

# **Report for 2003DE26B: Undergraduate Internship: Blue Hen Creek: An Evaluation of Stream Habitat Restoration at the UD Experimental Watershed**

- Water Resources Research Institute Reports:
  - Walker, Judith, Gerald J. Kauffman, 2004, Blue Hen Creek: An Evaluation of Stream Habitat Restoration at the UD Experimental Watershed, Delaware Water Resources Center, University of Delaware, Newark, Delaware, 61 pages.

Report Follows

## **Undergraduate Internship Project #7 of 10 for FY03**

The project is co-sponsored by the *UD Institute for Public Administration Water Resources Agency (WRA and DWRC)*. Ms. Walker, University of Delaware undergraduate senior, Natural Resource Management major, will recommend habitat restoration techniques for areas along Blue Hen Creek, a tributary of the White Clay Creek. Blue Hen Creek was classified by previous *DWRC* interns (Jennifer Campagnini in FY00 project G-04, continued by Tara Harrell in FY01 as project G-14) as impaired by bank erosion due to watershed urbanization. A related project, investigated by Kristen Sentoff and also advised by Gerald Kauffman, is "Fairfield Run: An Evaluation of Stream Habitat Restoration at the UD Experimental Watershed", project **2003DE22B** (intern project #25 of 32 to date).

### **Abstract:**

Previous student researchers have delineated an Experimental Watershed on the University of Delaware campus and further linked how changes in land use affect the health of streams. The purpose of this project is to research various types of stream restoration techniques that are applicable to Mid-Atlantic Piedmont streams and use the research to design a restoration plan for Blue Hen Creek. All of the restoration technique sources found during the research phase of this project were tabulated into a matrix that can be used to determine the appropriate restoration technique based on stream condition and available resources. A reference stream was selected and used throughout the project as a comparison of stream health to Blue Hen Creek. The reference stream was also used as a model for the results desired after the restoration techniques are implemented in later phases of the project. Field stations every 100 feet were set up along the stream to aid in the placement of the restoration designs. Following similar monitoring techniques of previous researchers, stream health grades were given to both Blue Hen Creek and the reference stream. The overall, Blue Hen Creek received a water quality score 3.03 or a B- and the reference stream received 3.56 or an A-. Stream habitat surveys were conducted on both streams as well with Blue Hen Creek only receiving a moderate score while the reference stream received the high rating of Very Good. The Rosgen method of stream classification was also performed on Blue Hen Creek and the reference stream. The streams received very close classifications meaning that the reference stream is a good approximation of what Blue Hen Creek would be without human disturbances. Blue Hen Creek is currently classified as a C5 and the reference stream is a class C3b. All of the results from the data collected indicated that while Blue Hen Creek is in need of restoration, the stream should respond positively to properly applied restoration techniques. Based on the literary research and fieldwork, specific sites were selected for restoration and paired with appropriate restoration techniques to be implemented in a later phase. Nine restoration techniques are recommended for implementation on either the entire length of the stream or on specific field stations on Blue Hen Creek. Future researchers will be able to implement the restoration designs and monitor their effects on the stream health and overall health of the watershed.