

Bull Shoals Field Station Annual Report 2009

March 2010



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.

Overview of yearly activities

Our major goal continues to be to increase the number of users. This year we held steady from the previous year.

Our total number of person days was 902. Two workshops, including a week-long workshop for high school students and one scientific conference, were held at the field station. One Missouri State class was held completely on site and five others conducted field trips to BSFS.

Expenditures

The major expenses for 2009 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) and (2) travel to conferences and Project WET workshops.

Partnerships

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

J. Greene 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 as well as J. Greene counting on the Drury Conservation Area. GOAS, MDC and Greene and Celeste Prussia worked closely on the Green Leadership Academy for Diverse Ecosystems (GLADE).

Beth Bowles worked closely with the Upper White River Basin Foundation on the basin monitoring project and provided the data and analysis for the Foundation's 2009 Status of the Watershed Report. J. Greene worked was elected President of the James River Basin Partnership Board which continues to address a variety of watershed issues.

Erica Cox works with Springfield and Greene County on a variety of stormwater education issues and with the James River Basin Partnership on their watershed festivals. She also works with the public and private schools to improve water education throughout the state.

Classes, Workshops, & Meetings held at BSFS

- MSU
 - Identification of Woody Plants
 - Herpetology
 - Plant Ecology
 - Plant Taxonomy
 - Mammalogy
 - Introduction to Ozark Lichens

- Workshops
 - Green Leadership Academy for Diverse Ecosystems (GLADE): June 21-27, 2009
 - Leopold Education Project Facilitator Workshop: October 2009

- Scientific meetings
 - Missouri Herpetological Association: September 25-26, 2009

BSFS Use Statistics for 2009 (person-days): Total = 902

- Classes: 559 (including students and faculty and workshops)
- Professional meeting: 47 for one meeting
- Research (undergraduate, graduate, and staff research): 179
- Community use: 41
- Maintenance, security, or staff work day: 76

Research

Faculty/Staff

Bowles, B.D. and D. Bowles. Biodiversity of aquatic vegetation in Ozark springs.

Graduate Students

Chloe Bethany, undergraduate, Washington University. Studying the Phenomenology of Place Through The Poetics of Botany and Art

Becky Gehringer. Fire effects on canopy development, oak regeneration and understory plant community composition. Advisor: Dr. Alexander Wait.

Michelle Highfill-Undergraduate. Advisor: Dr. Alexander Wait.

Rob Hunt. Collection of pond-breeding salamanders (*Ambystoma maculatum* & *Notophthalmus viridescens*) for use in laboratory experiments

Nicole Miller, Washington University Missouri Botanical Garden, Plant-pollinator interactions and stress adaptation: Implications for glade endemism.

Jenny Parsons. Collection of terrestrial (*Plethodon angusticlavius*) salamanders for use in laboratory experiments

Manuscripts and reports

Bowles, B., and J. Greene. 2009. Upper White River Basin Monitoring Analysis: Year 2. Report submitted to Upper White River Basin Foundation.

Bowles, B. and E. Theriot (*in prep*) Contrasting winter limnology of two subtropical reservoirs.

Crane, A. and A. Mathis (*in prep*) Landmark learning by the Ozark zigzag salamander, *Plethodon angusticlavius*.

Wilbers Lueckenotto, A., and J. Greene. (Winter 2009-2010). For Slugs Sake: Making a refuge for slugs, bugs & other invertebrates. Green Teacher. 87:23-26.

Presentations

Crane, A. and A. Mathis. Missouri Herpetological Association (oral): Landmark learning by the Ozark zigzag salamander, *Plethodon angusticlavius*.

Gehringer, B. and D.A. Wait. 2009. Fire effects on canopy cover and light in Ozarks forests: management implications. Missouri Natural Resource Conference. Osage Beach, MO.

Greene, J. 2009. The GLADE Program. Missouri Environmental Education Association Annual Conference. Ozark, Missouri. (oral)

Greene, J. August and October, 2009. Integration of the environment into the classroom. Springfield Public Schools science teacher inservice training. Springfield, MO.

Mathis, A. and A. Crane. Missouri Herpetological Association (oral): Morphological and behavioral changes in the Ozark zigzag salamander, *Plethodon angusticlavius*, following infection with the chytrid fungus.

Miller, N. Stress-adaptation and reproductive specialization: Implications for endemism. Ecological Society of America Annual Meeting, Albuquerque, New Mexico.

Parsons, J., A. Crane and A. Mathis. Missouri Herpetological Association (oral): Influence of prior exposure to predator cues on the Ozark zigzag salamander, *Plethodon angusticlavius*.

Prussia, C. Missouri Environmental Education Association (MEEA) Conference – Dutch Oven Cooking LEP-Style. October 2009.

Prussia, C. Quail Forever – Missouri State Meeting, August; LEP Opportunities for Hunter Education. Oral presentation.

Romeling, S.E., C.R. Allen, and L.W. Robbins. 2009. Searcher Efficiency and Carcass Persistence Rates of Bat and Mice for Use in Post Construction Monitoring at Wind Energy Facilities. North American Symposium on Bat Research, Portland, OR.

Scientific meetings held at BSFS

The 22nd Annual Meeting of the Missouri Herpetological Association: September 25-26, 2009

Grants

Bowles, B.D. and J. Greene. 2009. Upper White River Basin Foundation. Long-term monitoring of water quality and ecological condition of the Upper White River basin in Arkansas and Missouri. Funded for \$23,612.

Bowles, B.D. and J. Greene. 2009. The addition of a wet laboratory at the Bull Shoals Field Station to enhance research and teaching. Funded by the National Science Foundation for \$61,101.

Cox, E., and J. Greene. 2009. Increasing water education in Missouri Public Schools. U.S. Environmental Protection Agency. Applied for \$35,000. Not funded.

Cox, E. 2009. Coover Grant (Community Foundation of the Ozarks) for rural area WET workshops in Southern MO. Applied in April 2009. Not funded.

Cox, E. 2009. EPA Environmental Education Grant for 11 state-wide WET workshops in conjunction with the Missouri Department of Elementary and Secondary Education and Missouri Department of Conservation. Applied in December 2009—status not known until summer 2010

Cox, E. 2009. Missouri Department of Natural Resource Nonpoint Source Pollution 319 Grant—pre-proposal submitted September 2009/Final due January 2010) Applied—interview granted for March 2010, but status unknown until late fall 2010.

Greene, J. and C. Prussia. 2009. Green Leadership Academy for Diverse Ecosystems. Greater Ozarks Audubon Society. Funded for \$11,000.

Miller, N. (Washington University) 2009. Grants in aid of research. Sigma XI. \$500.

Miller, N. (Washington University) 2009. Graduate Student Research Award, Botanical Society of America, \$1000

Wait, D.A. Missouri Department of Conservation. Fire, Oak Regeneration, and Understory Flora Development in Managed Ozark Forests: Mechanistic Assessments for Managers. 7/09-6/10. Funded for \$3,500.

Research use outside of the university

Nicole Miller. Washington University Missouri Botanical Garden.

Upper White River Basin water quality monitoring project

The Bull Shoals Field Station completed the second year of a major water quality monitoring analysis project for the Upper White River Basin Foundation. The project will provide multi-year funding for an analysis of water quality and macroinvertebrate data from the Upper White River basin in Arkansas in Missouri. The activities completed in the second year included the evaluation of the status of ten stream sites in the basin using the Water Quality Index (developed by BSFS staff in the first project year), trend analysis of long-term water quality data for eight sites in the basin, analysis of benthic macroinvertebrate data from ten sites in the basin, and writing the technical report to the Foundation of the water quality data analysis.

National Science Foundation Grant

BSFS was awarded \$61,101 from the National Science Foundation to build a wet laboratory from an existing stone shed at the field station. A recent long-range planning committee recommended that a wet laboratory was the most important facility needed to increase use at BSFS. Renovations will include adding plumbing, electrical wiring and connection to the solar power system, insulation, new roof, new windows, and new door. The addition of a wet laboratory will increase productivity in research and training for students, provide more opportunities for course use, increase the pool of potential users from inside and outside the university, and enhance the current water quality research that is useful to the local community.

Green Leadership Academy for Diverse Ecosystems (GLADE)

GLADE, the week-long academy, brought 16 high school students from southwest Missouri to BSFS to learn about biodiversity and conservation, endangered species, water, caves, and habitat restoration. They restored a section of giant river cane which is home to the endangered Swainson's warbler. As part of the Academy, they each received \$100 to go back into their community and conduct some type of environmental project. Projects have included buying plastic recycling bins for their school, building a rain garden at their school, and working with their local Park Board on the design of a new local park. The GLADE website is:

<http://www.greenleadershipacademy.org/index.htm>

Additional BSFS Activities

- Bull Shoals Field Station Display at Missouri Natural Resources Conference
- J. Greene served on James River Basin Foundation Board

- Christmas Bird Count January 2009
- Continuation of algae and zooplankton collection at two sites on Bull Shoals Lake to complement the data collected by the Lakes of Missouri Volunteer Program.
- Green Leadership Academy for Diverse Ecosystems (GLADE) 21-27 June, 2009. Various radio and television spots.
- MEEA Conference Planning Committee – Erica Cox, Celeste Prussia, Janice Greene
- GLADE Planning Committee – Celeste Prussia, Janice Greene
- 3/25/09 Tour & orientation: Illinois Natural History Survey staff (7)
- 6/8/09 Tour – Greg Swick & Andrew Kinslow – Bird mist netting sites
- 12/4/09 Tour – Jesse Heers, Campbell Scientific

Project WET – Erica Cox

Presentations.

Interface Science and Math Teacher’s Conference—Project WET/Webfoot workshop for elementary teachers, Project WET/Healthy Water/Healthy Water workshop for secondary teachers and “Beyond Project WET” workshops for both elementary and secondary teachers—all oral presentations.—February 2009

Professional Development Day in Miller—Project WET—February 2009—Oral Presentation

MSU Teach In Panel Discussion—WET and EE--February 2009—Oral Presentation

Project WET workshop—Springfield Nature Center—April 2009—Oral Presentation

Water Conservation Programs—4th graders at Wanda Gray, McBride and Sequiota Elementaries—March and April 2009—Oral Presentations

Rain Barrel Program—1st Graders at Holland Elementary—March 2009—Oral Presentation

Mature Learning Conference—Drury University Series—Clean Water and Project WET—March 2009—Oral presentation

New Facilitator Training at National Project WET Coordinator’s Conference—Orlando-June 2009—Oral Presentation

Project WET activities in Science Classroom—SPS Secondary Science teachers—August and October 2009—Oral Presentation

Projects Workshop—Springfield Public School teachers—September 2009—Oral Presentation

Professional Development Day at Schell City (6 school districts present)—September 2009—Oral presentation

Wastewater Management Program—4th graders at Field Elementary—October 2009—Oral Presentation

Project WET workshop—SWCD/USDA Office in Ozark—October 2009—Oral Presentation

Projects WET, WILD and Learning Tree workshop for MSU credit—November 2009—Oral Presentation

Sustainability Fair—MSU—November 2009--Poster

Project WET workshop—Ozark National Scenic Riverways—December 2009—Oral Presentation

Other Activities

- Trained 20 new Projects WET, WILD and Learning Tree Facilitators—January 2009
- Watershed Festivals-Developed Teacher Materials for Barry, Christian, Stone, Taney and Greene Counties—February-May 2009
- Worked with Holland Elementary School in Springfield—on Green Team Committee Jan-May 2009
- Project activity with Big Brothers/Big Sisters K-5 students after school program in Springfield Schools.—March/April 2009
- Judged OSEF Science Fair—March 2009
- Work with 8th graders from Study MS at Valley Water Mill—April 2009
- Discovery Center Earth Day Event—Had a WET booth/display—April 2009
- Helped with State Envirothon Competition (High School) at Lake of Ozarks—May 2009
- Worked with Phelps Gifted Center's 6-8th graders at Valley Water Mill—3 days—May 2009
- Worked with Cherokee 6-8th graders at Valley Water Mill—May 2009
- Selected to be on MO Environmental Literacy Plan Team—met in Nebraska City, NE—June 2009 (On-going committee meetings remainder of 2009)
- Coordinated Project WET Facilitator Advanced Training—Johnson Shut-Ins/Geology and Stream Restoration following Taum Sauk Reservoir breach—July 2009
- Served on MEEA Annual Conference Committee—July-October, 2009
- Free Wheelin' Friday Teacher event to showcase potential field trip sites in Springfield/Greene County—August 2009
- Developed list of potential MO Project WET facilitators/educators to field test new Project WET activities for new guide and provided communication between National Office, Field Test Sampling Site at Western Michigan and MO Field Testers—August-December 2009
- Worked with Parkview HS Environmental Chemistry class at Fasnicht Creek—October 2009
- Project WET activities with MSU GRY course—October 2009
- Judged Oral Presentations for Regional Envirothon Competition (High School)—November 2009
- Participated in Environmental Education workgroup for Springfield/Greene County Environmental Report Card—December 2009
- Worked with Miller Chemistry students at Valley Water Mill—December 2009

Facilities

Work will begin on renovations of the shed as soon as approval is received from the Corps of Engineers. The laboratory space will add a new dimension to classes that are taught at BSFS and will open up opportunities for research at the Field Station. The battery bank of the solar-power system was upgraded to provide the power necessary for the increased laboratory space.

Christmas Bird Counts

The annual Christmas Bird Count was held on January 3, 2009, in conjunction with the Greater Ozarks Audubon Society. Nancy and Hammonds Schanda (Master Naturalists) counted on the Drury area.

Goals for 2010 and list of needs for the future

Although some equipment is available for the new laboratory space, other equipment will have to be bought. Funding for this new equipment will be sought. Additionally, the furnace and air conditioner at the Mincy House are declining in their efficiency and will have to be replaced in the near future.

The continuation of the GLADE Academy is a priority of BSFS. The 2010 Academy is funded but funding will be needed for the 2011 year.

We are also looking at the possibility of real time data collection for the weather station. Campbell Scientific has provided a bid for \$700 for the equipment. Monthly charges would be in the \$30 range. This could be a valuable resource on our web page but we will have to look at the financial situation first.