

Bull Shoals Field Station

Southwest Missouri State University
Annual Report
2004



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Director

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Overview

The Bull Shoals Field Station (BSFS) of Southwest Missouri State University entered its 5th year of operation in 2004. This year, nearly 300 public school and university students have had the opportunity to engage in direct study of the natural world expressed throughout the varied ecosystems represented on the Drury Wildlife Area. Additionally, university faculty and students have collected data through research on the site and made important contributions to the field of ecology as a result.

The National Science Foundation awarded BSFS funding to upgrade the electrical and plumbing infrastructure and install a septic system at the Frank Drury house. The peat moss septic system was installed around Thanksgiving. The plumbing and electrical wiring should be completed by spring 2005.

One highlight of 2004 has been usefulness of the residence acquired at 547 Drury Road, just outside the gate leading to the Field Station. The house was frequently used by researchers doing field work at BSFS and in the Drury Conservation Area. Additionally, it accommodated a number of classes and teacher workshops. All who have stayed there gave compliments to SMSU/BSFS for having the foresight to purchase this important resource.

Classes, Workshops, & Meetings

- SMSU
 - Watershed Ecology and Education Workshop – MOWIN funded teacher workshop
 - Advanced Outdoor Teaching
 - Herpetology
 - Plant Taxonomy
 - Limnology
 - Entomology
 - Mammalogy
 - Plant Ecology
 - Woody Plant Identification
 - Leopold Education Project – Facilitator Workshop
- Non-SMSU
 - Central Missouri State University – Mammalogy
 - Study Middle School (Spud-Buster program – 4 days)

Research

- Graduate Students
 - Aubrey, Doug – Physiology and Demography of Oak and Hickory Seedling and Saplings as a Function of Habitat Type and Fire (completed; Alexander Wait, advisor)
 - Brown, Pam – Herbivory of Oak Seedlings and Saplings as a Function of Habitat Type and Fire (Alexander Wait, advisor)
 - Boyles, Justin – Roosting Ecology of Evening Bats (completed; Lynn Robbins, advisor)
 - Milam, Miranda - Thermoregulation and Arousal Patterns of Hibernating Eastern Red Bats (Tom Tomasi, advisor)

- Mormann, Brad – Roost Site Selection of Over-wintering Red Bats (Lynn Robbins, advisor)
- Pulley, David - Evaluating the effects of fire frequency and intensity on nutrient cycling in an Ozark forest by monitoring soil respiration (Alexander Wait, advisor)
- Schoppet, Corinne – Acorn Consumption by Mammals (Tom Tomasi, advisor)
- Jerry Weimer – Examination of cloning in Savanna oaks (Michelle Bowe, advisor)
- Undergraduate Students
 - Pulley, David - Soil Respiration as a Function of Habitat Type and Fire (Alexander Wait, advisor)
 - Shane Snider and Megan Ladd – Genetic diversity in bamboo (Michelle Bowe, advisor).
 - Shane Snider (in prep for graduate work) – Solidifying the distinction between poison ivy and poison oak (Michelle Bowe, advisor).

Manuscripts

- Greene, J. S., and R. Aram. In preparation. FIELDS Project: Outdoor teacher training. Journal of Science Teacher Education.
- MS Thesis: Doug Aubrey (August 2004): "Savanna restoration through prescribed fire: demographic and physiological responses of oak and hickory seedlings and saplings to a changing light environment"
- MS Thesis: Justin Boyles (May 2004): "A comparison of summer and winter roosting habitat and behavior of evening bats (*Nycticeius humeralis*) in Missouri.
- Mormann, B., M. Milam, and L. Robbins. 2004. Hibernation: Red Bats Do It In The Dirt. "Bats", Bat Conservation International. 22:6-9.
- Boyles, J.G., B. Mormann, J.C. Timpone, and L.W. Robbins, In Press. Use of a Subterranean Winter Roost by a Male Evening Bat. Southeastern Naturalist.

Presentations & Outreach

- Janice S. Greene, Ph.D.
 - Guest presentations to BIO 694 and BIO 494 classes
 - CNAS Faculty lunch seminar on BSFS
 - Leopold Education Project workshop and facilitator training – overnight
 - Exhibited at Missouri Natural Resources Conference
 - Greene, J. S. 2004. Research in the Outdoors. Invited 3-hour workshop at Missouri Environmental Education Association's EE Campus. Columbia, Missouri.
 - Rapp, W., and J. S. Greene. 2004. Amphibians in the Classroom: An Issues-Based Approach. National Association of Biology Teachers. Chicago, Illinois.
- Lynn Robbins, Ph.D.
 - Oral - Boyles, J.G., and L.W. Robbins. 2004. Summer and Winter Roost Characteristics of Evening Bats in Missouri. Annual North America Symposium on Bat Research. Salt Lake City, Utah.

- Oral - Mormann, B., and L. Robbins. 2004. Roost Site Selection of Over-Wintering Red Bats in Southwest Missouri. Annual North American Symposium on Bat Research. Salt Lake City, Utah.
- Oral - Justin G. Boyles and Lynn W. Robbins. Winter roost site selection of evening bats (*Nycticeius humeralis*) with comparisons to summer roosting sites. Central Plains Society of Mammalogists. Hays, Kansas.
- Oral - Brad M. Mormann and Lynn W. Robbins. Red bat (*Lasiurus borealis*) over-wintering strategies in southwestern Missouri. Central Plains Society of Mammalogists. Hays, Kansas.
- D. Alexander Wait, Ph.D.
 - Pulley, D., and D.A. Wait. 2004. Does fire stimulate soil respiration and nutrient cycling in Ozark forests? Missouri Natural Resource Conference. Osage Beach, MO.
 - Brown, P., and D.A. Wait. 2004. Is arthropod herbivory in Ozark forests affected by prescribed burns? Missouri Natural Resource Conference. Osage Beach, MO.
 - Aubrey, D.P., and D.A. Wait. 2004. Effects of prescribed fire on canopy coverage and seedling and sapling response to a changing light environment in an Ozark forest. Missouri Natural Resources Conference, Osage Beach, MO.

Annual Open House and Field Day

We had another successful Open House in May, 2004. Several programs interested guests including water quality trips out on the lake, pond visits, and wildflower walks. Brad Mormann also had a set-up about his bat research. The weather was very pleasant this year.

We were fortunate to have several members of the Baker Family present, who lived in the Drury House while their father worked for the Missouri Department of Conservation. It was insightful to hear stories about how this family lived in the Drury House in the “old days”.

Another silent auction helped raise funds for renovation. With all our latest work on the construction and the water quality monitoring project, we collected a smaller number of items this year. However, we still raised almost \$500 and gave thanks to everyone who contributed and who bought items.

In lieu of a single Open House in May, a number of specified field days will occur in 2005. These field days are offered in hopes of serving a greater number of people through the diverse topics and are detailed on the BSFS website, <http://bullshoals.smsu.edu>.

Grants

- Bowe, L. M. 2004. \$6761. Use of AFLPs in a genetic comparison of two aspects of biological conservation: rare species and invasive exotics. Faculty Research Grant
- Greene, J. 2003. \$99,395 (1st year completed of 5 year project). Water quality monitoring of Beaver Creek and Bull Shoals Lake. Upper White River Basin Foundation.
- Greene, J. 2004. \$19,341. Missouri Watershed Information Network. Watershed Data Collection (James, Elk, Sac, and Spring Rivers) and Watershed Workshops.
- Greene, J., and E. Redd. Awarded 2004. \$61,144. National Science Foundation. Facilities improvement at the Bull Shoals Field Station.

- Greene, J. 2004. \$467,225. Not Awarded. National Science Foundation, Undergraduate Mentoring in Environmental Biology. Investigations of Aquatic and Terrestrial Ozarks Ecosystems: From microbes to mammals.
- Robbins, L. 2003-2004. \$2,850. Biology of Bats at the Drury/Mincy Wildlife Area. Missouri Dept. of Conservation.
- Pulley, David. 2004. Evaluating the effects of fire frequency and intensity on nutrient cycling in an Ozark forest by monitoring soil respiration. Sigma Xi Grant-in-aid-Research.
- Missouri Department of Conservation, Wildlife Diversity Fund. 2004-2005. Winter Ecology and the Effects of Fire on Bats in Southwest Missouri. \$15,822.
- Brad Mormann received a Bat Conservation International Student Scholarship - \$2,500.

Facilities

The September 2003 acquisition of the residence and large garage on 5 acres at 547 Drury Road has positively impacted the field station's ability to host researchers, teachers, and students for overnight accommodations in 2004. Although the original Frank Drury Stone House continues to serve suitably as a classroom, laboratory, and "home-base" for fieldwork, the amenities for basic comforts offered at the new residence provide options not yet available at the stone house. The house was used for 133 visits for classes, 55 visits for researchers, 52 visits for maintenance, 49 nights for classes, and 19 nights for researchers. Nearly 300 individual visits were made to the house.

An outdoor shelter at the original Field Station site was constructed in the spring of 2004. Benchmark Construction, owned and operated by Jeff and Shirley Medley, provided the labor to construct the shelter from plans prepared by Celeste Prussia, BSFS Manager. SMSU faculty, graduate students, and staff provided many hours of labor to construct the retaining wall around the shelter support piers and to smooth the rock fill that provides the foundation.

Official notice of the award from the National Science Foundation (\$61,144) was received this year. The peat moss septic system specially designed for the BSFS site has been installed and the plans to upgrade the electrical wiring, plumbing, and fixtures will soon turn into tangible upgrades to the Frank Drury House.

Additional Activities Related to BSFS

- Greene, Janice S.:
 - Served as a member of an outside Advisory Committee for the new Indiana University Research and Teaching Preserve.
 - Attended Organization of Biological Field Stations Conference. Maine. September 2004.
 - Exhibited at Missouri Natural Resources Conference. January 2004
 - Participated in Christmas Bird Count with Greater Ozarks Audubon Society members. Jan. 2004. List available.
- Presentations at the 2004 Annual Field Day Open House:
 - Michelle Bowe – Wildflower Tour
 - Brian Greene – Pond Study
 - John Haywood – Pond Study

- Kim Medley – Water Quality
- Brad Mormann – Bat Research

Future

The Bull Shoals Field Station continues to grow in facilities and usage. The BSFS Committee, composed of faculty members from Biology, Chemistry, Physics, and Geography, Geology, and Planning Departments, has the following recommendations for next year.

- Long-term monitoring
 - Continue weather station data collection and posting
 - Continue Christmas bird count data collection
 - Conduct an insect survey
 - Conduct a lichen survey
 - Develop plant monitoring protocols
- Develop grid system on Drury area
- Develop application process for research projects
- Complete the landscaping of the shelter at the Drury House
- Continue to increase the number and diversity of Field Days for the public