

## Updates from Our Natural Areas

### Taylor Fork Ecological Area

The TFEA student work crew took on some major habitat management tasks this past year. Addison McCoy, an intern from Recreation and Parks Administration Department, worked with Hunter Loyall and Wyatt Ruckel to clear cedar trees from 5 acres. This work helps to maintain the early successional habitat at TFEA. Hunter and Ted Brancheau made good use of their credentials as certified pesticide applicators by treating thousands of invasive plants. In particular, they focused on reducing Osage Orange, Bush Honeysuckle, Japanese Honeysuckle, and Multiflora Rose. Dr. David Brown, Faculty Manager, polished his credentials as a tractor mechanic by successfully troubleshooting a pesky ignition and fuel problem on Roberta, the 1971 Ford Tractor inherited from Lilley Cornett Woods.

Classes from several departments continue to make good use of TFEA for field trips and student research projects. The Nature Walk series continues to be popular with students and community members. Recent walks had themes related to wildflowers, birding, and pollinators. In late January of 2019 there was a significant chemical spill from the Sherwin Williams paint factory in the headwaters upstream of TFEA. The KY Division of Environmental Protection responded to the spill, but it still caused a major fish kill. Faculty from Biological Sciences plan to track the recovery of the stream as part of class projects.



### Maywoods Environmental and Education Laboratory

This was another exciting and productive year with a variety of EKU classes, regional school groups, student organizations, community groups and individuals utilizing Maywoods for education, research and outreach. EKU's Wildlife Population Analysis class conducted an annual mast survey at Maywoods as part of a state wide study by the Kentucky Department of Fish and Wildlife. An Eagle Scout project was completed in December 2018. Andrew Sission, Richmond, KY Troop 1014, designed and installed new trail signs along the Tree Identification trail. This project is a nice upgrade to our trail system. Improvements in the lodge include new ceiling tiles and LED lighting in both dorm areas and reupholstered sofas in the main room. We continue to collaborate with Shannon McCarthy to develop an interesting and educational information board.

We are excited to welcome Kenna Smith as an intern at Maywoods this spring. Kenna is a Parks and Recreation student.



### Lilley Cornett Woods Appalachian Ecological Research Station

We have had an unusual amount of rainfall in 2018. From Jan 1 – Dec 31, Lilley Cornett Woods recorded an astonishing 58.42 inches of precipitation. The typical average is 44 inches a year. Many of the projects at Lilley Cornett Woods have been put on hold until dryer conditions prevail.

Lilley Cornett Woods hosted a three day "yard sale" at the historic Craig-Ledford House. The items for sale once belonged to the Craig-Ledford family and were left with the house when Eastern Kentucky University purchased the property. The sale was a major success. The proceeds will be used for repairs and renovations on the property.

Recently, 493 hemlock trees were treated for hemlock woolly adelgid. A huge thanks goes to James Madden and the Kentucky Division of Forestry personnel for assistance with the treatment.

In the fall, new boundary signs were placed around the Craig-Ledford property. Approximately 90% of the boundary signs placement around Lilley Cornett Woods have been completed as well. Unfortunately, many of the signs have had to be put in 2 or 3 times due to bears chewing on them.



ISSUE

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Spring  
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# EKU Division of Natural Areas Spring 2019 Newsletter



## Upcoming Events

### March

Mar 19:  
American Woodcock  
Viewing at TFEA

Mar 30 – Apr 7:  
Service Learning Pro-  
gram, Costa Rica

### April

Apr 13:  
Maywoods 5K Trail Race  
and Family Fun Run

April 27:  
Maywoods Service Pro-  
ject

### May

May 4:  
Maywoods Family Nature  
Day

### June

Jun 3-5:  
Lilley Cornett Woods Field  
Camp & 3rd Annual William  
Martin Appalachian Re-  
search Symposium



## This issue

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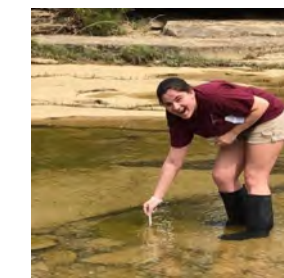
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## Challenges and Changes

Throughout the Commonwealth of Kentucky, institutions of higher education experienced a variety of challenges during 2018. Eastern Kentucky University and our Division of Natural Areas were not exempt from those challenges and the resultant changes. Due to budgetary issues we lost our Seasonal Tour Guide at Lilley Cornett Woods as well as endured another decrease in our operating budget. Despite these challenges we continue to find ways to implement our mission — "protect and restore for posterity EKU's unique Natural Areas while supporting innovative student experience and regional engagement through multidisciplinary research, public outreach and experiential teaching and learning."

The changes have primarily affected the members of the Natural Areas team. In October, through collaboration with the College of Science and the Kentucky Environmental Education Council, we added an Environmental Education Leadership Corp volunteer to our staff, Mahala Watts. Mahala has a B.S. in Biology from EKU and is currently working on her Master's in Recreation and Park Administration. In a few short months, she has become a valuable contributor by taking over planning and organizing of the Saturday Morning Science sessions, developing an evaluation project for our school programs and collaborating with Adrian Nix at Model Lab School to do weekly environmental education programming with 6th graders.

Additional notable changes in personnel on the horizon include the retirement of Robert Watts, long time manager of Lilley Cornett Woods and Director, Melinda Wilder. Robert has contributed to the success and well being of the unique forest at Lilley Cornett Woods for 47 years. He began his career at Lilley Cornett Woods as a Forestry Aide, April 1972, for the Kentucky Division of Forestry and eventually transitioned into the manager position in 1999. Rob has been recognized for his dedication and exemplary service by the American Chestnut Foundation, the National Weather Service, and EKU's President, Dr. Michael Benson. Dr. Melinda Wilder has served as Director since 2005 and has brought her expertise and passion for environmental education to the Division's programs.





### Environmental Education in Our Natural Areas

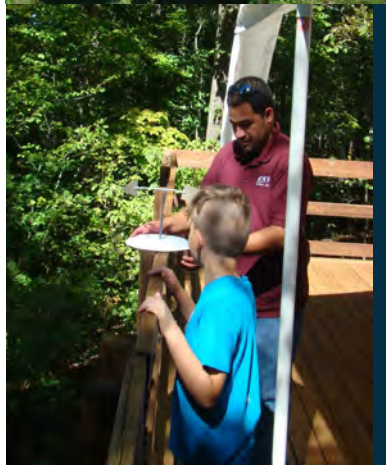
As in the past years, environmental education outreach continues to be an important component of the Natural Areas' mission. This year we decided to revise our curriculum offerings to better align with the Kentucky's Science Academic Standards. The goal was to engage the students in 3 dimensional science learning activities based on grade level topics, using the natural environment setting. The curriculum change was well received by the teachers and students that participated in our spring programming. Natural Areas staff and our student interns enjoyed working with 1,146 enthusiastic K-12 students from 7 surrounding counties at Maywoods and another 95 Letcher County middle school students at Lilley Cornett Woods. A rainy fall prove to be a challenge for some of the groups scheduled to come to Maywoods. To make sure the 214 elementary students still had the opportunity to participate in hands-on, environment-based, learning experiences, we modified the activities to deliver the program at 3 different elementary schools— Berea Community School, Stanford Elementary and Roundstone Elementary. Students and teachers alike benefit from these events whether happening in a Natural Area or on the school grounds.



### Research Experience for Undergraduates

The second year of the NSF funded Research Experiences for Undergraduates (REU) focused on Disturbance Ecology in Appalachia took place over 10 weeks during the summer of 2018. Ten students from across the country worked with ECU faculty and students to conduct research projects. These projects took place throughout the Appalachian region of Kentucky, with the following five projects being conducted primarily at LCW:

- Kevin Faccenda, Millersville University, Mentor: Dr. Jennifer Koslow. Quantifying Changes in Herb Layer Diversity as *Microstegium vimineum* Invades an Old Growth Forest in Eastern Kentucky.
- Sarah Sheehan, Mary Baldwin University, Mentor: Dr. Luke Dodd. Estimating Mammalian Diversity Along Trails in Relation to Old Growth Using Camera Traps.
- Cody Beavers, Dalton State College, Mentor: Dr. Amy Braccia. Macroinvertebrate Flux Between Aquatic and Terrestrial Systems in a Disturbed Headwater Stream in the Southern Appalachian Mountains.
- Pavlina Slezak, Occidental College, Mentor: Dr. David Brown. Variation in Bird Foraging Behavior and Abundance Between Hemlock Forested Sites Treated and Untreated for Hemlock Woolly Adelgid.
- Emily Jones, Eastern Kentucky University, Mentor: Dr. Stephen Richter. The influence of Salamanders on Leaf Litter Decomposition Rate in Headwater Streams of Lilley Cornett Woods, an Old Growth Forest.



### Upcoming Summer Field Courses

During the summer of 2019, we are offering three field courses based at Maywoods that will visit Taylor Fork and Lilley Cornett Woods. The courses are Field Ichthyology, Field Botany, and Ecology for Teachers. All participants enrolled in our summer courses reside in the lodge at Maywoods free of charge. Contact Stephen Richter ([stephen.richter@eku.edu](mailto:stephen.richter@eku.edu)) for more information.



### Natural Areas Research Highlights, 2018

**Our Student Grant in Aid Program** provides funding for students, up to \$500 plus free lodging, to conduct research at ECU's Natural Areas as part of the study. The deadline to apply is 1 April 2019, but we also have a rolling deadline that allows funding for time-sensitive or solicited projects. See <http://naturalareas.eku.edu/student-grant-aid-program> for more information. To date, we have funded twenty research projects!!

### Peer Reviewed Publications

The Natural Areas met a milestone by having its 50th peer reviewed publication this year! To date, 54 publications have resulted from research focused at one or more of our Natural Areas or included them as a study area for regional research. Below are the recent additions:

- Bradley, M.J., Sharp, R.L., Bradley, C., & Riley, T. 2017. A pre-test post-test pilot assessment of environmental education on youth's knowledge and intended behavior changes. *KAHPERD Journal* 54:24–31.
- Guidugli-Cook, M., S.C. Richter, B.J. Scott, and D.R. Brown. 2017. Field-based assessment of wetland condition, wetland extent, and the National Wetlands Inventory in Kentucky, USA. *Wetland Ecology and Management* 25:517–532.
- Hutton, J.M., S.J. Price, and S.C. Richter. 2017. The diet of the Cumberland Plateau Salamander (*Plethodon kentucki*) in an old-growth forest of southeastern Kentucky. *American Midland Naturalist* 178:144–150.
- Sharp, R.L., Bradley, M.J., Maples, J. 2017. A methodological evaluation of an environmental education survey: Is there a technological advantage? *Journal of Outdoor Recreation, Education and Leadership* 9:275–279.
- Baecher, J.A.\* and S.C. Richter. 2018. Environmental gradients in old-growth Appalachian forest predict fine-scale distribution, co-occurrence, and abundance of woodland salamanders. *Ecology and Evolution* 8:12940-12952.
- Hutton, J.M.\*, R. Leloudis\*, and S.J. Price. 2018. *Desmognathus walteri* (Black Mountain Salamander: Cannibalism. *Herpetological Review* 49:296.
- Hutton, J.M.\*, S.J. Price, and S.C. Richter. 2018. Diet of the Black Mountain Salamander (*Desmognathus walteri*) in southeastern Kentucky. *Herpetological Review*:12–19.
- Chapman, J.I., and R.W. McEwan. 2018. The role of environmental filtering in structuring Appalachian tree communities: Topographic influences on functional diversity are mediated through soil characteristics. *Forests* 9, 19; doi:10.3390/f9010019.
- Chapman, J.I., and R.W. McEwan. 2018. Topography and vegetation patterns in an old-growth Appalachian forest: Lucy Braun, you were right! Pp. 83–98 In: A. M. Barton and W. S. Keeton (eds.) *Ecology and Recovery of Eastern Old-Growth Forests*. Island Press, Washington, DC.

### Ongoing and recently completed research projects

\* = grant-in-aid project; <sup>u</sup> = undergraduate student; <sup>g</sup> = graduate student

### Maywoods Environmental and Educational Laboratory

- Clinal Patterns of Local Adaptation in Eastern Deciduous Forest Mammals:** Dr. Andreas Chavez (Ohio State University)
- Annual Output of Oak and Hickory Mast Output:** Dr. David Brown (EKU Biology and Natural Areas), students in WLD 382 (EKU Biology).

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### Research Projects (continued)

#### Lilley Cornett Woods

- Estimating Mammalian Diversity Along Trails in Relation to Old Growth Using Camera Traps: Sarah Sheehan<sup>u</sup>, REU student (Mary Baldwin University), and Dr. Luke Dodd (EKU Biology).
- Variation in Bird Foraging Behavior and Abundance Between Hemlock Forested Sites Treated and Untreated for Hemlock Woolly Adelgid: Pavlina Slezak<sup>u</sup>, REU student (Occidental College), and Dr. David Brown (EKU Biology and Natural Areas).
- Insect Emergence from a Disturbed Headwater Stream in the Southern Appalachian Mountains: Cody Beavers<sup>u</sup>, REU student (Dalton State College), and Dr. Amy Braccia (EKU Biology).
- The Influence of Salamanders on the Leaf Litter Decomposition Rate in Headwater Streams in Lilley Cornett Woods. Emily Jones<sup>u</sup> (EKU Biology), Dr. Amy Braccia and Dr. Stephen Richter (EKU Biology and Natural Areas).
- Quantifying Changes in Herb Layer Diversity as *Microstegium vimineum* Invades an Old Growth Forest in Eastern Kentucky: Kevin Faccenda<sup>u</sup>, REU student (Millersville University), and Dr. Jen Koslow (EKU Biology).
- Taylor Fork
- Ecosystem functional consequences of top predator mortality in ephemeral ponds, due to the invasive shrub, *Lonicera maackii*: Josey Berta<sup>g</sup> and Dr. Cy Mott (EKU Biology)
- Ecosystem functional consequences of body size variation in an apex predator: David Smith<sup>g</sup> (EKU Biology) and Dr. Cy Mott
- Running Buffalo Clover restoration strategies: Dr. Jennifer Koslow, Bailey King<sup>g</sup>, Claire Kelley<sup>u</sup>, Faithe Goff<sup>u</sup>, and Ted Brancheu<sup>u</sup> (EKU Biology)
- Temperature profiles of three-chambered bat houses at Taylor Fork Ecological Area: Elizabeth Robinson<sup>u</sup>, and Dr. Luke Dodd (EKU Biology)