

Rock Creek restoration

Project yields improved water quality, vegetative growth

By John Webb
Division of Water

Rock Creek is a beautiful, meandering stream that flows across the Tennessee line into McCreary County, Kentucky. After crossing the state line, it flows for 21 miles before entering the South Fork of the Cumberland River, known locally as Big South Fork.

Eighteen miles of the upper portion of Rock Creek is typified by magnificent boulders, riffles, glides and pools. It is a major recreational attraction and has been recognized nationally as a Blue Ribbon trout stream. Upper Rock Creek has also been designated a state Wild River and an Outstanding State Resource Water by the state of Kentucky.

A decade ago, the same could not be said, however, for portions of the creek below its juncture with White Oak Creek, where acid mine drainage from abandoned mine lands had killed most of the vegetation and aquatic life. In the years preceding the Surface Mining Reclamation Act of 1977, this three-mile stretch of Rock Creek had been harmed to the point that the Division of Water, in 1990, had listed it as “non-supporting for aquatic life and swimming” in the 303(d) list of

impaired state waters and began developing a Total Maximum Daily Load to limit pollutants entering the stream.

Then in 2000, the Rock Creek Task Force watershed group developed the Rock Creek Clean Water Action Plan Project to tackle the job of restoring the unhealthy stream portion. Twelve state and federal agencies and conservation organizations obtained \$970,000 in funding for Phase 1 of the project (see box at right).

The Kentucky Division of Abandoned Mine Lands led implementation of Phase 1 in the spring of 2000. Innovative wetlands were constructed to treat the mine flow

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ABOVE: *The Lower Rock Creek watershed was stocked with fish after limestone was used to treat acid mine drainage from abandoned mines and coal processing refuse piles.*

LEFT: *Prior to the limestone treatments, the streambed appeared to flow red from acid mine drainage.* Photos provided by Abandoned Mine Lands



Funding for Phase I

- \$200,000 in a Clean Water Action Plan grant from the U.S. Environmental Protection Agency through the Kentucky Division of Water.
- \$280,000 in grants from the Appalachian Clean Streams Initiative.
- \$250,000 in a Personal Responsibility in a Desirable Environment grant from the National Oceanic and Atmospheric Administration.
- \$160,000 in a Kentucky Abandoned Mine Land grant.
- \$80,000 in an U.S. Geological Survey cost share grant.

Rock Creek Task Force

- Kentucky Division of Abandoned Mine Lands (Department for Surface Mining Reclamation and Enforcement)
- Kentucky Division of Water (Department for Environmental Protection)
- Kentucky Department of Fish and Wildlife Resources
- U.S. Department of the Interior Geological Survey
- U.S. Department of the Interior Office of Surface Mining
- U.S. Department of Agriculture Forest Service
- U.S. Department of Agriculture National Resources Conservation Service
- U.S. Army Corps of Engineers
- U.S. Department of the Interior Fish and Wildlife Service
- U.S. Department of the Interior National Park Service
- Trout Unlimited

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Mark Carew, of Abandoned Mine Lands, holds a brown trout caught in Rock Creek. The watershed now supports aquatic life and is safe for swimming. Photo by Abandoned Mine Lands

heading into the stream. Coal refuse materials totaling 20,000 to 30,000 tons was removed, treated and relocated to designated storage locations. Limestone rock was placed along the channels to boost alkalinity. Water in the creek was then treated with monthly applications of limestone sand to continue to reduce acidity.

Activities to date have dramatically improved the water quality in the Lower Rock Creek watershed. Acid loading into the South Fork of the Cumberland River from Rock Creek has decreased from a monthly average of 110 metric tons to near zero.

Removal of the coal refuse from streamside areas and revegetation of the creek banks have reduced the amount of sediment entering the stream by 500 tons annually. Fish populations are improving in the lower Rock Creek watershed, and the number and diversity of fish species are increasing. Monitoring stations that once found no fish are now supporting fish.

The aesthetic improvements to Lower Rock Creek are obvious. More importantly, monitoring of Lower Rock Creek has shown dramatic improvements in water quality. By 2004, watershed assessments indicated that water quality had improved sufficiently to partially support primary contact recreation (swimming). By January 2008, DOW assessments listed Rock Creek as fully supporting its use for swimming.

The value of trees

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division's Central District, has worked extensively with Prospect officials since 2008 to assist the city in becoming a certified Tree City U.S.A., organize an Arborfest celebration, locate and record the state champion Kentucky coffeetree, and write and develop a forest stewardship plan for one of the city's natural areas.

Mayor Todd Eberle noted the importance of partnering with KDF and expressed appreciation for support and assistance from the two KDF foresters.

"Small cities have a cost-effective, unique capacity to manage their environment and quality of life simply through their management of trees and forest lands," said Eberle. "The technical assistance and guidance from KDF has been indispensable to our community and Forestation Board."

Other communities who care about their urban trees can easily model the city of Prospect. *i-Tree* software is available free of charge and can be downloaded from the *i-Tree* Web site at www.itreetools.org. For more information about urban forestry assistance, contact KDF at 1-800-866-0555 or visit <http://www.forestry.ky.gov/programs/urban/>.

Storm water permit protects water quality

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in storm water runoff. The permits are implemented based on best management practices such as diversion, detention, erosion control, sediment traps, gravel construction entrances, covered storage, spill response, stream buffer zones and good housekeeping. These techniques help control nonpoint source pollution by intercepting surface runoff from disturbed areas, filtering and treating it, and then discharging it at a controlled rate.

Documentation and accountability are also important aspects of the permit. Permittees are required to conduct weekly inspections and the day after any rainfall event resulting in runoff. They must maintain on-site copies of written inspection reports and any associated enforcement actions. In a move to further protect the waters of the Commonwealth, certain construction projects are ineligible for coverage under the 2009 general storm water permit that:

- discharge to an impaired water listed in the 2008 305(b) Integrated Report as impaired for sediment and for which an approved Total Maximum Daily Load has been prepared.
- discharge into a Cold Water Aquatic Habitat, Exceptional Water or Outstanding State Resource Water (Outstanding National Resource Waters were already protected from discharges).

For more information, go to www.water.ky.gov or call the Division of Water at 502-564-3410.