

# Missouri State<sup>™</sup>

U N I V E R S I T Y

## Bull Shoals Field Station Annual Report 2015



March 2016

## **Bull Shoals Field Station Mission**

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.

2015 continued to be a year of growth for BSFS in activities, research and monitoring.

## **Expenditures**

The major expenses continue to be for personnel:  $\frac{3}{4}$  time Manager (C. Prussia), part-time Research Specialist (B. Bowles), State Coordinator for Project WET (E. Cox), and student workers. Other major expenses include (1) maintenance of the facilities (utilities for the Mincy House, maintenance agreement for the solar power system, propane for the heat at the Drury House, boat maintenance and marina rental); (2) travel to conferences and Project WET, Learning Tree, and Flying WILD workshops; and (3) partner of GLADE. We also purchased a mini-van this year to ease travel to conferences/workshops and to take guests to BSFS.

## **Partnerships**

BSFS staff continues to work with the U.S. Army Corps of Engineers and Missouri Department of Conservation staff. We correspond on research and monitoring questions. The Drury-Mincy staff and the BSFS Staff also communicate about maintenance issues and the timing of group events.

Celeste Prussia works with the USDA-Forest Service and GLADE graduates on glade restoration and site improvements at the Dabbs Creek Spring Turkey Walk-in Area of the Mark Twain National Forest. Additional efforts in 2015 include planting on the Glade Top Trail to return illegally removed *Echinacea* roots to appropriate glade habitat.

J. Greene, again this year, worked closely with the Greater Ozarks Audubon Society (GOAS) on the Christmas Bird Count for Taney County serving as the host site for the compilation event and counting birds on the Drury Conservation Area. GOAS, MDC, and staff (Greene and Prussia) work together to plan and conduct the Green Leadership Academy for Diverse Ecosystems (GLADE). Additional groups assisting with GLADE include the Springfield Plateau Chapter of the Master Naturalists, James River Basin Partnership, Watershed Committee of the Ozarks, and various university faculty/staff.

Janice Greene serves on the Greater Ozarks Audubon Society Board. Beth Bowles serves on the James River Basin Partnership Board to address a variety of watershed issues in the James River basin. Erica Cox works with Springfield and Greene County on a variety of stormwater education issues, with the James River Basin Partnership on their watershed festivals, and with the public and private schools to improve water education throughout the state.

## Classes, Workshops, & Meetings held at BSFS

- MSU
  - Identification of Woody Plants
  - Plant Ecology
  - Plant Taxonomy
  - Winter Ecology
  - Fisheries Management
  - Mammalogy
  - Herpetology
  - Plants and Ozarks Culture
  - MSU West Plains Biology Class
  
- Workshops and meetings
  - Green Leadership Academy for Diverse Ecosystems (GLADE)
  - GLADE Reunion
  - Boy Scouts
  - Kirbyville Middle School summer school program
  - Homeschool lichen class
  - Three-state Environmental Education Regional Ecosystem workshop

## BSFS Use Statistics for 2013 (person-days): Total = 1027

- Classes (including students and faculty): 435
- Meetings and workshops: 413
- Research (Missouri State faculty and staff and non-MSU groups): 77
- Maintenance, security, or staff work day: 78
- Tour: 24

## Research

### *Faculty/Staff*

Bowles, B.D. and D. Bowles. Plant Diversity of Ozark springs.

Greene, J.S. Monitoring Avian Productivity and Survivorship at BSFS – bird banding and health data collection

### *Graduate and undergraduate students*

Catherine Combs (G) - Exploring the GLADE: A residential program as a transformational factor on environmental knowledge, attitudes, and action. Thesis: graduated May 2015.

Stephanie Ellison (G) – Sampling methods for small mammals and parasites.

Sarah Heimbach (G) - Effects of territorial pressure on the behavior of the Ozark zigzag salamander.

Ashley Prince (U) - Effects of prescribed fire on over story production in Ozark woodlands.

Kayla Shelton (G) - Kin recognition and its effects on cannibalism in *Ambystoma annulatum* (Ringed Salamanders)

*Research use outside of the university*

Nicole Soper Gordon. Project Baseline seed collection.

### **Manuscripts and educational materials**

Bowles, D.E. and R.W. Sites. 2015. Alderflies, Fishflies and Dobsonflies (Insecta: Megaloptera) of the Interior Highlands, U.S.A. Transactions of the American Entomological Society 141: 405-429

Prussia, C. Lichen Brochure published by MSU printing services

### **Presentations**

Combs, C., and J. Greene. February 2015. Residential education: impacts on long-term knowledge, attitudes, and environmental behavior. Poster. Missouri Natural Resources Conference.

Dalton, Reeder, Bortosky, & Mathis, 2015. Comparison of behavior and metabolic rates in two species of salamanders. Animal Behavior Society, Anchorage, AK. – Oral Presentation

Dalton, Reeder, Bortosky, & Mathis, 2015. Comparison of behavior and metabolic rates in two species of salamanders. Missouri Herpetological Association, Reis Biological Station, Steelville, MO. – Oral Presentation

Foster, S., and J. Greene. October 2016. Zoo attendance and Visitor's Conservation Mindedness. Poster Presentation. North American Association for Environmental Education. San Diego, California.

Greene, J. and B. Widmar. March 2015. Green Leadership Academy for Diverse Ecosystems. Invited Presentation: Missouri Outdoor Summit. Conservation Federation of Missouri. Jefferson City, MO.

Greene, J. June 2015. Environmental Education: GLADE and the Environmental Projects. Invited Presentation: Children and Families in the Outdoors. Ozarks Water Watch. Branson, MO.

Greene, J. November 2015. Aldo Leopold: His life and birds. Gateway Audubon Chapter, Joplin, MO. Invited presentation, November 2015

Greene, J., K. Loyd, and M. Mac. 2015. An overview of the Bull Shoals Field Station programs. Invited presentation, November 2015. Missouri State University Foundation.

Rumley, K., and J. Greene. February, 2015 An analysis of five years of bird banding data at the Bull Shoals Field Station. Poster. Missouri Natural Resources Conference.

Shelton & Mathis, 2015. Behavioral responses of ringed and spotted salamanders when exposed to cues from predators with different diets. Missouri Herpetological Association, Reis Biological Station, Steelville, MO. – Oral Presentation

Siverly, K., and J. Greene. February 2015. Nesting success and parental behavior of the Prothonotary Warbler (*Protonotaria citrea*) in southwestern Missouri. Poster. Missouri Natural Resources Conference.

Wait, A. Oral presentation: Missouri Master Naturalist Annual Advanced Training Conference (MDC and MU). Springfield, MO. May 2015

## **Grants**

Bowles, B.D. Oklahoma phytoplankton survey. Subcontract from Oklahoma State University. Awarded December, 2014. Funded for \$31,840.

## **Activity Highlights**

### *Long-term monitoring for climate change*

Bull Shoals Field Station's phenocamera continues to collect forest canopy pictures every 30 minutes during the daylight hours at Shanda's Point. These pictures are sent real-time to the Phenocam Network (<http://phenocam.sr.unh.edu>), hosted by Harvard University and the University of New Hampshire. The pictures can be used to monitor canopy phenology (the dates of leaf development and leaf fall every year) and can serve as a link to remote sensing information. Phenology, the study of the annual timing of life cycle events of plants and animals, is a powerful indicator of climate change.

New and updated equipment was installed BSFS weather station. In addition, A. Wait continues to conduct yearly monitoring for the "Drought Open-Source Ecology" (DOSE) network. The purpose of DOSE is to collect information about the response of plant physiology to drought. Also, long-term temperature data are being collected from four BSFS ponds.

### *Flying WILD, Project WET and Project Learning Tree*

Six Flying WILD, 12 Project Learning Tree, and 11 Project WET workshops were held throughout Missouri in 2015. Approximately 300 educators were trained which could reach thousands of Missouri students in environmental education.

### *Green Leadership Academy for Diverse Ecosystems (GLADE)*

The 7th year of the week-long GLADE brought 16 high school students from southwest Missouri to BSFS to learn about biodiversity and conservation, endangered species, water, and habitat restoration. They transplanted giant river cane along Bee Creek. This will provide new habitat for the endangered Swainson's Warbler and other species. As part of the Academy, each could receive up to \$500 to go back into their community and conduct some type of environmental project. The GLADE website is: <http://www.greenleadershipacademy.org/index.htm>

### **Additional BSFS Activities by BSFS Faculty and Staff**

- Janice Greene serves as the State Coordinator for Flying WILD. Janice and Erica Cox are Co-Coordinators for Project Learning Tree, and Erica is the State Coordinator for Project WET. All three are national environmental education programs focusing which use the themes of birds, trees, and water to help youth understand science and the complexity of environmental issues.
- Exhibited Bull Shoals Field Station, Project WET, Learning Tree and Flying WILD at the Missouri Natural Resources Conference and Interface 2015 Conference (J. Greene and E. Cox)
- Worked on the Environmental Education Certificate program for MSU (J. Greene, C. Prussia)
- Served as judge for Envirothon (J. Greene) and served on planning committee (E. Cox)
- Homeschool Outdoor Fairs (C. Prussia)
- Tri-State EE Field Trip to BSFS: Dutch Oven Demo & Dinner (C. Prussia); Planning Committee (E. Cox and J. Greene)
- Science Olympiad Judging (C. Prussia)
- Tours: Campus Construction Team; Quinta Scott, a St. Louis author researching Drury CA for Confluence article (C. Prussia)
- Represented BSFS at OBFS meeting at Rocky Mountain Biological Laboratory (and attended iDigBio workshop to begin plans and funding for digitization of BSFS collections)
- Hosted a GLADE reunion (J. Greene and C. Prussia)
- Bull Shoals Lake sampling on two sites for core water quality parameters, phytoplankton, and zooplankton (B. Bowles and C. Prussia)
- Assisted the James River Basin Partnership with River Jam Celebration (B. Bowles)
- Guest lecturing for Science Education and Limnology classes (B. Bowles)
- Elementary school presentation on Animal Survivors (B. Bowles)

**Goals for 2016**

We are continuing to search for funding opportunities for a dormitory or, at a minimum, a facility with a common room, kitchen, and bath facilities. This would provide an excellent meeting space for groups. Cabins or another housing facility could be added at a later date

Complete the renovation of the laboratory building into office space and secure storage on the sides.

We continue to work on increasing long-term monitoring stations including those for climate, lake conditions, and phenology. We will be installing a lake buoy to monitoring the temperature gradient and thermocline. This will be posted on the website.

The continuation of the GLADE Academy continues to be a priority of BSFS. The 2016 Academy is funded with the fundraising of the Greater Ozarks Audubon Society.

We will continue to recruit additional universities and conservation-related groups to use the field station to increase the usage of BSFS. We continue to update the website as part of this effort.

We plan to conduct a long-term planning document to guide BSFS through the next 5-10 years.