

Introduction

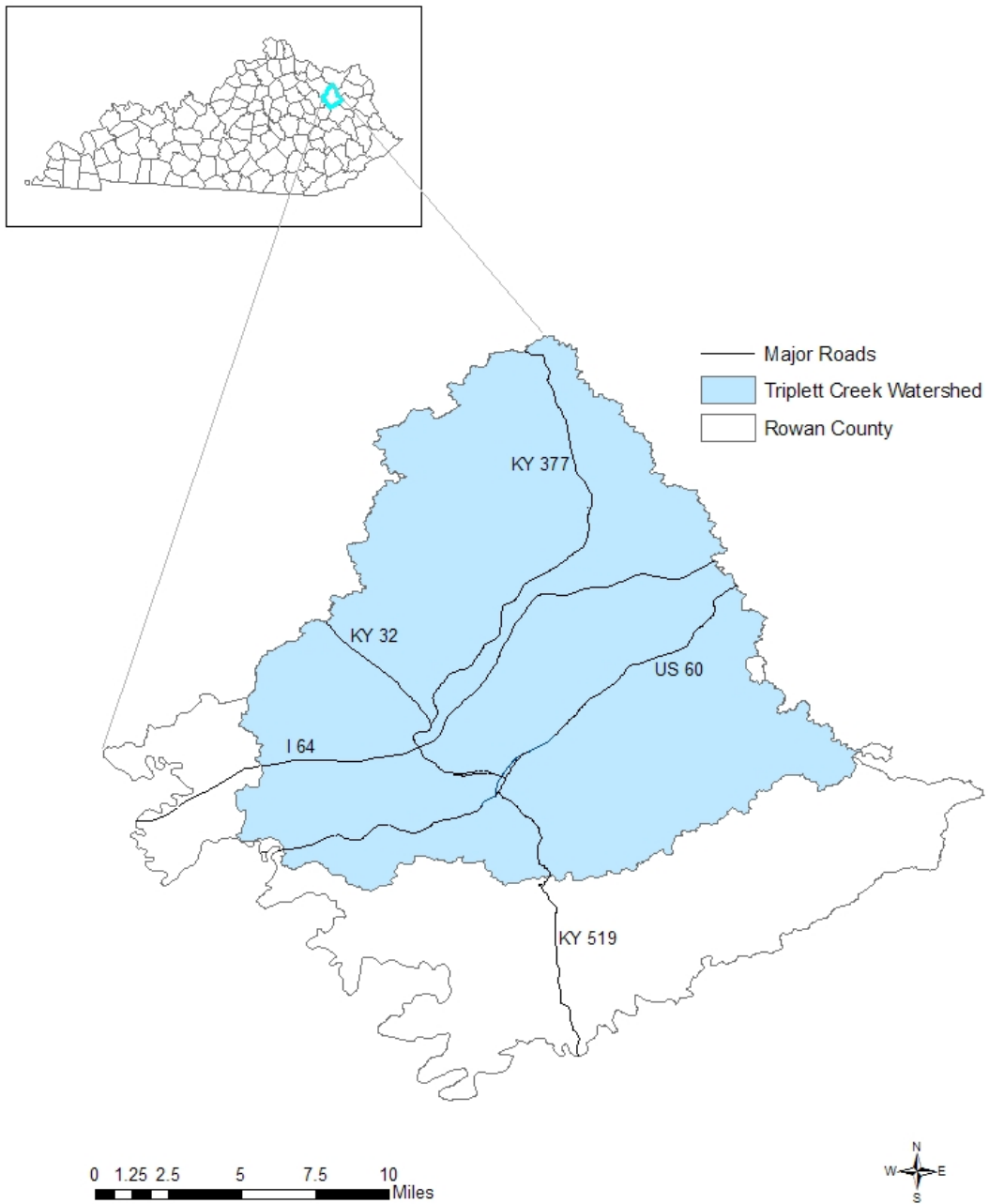
The Triplett Creek Watershed-based Plan (WBP) will outline all point and non-point pollution sources in the watershed, quantify the pollution coming from each source, and make recommendations for Best Management Practices (BMPs) to improve water quality of Triplett Creek and its tributaries.

Watershed

The Triplett Creek watershed comprises approximately 65% (about 180mi²) of Rowan County, most of which lies within the Daniel Boone National Forest. Availability of private land and steep terrain has forced agriculture, housing, parking areas, and commercial development to be concentrated along Triplett Creek and its tributaries. This, combined with limited community education and best management practices (BMPs) implementation, has negatively impacted these waterways. The negative impacts of unplanned and unchecked development on water quality will continue to increase as more development extends along Triplett Creek and the North Fork of Triplett Creek as the city limits expand.

Triplett Creek is listed as impaired under section 303(d) of the Clean Water Act and is on the state's first priority list (KYDOW, 2008). Documented pollutants include pathogens, nutrients, organic enrichments/low DO, and siltation (sediment). Christy Creek and Dry Creek, major tributaries of Triplett Creek, are on the state's second priority list. Triplett Creek is listed as partially supporting aquatic life and secondary recreational contact. In addition, the watershed is listed as non-supporting for primary recreational support (KYDOW, 2008). The North Fork of Triplett Creek, another major tributary, is not listed. However, observations by citizens and measurements by Morehead State University scientists suggest that serious water quality issues exist, and stream bank instability is common. North Fork of the Triplett is expected to experience rapid growth with road construction and new commercial development.

Sedimentation has resulted in the degradation of the waterway's ability to support aquatic life. Likely sources of pollutants include illegal and failing household septic systems, farm animal waste, development, open construction projects, storm water run off, and agriculture. These trends are expected to increase as development expands along Triplett Creek and its tributaries. Much of North Fork Triplett Creek and Christy Creek will remain or become more agricultural, but much farmland is being sold and partitioned for housing developments and development pressures increase as the city annexation increases. Tracts of timber are also being sold and logging pressures are likely to increase, in addition to the growth in cattle farming. Growth along Dry Creek and Christy Creek is expected to be much slower than on Triplett Creek and North Fork Triplett Creek and most likely will be restricted primarily to residential development.



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 Figure 1. Location of the Triplet Creek Watershed in Rowan County, Kentucky.

Goal

The goal of this project is to improve the water quality of Triplett Creek and its tributaries through the development of a Watershed Based Plan (WBP). As part of the scope of this project, the Triplett Creek Committee and other potential partners will implement selected components of the plan and identify responsible stakeholders to implement the remainder of the plan. The nine elements of a WBP as defined by the United States Environmental Protection Agency (EPA) will serve as the primary objectives of this project.

To accomplish these objectives, the following activities are planned for the duration of the project. The Kentucky Division of Water (KDOW) or the Triplett Creek Committee may modify these activities. Activities also may be modified based on any variation in the outcome of this QAPP. The activities outlined in this QAPP may be modified by the Kentucky Division of Water (KDOW) or the Triplett Creek Committee as conditions or Triplett Creek Watershed assessment data warrant.

1. Identify impaired waters and causes/sources of impairments.
 - a. Acquire, review, and summarize existing water quality data from the Triplett Creek Watershed. This activity will be coordinated with the KDOW, listed partners, and other identified partners.
 - b. After review of existing data, a pre-monitoring plan will be developed and implemented for the project. Simultaneous monitoring will be a coordinated effort involving multiple parameters (bacteria, nutrients, sediment, bank and channel instability, and discharge).
 - c. To address sedimentation, bank/channel instability, and subsequent habitat alteration, a geomorphologic assessment of the Triplett Creek Watershed will be performed MSU geologists.
 - d. MSU environmental scientists will collect water samples for nutrients and total suspended solids (TSS), and to record pH, dissolved oxygen, temperature, and conductivity.
2. Identify threats to waterways.
 - a. Acquire, review, and summarize existing water quality data for the Triplett Creek Watershed. This activity will be coordinated with KDOW and partners to identify previously collected data.
 - b. After reviewing the data, additional stream monitoring will be initiated in order to fill data gaps and to better evaluate identified threats and impairments.
 - c. Field data will be used to help develop load reduction models.
3. Identify point source controls and non-point source management measures needed to attain and maintain water quality standards.
 - a. Review and evaluate the point source and non-point source control measures that already exist or that will be implemented in the future. This will be coordinated with the Triplett Creek Committee and other potential partners.

- b. After a review and analysis of previous and new monitoring data, identified threats, and existing control measures, we will suggest control measures needed to maintain water quality standards for unimpaired stream reaches and to improve impaired stream reaches. Activities will be recommended based on their ability to prevent or reduce pollutant loading, improve habitat, and on their cost-effectiveness and feasibility.
- c. Use field data to implement an Environmental Protection Agency (EPA) approved model for estimating load reductions and costs associated with user-selected BMPs. The KDOW will be consulted regarding the EPA approved model.
4. Identify responsible parties for implementation of control measures.
 - a. Through discussions with partners and government officials and careful scientific review, appropriate stakeholders will be identified for the necessary remediation activities within the Triplett Creek Watershed.
5. Estimate load reductions that will be achieved.
 - a. Based on literature review, modeling, and field monitoring we will estimate the load reductions that will result from proposed BMPs within the Triplett Creek Watershed.
6. Provide an implementation schedule with interim milestones.
 - a. A quarterly report will be provided to the KDOW outlining the status of the milestones listed in the QAPP and MOA.
7. Estimate implementation costs and identify funding sources.
 - a. Costs for proposed activities will be estimated and presented in summary. Funding agencies will be informed of the WBP results and proposed implementation schedule. Partners will be especially important in efforts to obtain future funding for BMP implementation.
8. Identify technical assistance, outreach and education needed.
 - a. Technical assistance will be provided by the partners to develop a feasible, effective, and cost-conscious plan. Other stakeholders may be identified if needed. Our partnership includes people with a range of skills and backgrounds, from scientists to city planners with backgrounds in private industry, government, and academia.
 - b. Throughout the development of the WBP, MSU will allocate resources for necessary outreach efforts. This will include involving interested stakeholders in the process as well as marketing the results of the plan to the public, government agencies, and potential funding sources.
 - c. The WBP will identify and possibly develop educational programs that will augment existing water quality education efforts in Rowan County.
9. Establish a monitoring plan and adaptive implementation process
 - a. Post-implementation monitoring will occur for remediation activities implemented during the project. Monitoring will balance cost with sufficient data collection to assess the overall effectiveness of BMPs in improving water quality.
 - b. To be effective, the WBP must be flexible enough to adapt to unanticipated changes in the economic and political environment. We must move forward with available funding and implement activities that eventually will improve water quality.
 - c. Evaluate the GIS-based modeling and its effectiveness as a monitoring tool.
 - d. We expect initial improvements in water quality. It is unknown at this time what water quality parameters will show improvement until the BMPs are identified and

implementation begins. Our goal is to delist the impaired waterways. We are most likely to have positive numerical change in chemistry, sediment, and physical habitat immediately after BMPs.

9. Implement selected activities of the WBP

- a. Identify components of the WBP that can be implemented within the scope and timeframe of this project and the approved budget.
- b. Solicit and work with necessary partners to ensure effective implementation.
- c. Implement BMPs according to the WBP and a KDOW-approved BMP Implementation plan.
- d. Ensure that all participating landowners with agricultural BMPs have completed an Agricultural Water Quality Plan.

10. Develop a plan to continue the implementation of the WBP.

- a. Identify stakeholders interested in serving on the Triplett Creek Committee.
- b. Develop periodic assessment recommendations to ensure that the WBP is implemented properly and evolves as necessary in response to changes in growth and land use.

Partners and Stakeholders

The watershed planning effort is funded in part by a grant from the U.S. Environmental Protection Agency under 319(h) of the Clean Water Act through the Kentucky Division of Water to Morehead State University.

MSU's location, resources, facilities, faculty and staff involved in the community have supported and initiated a number of extensive ongoing and new projects focused on improving the water quality in the Triplett Creek watershed. This research has resulted in a greater understanding of the water quality issues. Although many data gaps still exist, this research has produced quality data that may be used in the development of a comprehensive watershed based plan MSU's most recent projects include the monitoring before and after municipal sewer installation and a focus study on the Triplett Creek Watershed.

Approximately four years ago, a group of citizens complained about an increase in the frequency and severity of flooding on the west end of Morehead and in the Clearfield area. As citizens and local officials began to discuss the issue and possible solutions, it became apparent that no simple, one-time fix existed. In response, the City of Morehead formed the Triplett Creek Committee, which consists of citizens from Rowan County; a biologist and geologist from MSU; the Rowan County Solid Waste and Flood Plain Manager; representatives from the United States Forest Service, KDFWR, US Division of Agriculture Natural Resources Conservation Service; and the Licking River Basin Coordinator. This committee will serve and assist with the development of the Triplett Creek WBP.

Since a group had already been established these members were asked to participate in creating the Triplett Creek WBP. The official representation on the team is Morehead State University (faculty, staff and students), Morehead Utility Plant Board, Licking River Basin Coordinator,

Rowan County Fiscal Court, City of Morehead, USFS, Rowan County Extension Service, citizens living in the Triplett Creek watershed, and community representatives. This list may grow as the planning process continues and the watershed team identifies more partners and stakeholders. In addition to the stakeholder list, the Rowan County Fiscal Court and City Council will be regularly updated on the planning process via briefings during regularly scheduled meetings. Kentuckians for the Commonwealth and the Morehead New Cities committees will also be provided regular updates on the WBP process.

The attendance of at least seven stakeholder groups of the watershed team is required in order to have a quorum. Major decisions will require an 80% majority vote. The team will use the “spirit” of Roberts Rules of Order to conduct its meetings. The stakeholder contact list currently consists of 34 people. This stakeholder list has been developed from phone conversations, as well as one-on-one conversations with those interested in the process.

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