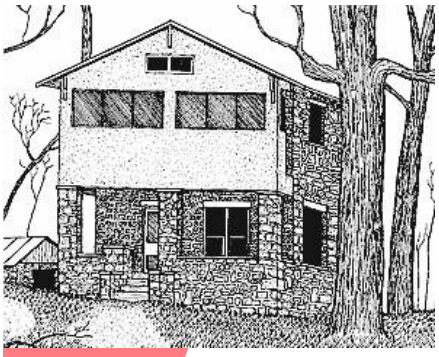

# Bull Shoals Field Station Newsletter

**Winter 2014-15**

## Inside this issue:



## Class/Events in 2014

- Herpetology (B. Greene), June 5
- Plant Taxonomy (Bowe), Apr 12 & 26
- Advanced Limnology (Havel), Apr 25-27
- Kirbyville Middle School Field Days (Prussia), Jun 9, 16
- GLADE (J. Greene, Prussia), Jun 20-26
- Ozark Lichen Ecology (Prussia), Jul 15-16; 22-23
- MU Researchers (Womack), Jun2 8-Jul 20
- Plant Ecology (Wait), Oct 20
- Woody Plants ID (Bowe), Sep 27, Oct 4
- MO Herpetological Society Meeting, Sep 27-28
- Mammalogy Weekends (Robbins), Oct 9-12, 17-19
- Master Naturalists Retreat (Cantrell), Oct 24-26
- GLADE Reunion, Nov. 9
- Christmas Bird Count (J. Greene), Dec. 26-27

## BSFS Notes

*Northern Saw-whet Owls banded in December 2014*

Just as the list of bird species banded at the BSFS increases with the addition of two Northern Saw-whet Owls in December 2014, so does the list of national environmental education programs, or "Projects" as they are frequently called, grow with the expansion of the user groups finding their way to the field station.

MSU-BSFS now leads the state coordination of Project WET (Erica Cox), Project Learning Tree (Erica and Janice Greene), Flying WILD (Janice), and Leopold Education Project (Celeste Prussia). Each of these nationally-developed and distributed environmental education programs provides teacher and youth leader educational workshops to encourage immediate use of activities and provide ready-made lessons for educators to get people of all ages to observe and interact with the natural world. The activity guides provide multidisciplinary lessons that promote the development of critical thinking and problem solving skills. All Projects include lessons that embrace habitat improvement with the goal of increasing the awareness-to-action progression that moves people from appreciating the natural world to doing something in their locale to benefit all members of the land community. From the environment's abiotic elements of soil, water, air, and energy to the biotic community members themselves, every component is given a seat at the table as explorations, discussions, plans, and actions develop in absence of bias. The ultimate goal is a citizenry that is environmentally literate and prepared to use their knowledge, skills, and action to improve the world around us.

The Northern Saw-whet Owls mentioned at the head of these notes were caught and banded by Janice with assistance from undergraduate Allison Jones over four nights that sometimes included a few guests of the Greater Ozarks Audubon Society.

As usual, we are always happy to show the field station to you if you're in the area.

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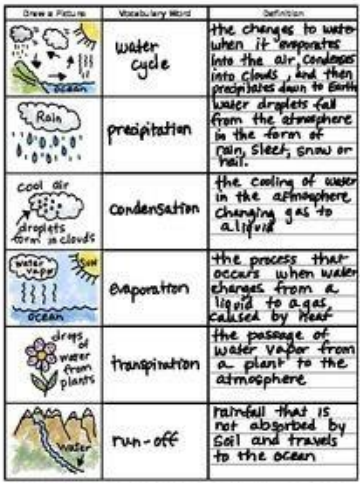
## Kirbyville Middle School Field Days

Our newest user group is also one of our closest neighbors. Amy Burton, former MSU student and Principal of the Kirbyville MS, was contacted by Janice in March and by June we had a set of three days planned when BSFS staff would guide KMS students in science-based activities with the theme of "Unsolved Mysteries." Janice broadened their horizons at the school with bird-related activities in early June. The students arrived at the field station on June 9 to learn lichen identification, ecology, and express their learning in poetry. They returned on June 16 to explore the water quality in the lake and a pond. Many thanks to our lichen volunteers, Pat and Darrell Bleck and Nancy and Hammons Shanda. Kudos to our water leaders Beth Bowles and Kendell Loyd of MSU, and Master Naturalists Gala Solari Keller and Sherryl Walker..



| Draw a Picture | Vocabulary Word | Definition |
|---|---|---|
| | water cycle | the changes to water when it evaporates into the air, condenses into clouds, and then precipitates down to earth |
| | precipitation | water droplets fall from the atmosphere in the form of rain, sleet, snow or hail. |
| | condensation | the cooling of water in the atmosphere, changing gas to a liquid |
| | evaporation | the process that occurs when water changes from a liquid to a gas, caused by heat |
| | transpiration | the passage of water vapor from a plant to the atmosphere |
| | run-off | rainfall that is not absorbed by soil and travels to the ocean |

## Exploring the GLADE—Graduate Research by Cathy Combs

We, as a society, tend to underestimate the power of our youth. Young people are still largely viewed as having passive roles in our society. They are the students not the teachers. They are the workers not the leaders. They are the consumers not the creators. But, as many are realizing the importance of conserving our remaining glades, the importance the young and hardy wildflowers possess, so too are we realizing the important roles our youth play, not just in the future, but here and now. For the last year, I have been working with the Green Leadership Academy for Diverse Ecosystems, or GLADE. Specifically, I've been looking at the impact this program has had on youth in terms of knowledge, attitude, leadership, and action. These youth were brought together with a foundational love for the world they live in. My role has been to observe if they leave the program blooming and to learn about the factors that have aided in them doing so.

In the spring of 2014, GLADE alumni were sent out surveys and contacted for interviews concerning the impact GLADE has had on them. Findings show that the GLADE experience has remained with these students far after its conclusion. Regarding memories, certain activities were more frequently mentioned than others (habitat restoration, the leadership activities, bird-banding), but ALL activities were mentioned fondly at least once. The program has also resulted in students with stronger knowledge and connection to the Ozarks. Statistics reveal a significant difference between pretest and posttest knowledge and attitude scores. These gains stayed with students between the posttest and the follow-up survey (for some students this was up to four years later). In addition, many students reported that they saw a large change in their view of leadership. Concerning attitudes, the change was less evident to students, but comments support that this is due to the presence of a connection to nature before the program's influence. Changes reported more-so relate to the realized impact one has and the strengthening of this connection.

When it comes to behavior, there was no correlation between scores and self-reported behavior or completion of the post-GLADE project. I turned to interviews to learn about why this was the case. Support from the community was the number one factor that discouraged completion of the post-GLADE project. In interviews, students that did not complete the project communicated an isolation—that they had intentions to lead, but who can lead when none follow? On the other hand, a commonality amongst students that completed the project was a supportive community made up of teachers, peers, and GLADE staff. In such communities, a network of people and resources is more readily established. These provide proper habitat for students to grow and act. In interviews, graduates communicated the value of working alongside peers as sources of encouragement, ideas, manpower, and contacts. From the survey, teachers were seen as especially important. This might be because teachers can provide a bridge between students and the network needed via encouraging students to communicate with professionals and encouraging these professionals to see these students as active members of the community.

Interviews depict changes in self-esteem and a love of nature that holds so much promise and excitement for what these graduates will accomplish. But no matter how strong one's roots, if situational factors constantly bombard the youth, intention to act may not result in actual behavior. Graduates need to maintain the networks built during GLADE and work on building new ones in order for public projects to be successful. Parents, teachers, principals, and peers, the students that are returning to you are excited to grow and lead….let them.

## Project Baseline Seed Bank at BSFS– by Nicole Soper Gordon, University of Minnesota

Humans have been saving seeds since the dawn of agriculture around 14,000 years ago. Today, there are designated seed storage facilities scattered throughout the world. These seed banks range from local repositories for rice varieties grown in one town to the Svalbard Global Seed Vault in Norway, which is designed to protect the world's genetic seed diversity against disaster. Many seed banks store crop seeds, while others focus on rare or ecologically important seeds for conservation purposes. Project Baseline, however, has a slightly different objective.

The Project Baseline seed bank is collecting seeds to facilitate studies of evolution in wild plants. Basically, if we collect and store seeds today, researchers can recollect from the same locations in the future to compare ancestors and descendants. For example, 30 years from now, someone could collect new seeds and compare them to seeds already in the Project Baseline seed bank to see how plants have changed over time in response to climate change, invasive species, or other landscape level changes. This method – growing archived seeds and contemporary seeds together – is called "resurrection ecology." Thanks to funding from the National Science Foundation, Project Baseline seeds will be stored for at least 50 years, allowing some very long-term resurrection ecology studies!

Our goals aren't the same as those of other seed banks so we do a couple of things differently. First, collect from at least ten sites per species throughout the United States to capture genetic variation from each specie's full geographic range. Second, we keep seeds from individual plants separate when collecting, which will allow studies of genetic variation within populations. Finally, instead of focusing our collections on agricultural or rare plant species, we focus on species that are frequently used in research. This means that we have a mix of species, including high-quality native species like big bluestem (*Andropogon gerardii*), weedy natives like milkweed (*Asclepias tuberosa*), and invasive species like sweet clover (*Melilotus officinalis*).

During 2013 and 2014, we collected many seeds from southern Missouri and northern Arkansas, including within the Drury-Mincy Conservation Area, adding to the Project Baseline seed bank. While collecting in the area, we have particularly enjoyed staying at the Bull Shoals Field Station, and the staff at BSFS have been invaluable in helping us locate populations of plants from which to collect seeds. We look forward to stopping by again in 2015. If you see us out collecting, feel free to stop and say hello!

If you are interested in learning more about Project Baseline, what species we are collecting, or how to get involved, you can view our website at www.baselineseedbank.org, follow us on Facebook at www.facebook.com/projectbaselineseedbank, or send an email to seed collector Nicole Soper Gorden (sope0007@d.umn.edu) or principal investigator Dr. Julie Etterson (jetterso@d.umn.edu).

# BIO 725 Advanced Limnology visits BSFS

by Kristopher Maxson

On April 26, 2014, Dr. John Havel's Advanced Limnology class took a field trip to Bull Shoals Field Station to demonstrate various methods each graduate student has used during his or her research.

To the left, Dr. Havel demonstrates the use of a Wisconsin tow net for collecting zooplankton samples. Markings along the rope indicate distance. The net is tossed or lowered into the water to the desired depth, then dragged back to the surface, collecting plankton along the way. The zooplankton sample was stored in a cooler and then observed later in the lab under dissection microscopes.

The three images above demonstrate the use of a gill net. A gill net consists of a mesh panel made of monofilament line. Buoyant rope on the top and weighted line along the bottom ensure the net creates a barrier in which fish become caught as they attempt to swim through. The net is anchored at each end and stretched horizontally across the lake site and allowed to sit for approximately two hours. The two additional photos show a common carp and longnose gar captured by the net.

The bottom right image shows minnow traps being deployed. This was a trial run for a method Kristopher Maxson was proposing to use in field research in northern Wisconsin during Summer 2014. Because he is interested in the diets of small bluegill, the minnow traps were deployed for two hours to limit the time the fish have to digest food while trapped.

A small bluegill was caught using a fishing pole later in the day. Kristopher demonstrated how to collect stomach contents. The photo on the left (from http://limnology.wisc.edu) demonstrates the method. By inserting the spout of a wash bottle into the stomach of the fish, water is used to flush the contents out and into a collection jar.

Next we went to a local creek to learn how to backpack electrofish. Backpack electrofishers are useful for determining the fish community in streams. On the right, one student operates the unit while three students help collect the stunned fish with long handled dip net. Below, Dr. Havel holds a common snapping turtle we caught while sampling.

While at the creek, we also learned how to characterize a creek by pebble size and percent embeddedness. These two characteristics can help determine the habitat quality for aquatic macroinvertebrates, such as mayflies and caddisflies.

We would like to thank Celeste Prussia for being our boat captain for the day, as well as all the Bull Shoals Field Station staff who make it possible for educational opportunities such as these.

# GLADE at BSFS

GLADE Green Leadership Academy for Diverse Ecosystems

*GLADE 2014 class, alumni and staff after Giant Cane Restoration*

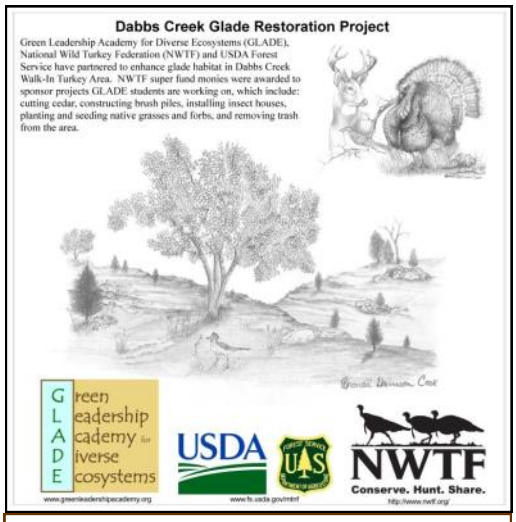
*MSU students Jessica Blomenkamp and Cathy Combs Dabbs Creek*

The Bull Shoals Field Station hosted its sixth week long residential program June 20-26, 2014 with 15 motivated southern Missouri high school students who desired to impact their communities in the areas of environmental sciences and conservation leadership. The GLADE project has developed as a collaborative effort between the Greater Ozarks Audubon (GOAS) and Missouri State University. GLADE 2014 was made possible by financial assistance from The Community Foundation of the Ozarks—Rural Schools Partnership Initiative, Delta Foundation, Audubon Society of Missouri, North Face, L.A.D. Foundation, K-Dock Marina, Ozarks Water Watch, White River Valley Electric Cooperative, Great Southern Bank, and Missouri Department of Conservation by grant awards or in-kind support and numerous private donations from people like you..

GLADE continued its involvement in glade restoration and habitat improvement projects in spring and fall with the USDA-Forest Service staff at the Dabbs Creek Area of the Mark Twain National Forest. A new sign was erected on Public Lands Day, September 27, 2014, to acknowledge our partnership.

MSU graduate student Cathy Combs has undertaken a research project on the long-term effects of GLADE on participants (see related article)

**Thanks to *ALL* our students, funders, presenters, organizers and volunteers!!!**



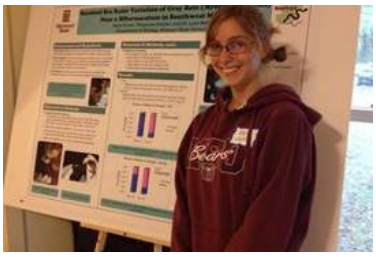

*New sign at Dabbs Creek acknowledges GLADE's contribution to the glade restoration project*

## University of Missouri Researcher at BSFS

Kathryn Womack, a doctoral graduate student at the University of Missouri, used the Bull Shoals Field Station as a home base while trapping insects and bats in the southwestern part of Missouri. Her dissertation focus is to understand how savanna-woodland restoration throughout the Ozarks affects bat and insect abundances at sites. Kathryn is a bat ecologist with interest in landscape ecology, wildlife management and how structural changes to forests, as part of savanna-woodland restoration affect bats (multiple species) use of sites. Questions on whether the forest structural changes are driving use patterns compared to food availability (e.g., insects) is the reason insect samples are being collected at bat mist-net sites. Teasing apart whether food vs. habitat characteristics are the driving factors of various bat species use of a site is critical for sound management of these habitats and species.

*Erecting a mist net to trap bats flying over a woodland pond*

**Dana Green**, senior biology major, won the Best Undergraduate Research Poster at the Central Plains Society of Mammologists conference. The conference was held at BSFS October 10-12, 2014.



## BSFS Wish List

—New or used mini-van to transport small groups to the field station
—Outdoor benches for the porches and grounds
—Two tumbling drum composters and an outdoor fireplace
—Two stackable bunk beds for the Drury House
—Remodel the hall bathroom at the Mincy House

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**Visit us on the web…**
**bullshoals.missouristate.edu**
**Or Like us on facebook at MSU Bull Shoals Field Station**

Our mission is to provide a location for faculty, students, and visiting scientists to conduct research and educational programs that increase public understanding of southwest Missouri ecosystems.


| | | |
|---|---|---|
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| **Dr. Beth Bowles, BSFS Research Specialist** | **417-836-3731** | **BethBowles@MissouriState.edu** |
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## BSFS Continues Outreach Support for Homeschool Outdoor Fair

May 1st and October 2nd marked the fourth and fifth semi-annual Homeschool Outdoor Fairs in 2014. The spring event was hosted by The Equestrian and Watershed Centers and the Springfield Conservation Nature Center hosted the fall fair. About 300 attendees came to each of the fairs. Environmental and conservation educators from throughout the Springfield area presented a wide array of activities, tours, demonstrations, and exhibits to showcase the rich diversity of outdoor educational opportunities that exist in our area.

BSFS is delighted to announce that the next Homeschool Outdoor Fair is scheduled for May 8, 2015 at The Botanical Center. This day coincides with National Public Gardens Day to highlight programs in plant conservation, water conservation, the preservation of green spaces and home gardening, Contact Celeste if you'd like to be part of the action!

*Homeschool student holds a Luna Moth*

## Friends of Bull Shoals Field Station

Are you interested in the protection of southwest Missouri's unique ecosystems? Do you have a love of the outdoors? Did you do field research as a student at MSU? Have you shared your excitement about nature with others? If you answer yes to any of these, then you're a perfect fit to be a **Friend of Bull Shoals Field Station**, and we're still looking for a few good friends..

Membership donations support projects such as: *Undergraduate and Graduate research*, *education*, *ongoing research and long-term monitoring*
Membership benefits include: Newsletters, invitations to special member events; Corporate sponsorship (gains your logo on BSFS publications)
Membership levels range are: $25 (Individual), $40 (Family), $100 or more (Sustaining); and $200 (Corporate)
A donation of any amount may be made in honor or memorial to someone for whom you care

*You can give online today at www.missouristate.edu/giving (enter Bulls Shoal Field Station in search bar) or contact Janice Greene to learn more.*

## A Few Views from the BSFS Phenocam

If you haven't been following MSU Bull Shoals Field Station on Facebook, then you have probably missed seeing some of the landscape changes from the BSFS Phenocam. The legend to the right corresponds with the image location for the dates listed, all taken at the 1:30 pm image capture on each day. A comparison of the two January captures shows people around the world that there is not snow in southwestern Missouri every winter day.

The latest image capture can be seen in your Internet web browser at this URL:

https://phenocam.sr.unh.edu/data/latest/bullshoals.jpg