



National Wildlife Federation®  
**CAMPUS**  
ecology®

**Furman University  
Greenville, South Carolina  
Spring 2008, Habitat Restoration**

**BACKGROUND**

**Campus Profile**

Furman University is an independent liberal arts college located on 750 acres in Greenville, South Carolina. With 2,700 undergraduates, it is ranked as one of the top 50 liberal arts colleges in the country and is a leader in undergraduate research. Over the last five years, Furman has also become a leader in environmental programs. The trustees have made environmental sustainability one of their eight institutional priorities and have included sustainability in the university's mission statement. University President David Shi has also signed the American College and University Presidents Climate Commitment, which commits the university to achieving carbon neutrality. This commitment to environmental sustainability is expressed in every aspect of university life.

Furman built the first Leadership in Energy and Environmental Design (LEED) certified building in South Carolina and has committed to attaining LEED certification on all new buildings. In student life, Furman is supporting 20 students on \$1000 scholarships to live in an Environmental Community of Students (ECOS), a living group that performs environmental service projects and completes an environmental science course together. In addition, Furman constructed an Environmental Studies Concentration (five courses from three different departments) and will require an environmental course of all students when the new curriculum begins in fall 2008. In the area of research, Furman is home to the River Basins Research Initiative, a program that studies the effects of urbanization on water quality, and has supported more than 150 students in undergraduate research with support from National Science Foundation Research Experiences for Undergraduate grants. As a consequence of this research, Furman is also thoroughly engaged with local environmental issues of land use and water quality, including cooperation with nonprofit organizations such as the Friends of the Reedy River, Upstate Forever, and the local chapter of The Nature Conservancy. Furman declared 2006–2007 the Year of the Environment to showcase its institutional commitment and to stimulate further initiatives. The school received the institutional award from the South Carolina Wildlife Association for these efforts.

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**GOALS AND ACCOMPLISHMENTS**

**Goals**

A 2007–2008 National Wildlife Federation (NWF) Campus Ecology Fellowship was awarded for the installation of a rain garden at Furman University. The rain garden is part of a larger university initiative

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to restore the 28-acre Furman Lake. The purpose of the rain garden is to prevent sediment, pesticide and fertilizer runoff into Furman Lake during storm events. A secondary purpose is to educate the wider community about the benefits of rain gardens as a tool for water quality management.

The primary new initiative is the Furman Lake restoration project. Furman Lake is a 50-year-old, 28-acre impoundment in the center of campus. Constructed on the “municipal duck pond model” common in the 1950s, the lake was surrounded by lawns and mowed to the waterline until the start of the restoration project in 2007. In addition, the lake was home to more than 250 ducks and Canada Geese before the beginning of restoration efforts. Nutrient runoffs and fecal inputs contribute to excessive populations of *E. coli* bacteria and algae. The restoration project will establish a natural border of vegetation to reduce runoff, establish wetlands in the shallows, and reduce the population of Canada Geese.

### **Accomplishments**

The first installment of the NWF grant money was used to construct a rain garden at one of the major point sources of runoff to the Furman Lake. Rick Huffman, the landscape architect who is coordinating the entire Furman Lake restoration project, suggested a site along one of the two tributary streams of the lake. The site is situated in the midst of the North Village apartment complex, which provides housing to upperclassmen. It is both a highly trafficked area and prone to rapid runoff and erosion due to the large amount of paved surfaces and bare ground in the area.

### Rain Garden Construction

In September 2007, I hosted two workdays to construct the garden. In preparation for the proposed workday, NWF Campus Ecology Fellow Elizabeth Cooke made fliers that she distributed to students to encourage participation in the project (Appendix A). She particularly targeted the Environmental Community of Students (ECOS) and the Environmental Action Group (EAG). Some seven to nine students and faculty members participated each day. The faculty members were the project advisor, Dr. Wade Worthen of the Biology Department, and the EAG advisor, Dr. Wes Dripps of the Earth and Environmental Sciences Department.

On the first day, we excavated several inches of woodchips and soil at the garden site, which measures approximately 50 square feet with an additional 10 foot × 2 foot feeder channel. We then leveled the site and filled it with gravel, landscape fiber, sand and soil. On the second day, we reinforced the edges of the garden, installed a drainage pipe and planted a variety of native plants, including beautyberry bush (*Callicarpa Americana*), cardinal flower (*Lobelia cardinalis*), tickseed (*Coreopsis*), dwarf irises (*Iris verna*) and pink muhly grass (*Muhlenbergia capillaries*). The entire process went smoothly, largely due to University Horticulturist Bruce Fox’s help in securing supplies (see Appendix B for photos).

### Additional Gardens

As a result of the success of the first garden, President Shi offered to fund additional rain gardens, with the stipulation that students build them. In honor of Campus Sustainability Day on October 24, the ECOS students spent their afternoon lab constructing two additional gardens. Elizabeth Cooke helped install one of the gardens and enjoyed the opportunity to teach more students about rain gardens.

Unfortunately, both of these gardens were destroyed or displaced, one in the winter by a truck that was dredging Furman Lake as part of the restoration project; the other in early spring as a result of work on a culvert draining to the lake. The plants from the latter garden were relocated to other sites around the lake.

### Effects on Water Quality

Furman Lake was partially drained for most of the winter months as part of efforts to dredge the lake. This draining disrupted the monitoring of water quality in the lake. As a result, the effects of the rain garden on lake's water quality could not be immediately ascertained. However, observations of the garden during rain events indicate that the garden is functioning properly. Whereas water formerly traveled quickly from a drainage pipe through the site and directly into the stream, water now slows when it encounters the plants in the garden, collects inside the borders of the garden and slowly drains out the bottom of the garden into the stream. In addition, students and professors in the Earth and Environmental Sciences Department are conducting ongoing research into the functioning of Furman Lake. This research will provide a long-term picture of the lake's health, spanning the time before, during and after the restoration project.

## **ENGAGEMENT AND SUPPORT**

### **Leaders and Supporters**

Landscape architect Rick Huffman and students from the Environmental Community of Students (ECOS) and the Environmental Action Group (EAG) have participated as volunteers. Dr. Wade Worthen of the Biology Department and the fellowship project advisor and EAG advisor Dr. Wes Dripps have both provided support.

### **Funding and Resources**

This project was supported through an NWF Campus Ecology Fellowship grant.

### **Community Outreach and Education**

Numerous articles have been written specifically about the rain garden funded by the NWF Campus Ecology Fellowship. It was featured in *The Paladin* (Furman's newspaper), FUnet (Furman's internal website), *The Bonhomie* (Furman's yearbook) and a university publication that was sent to other liberal arts colleges. In addition, Upstate Forever, a local environmental nonprofit organization, featured the garden in a fact sheet about rain gardens. Finally, Elizabeth Cooke has conducted several tours of the garden for interested students and faculty members who have heard about it through these publications.

Since receiving the second installment of the NWF grant money, Ms. Cooke has been working with her project advisor and a member of the university's Marketing and Public Relations staff to develop an educational sign for the garden. We have developed text and a diagram for the sign (Appendix C). However, production of the sign has been delayed due to efforts to coordinate this sign with other new signs that are being developed for the lake restoration project. We are requesting an extension of the NWF Campus Ecology grant period in order to use our remaining funds for this sign once the Marketing and Public Relations office has approved its design. If additional funds remain after the sign has been purchased, those funds will be used for the purchase of additional plants for the rain garden.

## **CLOSING COMMENT**

As of May 2008, the rain garden is flourishing. The plants survived the winter remarkably well and have been flowering throughout the month of May. The garden continues to function well during rain events, collecting and gradually releasing water that flows into the site. It also continues to attract attention, providing opportunities to educate members of the university and the wider community. With the addition of an informational sign, the rain garden should serve far into the future as a tool for educating people about rain gardens as a simple, effective way to improve water quality and encourage native plants.