarkson, and D. J. Gardner. 2024.

Improving the Recyclability of Polymer Composites With Cellulose Nanofibrils. J Polym Environ, 32(10):5360-5374.

Da Silva Neto, J. G., R. H. Hardman, **A. Engman**, G. R. Dinkins, T. W. Lane, M. M. Fry, C. R. Rines, A. L. Bisenieks, S. Rajeev, and M. M. Dennis. 2024. Multisystemic inflammatory disease in Pheasantshell (*Unionidae, Actinonaias pectorosa*) associated with Yokenella regensburgei infection at sites experiencing seasonal mass mortality events. PLOS ONE, 19(8):e0301250.

Dixit, S., **N. C. Poudyal**, T. Silwal, O. Joshi, A. Bhandari, G. Pant, and D. G. Hodges. 2024. Perceived benefits, burdens and effectiveness of a buffer zone programme in improving protected area–people relationships. Environmental Conservation, 51(2):141-151.

Dixit, S., **N. C. Poudyal**, T. Silwal, O. Joshi, A. R. Bhandari, G. Pant, and D. G. Hodges. 2024. Effectiveness of protected area revenue-sharing program: Lessons from the key informants of Nepal's buffer zone program. Journal of Environmental Management, 367:121980.

Frakes, A., O. Joshi, and **N.C. Poudyal**. 2024. Factors that determine visitor satisfaction to a lake: A case study from Oklahoma, USA. Journal of Environmental Planning and Management, 67(3): 504-521.

Godwin, J. A., H. Yi, **K. Seabright**, **D. P. Harper**, and S. C. Chmely. 2024. Optimization of Cosolvent Enhanced Lignocellulosic Fractionation for Isolating Switchgrass Lignin with Distinct Structural Features Using Response Surface Methodology. ACS Sustainable Resour. Manage., 1(10):2266-2275.

Gomez-Maldonado, D., B. R. Dickson, G. Au, M. J. Bortner, **M. Li**, E. Espinosa, A. Rodriguez, B. Higgins, and M. S. Peresin. 2024. Exploring the effects of cellulose sources on silver reduction and the bacterial removal of nanocellulose-based hydrogel beads. Carbohydrate Polymers, 347:122771.

Gorrell, J., **S. R. Jean-Philippe**, P. Ries, J. K. Richards, **N. C. Poudyal**, and R. Bulter. 2024. Geospatial Analysis of Urban Heat Island Effects and Tree Equity. Open Journal of Forestry, 14, 1-18.

Graves, C. A., and **D. C. Mercker**. 2024. Planting Procedures for Bare-Root Tree Seedlings in Landscape Settings. University of Tennessee Extension. W 1038..

Graves, C. A., **C. A. Harper**, **D. C. Mercker**, and **A. M. Taylor**. 2024. Tennessee 4-H Forestry Judging Manual. UT Extension, PB 1922.

Graves, C. A. and **C. A. Harper.** 2024. Tips for Reducing Human-Wildlife Conflicts Around the Home in Residential Areas. UT Extension, SP 1035.

Graves, C. A. 2024. Controlling Woody Vegetation Using Hack-and-Squirt, Girdle and Spray, & Cut Stump Treatments: Part 1. YouTube. https://www.youtube.com/watch?v=vv-J89P0RtA.

Graves, C. A. 2024. Controlling Woody Vegetation Using Hack-and-Squirt, Girdle and Spray, & Cut Stump Treatments: Part 2. YouTube. https://www.youtube.com/watch?v=xWaGBOdofBc

Greenberg, C. H., M. Woodbridge, M. Whitehead, J. D. Lanham, **C. Kwit**, and J. Tomcho. 2024. Seasonal Bird Communities in Shelterwood Harvests and Unmanaged Mature Forest. Canadian Journal of Forest Research, Accepted December 13, 2024. (in press)

Grubb, C. A., D. J. Keffer, C. D. Webb, M. Kardos, H. Mainka, and **D. P. Harper**. 2024. Paper fiber-reinforced polypropylene composites from nonwoven preforms: A study on compression molding optimization from a manufacturing perspective. Composites Part A-Applied Science and Manufacturing, 185:108339.

Grubb, C. A., M. Mokhtarnejad, J. Greene, J. Misasi, D. J. Keffer, M. Kardos, H. Mainka, and **D. P. Harper**. 2024. Development of an Automotive-Relevant Recycling Process for Paper Fiber-Reinforced Polypropylene Composites. Recycling, 9(6):126.

Grunwald, P. J., M. G. Ruder, D. A. Osborn, **L. I. Muller**, K. O. Goode, and G. J. DAngelo. 2024. Comparison of butorphanol-azaperone-medetomidine and nalbuphine-medatomidine-azaperone for immobilization of white-tailed deer (*Odocoileus virginianus*). Journal of Wildlife Diseases.

Grunwald, P. J., M. G. Ruder, D. A. Osborn, **L. I. Muller**, K. O. Goode, and G. J. DAngelo. 2024. Immobilization efficacy of conducted electrical weapons on captive white-tailed deer. Wildlife Research, 51: 1-10.

Hagan, A.G., K. L. DeLong, A. P. Griffith, C. Boyer, C. C. Martinez, K. L. Jensen, and **S. M. Schexnayder**. 2024. Feedlot Willingness to Pay for Genomic Tested Feeder Cattle. Journal of Extension. (in press)

Harper, C. A. and **C. A. Graves**. 2024. National 4-H Wildlife Habitat Education Program manual, Sixth Edition. UT Extension, PB 1872.

Harper, C. A., B.K. Strickland, M.A. Lashley, M.A. Turner, J.S. Nanney, and C.E. Moorman. 2024. Soil quality does not predict plant nutrition available to white-tailed deer. Journal of Wildlife Management.

Harper, C. A., and A. Warwick. 2024. Considerations for wildlife and fire in the southern Blue Ridge, 2025 revision. UT Extension. (in press)

Hopkins, C., D. Lesbarrères, N. Claunch, E. Emmenegger, B. Hardy, M. Torres-Sánchez, T. Stark, A. Julian, S. McGrath-Blaser, C. A. Parker-Graham, K. Haman, A. Morgan, and **D. L. Miller**. 2024. Balancing the scales: Including under-represented herptile species in a One Health approach. Res. dir. One health, 2.

Izzo, L. K., D. J. Dembkowski, T. R. Binder, S. P. Hansen, C. S. Vandergoot, and D. A. Isermann. 2024. A comparison of survival and behavior of lake whitefish following transmitter implantation using electro- or chemical immobilization. Animal Biotelemetry.

Izzo, L. K., D. J. Dembkowski, T. R. Binder, T. A. Hayden, C. S. Vandergoot, S. P. Hansen, D. C. Caroffino, C. C. Krueger, and D. A. Isermann. 2024. Comparing

conventional tagging methods and acoustic telemetry to inform management of Lake Whitefish in Lake Michigan. North American Journal of Fisheries Management, undefined.

Jackson, S., **R. L. Sharp**, Zajchowski, C., Wolken, B., and Henry, C.. 2024. Evaluating visitor use at Manassas National Battlefield Park. Technical Report for the National Park Service.

Jean-Philippe, S. R., N. R. Bumgarner, D. Rumble, N. Vercler, R. Fowler, and S. Adams. 2024. Fall Harvest on Your Urban Food Forest. E-Newsletter Publication.

Jean-Philippe, S. R., N. R. Bumgarner, D. Rumble, N. Vercler, R. Fowler, and S. Adams. 2024. Your Tree May Be Thirsty! E-Newsletter Publication.

Jean-Philippe, S. R., N. R. Bumgarner, D. Rumble, N. Vercler, R. Fowler, and S. Adams. 2024. Whose Tree Is This?. E-Newsletter Publication.

Jean-Philippe, S. R., N. R. Bumgarner, D. Rumble, N. Vercler, R. Fowler, and S. Adams. 2024. Evaluating Tree Health, Structure, and Condition. E-Newsletter Publication.

Jean-Philippe, S. R., N. R. Bumgarner, D. Rumble, N. Vercler, R. Fowler, and S. Adams. 2024. Pruning Techniques – Combing Art and Science. E-Newsletter Publication.

Jean-Philippe, S. R., N. R. Bumgarner, D. Rumble, N. Vercler, R. Fowler, and S. Adams. 2024. Where not to Plant a Tree!. E-Newsletter Publication.

Jean-Philippe, S. R., N. R. Bumgarner, D. Rumble, N. Vercler, R. Fowler, and S. Adams. 2024. Bucking Tree Selection Trends. E-Newsletter Publication.

Johnson. K., Castillo, M., da Silva, L., **P. D. Keyser**, Smith, R., and Philipp, D. 2024. Practices Guidelines: Improved Grazing Management. Grasslands Partnership, University of Tennessee, Knoxville, 3 pp.

Keyser, P. D., Dillard, S., Fike, J., Johnson, K., Smith, R., and F. R. Walker. 2024. Practice Guidelines: Introduction to Climate Smart Practices. Grasslands Partnership, University of Tennessee, Knoxville, 2 pp.

Keyser, P. D., F. R. Walker, Fike, J., Johnson, K., Smith, R., Philipp, D., Castillo, M., Dillard, L., Naumann, H., and da Silva, L.. 2024. Agents' Manual: Information And Resources To Guide Agents' Recruitment Of And Assistance To Producers. Grasslands Partnership, University of Tennessee, Knoxville, 75 pp.

Keyser, P. D., Naumann, H., Smith, R., Castillo, M., de Koff, J., and Philipp, D. 2024. Practice Guidelines: Native Grass Forage. Grasslands Partnership, University of Tennessee, Knoxville, 9 pp.

Knapp, R. A., **M. Q. Wilber**, M. B. Joseph, T. C. Smith, and R. L. Grasso. 2024. Reintroduction of resistant frogs facilitates landscape-scale recovery in the presence of a lethal fungal disease. Nature Communications, 15(1).

Kosiewska, J. R., **D. M. Grove**, **M. Q. Wilber**, D. L. Metts, J. D. Wyrick, **A. E. Houston**, and **L. I. Muller**. 2024. White-Tailed Deer Quintuplets in an Area with High Prevalence of Chronic Wasting Disease. Southeastern Naturalist, 23(4): N70-N74.

Kumar, V., M. L. Ricco, R. D. Bergman, P. Nepal, and **N. C. Poudyal**. 2024. Environmental impact assessment of mass timber, structural steel, and reinforced concrete buildings based on the 2021 international building code provisions. Building and Environment, 251: 111195.

Kumar, V., M. L. Ricco, R. D. Bergman, P. Nepal, and **N. C. Poudyal**. 2024. Data and bills of materials for buildings designed for mass timber, structural steel, and reinforced concrete based on the 2021 international building code provisions. Data in Brief, 55:110641.

Kuschke, S. G., J. Wyneken, and **D. L. Miller**. 2024. Baseline Skin Microbiota of the Leatherback Sea Turtle. Microorganisms, 12(5):925.

Lash, C. L., M. A. Cregger, A. M. Kinkopf, N. Buerger, D. M. Klingeman, and **C. Kwit**. 2024. Ant handling changes myrmecochore seed coat microbiomes and alters diversity of seed-borne plant pathogenic fungi. Functional Ecology, Vol. 38, pp. 861-874.

Le Sage, E. H., L. K. Reinert, M. E. B. Ohmer, B. C. LaBumbard, K. A. Altman, L. A. Brannelly, I. Latella, N. B. McDonnell, V. Saenz, J. C. Walsman, **M. Q. Wilber**, D. C. Woodhams, J. Voyles, C. L. Richards-Zawacki, and L. A. Rollins-Smith. 2024. Diverse Relationships between Batrachochytrium Infections and Antimicrobial Peptide Defenses Across Leopard Frog Populations. Integrative and Comparative Biology, 64(3):921-931.

Liu, L., F. Yu, **S. Wang**, and X. Ye. 2024. Synergistic effects of nonthermal plasma and solid acid catalysts in thermo-catalytic glycerol dehydration (invited paper in the Special Issue Topical Advisory Panel Members' Collection Series: Biomass Catalytic Conversion). Catalysts, 14 (11), 790.

Luo, R., R. Li, Z Zheng, L Zhang, L Xie, C Wu, **S. Wang**, and X. Chai, N. Ma, M. Naushad, G. Du, K. X. 2024. Efficient Cr (VI) remediation by electrospun composite porous nanofibers incorporating biomass with metal oxides and metal-organic framework. Environmental Pollution, 351: 124026.

Lussier, N. M., R. E. Crafford, J. L. Reid, and **C. Kwit**. 2024. Seeding success: Integrating seed dispersal networks in tropical forest restoration. Biotropica, 57(1). (in press)

Mayorga, M., and **R. L. Sharp**. 2024. Gestión del uso público en áreas silvestres protegidas de Costa Rica: revisión bibliográfica, síntesis y agenda de investigación. InterSedes.

McKim, K., A. Fulcher, A. L. Rihn, L. Warner, A.V. LeBude, M. Velandia, N. R. Bumgarner, and **S. M. Schexnayder.** 2024. The Role of Automation in Addressing the Nursery Industry Labor Shortage Part II: Advances in Automation within Task. UT Extension Publication, W1235.

McNew, L., **C. A. Harper**, J. Brooke, and M. McConnell. 2024. Grasslands and croplands. The Wildlife Society, Wildlife Techniques Manual. (in press)

Mercker, D. C. 2024. Focal Points Forestry. University of Tennessee Extension. W 1253..

Mercker, D. C. 2024. Forestry Footnotes. University of Tennessee Extension. Vol. 7. No. 1..

Mercker, D. C. 2024. Forestry Footnotes. University of Tennessee Extension. Vol. 7 No. 2..

Mercker, D. C. 2024. Forestry Footnotes. University of Tennessee Extension. Vol. 7. No. 3..

Mercker, D. C. 2024. Forestry Footnotes. University of Tennessee Extension. Vol. 7. No. 4..

Mercker, D. C., and **A. M. Taylor**. 2024. Common Questions Related to Forest Carbon Credit Programs. University of Tennessee Extension. W 1274.

Metts, D. L., K. A. Kurth, E. M. Watson, B. F. Miller, **C. Kwit**, J. M. DeBruyn, V. A. Brown, and **L. I. Muller**. 2024. Evaluating the winter diet of elk using high-throughput sequencing. Wildlife Biology, 2024: e01260: 1-16.

Miller, D.L., Pessier, A.P., Hick, P., Whittington, R.J., Forzán, M.J. (2025). Pathology and Diagnostics. In: **Gray, M.J.**, Chinchar, V.G. (eds) Ranaviruses. Springer, Cham. https://doi.org/10.1007/978-3-031-64973-8_8

Moorman, C.E., **C. A. Harper**, S. Grodsky, and J. Verschyul. 2024. Forest management for wildlife. The Wildlife Society, Wildlife Techniques Manual. (in press)

Muhammad, A., R. J. Menard, D. W. Hughes, and **A. M. Taylor**. 2024. Economic Impact of Tennessee Forest Product Exports in 2023. University of Tennessee Extension, W 1262.

Myers, B.J.E, **A. Engman**, A. Ramírez, A. Torres-Molinari, A.J. Lynch, M. Eaton, P.B. Cooney, and T.J. Kwak. 2024. The effects of flow extremes on native and non-native stream fishes in Puerto Rico. Freshwater Biology.

Nan, Y., D. Gomez-Maldonado, K. Zhang, H. Du, D. C. Whitehead, **M. Li**, X. Zhang, and M. S. Peresin. 2024. Polyethylenimine functionalized graphene oxide and cellulose nanofibril composite hydrogels: Synthesis, characterization and water pollutants adsorption. Carbohydrate Polymer Technologies and Applications, 8:100585.

Nepal, P., J. P. Prestemon, I. Ganguly, V. Kumar, R. D. Bergman, and **N. C. Poudyal**. 2024. The potential use of mass timber in mid-to high-rise construction and the associated carbon benefits in the United States. PLOS ONE.

Neufang, L., J. Ramos, **S. Eda**, B. Flatland, and L. Giori. 2024. Initial development of a rapid, portable, stall-side ELISA for the measurement of equine adrenocorticotropic hormone. J VET Diagn Invest. 37(1):208-211. doi: 10.1177/10406387241285453.

Olsen, D. H., E. H. Grant, M. Bletz, D. Lesbarrères, J. L. Kerby, M. J. Adams, M. Florencia Breitman, M. Christman, M. J. Forzan, **M. J. Gray**, A. J. Hill, M. S. Koo, O. Milenkaya, E. A. Rebollar, L. A. Rollins-Smith, M. Serr, A. Shepack, L. Shirose, L. Sprague, J. Walke, A. R. Warwick, and B. A. Mosher. 2024. Preparing for a Bsal invasion into North America has improved multi-sector readiness. Frontiers in Amphibian and Reptile Science.

Peairs, S. E., and Timilsiina, N.. 2024. Herbicide Uptake (Flashback) in Non-Target Hardwood Species within South Carolina Floodplains. Journal of ForestryForests, Volume 15, Issue 8, page 1307.

Pearhill, R., **M. J. Gray**, J. Jones, Z. Brinks, and J. Brunner. 2024. Microbe surveillance in the amphibian pet trade: results from a pilot study. Ecosphere, 15:e4968.

Pedreira, B., **C. A. Harper**, T. B. Raper, V. R. Sykes, and J. McNeal. 2024. Forage and Field Crop Seeding Guide for Tennessee. UT Extension, PB 378.

Pekol, C., J. Furst, Y. Li, J. Keum, and **D. P. Harper**. 2024. 3D Printing of Thermally Responsive Shape Memory Liquid Crystalline Epoxy Networks. ACS Omega, 9(39):40801-40809.

Phillips, L. M., V. M. Johnson, **C. A. Harper**, **N. C. Poudyal**, R. D. Shields, and **D. A. Buehler**. 2024. Effects of COVID-19 on wild turkey hunter satisfaction and behavior in Tennessee. Journal of the Southeastern Association of Fish and Wildlife Agencies, 11:92-101.

Phillips, L. M., V.M. Johnson, **C. A. Harper**, **N. C. Poudyal**, R. Shields, and **D. A. Buehler**. 2024. Effects of COVID-19 on Wild Turkey Hunter Satisfaction and Behavior in Tennessee. Southeastern Association of Fish and Wildlife Agencies.

Poudyal, N. C., B. R. Gyawali, and S. Acharya. 2024. Reclamation satisfaction and post-mining land use potential in Central Appalachia, US. The Extractive Industries and Society, 20:101550.

Poudyal, N. C., B. R. Gyawali, B. Pokharel, A. R. Khanal, and K. Paudel. 2024. Socioeconomic Legitimacy of Surface Mining: Assessing the Role of Environmental Change, Trust, and Reclamation Satisfaction in Southern Appalachia of Kentucky, USA. Society and Natural Resources, 38(5), 414–438.

Poudyal, N. C., T. Silwal, **S. Dixit**, A. R. Bhandari, R. C. Kandel, S. R. Bhatta, and G. Pant. 2024. A Perception-Based Assessment of Buffer Zone Programs' Contribution to Integrated Conservation and Development: Evidence from Protected Areas in Nepal. Society and Natural Resources, 37(9):1313-1338.

Powell, B. L., J.W. GeFellers, **D. A. Buehler,** C.E. Moorman, J.M. Zobel, and **C. A. Harper**. 2024. Change in plant composition following disturbance in early successional plant communities. Rangeland Ecology and Management, 98:480-489.

Prigge, J., **E. Bisangwa**, **P. D. Keyser**, J. Richwine, V. R. Sykes, and J. L. Ivey. 2024. Native Forbs Provide

Pollinator Resources and Improve Forage Nutrient Composition, Animal Performance, and Pasture Productivity. Agronomy, Special Issue ''Enhancement of Grassland Function and Productivity with Legumes and Other Forbs''. 2024, 14(10), 2184.

Prigge, J.L., **Bisangwa, E.**, Richwine, J., **Swilling, K.**, and **P. D. Keyser**. 2024. Blooming and Forage Characteristics of Twelve Native Forbs Subjected to Repeated Defoliation. Agronomy, Special Issue "Enhancement of Grassland Function and Productivity with Legumes and Other Forbs."

Quehl, J. O., **L. M. Phillips**, V. M. Johnson, **C. A. Harper**, **J. D. Clark**, and **D. A. Buehler**. 2024. Assessing wild turkey productivity before and after a 14-day delay in the start date of the spring hunting season in Tennessee. Ecology and Evolution, 14: E11390.

Quehl, J. O., **L. M. Phillips**, V. M. Johnson, **C. A. Harper**, **N. C. Poudyal**, and **D. A. Buehler**. 2024. Changes in hunter behavior, success, and satisfaction in relation to wild turkey season opening dates and season length. Journal of the Southeastern Association of Fish and Wildlife Agencies, 11:83-91.

Rafie, S. A. A., L. Blentlinger, A. D. Putt, D. E. Williams, D. C. Joyner, M. F. Campa, M. R. Schubert, **K. P. Hoyt**, **J. A. Franklin**, and S. P. Horn, T. C. Hazen. 2024. Impact of a Prescribed Fire on Soil Microbial Communities in a Southern Appalachian Forest Clearcut. Frontiers in Microbiology, Vol. 15.

Reeves, A. M., W. F. Swanson, C. D. Hilton, T. A. Campbell, L. Schofield, M. E. Tewes, H. M. Swarts, A. Miller, C. Springer, and **D. L. Miller**. 2024. Semen collection and characterization of normative reproductive traits in free-ranging ocelots (*Leopardus pardalis*) and bobcats (*Lynx rufus*) in southern Texas. Theriogenology Wild, 5:100107.

Richwine, J. D., **P. D. Keyser**, P. D. Zobel, and F. R. Walker. 2024. Native forbs interseeded into native grass pastures persist under grazing. Grass and Forage Science. https://doi.org/10.1111/gfs.12651.

Rihn, A. L., **N. Labbé**, Rajan, K., Jackson, S., and K. L. Jensen. 2024. Consumers' Perceptions of Per- and Polyfluoroalkyl Substances and Bio-based Treatments on Disposable Dinnerware. Journal of Agriculture and Food Research, 101436.

Saedi, S., A. Sobhan, M. Hoff, **S. Wang**, K. Muthukumarappan, S. Wang, and S. Wang. 2024. Development of Halloysite Nanotube-Infused Thermoset Soybean Bio-resin for Advanced Medical Packaging. Polymers, 16: 1616.

Samandari, M., M. T. Broud, **D. P. Harper**, and D. J. Keffer. 2024. Carbon Dioxide Capture on Oxygen- and Nitrogen-Containing Carbon Quantum Dots. J. Phys. Chem. B, 128(35):8530-8545.

Schweitzer, C., M. Varner, A. Conrad, D. Dey, C. Favorito, and **C. A. Harper**. 2024. Fire effects in contemporary eastern forests. Prescribed Fire for Ecosystem Resilience in the 21st Century. National Prescribed Fire Assessment.. (in press)

Sewid, A. H., H. C. Dylewski, J. H. Ramos, B. M. Morgan, B. D. Gelalcha, D. H. D'Souza, J. J. Wu, O. Kerro Dego, and **S. Eda**. 2024. Colorimetric and electrochemical analysis of DNAzyme-LAMP amplicons for the detection of Escherichia coli in food matrices. Scientific Reports, 14(1).

Sharp, R. L., Boley, B., Woosnam, K., Hicks, R., and Bullard, M. 2024. Examining visitor spatial and temporal distribution at Fort Sumter. Technical Report for the National Park Service.

Sharp, R. L., Zajchowski, C., Wilkes, J., Brunson, M., **N. C. Poudyal**, and Smith, K.. 2024. Social science research to support visitor use management at Harpers Ferry National Historic Park. Technical Report for the National Park Service.

Shen, M., and **A. Engman**. 2024. FreshLanDiv: A Global Database of Freshwater Biodiversity Across Different Land Uses. Global Ecology and Biogeography.

Smith, R., Philipp, D., Fike, J., Johnson, E., **P. D. Keyser**, and Philipp, D. 2024. Practices Guidelines: Perennial Grassland Buffer Strip. Grasslands Partnership, University of Tennessee, Knoxville, 8 pp.

Souza, L. S., J. Folmar, A. Sallee, and **S. Eda**. 2024. Partial privatization and cooperation in biofilms. Anais da Academia Brasileira de Ciências.

Sun, G., Y. He, L Xie, C Wu, L Zhang, X Chai, **S. Wang**, and K. Xu. 2024. Effects of various cold plasma atmospheres and external influencing factors on the adsorption of formaldehyde gas by bamboo-based carbon microfibers. Industrial Crops and Products, 215: 118607.

Torres-Molinari, A., **A. Engman**, Pacifici, K., Dolloff, C.A., Myers, B.J.E., and Kwak, T.J.. 2024. Patterns in longitudinal distribution of American Eel (*Anguilla rostrata*) population characteristics in rivers of Puerto Rico. Fisheries Management and Ecology.

Towe, A. E., R. H. Hardman, S. K. Cox, W. C. Sheley, J. A. DeMarchi, E. D. Carter, and **D. L. Miller**. 2024. Pilot study of intracoelomic terbinafine implants in greater sirens (Siren lacertina). Journal of Zoo and Wildlife Medicine, 55(2).

Turner, M. A., B. L. Powell, **L. M. Phillips**, and **C. A. Harper**. 2024. Influence of management on white-tailed deer use of perennial forage plantings. Journal of the Southeastern Association of Fish and Wildlife Agencies, 11:76-82.

Turner, M. A., J. T. Bones, S. G. Marshall, and **C. A. Harper**. 2024. Canopy reduction and fire seasonality effects on deer and turkey habitat in upland hardwoods. Forest Ecology and Management.

Turner, M.A., and **C. A. Harper**. 2024. Vegetation composition and structure for deer and turkey in pine stands following low-intensity management. Southeastern Naturalist, 23(2):175-193.

Turner, M.A., C. A. Harper, B.K. Strickland, M.A. Lashley, and **M. Q. Wilber**. 2024. Correlating male white-tailed deer antler size with female body mass across multiple

spatial scales. Journal of Wildlife Management, e22626.

Velandia, M., C. Trejo-Pech, D. M. Butler, L. Chen, A. L. Wszelaki, K. L. DeLong, **S. M. Schexnayder**, and H. H. Shanto. 2024. Tennessee Fruit and Vegetable Farmers' Willingness to Adopt Alley Cropping Systems. HortTechnology, 2025. Accepted 01/13/2025. (in press)

Wang, E, W. Huang, Y Miao, L Jia, Y Liang, **S. Wang**, W. Zhang, L. Zhou, and J. Huang. 2024. Conductive and superhydrophobic lignin/carbon nanotube coating with nest-like structure for deicing, oil absorption and wearable piezoresistive sensor. International Journal of Biological Macromolecules, 278:134886.

Wilber, M. Q., J. DeMarchi, C. J. Briggs, and S. Streipert. 2024. Rapid evolution of resistance and tolerance leads to variable host recoveries following disease-induced declines. American Naturalist.

Wilcox, M., C. A. Zajchowski, J. P. Fefer, E. E. Perry, **R. L. Sharp**, and M. T. J. Brownlee. 2024. Before, during, and irrespective of the pandemic: leisure constraints and urban national park visitation. World Leisure Journal, undefined:1-21.

Wilkes, J., **R. L. Sharp**, Perry, B., Zajchowski, C., Brownlee, M., and Powell, B. 2024. Intersecting Identities: Investigating Effects of Multiple Hierarchy Stratification Perspective on Visitor Activity Participation. Leisure Sciences.

Xie, D., Y. Pu, N. D. Bryant, **D. P. Harper**, W. Wang, A. Ragauskas, and M. Li. 2024. Synthesis of Bio-Based Repairable Polyimines with Tailored Properties by Lignin Fractionation. ACS Sustainable Chem. Eng., 12(17):6606-6618.

Xiong, J., R. Luo, Z. Jia, S. Ge, S. Lam, L. Xie, X. Chai, L. Zhang, G. Du, **S. Wang**, and K. Xu. 2024. Electrospun microcrystalline cellulose/chitosan porous composite nanofibrous membranes modified by non-thermal plasma activation for gaseous formaldehyde adsorption. International Journal of Biological Macromolecules, 256: 128399.

Xiong, J., Y. Wang, H. Wang, L. Xie, X. Chao, L. zhang, W. Peng, **S. Wang**, G. Du, and K. Xu. 2024. Electrospun biomass carbon-based porous nanofibers modified by green-dry cold plasma for gaseous formaldehyde adsorption. Industrial Crops and Products, 222: 119769.

Xu, Q., J. Ye, Y. Gao, P. Chen, **S. Wang**, and Q. Wu, Q. Li. 2024. P/N/S-containing cellulose nanofibrils enable curcumin encapsulation via Pickering emulsion based microcapsules. Colloids and Surfaces A: Physicochemical and Engineering Aspects, 690: 133785.

Yang, W., J. Li, Z. Yao, and **M. Li**. 2024. A review on the alternatives to antibiotics and the treatment of antibiotic pollution: Current development and future prospects. Science of The Total Environment, 926:171757.

Ye, J., Q Xu, Y Gao, Y Liang, Q Wu, G Wu, **S. Wang**, and P. Chen, Q. Li. 2024. Flexible, transparent, and fire-proof cellulose nanofibril films with outstanding flame retardancy. Industrial Crops and Products, 211: 118210.

Zhang, K., T. Elder, Z. Cheng, K. Zhan, Y. Peng, and **M. Li**. 2024. Cellulose nanofiber-templated metal-organic frameworks for fluorescent detection of methyl parathion pesticides. Journal of Environmental Chemical Engineering, 12(3):112670.

Zhang, L, L. Peng, S. Liang, Z .Chen, S. Lyu, and **S. Wang**. 2024. Green synthesis of silane-assisted fluorescent carbon dots based on sanding dusts and its application in flame-retardant and anti-leaching wood materials. Journal of Cleaner Production, 446: 141417.

Zhang, S., A. Ji, X. Meng, S. Bhagia, C. G. Yoo, **D. P. Harper**, X. Zhao, and A. Ragauskas. 2024. Structure-property relationship between lignin structures and properties of 3D-printed lignin composites. Composites Science and Technology, 249:110487.

Zhang, S., X. Meng, S. Bhagia, A. Ji, M. Dean Smith, Y.-y. Wang, B. Liu, C. G. Yoo, **D. P. Harper**, and A. Ragauskas. 2024. 3D printed lignin/polymer composite with enhanced mechanical and anti-thermal-aging performance. Chemical Engineering Journal, 481:148449.

Zhang, Y., Q. Li, Y. Chen, Y. Cao, J. Wang, J. Yang, L. Xie, X. Cai, L. Zhang, **S. Wang**, and G. Du, K. Xu. 2024. Effects of facile chemical pretreatments on physical-chemical properties of large clustered and small monopodial bamboo microfibers isolated by steam explosion. Industrial Crops and Products, 207: 117747.

Zhou, Z, K. Rajan, **N. Labbé**, and **S. Wang**. 2024. Significantly reducing energy consumption during nanolignin production via high-solid content grinding. Industrial Crops and Products, 211: 118209.

Zhou, Z, K. Rajan, S. Saedi, **N. Labbé**, M. Li, W. Wang, and **S. Wang**. 2024. A Fully Plant-Based Water- and Oil-Resistant Paper Composite. ACS Sustainable Chemistry & Engineering, 12:18043-18057.

POPULAR PRESS

Alphabetical order by author

Graves, C. A. 2024. Otey Mills Wildlife Refuge. NWTFonline. https://m.youtube.com/watch?v=5eVFcQTThZc.

Harper, C. A., and M.A. Turner. 2024. How to use growing-season fire in hardwoods for better deer habitat. National Deer Association website article.

Jean-Philippe, S. R. 2024. Outstanding in Their Field series, featured Sharon Jean-Philippe. University of Tennessee Institute of Agriculture.

Jean-Philippe, S. R. 2024. The ongoing story of Sharon Jean-Philippe. KnoxTNToday.com.

Jean-Philippe, S. R. 2024. More Black students embrace the potential of agriculture. Tennessean.

Jean-Philippe, S. R. 2024. The Forestry Source, SFI Urban Forestry and SAF Urban Foerster Credential, Spotlight Dr. Sharon Jean-Philippe. Society of American Foresters.

Jean-Philippe, S. R. 2024. Thank you for your dedication, Sharon. TREE Fund - LinkedIN.

Jean-Philippe, S. R., and T. K. Ruth. 2024. Grant seeks to provide pathways for community college students in STEM fields. The Mountain Press.

LeBude, A., L. Warner, A. Fulcher, A. L. Rihn, and **S. M. Schexnayder**. 2024. LEAP the Gap: Between Thinking About Automation and Adopting It into Production. Nursery & Landscape Notes, summer 2024, 30-32.

Mercker, D. C. 2024. Focal Points Forestry: a specialized Management Approach. Forest Landowner. Vol. 83. Is. 3..

Mercker, D. C., and L. E. Steckel. 2024. When Herbicides Fail. Forest Landowner. Vol. 83. Is. 1.

Payne, J., and **S. R. Jean-Philippe**. 2024. The National Champion Tree Program: An honor for Tennessee, a boon for the nation. Tennessee Turfgrass Association Magazine.

Ruth, T. K., and **S. R. Jean-Philippe**. 2024. Grant seeks to provide pathways for community college students in STEM fields. The Tennessee Tribune.

Taylor, A. M. 2024. US forests supply hardwoods to the world. TFA News & Notes for September 30.

Taylor, A. M. 2024. Carbon impact: Through the use of American hardwoods. https://lsems.gravityzone.bitdefender.com/scan/

THESES

Alphabetical order by author

Bremner, A. 2024. Assessing the current knowledge and future prospect of mass timber. M.S. Thesis.

Burken, E. F. 2024. Northern Bobwhite (*Colinus virginianus*) resource selection and survival on Quail Focal Areas in Tennessee. M.S. Thesis.

Burken, E.F. 2024. Northern bobwhite (*Colinus virginianus*) resource selection and survival on Quail Focal Areas in Tennessee. University of Tennessee.

Clark, Z.W. 2024. Biomagnification in Aquatic Food Webs of Great Smoky Mountains National Park. M.S. Thesis.

Kennedy, I. 2024. Identifying and Assessing Metrics of Ecosystem Recover in Eastern Hardwood Forests. M.S. Thesis.

Panos, B. 2024. Avian use of agricultural cover crop fields during winter, migration stopover, and the breeding season in Tennessee. M.S. Thesis.

Rader, D. 2024. Resource selection and relative abundance of Swainson's Warbler (*Limnothlypis swainsonii*) in the Appalachian Mountains on Cherokee National Forest, Tennessee. M.S. Thesis.

DISSERTATIONS

Berry, M. 2024. Improving eastern grasslands through native warm-season grasses. Ph.D. Dissertation.

Cable, A. B 2024. Investigating habitat, ties to aquatic food webs, and ecotoxicological threats to common and declining bat species. Ph.D. Dissertation.

Kuschke, S 2024. Health parameters in the leatherback sea turtle (*Dermochelys coriacea*) and the impact of climate change on them. Ph.D. Dissertation.

Mitchell, D. 2024. Northern bobwhite and grassland-associated birds benefit from native-warm season grasses in a working landscape dominated by cool-season grasses. Ph.D. Dissertation.

Prigge, J. 2024. Bee friendly beef: integrating pollinator-friendly native forbs into native grass pastures. Ph.D. Dissertation.

Turner, M.A. 2024. Evaluating the effects of forage availability and landscape composition on white-tailed deer morphometrics across the eastern US. University of Tennessee.

Xie, D. 2024. Design and Develop Lignin-based Recyclable Copolymers for Hydrophobic Coatings. Ph.D. Dissertation.

Research Grants

GRANTS

Alphabetical order by author

Assogba, N.P. 2021 — 2026. Analyzing and Enhancing Harvest Utilization Studies. USDA Forest Service. $125,030.

Assogba, N.P. 2021 — 2026. Exploring Enhanced Methodology for FIA's Resource Use Monitoring. USDA Forest Service. $119,965.

Assogba, N.P. 2022 — 2025 USDA Forest Service. Developing methodology for rapid assessment of hurricane damage on primary forest industry. $20,000.

Assogba, N.P. 2024 — 2027. Reporting on Timber Harvests and their Economic Contributions to U.S. State Economies. USDA Forest Service. $134,860.

Buehler, D.A. 2020 — 2025. Long Term Songbird Monitoring South Zone - Cherokee National Forest. USDA Forest Service. $12,500.

Buehler, D.A. 2023 — 2025. Tennessee Cooperative Wild Turkey Project- Value-Added Extension. Tennessee Wildlife Resources Agency. $129,618.

Eda, S. 2021 — 2026. NDA - US Biologic - UTRF - MUTUAL NON-DISLOSURE AGREEMENT. U.S. Biologic, Inc.

Eda, S. 2021 — 2025. TDA - Lab License Agreement - Eda - #25151. Tennessee Department of Agriculture.

Eda, S. 2022 — 2024. Invention Disclosure - Electrochemical detection of isothermal nucleic acid amplification product. UT Reserach Foundation.

Eda, S. 2023 — 2024. Development of a new platform for rapid and sensitive detection of chronic wasting disease prion in live animal samples. USDA Animal and Plant Health Inspection Service. $169,782.

Eda, S. 2024 — 2026. RapiOmics: A Platform for Rapid Detection of Multiplexed Multi-omics Biomarker Panel. CFD Research Corporation. $59,422.

Eda, S. 2024. Development of a portable system for rapid and sensitive detection of chronic wasting disease prion in live animal samples. Wildlife Management, Inc. $90,905.

Eda, S. 2023 — 2024. Platform for Rapid Detection of Multiplexed Multi-omics Biomarker Panel. CFD Research Corporation. $24,930.

Eda, S. 2023 — 2024. Platform for Automated Detection of Circulating and Exosomal miRNAs. CFD Research Corporation. $24,930.

Engman, A. 2022 — 2024. Trophodynamics of Mercury Contamination of Smallmouth Bass Micropterus dolomieu in Great Smoky Mountains National Park. National Park Service. $36,073.

Engman, A. 2023 — 2025. A Roadmap to Restoration of the Abrams Creek Mussel Fauna. Tennessee Wildlife Resources Agency. $60,000.

Engman, A. 2024 — 2026. Diversity and Distribution of Aquatic Snails in the Louisiana Section of Bayou Bartholomew Drainage. Louisiana Department of Wildlife and Fisheries. $72,580.

Graves, C. 2024 — 2028. Wildlife Management Academy (UT Extension / TWRA). Tennessee Wildlife Resources Agency. $287,369.

Gray, M. 2021 — 2026. Pet Industry Joint Advisory Council - MOU and MOA - #24294 - Gray. Pet Industry Joint Advisory Council (PIJAC).

Gray, M. 2022 — 2027. Socioeconomic and Epidemiological Drivers of Pathogen Dynamics in Wildlife Trade Networks. National Science Foundation. $2,755,617.

Harper, C. 2021 — 2024. Effects of Fire Seasonality in Southern Yellow Pine Communities. Alabama Department of Conservation and Natural Resources. $70,800.

Harper, C. 2022 — 2025. Plant communities research. Tennessee Valley Authority. $25,000.

Harper, C. 2023 — 2024. Effects of Timing of Fire on Upland Plant Communities. Tennessee Valley Authority. $25,000.

Harper, C. 2023 — 2027. Effects of timing of prescribed fire on ticks and associated pathogens. Mississippi Department of Fish, Wildlife and Parks. $85,579.

Harper, C. 2024 — 2025. UTK Native Plant Community Research — FY25. Tennessee Valley Authority. $25,000.

Harper, C. 2024 — 2027. Effects of Fire Seasonality in Southern Yellow Pine Communities in South Carolina. South Carolina Department of Natural Resources. $165,996.

Harper, C. 2024 — 2027. Effects of Fire Seasonality in Southern Yellow Pine Stands. Mississippi Department of Fish, Wildlife and Parks. $165,996.

Harper, C. 2024 — 2025. UT — Coordinate and Conduct Wildlife Judging Contests. Tennessee Wildlife Resources Agency. $6,000.

Harper, D. 2022 — 2024. Groundstar LLC & UTRF - NDA - Harper - #26324. Groundstar, LLC.

Harper, D. 2022 — 2024. Invention Disclosure - Novel manufacturing process for short natural fiber reinforced composites. University of Tennessee Research Foundation.

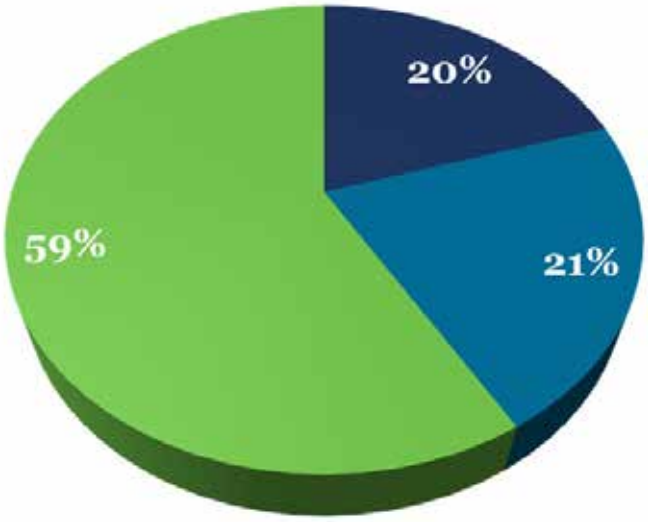
Harper, D. 2022 — 2024. Invention Disclosure - Use of Carbon Quantum Dots for Gas Separation. University of Tennessee Research Foundation.

Harper, D. 2023 — 2024. Mutual Non-Disclosure Agreement. BioLogiQ, Inc.

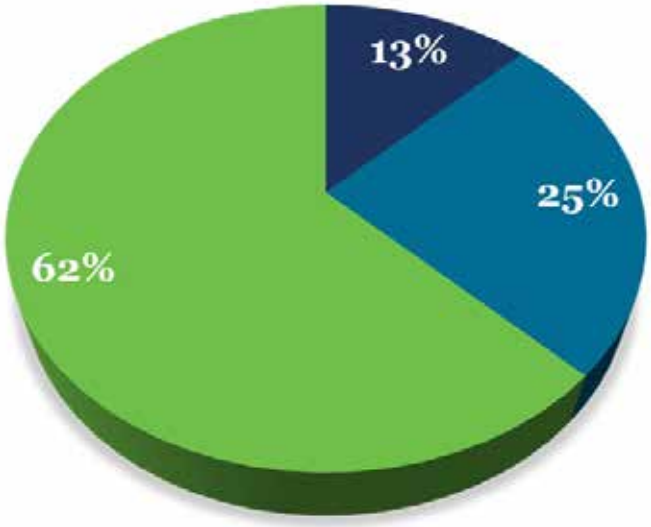
Harper, D. 2023 — 2024. NDA - Biomass Conversion to Sugars, Intermediates, Functional Carbon Products, & Liquid Fuels. SIEV Technologies, LLC.

Hodges, D. 2019 — 2024. Administrative support for the Southern Appalachian Field Branch. U.S. Geological Survey. $28,000.

2024 SNR Research expenditures



2024 SNR Extension expenditures



Grants, Contracts

State Funds

Federal Funds

Hodges, D. 2021 — 2026. Leadership, Coordination and Administrative Oversight for the Southern Appalachian Mountains Cooperative Ecosystem Studies Unit. National Park Service. $12,600.

Hodges, D. 2021 — 2026. Evaluating the sustainability of mixed-hardwood forest resources in the Eastern U.S. USDA Forest Service. $371,970.

Hodges, D. 2021 — 2024. Movements and Fates of Relocated Black Bears in Great Smoky Mountains and Shenandoah National Parks. National Park Service. $296,497.

Hodges, D. 2021 — 2024. Monitoring the Louisiana Black Bear. Louisiana Department of Wildlife and Fisheries. $170,200.

Hodges, D. 2022 — 2025. Socioecological Vulnerability Assessment - Southern Appalachian Biosphere Region. National Park Service. $120,000.

Hodges, D. 2022 — 2027. Master Challenge Cost Share Agreement. USDA Forest Service.

Hodges, D. 2023 — 2025. Movements of black bears (Ursus americanus) along Interstate 40 in the Pigeon River Gorge in North Carolina. North Carolina Wildlife Resources Commission. $24,997.

Hodges, D. 2023 — 2024. Evaluate movements of relocated and resident black bears (Ursus americanus) along Interstate 40 in the Pigeon River Gorge in North Carolina and Tennessee. Tennessee Wildlife Resources Agency. $26,304.

Hodges, D. 2023 — 2024. Tennessee Youth Hunter Education and Youth in the Outdoors programs. Tennessee Wildlife Resources Agency. $634,000.

Hodges, D. 2023 — 2026. COOPERATION AGREEMENT for cooperation in the COMET Programme of the Kompetenzzentrum Holz. Wood K Plus.

Hodges, D. 2024 — 2026. Exploring Sample Design Possibilities to Improve Forest Inventory and Analysis National Timber Products Output Nationwide. USDA Forest Service. $315,472.30.

Jean-Philippe, S. 2021 — 2026. Cooperative Work Study Partnership. USDA Forest Service. $115,800.

Jean-Philippe, S. 2022 — 2024. Knox Urban Renewal DOW Landscape Design. DOW Chemical Company. $10,000.

Jean-Philippe, S. 2023 — 2025. Community Riparian Restoration Program. Tennessee Department of Agriculture. $99,600.

Jean-Philippe, S. 2023 — 2025. National Champion Tree Program. American Forests. $200,000.

Jean-Philippe, S. 2024. Agreement Job Corps Community Connection Support. Society of American Foresters. $28,362.

Jean-Philippe, S. 2024 — 2029. Gravel Tree Stormwater Systems:

Bringing Ecosystem Services, Education, and Workforce Development to East Knoxville. USDA Forest Service. $173,667.

Jean-Philippe, S. 2023 — 2024. Urban Wood Economy Internship Experience. Urban Wood Economy. $30,735.

Jean-Philippe, S. 2021 — 2026. Cooperative Work Study Partnership. USDA Forest Service. $20,000.

Keyser, P. 2021 — 2024. Back to the Future: Improving Productivity, Sustainability, and Resilience of Eastern Grasslands. USDA National Institute of Food and Agriculture. $499,724.

Keyser, P. 2022 — 2023. BGAD Quail Telemtry Study. Kentucky Department of Fish and Wildlife Resources. $15,000.

Keyser, P. 2022 — 2025. Improving Native Vegetation Establishment Outcomes. Stone Barns Center for Food and Agriculture. $299,924.

Keyser, P. 2023 — 2028. Climate Smart Grasslands - the Root of Agricultural Carbon Markets. USDA Natural Resources Conservation Service. $30,000,000.

Keyser, P. 2023 — 2027. Assess the nutritional and parasite management. USDA Natural Resources Conservation Service. $174,372.

Keyser, P. 2023 — 2028. Matching Funds for Climate Smart Award. Tennessee Department of Agriculture. $354,741.

Li, M. 2022 — 2024. Queen's University Belfast - CDA - Li - #26287. Queen's University Belfast.

Mercker, D. 2022 — 2024. USDA RREA Renewable Resources Extension Act FY 2023. USDA National Institute of Food and Agriculture. $73,969.

Mercker, D. 2023 — 2025. FY2024 USDA Renewable Resources Extension Act Program (Capacity Grant Program). USDA National Institute of Food and Agriculture. $72,360.

Molina-Moctezuma, A. 2023 — 2024. Estimating Spatial Mortality Components from Acoustic Telemetry Detection Data. Michigan State University. $45,470.

Molina-Moctezuma, A. 2024 — 2027. Fish Passage, Microhabitat use, and Assemblage Response to Ecological Restoration of Cub Creek. Tennessee Department of Environment and Conservation. $250,000.

Muller, L. 2023 — 2028. Appalachian Wildlife Foundation MOU 27429 Muller. Appalachian Wildlife Foundation.

Muller, L. 2023 — 2024. Reproduction and Recruitment in a High Prevalence CWD Area in West Tennessee. USDA Animal and Plant Health Inspection Service. $249,975.

Muller, L. 2024 — 2025. Stress Effects on White-Tailed Deer in a High Prevalence Chronic Wasting Disease Area. USDA Animal and Plant Health Inspection Service. $203,326.

Peairs, S. 2024 — 2025. International Oak Symposium. USDA Forest Service. $25,000.

Phillips, L. 2024 — 2025. Quail Technician to Assist with Providing Improvements to Bobwhite Quail Habitats and Populations on Suitable Landscapes in Tennessee. Tennessee Wildlife Resources Agency. $30,000.

Poudyal, N. 2021 — 2025. Economic implications of Chronic Wasting Disease (CWD) on Deer Hunting. USDA National Institute of Food and Agriculture. $499,527.

Poudyal, N. 2021 — 2025. A holistic evaluation of US forest sector carbon mitigation impacts of varying climate and socioeconomic futures using the consequential life cycle assessment framework. USDA Forest Service. $20,000.

Poudyal, N. 2021 — 2025. Exploring potential for market development of hardwood mass timber products. USDA Forest Service. $80,804.

Poudyal, N. 2021 — 2024. An Investigation of Economics, Market, and Policy Research Opportunities in Mass Timber Industry. USDA Forest Service. $33,500.

Poudyal, N. 2022 — 2027. Conduct surveys of Hunting, Fishing, Boating and other wildlife-associated recreation. Tennessee Wildlife Resources Agency. $350,000.

Poudyal, N. 2023 — 2026. Human Interaction with Deer in the Context of SARS-CoV2/Covid Transmission. USDA Animal and Plant Health Inspection Service. $467,232.52.

Poudyal, N. 2024 — 2027. Utilizing Small Diameter Trees for Mass Timber Production: Economic, Environmental, and Supply Chain Network Assessment. USDA Forest Service. $ 477,000.

Schexnayder, S. 2022 — 2026. National Visitor Use Monitoring FY 2023 — FY 2027. USDA Forest Service. $66,000.

Schexnayder, S. 2024 — 2026. National Visitor Use Monitoring FY 2023 - FY 2027. USDA Forest Service. $255,000.

Schlarbaum, S. 2021 — 2026. Cooperative Research on Oak Reforestation and American Chestnut Reintroduction in the Southeastern United States. USDA Forest Service.

Schlarbaum, S. 2023 — 2024. UT Tree Improvement Partnership for Tree Propagation and Planting. Tennessee Valley Authority. $15,000.

Schlarbaum, S. 2023 — 2028. UT Hardwood Improvement. USDA Forest Service. $219,000.

Schlarbaum, S. 2023 — 2024. Developing a Wild Seed Collection Network in Tennessee. American Forests. $60,000.

Schlarbaum, S. 2023 — 2024. UT Tree Improvement Partnership for Tree Propagation and Planting. Tennessee Valley Authority. $15,000.

Schlarbaum, S. 2024 — 2025. FY 25 UT Tree Improvement Partnership for Tree Propagation and Planting. Tennessee Valley Authority. $15,000.

Sharp, R. 2023 — 2025. Visitor Estimation on the Lewis and Clark National Historic Trail. Lewis and

Clark Foundation. $55,000.

Sharp, R. 2023 — 2024. Harpers Ferry National Historic Site Visitor Use Study. Old Dominion Research Foundation. $23,679.58.

Sharp, R. 2023 — 2024. Lewis and Clark National Historic Trail (LECL) Economic Impact and Use Pattern Study Proposal. National Park Service. $97,448.

Sharp, R. 2024 — 2026. Generating actionable information on public perceptions and use of forests. USDA Forest Service. $70,000.

Sharp, R. 2024 — 2027. Improving Mountain Lion Management with Outreach, Inclusiveness, and Community Science. National Park Service. $207,681.41.

Sharp, R. 2024 — 2025. Understanding OHV Use and Impacts on State Forest Lands in Tennessee. Tennessee Department of Agriculture, Division of Forestry. $117,248.

Sharp, R. 2024 — 2026. Examining Visitor Spatial and Temporal Distribution at Fort Sumter National Historic Site. National Park Service. $92,594.

Taylor, M. 2024 — 2026. Mixed Method Social Science Assessment of Solid Wood Products End Use Ratios. USDA Forest Service. $232,100.

Taylor, M. 2024 — 2027. Assessing and Updating U.S. Statistics on Forest Products Production, Trade and Carbon Impacts. USDA Forest Service. $135,880.51.

Taylor, M. 2024. University of Tennessee Firewood Bank. Alliance for Green Heat. $10,000.

Wilber, M. 2021 — 2024. BII-Implementation: Uncovering mechanisms of amphibian resilience to global change: from molecules to landscapes. University of Pittsburg. $57,827.

Wilber, M. 2021 — 2024. BII-Implementation: Uncovering mechanisms of amphibian resilience to global change: from molecules to landscapes. University of Pittsburg. $15,000.

Wilber, M. 2022 — 2025. Using fine-scaled movement data to estimate the transmission potential of SARS-COV-2 in white-tailed deer. USDA Animal and Plant Health Inspection Service. $1,047,642.

Wilber, M. 2022 — 2026. Collaborative Research: LTREB Renewal: Long-term dynamics of amphibian populations following disease-driven declines. National Science Foundation. $34,837.

Wilber, M. 2023 — 2026. MCA: Understanding the animal movement and disease transmission interface. University of Minnesota. $15,862.

Willcox, A. 2022 — 2024. Enhancing Climbing Recreation and Conservation in Vertical Environments Shared by Humans and Bats Through Input from Climbers Visiting National Parks. National Park Service. $99,131.

Willcox, E. 2021 — 2025. TWRA Internship Program - Fisheries. Tennessee Wildlife Resources Agency. $59,280.

Willcox, E. 2021 — 2024. Environmental Contaminant Exposure and White-Nose Syndrome Vulnerability. U.S. Fish and Wildlife Service. $89,229.

Willcox, E. 2022 — 2026. Wildlife Management assistants to aid with data collection and management of game species. Tennessee Wildlife Resources Agency. $378,900.

Willcox, E. 2022 — 2025. TWRA Internship Program - Biodiversity. Tennessee Wildlife Resources Agency. $201,225.

Willcox, E. 2023 — 2027. NEX - ORNL Deer Check Stations. UT-Battelle — Oak Ridge National Laboratory. $8,000.

Willcox, E. 2023 — 2026. Roost Selection Of Tricolored Bats In The West Gulf Coastal Plain Of Arkansas. Arkansas Game and Fish Commission. $139,114.

Willcox, E. 2023 — 2024. Indiana Bat Maternity Colony Monitoring. Tennessee Wildlife Resources Agency. $22,045.

Willcox, E. 2024 — 2029. Data Collection at Deer Check Stations. Tennessee Wildlife Resources Agency. $20,000.

Willcox, E. 2024 — 2026. Dietary pathways of contaminant effects on bats in NRDAR cases. U.S. Geological Survey. $191,220.

Willcox, E. 2024 — 2029. NEX - ORNL Deer Check Stations. UT-Battelle — Oak Ridge National Laboratory. $8,000.

Xin, H. 2023 — 2028. CESU SOAP 2023 - 2028 - Leadership, Coordination and Administrative Oversight for the Southern Appalachian Mountains Cooperative Ecosystem Studies Unit.

Awards & Honors

STUDENTS

Zoey Best
Fourth Place in Painting, The Wildlife Society 2024 Southeastern Student Wildlife Conclave

Jake Bones
Best Student Presentation, Tennessee Chapter of The Wildlife Society's annual meeting

Rachel Brock
2024 Kentucky — Tennessee Society of American Foresters Scholarship

Ellie Burken
Best Student Presentation, Tennessee Chapter of The Wildlife Society's annual meeting

Jimmy Collins
First Place in Fly Casting, The Wildlife Society 2024 Southeastern Student Wildlife Conclave

Ricky Davis
Second Place in Pole Classification, 65th Association of Southern Forestry Clubs Conclave

Cohen Eastridge
Spring 2024 Top Graduate Award, Herbert College of Agriculture

Jake Ford
Fourth Place in Trap Setting, The Wildlife Society 2024 Southeastern Student Wildlife Conclave

Bereket Graves
First Place in Kayak Relay
Fastest Time in Squirrel Processing, The Wildlife Society 2024 Southeastern Student Wildlife Conclave

Hannah Guess
Second Place in Trail Camera Photography
Fourth Place in Drawing, The Wildlife Society 2024 Southeastern Student Wildlife Conclave

Bradley Hatcher
Fourth Place in Rifle, The Wildlife Society 2024 Southeastern Student Wildlife Conclave

David Holdridge
2024 Fulbright Scholarship

Samantha Kuschke
Jimmy & Ileen Cheek Graduate Student Medal of Excellence

Michael Radford
Second Place in Pole Felling, 65th Association of Southern Forestry Clubs Conclave

Katie Smith
2024 Basecamp Conference Scholarship

Haley Snyder
Third Place in Women's Bow Sawing, 65th Association of Southern Forestry Clubs Conclave

Kayla Stuart
2024 Young and Emerging Professionals Award, Urban and Community Forestry Society

Drew Turek
First Place in Kayak Relay, The Wildlife Society 2024 Southeastern Student Wildlife Conclave

UT Forestry Club — UT Chapter of Society of American Foresters
Fourth Place in men's bow sawing, women's crosscut sawing, and wildlife ID, 65th Association of Southern Forestry Clubs Conclave

UTK Wildlife and Fisheries Society
Best Student Subunit Award, Southern Division of the American Fisheries Society

UTK Wildlife and Fisheries Society
2024 Student Chapter of the Year Award, 78th Southeastern Association of Fish and Wildlife Agencies Annual Conference

UTK Wildlife and Fisheries Society
Fourth Place Overall, The Wildlife Society 2024 Southeastern Student Wildlife Conclave

FACULTY AND STAFF

Craig Harper
Career Achievement Award, Southeast Deer Study Group

David Harper
Undergraduate Research Mentor of the Year, UT Academic Honors Banquet

Matt Gray
Undergraduate Research Mentoring Award, Herbert College of Agriculture

Sharon Jean-Philippe
2024 Alex L. Shigo Award for Excellence in Arboricultural Education, International Society of Arboriculture

Niki Labbé
Named Director of Center for Renewable Carbon

Mi Li
Finalist for Forest Bioproducts Young Professional Award, American Institute of Chemical Engineers in the Forest Bioproducts Division

Lindsey Phillips
Named President-Elect, Tennessee Chapter of The Wildlife Society

Ryan Sharp
2024-2025 UT Anderson Center Entrepreneurship and Innovation Teaching Fellow

Emma Willcox
James R. Cox Professorship

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