

THE DUKE FOREST LOG

A bulletin from the
Office of the Duke Forest

Fall 2024



The Future of Research

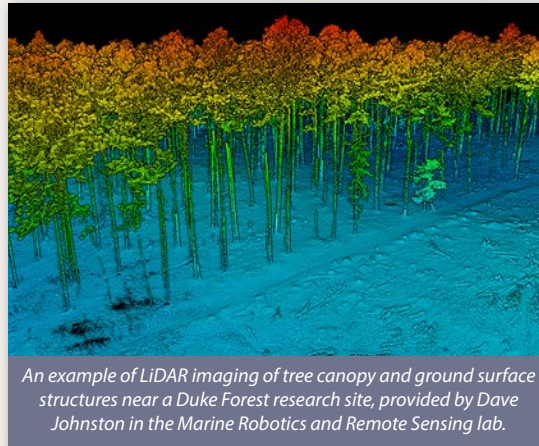
This year, as Duke University celebrates its centennial, it is appreciating the researchers, teachers, students, staff, and many others who have built Duke's reputation as a global leader in boundary-breaking research. Importantly, it is also looking forward and embracing new technologies and social paradigms that will continue to drive this work, especially as they apply to advancing the Climate Commitment. The previous default of individual, discipline-specific research, while still valuable, has shifted significantly toward highly collaborative, interdisciplinary approaches.

As a unique asset for innovative teaching and research for nearly as long as Duke has existed, the academic uses of the Duke Forest are evolving similarly. While historically and importantly the domain of ecologists and botanists, it is now also home to engineers, physicists, mathematicians, visual artists, writers, archaeologists, and historians, among others. Increasingly, it hosts teams of faculty, students, and staff from many different disciplines that are investigating novel questions and testing new technologies.

To adapt to changing research paradigms, the Duke Forest team has grown. This year, we welcomed **Lee Anne Reilly**, our first Assistant Director of Teaching and Research. Lee Anne's primary roles include facilitating day-to-day teaching and research uses, overseeing implementation of related strategic plan aims, and, importantly, providing enhanced



Assistant Director of Teaching and Research Lee Anne Reilly discussing sustainable forest management with event attendees.
Photo by Ryan Helsel, Duke University Press



An example of LiDAR imaging of tree canopy and ground surface structures near a Duke Forest research site, provided by Dave Johnston in the Marine Robotics and Remote Sensing lab.

capacity for special projects and programs. This extra capacity specifically supports Duke's Climate Commitment efforts, the push to expand experiential learning opportunities, and ongoing efforts to develop academic engagement around diversity, equity, inclusion, and justice. Lee Anne's leadership also helps shepherd research focused on issues affecting management of the Forest, ensuring that our decisions are founded on the most current science.

A collaboration with **Dave Johnston** and the Marine Robotics and Remote Sensing Laboratory is a terrific example of ongoing work that leverages new teams and new technology to answer Duke Forest management questions. Remote sensing by drones offers never-before-seen opportunities to acquire highly resolved and three-dimensional data about ecosystem structure and biodiversity. Right now, we are working on a plan with Dave's team to collaborate on a multi-year study that uses this technology to collect and analyze data we can use to assess the effects of our New Hope Creek Stream Restoration Projects (see the project update on page 6).

As Duke forges ahead into its second century, we have no doubt that the research hosted at the Duke Forest — conducted by increasingly diverse teams of people and answering the most pressing challenges of our day — will help uphold Duke's reputation as a world-class research institution.

The Duke Forest Teaching and Research Laboratory comprises over 7,000 acres of land in Durham, Orange, and Alamance counties and has been managed for research and teaching purposes since 1931. The mission of the Duke Forest is to facilitate research that addresses fundamental and applied questions across a variety of disciplines and to aid in the instruction of all students in their pursuit of knowledge, especially regarding the stewardship of our natural resources.

CONTACT INFORMATION:

Office of the Duke Forest
Duke University
Levine Science Research Center
Suite A233
Box 90332
Durham, NC 27708

Phone: 919-613-8013
E-mail: dukeforest@duke.edu

 dukeforest.duke.edu/newsletter

 facebook.com/dukeforest

 instagram.com/thedukeforest

dukeforest.duke.edu

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DUKE FOREST STAFF

Sara Childs
Executive Director

Tom Craven
Forest Supervisor

Craig Hughes
Maintenance & Infrastructure Manager

Zach Carnegie
Forest Technician

Kevin Egan
Protection & Safety Coordinator

Lee Anne Reilly
Assistant Director of Teaching & Research

Tyler Gibson
Assistant Director of Engagement

Maggie Heraty
Senior Program Coordinator

Tim Barco
Operations Coordinator

ADVISORY COMMITTEE

Lori Benneer, Chair
Stanback Dean of the Nicholas School of the Environment; Professor, Energy Economics and Policy

Dan Richter
*Professor, Soils and Forest Ecology
Nicholas School of the Environment*

Pat Halpin
*Professor, Marine Geospatial Ecology
Nicholas School of the Environment*

Nicolette Cagle
*Senior Lecturer, Environmental Science and Policy; Associate Dean, Diversity, Equity, and Inclusion
Nicholas School of the Environment*

Sari Palmroth
*Research Professor, Environmental Science and Policy
Nicholas School of the Environment*

Neal Flanagan
*Assistant Professor, Duke Wetland Center
Nicholas School of the Environment*

Bill LeFevre
*Executive Director
Sarah P. Duke Gardens*

William Tricomi
Associate General University Counsel

Edward Balleisen
*Vice Provost for Interdisciplinary Studies;
Professor of History*

Justin Wright
Graduate Dean for Trinity College of Arts & Sciences; Professor of Biology

Forest Greeting From the Director's Desk

As I write this, residents across our home state of North Carolina are reeling from the devastating and deadly impacts of Hurricane Helene. Our thoughts are with all those affected, and all of us on the Duke Forest team are finding ways to support disaster relief efforts. It's hard to pivot from this event to the usual focus of this director's update, but perhaps I can draw a connection in our common commitment to stay the course. We stand in solidarity with our entire community in the mountains for as long as it takes to endure, to rebuild, and ultimately one day, to thrive again.

Duke University is celebrating its 100th anniversary this year while the Duke Forest approaches its 94th as the University's largest teaching and research laboratory. As the front-page article highlights, the Forest's contributions to Duke's academic mission continue to grow and evolve, serving an even greater diversity of learners, researchers, and disciplines than ever before. It also remains vital in supporting Duke's efforts to achieve its other "outrageous ambitions." I'll paraphrase those here as a commitment to becoming a place of belonging for every person across our Duke and Durham communities, especially as we advance critically important efforts to tackle climate change and issues of equity and access.

Some of the ways we as the Office of the Duke Forest intend to help achieve these ambitions are laid out in our recently updated strategic plan. While we remain focused on the core goals of sustaining the Forest's resources, facilitating teaching and research, and engaging with the community, we easily incorporate opportunities around programs and projects that address Duke's ambitions in these areas.

Catalyzing this work are budding collaborations developing under our new Office of Climate and Sustainability umbrella and a reinvigoration of our role and connection to the Nicholas School of the Environment. Likewise, our team has grown this year to include two first-ever positions for the team: an Assistant Director of Teaching and Research and a Forest Protection and Safety Coordinator. These titles alone demonstrate the breadth of skill, expertise, and cooperation required to accomplish Duke and the Duke Forest's goals.



*Tim, Tyler, Sara, Craig, Lee Anne, Kevin, Maggie, Zach, and Tom
The Duke Forest Team*

When and where we work together, we can make achieving outrageous ambitions seem routine. And when we do that, we'll know we've done our job on behalf of the Forest, Duke, and hopefully our community too.

Sincerely,

Sara DiBacco Childs | Executive Director

Duke 100

— CENTENNIAL —

Join in the Centennial Celebration and learn more about Duke University's rich hundred-year history by visiting 100.duke.edu where you can read stories, see pictures and videos from the archives, and a list of upcoming events.

Teaching & Research



First and foremost, the Duke Forest is an outdoor classroom and living laboratory, and it is the mission of our office to facilitate this use through our daily operations and strategic initiatives. We help establish and maintain dozens of research projects every year; we assist faculty and teachers in creating high impact learning experiences for students of all ages; and we work directly with students interested in designing and conducting projects focused on any aspect of the Duke Forest.

Research Activities	
Research projects	64
Primary investigators	43
Institutional affiliations	17
Total research dollars	\$8,646,359 <i>(39 of 64 reporting)</i>

Teaching Activities	
Teaching activities	34
Educators	19
Class visits	133
Participating students	860

A Duke graduate student and an NC Wildlife Resources Commission biologist identify mussels during a relocation project held in advance of the restoration of New Hope Creek.

Management & Stewardship



Management of the Duke Forest is guided by a comprehensive plan that promotes the Forest's academic mission while ensuring the protection of its natural resources. Our holistic approach sustains a wide variety of benefits that are available to Duke University, as well as the broader academic and public communities. This management system is certified by Preferred by Nature to Forest Stewardship Council® guidelines, a strict set of environmental, social, and economic standards.

	Acres
Harvests	23
Regeneration	23
Stand Improvements	83
Pine release	55
Prescribed burn	28
Planting	23

	Miles
Road & Trail Maintenance	112
Ditch clearing	39
Road mowing	37
Side mount mowing	20
Trail work	13
Road surface work	3
Boundary Line Maintenance	9



Forest Supervisor Tom Craven slingshots a throw line to safely fell a hazard tree near research infrastructure.

Engagement & Outreach



The Duke Forest engages a large audience, including the Duke University community, local K-12 schools, and the general public. Through engagement and outreach, we leverage the Forest's resources to connect people with science, to educate about natural resources conservation and forest management, and to empower the public with information about issues affecting the environment. We rely on a critical core of volunteers to help us accomplish teaching, research, and management goals.

Volunteer Activities			
Community Science		Forest Stewards	
Data collection visits	246	Route visits	149
Volunteers	68	Volunteers	45
Volunteer hours	943	Volunteer hours	473
Stewardship Projects			
Events		3	
Volunteers		14	
Volunteer hours		40	

Outreach Activities	
Tours and activities	39
Participants	852
Outreach hours	90

Community scientist Ed Lunk monitors ephemeral wetlands for adult amphibians and their eggs and larvae to learn more about their populations.

Project Updates

Mentoring Student Projects

The Duke Forest team regularly proposes projects for courses and co-curricular offerings at Duke, giving students a unique and robust opportunity to apply their learning to the real world. In return, these projects offer our staff valuable support for investigating forest management questions and the viability of potential programs. This past year, our staff mentored three such student projects.

In spring 2023, the Duke Forest became a client and mentor for an interdisciplinary Bass Connections research team focused on using innovative technologies to monitor forest wildlife. The team of undergraduates, professional master's students, and Ph.D. candidates deployed camera traps, acoustic recorders, and terrestrial LiDAR in the Duke Forest and Ivindo National Park in Gabon. While the initial project has ended, Executive Director **Sara Childs**, Assistant Director of Teaching and Research **Lee Anne Reilly**, and Senior Lecturer **Nicki Cagle** continue to collaborate with some of the researchers. Together, they are working to determine viable methods for continuing to process huge volumes of raw data from the Duke Forest and to clarify next steps for additional research.

Last spring, Senior Program Coordinator **Maggie Heraty** worked with two graduate students in the Community-Based Environmental Management (CBEM) course at Duke's Nicholas School of the Environment to explore the potential for a Duke Forest Conservation Corps. The CBEM students researched various program structures and their alignment with Duke Forest's strategic goals and identified possible partner organizations and funding opportunities. Their efforts provided staff with the information needed to evaluate the program's potential at the Duke Forest.

This past summer, Maggie, Nicki, and Postdoctoral Researcher **Sarah Roberts** co-led a Duke Data+/Climate+ research project for students to explore data-driven approaches to interdisciplinary challenges. The students organized over five years of data from our Herpetofauna Community Science Program, improved the program's data entry system, and created a data visualization webpage. These outcomes allow our staff, community scientists, and researchers to more efficiently collect high quality data and investigate trends in the Forest's reptile and amphibian populations.



From left: Senior Program Coordinator Maggie Heraty, Harssh Golechha '26, Caroline Rowley '24, Senior Lecturer Nicki Cagle, Qianyu Zhu '25, Postdoctoral Researcher Sarah Roberts.

Leadership in Climate Initiatives

Previous *LOG* bulletins have shared about Duke University's ambitious Climate Commitment (CC) and the subsequent creation of the Office of Climate and Sustainability (OCS) to help marshal resources across the enterprise.

Though these initiatives and departmental structures are new, the Duke Forest's instrumental role in promoting sustainability, conservation, and stewardship of the natural world is not. Since the Forest's establishment in 1931, these tenets have been part of our mission and day-to-day work. This past year, our staff have contributed experience and expertise to an array of CC and OCS efforts:

Consisting of staff, faculty, students, and administrators from across Duke, the Climate Commitment Advisory Council (CCAC) is developing actionable work plans to implement the Climate Commitment and achieve a more resilient, flourishing, and carbon-neutral world. Duke Forest Executive Director **Sara Childs** serves on CCAC's Education subcommittee, and Assistant Director of Teaching and Research **Lee Anne Reilly** serves on the Research subcommittee.

Spring Breakthrough students and OCS staff lifting a herpetofauna coverboard to document the presence of amphibians and reptiles.

Photo by Bill Snead, Duke Communications

The Duke Forest staff also participated in several OCS gatherings and leadership retreats to develop relationships across the units and identify shared priorities for collaboration. Operations Coordinator **Tim Barco** served on a committee to collect Diversity, Equity, Inclusion, and Justice resources and best practices from each OCS unit. Sara, Lee Anne, and Senior Program Coordinator **Maggie Heraty** hosted meetings with education and engagement staff from other OCS units to align our approaches to experiential education and build the case for how our place-based units uniquely foster climate and sustainability fluency, personal transformation, and hope. Several of these staff, including Maggie, also co-led a Spring Breakthrough experience — a free, week-long program for Duke undergraduates to broaden their sustainability and climate knowledge and engage in outdoor learning.

Ensuring the Safety of Research and Recreation

The Duke Forest serves as a teaching and research laboratory for Duke University while also offering a place for people to recreate and connect with nature. Countless people enjoy time in the Forest, actively or passively receiving the many benefits that spending time in nature provides. Most visitors understand and appreciate the purpose of the Duke Forest and recreate responsibly. However, amidst a growing population, even a small proportion of people misusing it has outsized negative impacts.

To help protect the Forest and all the people using it, we recently added a new part-time position to our team. **Kevin Egan** is our inaugural Forest Protection and Safety Coordinator, and he spends his time in the woods interacting with recreators across the most popular areas of the Forest. Often, Kevin is the first opportunity visitors have to directly hear about the Forest's mission and goals. He also helps address unauthorized and unlawful activities by working with those involved and leveraging law enforcement's support when necessary.

"I see my primary purpose as ensuring the integrity of the research and keeping the Forest safe for students, staff, researchers, and recreational visitors," Kevin explains. He also notes that many recreational visitors are eager to support him, stating, "Whether it is a maintenance item such as a tree blocking a trail or letting me know about an unauthorized use of the Forest, I appreciate the help of these additional eyes and ears." We are excited to have Kevin as a part of our team and are thankful for his role in protecting the Forest.



Forest Protection and Safety Coordinator Kevin Egan stops for a picture during a monitoring shift.



Promoting Landscape Connectivity and Biodiversity

The Duke Forest continues to play a leadership role in the Triangle Connectivity Collaborative (TCC). The group's mission remains: to conserve and restore landscape habitat connectivity that ensures long term protection and resilience of biodiversity and natural resources in the region. TCC partners are currently working to implement the 2022 Strategic Action Plan, which provides strategies to improve connectivity across four focal areas: conservation, education, land use, and transportation.

The TCC's Transportation Working Group — chaired by **Ramona McGee**, a Senior Attorney and the Wildlife Program Leader at the Southern Environmental Law Center — continues to make strides. Ramona, Duke Forest Executive Director **Sara Childs**, and other TCC members have been serving on a technical advisory committee for the Durham-Chapel Hill-Carrboro Metropolitan Planning Organization (MPO). Spatial and field data generated by TCC helped catalyze the MPO's current work to create a plan that details how specific wildlife crossing areas can be improved during upcoming transportation projects. This effort demonstrates the critical role transportation planning can play in enhancing connectivity across our regional habitat network. Read more about this work on TCC's website [connectedconservation.org].

Our work with TCC is one of several examples that demonstrates Duke Forest's efforts to protect local and regional biodiversity. Promoting and restoring biodiversity is a well-recognized, essential strategy for ensuring the resilience of people and nature in the face of climate change. As showcased across this *LOG*, biodiversity conservation is a consistent focus of the Duke Forest's teaching, research, management, and community engagement.



Making an Impact

A Green Light for New Hope Creek Restoration Projects

Thanks to a combination of private and public support, the New Hope Creek Restoration Projects have received sufficient funding to enter final planning and design, and ultimately construction. New Hope Creek, a vital waterway that flows through the Duke Forest, is a crucial habitat corridor for numerous species and connects ecosystems across the region.

For decades, the Concrete Bridge and partially breached Billy Erwin Dam have degraded this creek, which is a primary tributary to Jordan Lake. To restore it, the planned projects will tackle three primary goals: (1) remove the Concrete Bridge; (2) construct a new, clear-span bridge to replace it; and (3) remove the defunct Billy Erwin Dam. By eliminating these obstacles, the creek will flow freely once again, improving water and habitat quality and restoring connectivity for native species like the federally threatened Atlantic Pigtoe mussel (*Fusconaia masoni*) and its host fish, the Creek Chub (*Semotilus atromaculatus*).

Funding for the projects was secured through partnerships and generous private donations. Working with our friends at Triangle Land Conservancy, we secured a grant from the North Carolina Land and Water Fund. A leadership level gift from **Brad and Shelli Stanback**, along with significant donations from **Alston Gardner** and **Adam and Rosalind Abram** helped us reach the threshold necessary to begin the projects.

"Having walked its trails since I was five years old, connecting with nature has always been central to my relationship with the Duke Forest," Gardner says. "By supporting this effort to restore vital habitats, I hope to help the Forest continue to thrive as a healthy environment for both wildlife and visitors like me."

As the projects progress, the Duke Forest team is excited about the opportunities they will bring for research, teaching, and community engagement. A recent mussel survey and reintroduction completed in partnership with the NC Wildlife Resources Commission is just one example of how the projects can engage students, researchers, and recreational visitors in

meaningful, hands-on learning experiences.

Our team is deeply grateful for the support that has set these projects into motion. We are eager to begin the work of restoring New Hope Creek, creating a healthier, more resilient ecosystem for all.

These restoration projects embody Duke University's commitment to research, education, and environmental stewardship and importantly, what we can achieve through partnership. Whether it's a small project or a multi-year initiative like this one, there are always opportunities to get involved with the work to steward this land. If you are interested in partnering with us to support these efforts, please reach out at dukeforest@duke.edu.



Duke graduate students from the Nicholas School of the Environment examining Notched Rainbow Mussels (*Villosa constricta*) before they are reintroduced into New Hope Creek.

Friends of the Duke Forest

The **Friends of the Duke Forest** are our foundation of support. When you become a Friend of the Duke Forest, you are part of the network of neighbors, community members, and Duke faculty, staff, and students that make our work possible. Show your dedication and appreciation for this irreplaceable resource by **donating \$50 or more per year**. You will receive a Friends of the Duke Forest car decal!

dukeforest.duke.edu/friends

Preserving the Forest Through Planned Giving

For over 90 years, the Forest has grown and evolved, innovative climate research has been conducted, and visitors have connected with nature in educational and recreational settings. Making a planned gift to the Duke Forest is one of many ways to preserve and advance this invaluable resource for decades and centuries to come.

Friends of the Forest **Susan Ross** and **Tom Hadzor** recently updated their estate plans, with Susan including the Duke Forest as a beneficiary in her will. The easy process of updating her estate plan and notifying Duke of the planned gift made it an appealing way to give back. "My husband and I thought about not just the people, but also the causes and places that were most important to us. The Duke Forest is one of those cherished places and including a bequest to the Duke Forest Improvement Fund in addition to what we will do for our family just made sense," Susan reflects.

As a lifelong Durham resident, Susan has been hiking and picnicking in the Forest since she was a little girl, and her kids grew up with the same positive experiences as neighbors of the Forest. "The Duke Forest has long been an important connector between the University and Durham, connecting local community members with nature, so supporting that matters to me," Susan says. "I trust the Forest team to use the bequest someday to care for the trails and facilities that make the Forest an important educational and recreational resource for all of us."

If you are interested in making a planned gift to preserve the legacy of the Duke Forest for the benefit of current and future generations, please visit dukeforest.duke.edu/give for more information or contact our team at dukeforest@duke.edu.



Susan Ross standing by the Bobby Ross, Jr. Memorial Shelter, dedicated to her late husband in 1995.



Emma Childs, inaugural Bruce and Ginny Roberts Intern, taking plot data for the hardwood regeneration project.

Supporting Experiential Education for Future Foresters

The Duke Forest provides a unique setting for hands-on learning, and one of the ways our staff help train the next generation of forest stewards is through our summer internship program.

This summer, our student interns **Emma Childs** (Master of Forestry and Environmental Management candidate) and **Sadie Horner** (Master of Forestry candidate) leveraged lessons from their coursework to support Duke Forest management operations. For example, Emma and Sadie updated and then implemented a data collection system to inventory available research infrastructure, which staff use to facilitate projects. They also supported an important effort to assess oak regeneration in areas that have undergone active timber management, which staff will use to plan future treatments.

When asked to reflect on her time in the Forest, Emma shared, "I'm more grounded as a result of spending

all the hours within these forested stands and groves. I'm glad for the chance to connect what I've been learning in the classroom with the day-to-day management that happens here amongst the field staff across these 7,100 acres. I'm humbled by what it takes to manage and steward the forest well. I'm struck by the effort it takes to give attention to all the creatures who make it their home."

The Bruce and Ginny Roberts Internship Fund, established by the Roberts family in 2023, alongside ongoing support from Toney Lumber Company, Inc. provides funding for these student experiences. If you are interested in securing or adding to this base of support, please contact our team at dukeforest@duke.edu.





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Peter Jeff Nicholls