

MOUNTAINS

Meet wild creatures native to 'sky islands'



Word from the Smokies
Aaron Searcy
Columnist

A new study is taking a closer look at the startling forms of life that exist only on some of Appalachia's highest mountaintops — some of which are in Great Smoky Mountains National Park. On these ancient peaks, dubbed 'sky islands,' are the last living remnants of the region's endangered spruce-fir forest dating back to the last ice age.

"Practically everything we're studying is less than four millimeters long," said Dr. Michael Caterino, director of the Clemson University Arthropod Collection and a lead researcher for the study along with Dr. Paul Marek of Virginia Tech University. For reference, that's a scope of study a little smaller than the width of a standard pencil eraser.

"You can walk through the forest and never see any of these things," he added. "They are underfoot by the millions, but most people are completely unaware of them."

The creatures at the heart of the National Science Foundation-funded study are called litter arthropods — tiny invertebrates that live within leaf litter on the forest floor including millipedes, mites, spiders, and beetles.

"Just because they're inconspicuous doesn't mean they're not fascinating," said Caterino. "They're beautiful little creatures with incredible diversity."

Caterino will be sharing images that document that diversity along with his own insights into the world of arthropods at this month's Science at Sugarlands speaker series hosted by park partner Discover Life in America (DLiA). Registration is currently open at dlia.org for the free online event set for 1 p.m. June 18.

Caterino and his colleagues are specifically collecting arthropods found in Appalachian mountaintops with an elevation higher than 5,000 feet. Sample sites include Mount Mitchell, Grandfather Mountain, Mount Hardy, and several peaks in GSMNP.

The researchers are particularly interested in these places and the rare spruce-fir forests found there because they host species that don't live anywhere else. Learning more about the



Dr. Michael Caterino, director of the Clemson University Arthropod Collection, sifts leaf litter to collect the small arthropod specimens at the center of the three-year Litter Arthropods of High Appalachia project.

PROVIDED BY KAYLA RUTHERFORD/CLEMSON UNIVERSITY



An array of litter arthropods documented so far by the three-year Litter Arthropods of High Appalachia project funded by the National Science Foundation. PROVIDED BY DR. MICHAEL CATERINO AND DR. PAUL MAREK

many forms of life dependent on these forests will also help public land managers protect them. Southern Appalachian spruce-fir forests are considered

some of the most endangered ecosystems in the United States due to the pressures of climate change, acid precipitation, and invasive pests like the

balsam woolly adelgid.

To collect samples for the study, researchers screen handfuls of coarse leaf litter down into gallon-sized batches of fine litter. That fine litter is then carried back to a lab for more intensive scrutiny and sorting, photography, and DNA sequencing.

What can be found in a single pile of litter can be surprising.

"One of those gallon samples can have five thousand individual arthropods," said Caterino. "At a single site, we've had as many as 220 different species from just one small bag of litter." Each one of these species is playing an important role in the spruce-fir ecosystem.

"Ultimately this community is really critical for recycling dead plant materials and ensuring there is nutritious soil there for subsequent generations," he continued. "But they also include predators and parasites, so there is a whole ecological network going on there."

Beyond breaking things down, litter arthropods provide significant food sources to larger animals like birds and lizards.

Despite the progress made over the last year of study, much remains to be learned about Appalachia's sky islands and litter arthropods in general. One of Caterino's hopes is that his work will encourage other biologists and students to enter a field with many major discoveries yet to be made.

"There is this sense that we know most things that are out there, but in the arthropod world, I'd be surprised if more than 10% of species globally were already known," said Caterino. "We've got a long, long way to go."

Although the project's collection and cataloging efforts will continue for at least another year, anyone with a smart phone can contribute to the better understanding of Appalachia's endangered forests by using the iNaturalist identification app to share photos of the wildlife and vegetation seen along the way on their next trip to a local Southern Appalachian sky island.

Aaron Searcy is a publications associate for the 28,000-member Great Smoky Mountains Association, an educational nonprofit partner of Great Smoky Mountains National Park. Learn more at smokiesinformation.org and reach the author at Aaron@gsmas-soc.org.

Senate gives final OK to bill with \$2B tax cut, end of corporate income tax

ASSOCIATED PRESS

RALEIGH — Legislation that includes more than \$2 billion in tax reductions over the next two years and the phase-out of North Carolina's corporate income tax by 2028 received bipartisan approval again in the Senate on Thursday.

The Republican-authored measure, which also would send up to \$1 billion in federal COVID-19 recovery aid to hundreds of thousands of businesses and nonprofits, already received the Senate's initial OK on Wednesday. Seven Democrats joined all Republicans present in voting 34-13 for the bill on Thursday.

The bill now heads to the House,

where action isn't expected. Rather, the Senate will insert the package in its state government budget plan later this month and negotiate it with the House after that chamber approves a competing tax and spending proposal.

The Senate plan would reduce the individual income tax rate of 5.25% to 4.99% next year, and increase the amount of income not subject to taxes for all filers by increasing the standard and per-child deductions. The corporate rate — currently the lowest among those states that have such a tax at 2.5% — would start falling in 2024.

Democrats opposing the bill say it would give tax breaks to out-of-state corporations and high wage-earners that don't need them.

STATE BRIEFS

Teacher accused of assaulting at-risk teen at school

ALBEMARLE — An assistant instructor at a military-style school for at-risk teens is accused of sexually assaulting a student in her dorm room, a North Carolina sheriff's office said.

The Stanly County Sheriff's Office said Cody Lee Eudy, 28, was arrested on May 30 and charged with second-degree forcible sex offense and sexual acts with a student, The Charlotte Observer reported.

Stanly County Sheriff Jeff Crisco said the charges stem from an incident at the Tarheel Challenge Academy in New London on May 29. Crisco said it occurred on a night when no female staff members were on duty. He said deputies were called to the academy on May 30 and spoke with the victim and then called for a detective, The detective spoke with Eudy, who cooperated and was charged, the sheriff said. The story was first reported by the Stanly News & Press.

The Tarheel Challenge Academy is

a quasi-military style program for at-risk teens 16 to 18 years old and sponsored by the North Carolina National Guard as part of the National Guard Youth Challenge Program, the academy's website says.

Eudy is jailed on a \$100,000 bond.

Police: Girl, 7, killed in rollover crash

FAYETTEVILLE — A 7-year-old girl was killed in a rollover crash in Fayetteville, police said.

Officers responded to a crash involving a Ford Explorer just before 2 a.m. Thursday near the intersection of state Route 87 and Eastern Boulevard, news outlets reported.

Police believe the SUV went off the highways onramp and rolled over numerous times, throwing the girl from the vehicle. The girl, identified as Perfection Simek of Fayetteville, taken to a hospital, where she was pronounced dead, police said.

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