

ASU Science Faculty Perspective:
Elements to address in the Kraut (Boone) Creek project design¹
(May, 2005)

1. Water temperature
 - For aquatic ecosystem recovery, it will be important to maintain water temperature within a few degrees of what it is in the upstream reaches (above Watauga County Human Resources complex).
 - We need to bear this in mind when designing stormwater retention ponds, wetlands, etc, which can cause increases in water temperature.
2. Water quality & chemistry
 - It will be important to address fine sediment and pollutant flux to the creek, which have physical and chemical effects on the aquatic ecosystem.
 - Can the design include an adequate number (with appropriate sizes, capacities) of innovative stormwater detention/retention areas along the length of the creek to help address this issue?
 - Fine sediment from disturbed sites (e.g., construction areas) should be controlled using BMP's and adequate enforcement of existing regulations.
 - Sediment delivery from bank slumping and undercutting is a significant problem that can be addressed by bank stabilization techniques.
3. Riparian zone
 - Wherever possible along the creek, a riparian buffer as wide as possible (25 feet minimum), consisting of trees and shrubs, should be included in the design. Such a buffer would provide shade and organic matter inputs for the creek, stream bank stabilization, riparian habitat, and potentially filtration of sediment and pollutants from run-off.
4. Geomorphic character
 - The creek should be daylighted along its entire length, and should have a more natural geomorphic character (including pools, riffles, bends, etc.).
5. Geomorphic stability
 - Since this will be a highly visible and expensive project, it is important that it maintain physical stability. This will be crucial for ensuring the long-term support of landowners along the creek, and the greater Boone community.
 - The project area combines the challenging hydrologic response typical of an urban area, with the intense precipitation patterns typical of our mountainous region. Creating both a stable and a relatively natural stream channel will therefore be challenging.
6. Multiple use
 - For this project to be successful in the long-term, the overall design should include multiple uses and values. We support the idea that there should be community access points along the creek, with opportunities for wading and other recreation. However, we hope that the design can also include reaches that

¹ This list is based on discussion at a meeting of interested ASU faculty which took place May 9, 2005. Attendees: Bill Anderson, Carol Babyak, Jana Carp, Ellen Cowan, Rich Crepeau, Gabrielle Katz, Jeffrey Scott (NCNR), Shea Tuberty, Michael Windelspecht.

are not accessible to the community, but that are designated as prioritizing ecological functions.

- One aspect of community involvement should be litter control, including well-publicized creek clean-ups.
- Visual enhancement (landscaping) should use native species for habitat as well as for local character.
- We would like to see dedicated scientific monitoring areas included in the design.

7. Monitoring & education

- The project will benefit from assessment of its effects, and ASU faculty can provide significant expertise for long-term monitoring of the changes that take place in the creek following the project. We propose to collect baseline data and to continue long-term monitoring of geomorphology, hydrology, water chemistry, sediment load, and aquatic and riparian ecosystems.
- We envision this project as an opportunity to create a working environmental laboratory in the community and on the ASU campus. This would provide an extremely valuable educational opportunity for ASU undergraduate and graduate students in many Departments, including Biology, Chemistry, Geography and Planning, and Geology.