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Stream Restoration Research along Blue Hen Creek at the University of Delaware
Experimental Watershed

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Undergraduate and graduate students conducted research into experimental stream restoration techniques along Blue Hen Creek. This 200-acre headwater tributary flows for a mile through the University of Delaware Experimental Watershed before entering the White Clay Creek National Wild and Scenic River in Newark, Delaware. Researchers included civil and environmental students in CIEG 440 Watershed Engineering, Planning, and Design during the spring 2004 semester and natural resources management majors funded through the undergraduate research intern program by the Delaware Water Resources Center.

The objective of the research was to evaluate stream restoration techniques that would 1) work well along small tributaries (less than 5 square miles) in the hilly, rocky piedmont of northern Delaware and southeastern Pennsylvania, 2) be low cost making use of native materials such as onsite rocks and trees, and 3) have low technology demands utilizing techniques that could be installed by hand by volunteers without heavy equipment. The researchers chose a reference stream reach with a heavily forested watershed as a control and ten candidate restoration reaches (each 500 feet long) along Blue Hen Creek. The students conducted water quality, habitat, and geomorphology surveys during and after class. The evaluation indicated the following techniques have the highest potential for success in meeting the low tech, low cost criteria: vortex rock weirs, branch packing, single vanes, tree revetments, stone toe protection, live stakes, and cross vanes. Based on this research, these stream restoration techniques are recommended for implementation as headwater stream BMPs in the Christina Basin Watershed Restoration Action Strategy as mandated by the total maximum daily load provisions of the Clean Water Act. This research project furthers the education and research mission of the UD Experimental Watershed by involving students and faculty to improve on-campus stream water quality and identify BMPs to improve watershed health in the surrounding Christina Basin.