

Annual Report

Bull Shoals Field Station 2006



Missouri State University

Overview

The Bull Shoals Field Station (BSFS) saw a productive year with many accomplishments. Renovations on the Drury House have been completed and the building is now ready to house visiting educators, researchers and students. Use of the Drury house was restricted for much of the year due to the renovations, but we anticipate the use to increase in the coming year. We purchased a new truck for field station use, replaced the flooring in three rooms of the new house, and purchased new water quality monitoring equipment. In addition, the classroom building is under construction and is due to be completed in January 2007. We hired a part-time staff member, Beth Bowles, in July to establish monitoring protocols for BSFS and assist with other activities at the field station.

Classes, Workshops, & Meetings

- MSU
 - Teaching Science With Journals
 - Ozark Ecosystems
 - Limnology
 - Plant Ecology
 - Herpetology
 - Mammalogy
 - Plant Taxonomy
 - Woody Plants

- Other Universities
 - Drury University – Undergraduate Research Experience (Dr. Wendy Anderson)

- Other Classes/Workshops
 - Leopold Education Project Facilitator Workshop
 - Master Naturalists
 - Missouri Chapter of the Wildlife Society Workshop

BSFS Use Statistics for 2006 (person-days): **Total = 975**

- Tours: 80 for Open House, 12 for long-range planning group, 6 for media day
- Classes: students / faculty: 434 / 44
- Professional meeting: 115 for Missouri Wildlife Society meeting
- Research (undergraduate, graduate, and staff research): 157
- Community use: 27 for Boy Scouts, 45 for Greater Ozarks Audubon Society
- Maintenance, security, or staff work day: 55

Research

Graduate Students

Mullich, D. Antipredatory behavior of the cottonmouth. Advisor: Dr. Brian Greene.

Pulley, D. The effect of scent and flagging on predation of artificial turkey nests. Advisor: Dr. Don Moll.

Undergraduate Students

Obgagu, Theo. Herbivory and leaf production in managed and unmanaged oak/hickory forest. Advisor: Dr. Alexander Wait.

Manuscripts

Aubrey, D.P. and D.A. Wait. Oak and hickory seedling and sapling response to fire following 50 years of fire suppression. *Forest Ecology and Management*. Submitted 12/06.

Boyles, J.G., B. Mormann, J.C. Timpone, and L.W. Robbins. 2006. Characteristics of summer and winter roost trees of Evening Bats (*Nycticeius humeralis*) in Southwestern Missouri. *American Midland Naturalist* 155: 210-220.

Dunbar, M.B. and T.E. Tomasi. In press; Dec 2006. Arousal patterns, metabolism, and a winter energy budget of eastern red bats (*Lasiurus borealis*). *Journal of Mammalogy*

Dunbar, M.B., J.O. Whitaker, Jr., and L.W. Robbins. In Press. Winter feeding by bats in Southwestern Missouri. *Acta Chiropterologica*.

Greene, J. 2006. Reading the Landscape: Strategies for helping students become curious observers of relationships and processes in nature. *Green Teacher* 78: 30-32.

Havel, J.E. and J. Graham. 2006. Complementary population dynamics of exotic and native *Daphnia* in North American reservoir communities. *Archiv für Hydrobiologie* 167: 245-264.

Havel, J.E., K.A. Medley, and R.G. Rhodes. In Prep. Spatial distribution and dynamics of algae blooms in an Ozark reservoir.

Lucas, P and D.A. Wait. In prep. Foliar herbivory on understory oaks in Ozark forests as a function of forest type and prescribed burning. *American Midland Naturalist*.

Mormann, B., and L.W. Robbins. In Press. Winter roosting ecology of Eastern Red Bats in Southwest Missouri. *Journal of Wildlife Management*.

Wilbers Luekenotto, A., and J. Greene. In press. For Slugs Sake: Making a refuge for slugs, bugs & other invertebrates. Green Teacher.

Presentations & Outreach

Bowles, B.D. September, 2006. Invited Seminar. Coexistence in phytoplankton: An examination of Hutchinson's solutions to the "Paradox of the Plankton". Missouri State University Department of Biology.

Dunbar, M.B. 2006. Ecophysiology of hibernation Eastern Red Bats (*Lasiurus borealis*). Society for Integrative and Comparative Biology.

Dunbar, M.B. 2006. Winter Energetics in Hibernating Eastern Red Bats (*Lasiurus borealis*). Missouri Natural Resources Conference.

Greene, J. October, 2006. Invited Seminar. Resources for Educating About Water. Arkansas Watershed Conference. Fayetteville, AR.

Robbins, L.W. 2006. Winter bats in Missouri. Missouri Natural Resource Conference, Lake of the Ozarks, Missouri.

Wait, D.A. and W.B. Anderson. 2006. Do biennial prescribed fires in closed oak/hickory forests initiate savannah restoration? Ecological Society of America. Memphis, TN. (poster)

Community Outreach

BSFS Open House. October, 2006.

Star Gazing at BSFS. December, 2006.

BSFS featured on "Ozarks Watch", Ozarks Public Television. Aired October, 2006.

Grants

Black, J., J. Greene, K. Shade, and M. Gutierrez. Submitted to NOAA. Earth Systems Education. \$700,000.

Bowles, B.D. and J.E. Havel. Submitted to USGS (Missouri Water Resources Research Center). Synchrony in neighboring phytoplankton communities and the predictability of nuisance algae. \$21,057

Greene, J. 2005. \$1,575. Missouri State University, University Grant. Curriculum Development at the Bull Shoals Field Station.

Greene, J. and A. Wait. 2006. \$3950. Missouri State University, Funding For Results Grant. Summer Program at Bull Shoals Field Station.

Prussia, C., and J. Greene. Leopold Education Project Non-Formal Activity Development. Submitted to Pheasants Forever – Leopold Education Project. \$16,625.

Wait, A. “Oak Restoration in Ozark Forests”. Missouri Department of Conservation. Submitted – funded pending final approval, \$14,400

Additional Activities

- Havel, John E. – Conducted a tour of BSFS field sites for a visiting researcher during the Open House.
- Rovey, Charles - Conducted groundwater level measurements in the monitoring well network.
- Greene, Janice S.:
 - Reviewer of National Science Foundation Field Station and Marine Laboratory grant proposals. July 2005 to May 2006.
 - Exhibited at the Missouri Natural Resources Conference.
 - Presented to MSU Scientific Writing class
 - Presented to MSU Senior Seminar.
- Prussia, Celeste, Beth D. Bowles, and Janice S. Greene. Progress Report to the Upper White River Basin Foundation. Water Quality Monitoring Results: Beaver Creek and Bull Shoals Lake. August 2005 to July 2006.
- Wait, Alexander:
 - Conducted a plant sale during BSFS Open House.
 - Continued baseline monitoring of leaf area index and overstory leaf production.
 - Provided information for inclusion of BSFS as a site within Domain 8 of NEON (NSF funded project). (The National Ecological Observatory Network (NEON) will be the first national ecological measurement and observation system designed both to answer regional- to continental-scale scientific questions and to have the interdisciplinary participation necessary to achieve credible ecological forecasting and prediction.)
- Robbins, Lynn – Presented bat research at BSFS Open House.
- Prussia, Celeste:
 - Conducted lichen survey and developed a key to the common lichens of the field station area with four Master Naturalists.
 - Presented lichen work at the BSFS Open House.

Facilities

Renovations at the Drury House (see pictures below):

- Solar power panels, batteries, and back-up generator installed

- New drywall installed and painted
- New windows installed
- Handicap access bathroom completed
- New floors installed
- Propane heat installed





Renovations at the New House:

- Wood flooring installed in three rooms
- Deck repaired

Classroom Building (see photo below):

- Frame and roof completed
- Propane tank and heater installed
- Siding is almost completed as of 12/31/06
- Interior walls painted
- Handicapped access ramp almost completed as of 12/31/06



New Acquisitions

- Ford Ranger extended cab
- Eureka multiprobe sonde for water quality monitoring
- Satellite internet, at the new house, will be installed in January 2007

Steering Committee

In September 2006, the BSFS hosted a workshop to obtain recommendations from an invited steering committee on long-range planning for the field station. Attendees included state and federal agency personnel, teachers, and external university faculty. The report should be available in January 2007.

Christmas Bird Counts

The Christmas Bird Count was held on December 30 in conjunction with the Greater Ozarks Audubon Society. Thirty-eight species were identified on the Drury area. Lots of wind and rain reduced the number of species seen.

Cane Restoration on the Drury and Mincy Areas

The Missouri Department of Conservation and the Greater Ozarks Audubon Society are restoring giant river cane along Mincy and Bee Creeks. BSFS is working with them to monitor the effects of the restoration on the endangered Swainson's warbler. The first round of monitoring will begin in May 2007.

Future Plans

BSFS will continue its work with the Greater Ozarks Audubon Society on cane restoration and Christmas Bird Counts. The two groups are also planning a Birding Festival for the community in April 2007.

Two organizations are hosting their annual meetings at BSFS in 2007: Missouri Herpetological Society and the Central Plains Mammal Society.

We hope to increase undergraduate and graduate research at BSFS by offering some research funds. This will partly be funded by a recently endowed fund with the Missouri State University Foundation.