



## NEW STUDIES AT THE HEE

This summer, two new research projects have started on the HEE.

### Fungi

Graduate student Stephen Russell from Purdue University is looking at changes in fungal community structures of white oak as a response to forest management. He is working on his Ph.D. with Dr. M. Catherine Aime in the Botany and Plant Pathology department.



### Earthworms

Graduate student Gwendolyn Lloyd from Miami University in Ohio is utilizing HEE research sites to expand her project looking at the interactions among invasive earthworms, leaf litter, and soil invertebrates. Gwendolyn is working on her Ph.D. with Dr. Tom Crist.



## The HEE Update in Numbers

- 13 years of data collection
- 10 years of post-harvest data collected
- 57 publications in peer-reviewed journals
- 28 published theses and dissertations
- >200 undergraduate and post-graduate technicians have worked on the HEE
- 22 different primary investigators have done a project on the HEE from 8 different universities

## New HEE Graduate Students

### Katelyn Harrison

Katelyn Harrison is a new Master's of Science graduate student at Ball State University working under Dr. Tim Carter. Her Master's project is studying bat use of upland man-made ponds in and around the HEE research sites via acoustic recordings. She hopes her project will provide answers to why certain ponds are more favorable to bats than others and subsequently provide information that will create forestry practices and policy for the betterment of bats. She is originally from California and looks forward to diversifying her ecological knowledge by working within the HEE.



### Brandon Connare



Brandon hails from Buffalo, NY and joins the HEE after spending several years working on a variety of avian research projects throughout the United States. He is now working on his M.S. degree with HEE Researcher Dr. Kamal Islam at Ball State University. Brandon is examining the differences between the territories and home ranges of Cerulean Warblers and how they change throughout the nesting cycle.

### Alex Sharp

Alexander Sharp is a new Master's student studying Cerulean Warblers with Dr. Kamal Islam at Ball State University. He returned to the HEE this summer as a graduate student after spending last summer as a technician for the Cerulean Warbler project.

### New HEE & HEE-Related Publications

**Kellner, K.F., Ruhl, P.J., Dunning, J.B., Barnes, K.W., Saunders, M.R., and R.K. Swihart.** 2018. Local-scale habitat components driving bird abundance in eastern deciduous forests. *The American Midland Naturalist*, 180(1): 52-65.

**Bergeson, S.M., O'Keefe, J.M., and G.S. Haulton.** 2018. Managed forests provide roosting opportunities for Indiana bats in south-central Indiana. *Forest Ecology and Management*, 427:305-316.

**Divoll, T.J.,** Brown, V.A., Kinne, J., McCracken, G.F., and **J.M. O'Keefe.** 2018. Disparities in second-generation DNA metabarcoding results exposed with accessible and repeatable workflows. *Molecular Ecology Resources*, 18(3):590-601. <https://doi.org/10.1111/1755-0998.12770>

## HEE Field Tours

### Central Hardwood Forest Conference

The 21st Central Hardwood Forest Conference was held in Bloomington, IN in May. Participants had an opportunity on the last day of the conference to visit a HEE research site and hear from various HEE researchers. Attendees learned about the bat, salamander, breeding bird, beetle, fire, and ruffed grouse studies taking place at the HEE as well as research taking place at the IU Flux Tower in Morgan-Monroe State Forest.

### The Natural Resources Teachers' Institute

This summer we once again had the opportunity to talk with participants from the Indiana Natural Resources Teachers' Institute. The Institute is coordinated by Project Learning Tree, Purdue FNR Extension and the Indiana DNR. Unfortunately, the group did not get to visit the HEE sites due to inclement weather but did get to hear about the various HEE projects and how different survey techniques could be incorporated into the classroom.

*Photos on the right from the Central Hardwood Forest Conference Field Tour: Dr. Jeff Holland sharing information with the group about wood-boring beetle findings and showing some of the beetle species he has caught on HEE Research sites (top); Brian MacGowan sharing findings from the salamander and timber rattlesnake projects (bottom).*



Interested in scheduling a tour of the HEE for your group?  
Please contact the HEE Project Coordinator at  
[freemac@purdue.edu](mailto:freemac@purdue.edu)

**Ruhl, P.J., Kellner, K.F., Pierce, J.M., Riegel, J.K., Swihart, R.K., Saunders, M.R., and J.B. Dunning.** 2018. Characterization of Worm-eating Warbler (*Helmitheros vermivorum*) breeding habitat at the landscape level and nest scale. *Avian Conservation Ecology*, 13(1):11. <https://doi.org/10.5751/ACE-01185-130111>

**Delancey, C., MacDonald, G., & Islam, K.** 2018. American Redstarts ( *Setophaga ruticilla* ) usurp Cerulean Warbler ( *Setophaga cerulea* ) nest in Southern Indiana. *The Wilson Journal of Ornithology.*, 130(2), 554-558.

**Ruhl, P., Delancey, C., & Dunning, J.** 2018. Roost preference, postfledging habitat use, and breeding phenology of adult female Worm-eating Warblers ( *Helmitheros vermivorum* ) on the breeding grounds. *The Wilson Journal of Ornithology.*, 130 (2), 397-409.

New HEE & HEE-Related  
Publications

## Photos from the Field Season



**Photo captions go clockwise from top-left:**

A Royal Walnut Moth that was attracted to one of the traps during summer moth surveys (*photo: Charlotte Owings*)

The BSU “bat crew” (Jackson Schoettle and Katelyn Harrison) getting ready to deploy acoustic equipment (*photo: Charlotte Owings*)

An eastern box turtle trying to stay cool in leaf litter on a hot day in one of the HEE Research areas (*photo: Charlotte Owings*)



A female (left) and male (right) Cerulean Warbler banded by the “Cerulean Warbler crew” from Ball State (*photo: Brandon Connare*)

The “bat crew” from Indiana State University all smiles (from left to right: Curt Hoffman, Chloe Story, Reed Crawford, Liz Beilke, and Alex Lewis; *photo: Liz Beilke*)

One of the four trap types put out this summer as part of the wood-boring beetle study (*photo: Charlotte Owings*)



## Congratulations Clayton, Garrett, and Patrick!

### Garrett MacDonald

Congratulations to Garrett MacDonald who successfully defended his Master's thesis at Ball State University. Garrett's thesis is entitled "Geographic song variation and dawn singing behavior of the Cerulean Warbler (*Setophaga cerulea*)". Garrett was advised by HEE Researcher Dr. Kamal Islam.

Congratulations Garrett!

### Patrick Ruhl

Congratulations to Patrick Ruhl who successfully defended his Ph.D. Dissertation at Purdue University. Patrick's dissertation is entitled "Postfledging habitat associations of mature forest birds in South-central Indiana". Patrick was advised by HEE Researcher Dr. Barny Dunning.

Congratulations Patrick!

### Clayton Delancey

Congratulations to Clayton Delancey who successfully defended his Master's Thesis at Ball State University. Clayton's dissertation is entitled "Habitat use by fledging Cerulean Warblers (*Setophaga cerulea*) and roost site selection by adult male Cerulean Warblers during the breeding season in southern Indiana". Clayton was advised by HEE Researcher Dr. Kamal Islam.

Congratulations Clayton!

### *What's Happening at the HEE this Fall?*

- Prescribed burns
- Spider surveys
- Mast production and removal surveys

\*Be on the lookout for job opportunities for spring/summer 2019. They will be posted on the HEE website in early January.



### Hardwood Ecosystem Experiment

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