Cumberland River Basin Watershed Initiative
Grant Proposal - November 21, 2002

I. A. Characteristics of Watershed & Watershed Planning Effort

The Cumberland River arises on the western flanks of the Appalachian Mountains, meanders westward through Kentucky and Tennessee to the Ohio River, and drains a basin with a total area of 17,720 square miles. The Nature Conservancy (TNC) and World Wildlife Fund (WWF) note the biodiversity in the Cumberland Basin as being among the greatest in the hemisphere with WWF choosing it as one of the "Big Three" Southeast U.S. Basins for special protection.

As with many other great basins in the Southeast, the Cumberland River flows through multiple states with differing jurisdictions, management philosophies, and political priorities. Natural resource, environmental, and socioeconomic conditions vary greatly along the river's course. Consequently, improving and maintaining water quality and quantity through watershed planning and implementation requires community driven and site-specific approaches.

Three specific project sub-watersheds of the Cumberland Basin were chosen for this proposal. They are the Red River, Cheatham Lake (specifically Mill Creek), and the Harpeth River (See Map – Appendix 1). These were chosen for their range of problems and their high probabilities for success in accomplishing water quality improvements. They also offer opportunities to demonstrate cooperative programs within the typical environmental and socioeconomic settings of the Southeast region. The three adjacent watersheds contain 16 counties in Tennessee and Kentucky, and include rural, urban, and suburban settings.

The range of land use and socioeconomic conditions varies across the sites. The rural Red River Watershed winds through 1,455 square miles of Kentucky and Tennessee farmland. Its largest city is Clarksville (>75,000 pop.), and the largest cash crop is tobacco in this mostly low to medium income area. In tandem, WWF and TNC have named the Red River headwaters a priority area for biodiversity. TNC is currently collaborating on programs with the Department of

Defense in the Ft. Campbell area, and the Red River Watershed Association (RRWA) is currently working with the Natural Resources Conservation Service (NRCS) and Tennessee Wildlife Resources Agency (TWRA) on stream restoration.

The urban Mill Creek watershed lies in the Nashville Basin and is a mixture of affluent and low-income minority populations within the Nashville metropolitan area. With the highest percentage of impervious surface in the three project watersheds, it is home to many of the city's Hispanic and Asian minorities. It is also home to the federally endangered crayfish, Orconectes shoupi, endemic to the Mill Creek watershed which has been adopted by the Tennessee Scenic Rivers Association (TSRA).

The affluent, suburban Harpeth River watershed contains a population which is expected to increase 53% to over 304,000 people by the year 2020. The Harpeth is in the top priority grouping for the Tennessee Department of Environment and Conservation (TDEC) based on the percentage of stream miles on the 303(d) list partially due to rapid conversion of agricultural land to sprawling residential development. However, the Harpeth still harbors G-1 rated streams and offers an opportunity for restoring a biologically diverse aquatic system with the help of groups like the Harpeth River Watershed Association (HRWA). It is designated as a State Scenic River and The Nature Conservancy has found globally rare seep communities, a high diversity of fish and aquatic invertebrates, and some of the most exceptional herpetological habitat in Middle Tennessee.

The Cumberland Basin is home to several active and effective watershed efforts. The Cumberland River Compact (CRC) and its partnership processes are making great strides in local capacity building through its development of sub-watershed organizations like the HRWA and RRWA. These organizations have advanced voluntary cooperation among government agencies, local officials, industries, business leaders, and citizens across political boundaries. In

addition, existing groups and initiatives listed in Appendix 2 will provide impetus for the success of this project through their good work and cooperation.

However, a cross-pollinating coordination mechanism among these diverse efforts is a missing piece of the watershed stewardship puzzle. This project, under the direction of CRC, will coordinate and unify these multi-faceted efforts toward maximum watershed protection success. This coordinated and synergistic approach will achieve long-term positive change.

B. Problems or threats

The number one pollutant of the Cumberland Basin and all three project watersheds is siltation. In addition, other pollutants often complicate sediment runoff, including low dissolved oxygen, high nutrient loading, and organic enrichment. The underlying factors of population and land use conversion are also threatening the unique biological diversity and the health of local citizenry. According to "Paving Our Way to Water Shortages" by the NRCS, Nashville has been ranked as 11th in the nation for sprawl, with a 30% increase in population and over 100% increase in land use over the past 10 years with accompanying loss of groundwater due to impervious surface runoff. Future projections show even greater growth in the Cumberland and other major basins in the Southeast. Both Tennessee and Kentucky have been tasked with creating hundreds of watershed restoration plans (TMDLs) over the next 10 years to address siltation and other specific pollutants in each of their impaired water bodies. Additional pollutant sources in the project area include: agricultural runoff, removal of riparian vegetation, urban runoff/storm sewers and collection system failure, and construction/land development.

The areas are also experiencing significant increases in flood events with loss of human life and property. Ironically, these flood events may be contributing to the current water supply shortfalls in some areas due to rapid storm water runoff that prevents natural water recharge of soils and underground aquifers. Water supply for a growing population must be addressed now through watershed stewardship to prevent a future crisis.

The Red River Watershed problems are related to its rural character and unsustainable agricultural practices. Restoration methods require on the ground BMPs that address agricultural land use practices as well as strategies to maximize riparian buffers and limit runoff on farms and cities alike. Mill Creek is experiencing intense pressure from urban development. Future flooding and stream degradation will worsen as land development and poor maintenance practices persist. Riparian zone restoration, land use planning, and urban runoff management are vital to reversing this decline. The rapid suburban sprawl development in the Harpeth, with poor erosion control at construction sites, is leading to extreme siltation and streambank erosion from high stormwater flow volumes that scour banks. A draft sediment TMDL applies to nearly 40 Harpeth stream segments. Correcting poor construction BMPs, finding ways to minimize impervious surfaces, and increasing planning that protects riparian habitat are essential for restoring and maintaining this watershed. Development is also affecting the hydrology of the area through loss of groundwater infiltration. The Harpeth and Pennyrile karst (Red River) topography call for special attention to protect surface and groundwater resources.

C. Watershed plan

The Cumberland Basin Watershed Initiative and Center for Living Watersheds Coalition is an outgrowth of a coalition of forces coming together for a common cause: to bring about measurable improvement to the water quality of three 303(d) listed streams within the Cumberland Basin and stimulate similar successes for the Southeast region. This proposal is presented by CRC on behalf of this coalition of 20 groups (See Appendix 3) that has been meeting over two years to develop a vision and action plan for enhancing watershed health. The specific goals for the watershed project plan in the three sub-watersheds are:

- Restore and preserve the water quality in three impaired Cumberland Basin stream segments sufficient to remove them from the 303 (d) list

- Demonstrate innovative methods for nonpoint source water pollution prevention
- Coordinate and/or combine existing efforts of organizations and agencies working in these watersheds and
- Provide outreach and replication of success by communicating results, building local capacity, and fostering multi-jurisdictional partnerships across the region.

II. Description of Proposed Projects

A. Relationship of projects to watershed plan and goals

The proposed project is a natural extension of the CRC's Basin Master Plan (See Appendix 4) already in progress across the Basin. CRC's mission is to develop local capacity and resulting projects in each of the 14 sub-watersheds of the Cumberland Basin. The CRC has already successfully completed their stakeholder-based, organizational development process in two watersheds (Red River and Harpeth River), and are in mid-process now within the Mill Creek watershed. Implementing on the ground water quality projects within these three watersheds is the next logical step. This project will accomplish water quality improvement, continue the local capacity building, and further enhance CRC's ongoing mission and Master Plan.

B. Project components, schedule, budget and milestones

The following outlines the broad project components and schedule for each project goal. Detailed components, schedule, timeline and budget may be found in Appendices 5 and 6.

Goals 1 and 2 - Restore water quality and demonstrate innovative methods for nonpoint source pollution prevention

- Create a base-line vs. end product evaluation process to measure sediment abatement
- Identify exact stream segments for project focus based on all known factors
- Implement protocols for measuring in-stream sediment flow/bank loss in each stream

- Identify and prioritize Best Management Practices (BMPs) for each stream segment
- Put in place site-specific BMP's, demonstration projects, and educational programs

Goal 3 – Coordinate Existing Efforts in Watersheds

- Identify and map existing watershed efforts, tools, and partners in project watersheds
- Coordinate volunteer/staff/partner activities for BMP placement with partner organizations
- Gather existing educational materials from all partners
- Synthesize those educational materials with information gained from this process

Goal 4: Promote outreach and replicate success

- Establish an organized home base for resources, operational coordination, and outreach programs under the guidance of the coalition-based Center for Living Watersheds program (See Appendix 7 for Center Vision and Mission.)
- Initiate outreach programs to broaden partnerships, recruit volunteers, generate matching funds, and increase BMP project implementation
- Create an accessible and user-friendly on-site and web "tool box" to assist organizations, industries, agencies and citizens in watershed protection work
- Participate in state/regional forum activities to share protocols, models, and success stories
- Develop an interactive website for the Southeast Watershed Assistance Network (SWAN) and the Center for Living Watersheds
- Assist with local capacity building to maintain BMP improvement and continue progress

Milestones

The overall environmental milestones used to judge success will be:

1. Measurable improvement in quality of three 303(d) listed streams in three adjacent rural,

suburban, and urban watersheds of the Cumberland River Basin

2. Completion of a final report and model process for measuring and reducing sediment transport and bank loss at three Southeastern sites
3. Completion of a final report and model process for erosion control and building design/retro-fitting so as to reduce the negative effects of development on water quality
4. Completion of the interactive Southeastern Watershed Assistance Network (SWAN)
5. Completion of an Education and Project Sustainability Plan and Educational Curriculum integrating these processes and practices into a well established Center for Living Watersheds program dedicated to education, applied research, model site design, technical assistance & information for the Southeast region.

Budget

The project budget represents a primary emphasis in on the ground water quality improvement projects, with a secondary focus on outreach, replication and sustainability. The BMP implementation projects on three river segments will utilize approximately 64% of the requested funds. The remaining 36% will establish lasting mechanisms for capacity building, education, technical assistance, outreach, and ongoing coordination of partnerships through the Center for Living Watersheds. (See Appendix 6 for Local Match from Partners)

C. Monitoring and Evaluation

Monitoring and evaluation of stream quality improvement will be overseen by a multi-agency/multi-stakeholder advisory body, the CRC Water Quality Advisory Committee (WQAC)(See Appendix 8 for member list), and completed in accordance with state guidelines. Monitoring and evaluation of final reports will also be completed by the WQAC in accordance with stated performance measures. Monitoring and evaluation of the SWAN initiative will be conducted by a survey of watershed association staff, local, state and federal officials through

informal feedback as well as a formal Likert Scale Evaluative Tool conducted by project staff. Monitoring and evaluation of the Education and Project Sustainability Plan will be completed in partnership between the Center Coalition and project staff. Sustainability will be assessed through the establishment of a program of education, applied research, technical assistance, and outreach under the auspices of the Center for Living Watersheds program.

D. Management, staff, supporters & stakeholders

The Cumberland River Compact and the Coalition will be responsible for coordinating and implementing the proposed project. A CRC project coordinator will gather and organize resource materials, coordinate project activities of the various cooperating partners, and stimulate an outreach education program. The Compact's WQAC will be responsible for the sound science base of the project, selecting exact 303(d) listed stream segments to restore, establishing baseline parameters, and measuring the parameters for success.

This project will be completed within three years. The success of this ambitious plan and time scale is based on the trust and good working relationships that already exist among all the coalition partners. In addition, the goals of the project parallel the goals of existing EPA mandated watershed planning schedules, Tennessee and Kentucky Growth Readiness (NEMO) projects, a U.S. Army Corps of Engineers Sediment Project taking place on Mill Creek, and current MS-4 processes in the three watersheds. Supporters and stakeholders in the project are widespread across the region (See Appendix 2).

III. Education / Outreach Activities

A. Strategy for Transfer

The Coalition has agreed that a regional resource site should be available where nonprofit organizations, agencies, officials, academics and the public can:

- Share resources concerning water, plan watershed management strategies, and research ways to measure efficacy of existing strategies and technologies
- Convey the bountiful knowledge that exists but may be out of reach or too dispersed for effective use by the general populace.

A developing Center for Living Watersheds will provide such opportunities for the public and will serve as a physical location for project management. The site will provide a space where watershed research and learning can take place in a non-confrontational atmosphere and will provide the opportunity for coalition members, partners, and the public to:

Potential Watershed Tool Box Components:

SE Watershed Train-the Trainer Academy
Key Watershed Research Reports
Key Watershed Restoration Success Stories
Model Watershed Restoration Plans
Database of BMP Demonstration Sites
Database of Watershed Expert Resources
GIS Visual Resource software and data
List of expert BMP contractors for industry
TN & KY Growth Readiness educational materials

- Promote watershed research programs in a collaborative, innovative, multi-disciplinary setting that incorporates problem solving through science and watershed stewardship.
- Provide education programs that feature interactive learning opportunities, outreach, and technical assistance to help people understand impacts on the environment and inspire sustainable practices.
- Gather and deliver complementary materials already developed and new information emerging from this project and others.
- Create educational materials or programs not now available, with the assistance of academic, agency and business professionals. Programs and materials would function on a Pilot/Model basis where pilot projects are tested in the Basin, then set up as models to be used across the Basin and region.

The work done in these pilot projects will be communicated to other communities in the Basin and throughout the Southeast through the Center outreach activities and the Southeast Watershed Assistance Network (SWAN) (See Appendix 9 and 10). SWAN will be an interactive website created in cooperation with our partners at the Southeast Watershed Forum. SWAN will offer a toolbox of materials from the Southeast Watershed Forum, key watershed research and reports, GIS and other visual resource data, funding resources, and case studies including the pilot projects in this grant. SWAN will be one of the initial and ongoing outreach methods of the Center.

Outreach and transfer strategies will be designed to take maximum advantage of existing resources, funding and agency programs. The Conservation Technology Information Center (CTIC) and National Association of Conservation Districts will provide alliance building and Core 4 program delivery in the agricultural communities. Mechanisms to effectively increase Farm Bill conservation funding and technical assistance will figure prominently in promoting BMP implementation in the project site areas and beyond. The Southeast and National Watershed Forums and the SWAN network will be used extensively to distribute success stories and toolbox materials developed by the project. The Center for Living Watersheds will serve as a long term home for the project materials, resources, and results for ongoing and sustainable positive impacts from the project. In total the project will result in clean water in three critical streams and an established program to replicate those successes.

List of Appendices

1. Map of Project Area and surrounding Cumberland Basin
2. Existing Current Projects
3. Center for Living Watersheds Project Coalition
4. Cumberland River Compact Basin Master Plan
5. Project Components, Schedule and Timeline
6. Project Budget and Local Match from Partners
7. Center for Living Watersheds Vision and Mission Statements
8. Water Quality Advisory Committee Members
9. Southeast Watershed Assistance Network – SWAN
10. Southeast Watershed Forum / Center for Watershed Protection Training Academy
11. Cooperating Partners of Harpeth River Watershed Association and Red River Watershed Association
12. Draft TMDL for Sediment in the Harpeth River Watershed
13. Endorsement Letters