

# *WHAT'S IN YOUR WATERSHED?*

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A CASE STUDY AND GUIDE  
TO

*THE BANKLICK CREEK WATERSHED  
ANALYSIS AND ISSUE  
CHARACTERIZATION  
FOR  
EDUCATION AND OUTREACH*

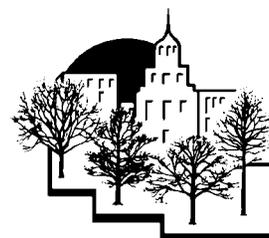
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## Acknowledgements

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*Reprinting of this guide is encouraged with credit given to the above groups.*

## ***For More Information***

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Contact any of the following project partners to learn how you can help protect the Banklick Creek watershed:

**Banklick Watershed Council**

322 East Third Street  
Covington, Kentucky 41012  
859-261-3880  
www.banklick.org

**Boone County Planning  
Commission**

2995 Washington Street  
Burlington, Kentucky 41005  
859-334-2196  
www.boonecountyky.org

**Sanitation District No. 1**

1045 Eaton Drive  
Ft. Wright, Kentucky 41017  
859-578-7450  
www.sd1.org

**Northern Kentucky Area  
Planning Commission**

2332 Royal Drive  
Ft. Mitchell, Kentucky 41017  
859-331-8980  
www.nkapc.org

**Northern Kentucky Urban and  
Community Forestry Council**

6028 Camp Ernst Road  
Burlington, Kentucky 41005  
www.nkyurbanforestry.org

**Davey Resource Group**

jgulick@davey.com  
Walton, Kentucky 41094  
859-384-8258  
www.davey.com

Numerous other information resources exist to assist you with watershed and forestry management and protection. Contact any of the following organizations for assistance in your watershed:

**Kenton County  
Conservation District**

6028 Camp Ernst Road  
Burlington, Kentucky 41005  
859-586-7903  
www.kentoncounty.org

**The Kenton Conservancy**

2332 Royal Drive  
Fort Mitchell, Kentucky 41017  
859-392-8358  
www.kentonconservancy.org

**Boone County  
Conservation District**

6028 Camp Ernst Road  
Burlington, Kentucky 41005  
859-586-7903  
www.boonecountyky.org

**The Boone Conservancy**

P.O. Box 416  
Burlington, Kentucky 41005  
859-689-0834  
www.thebooneconservancy.org

**Kentucky Division of Forestry**

627 Comanche Trail  
Frankfort, Kentucky 40601  
502-564-4496  
www.forestry.ky.gov

**Kentucky Waterways Alliance**

854 Horton Lane  
Munfordville, Kentucky 42765  
www.kwalliance.org

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## **Forward**

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Watershed councils are proliferating across the country and are taking on important tasks: protecting and improving water quality; monitoring and mitigating water quantity; educating the public and decision-makers; building consensus and creating advocacy for water and related natural resources; and guiding and implementing projects in a watershed, among many others. A watershed crosses political boundaries and public and private land ownerships; therefore, a watershed council must have access to much information in order to act as a forum for making watershed-based decisions.

This case study looks at how urban, rural, and riparian forests are critical to protecting water quality and reducing flooding in watersheds. Sustainable urban forest ecosystems provide benefits to not only the waters of a community, but also to the overall quality of life. Trees are a community's green infrastructure, yet watershed councils are often unaware of how much of a role urban forests play in providing watershed benefits.

Watershed councils can make valuable contributions by working to improve the urban forests and ecological health of communities. However, often they lack the professional guidance and expertise to determine precisely how much of an impact forests make, how to prioritize their actions with limited funding, and how to communicate this information effectively. Councils often need assistance to identify what significant issues are present in the watershed and how to formulate possible solutions to address the ecological issues.

This effort may seem daunting, especially to newly formed watershed councils. Where do councils begin? One of the best places to start is with the *facts*. Therefore, this manual was designed to document a process for gathering factual information on watershed characteristics and assessing the value of urban, rural, and riparian forests in water resources and watershed management. The manual also presents a protocol for determining how ecological and citizen-based priorities, as well as developing effective communication and educational tools and strategies.

The use of the information provided as a result of this project may be used by watershed councils in many valuable ways:

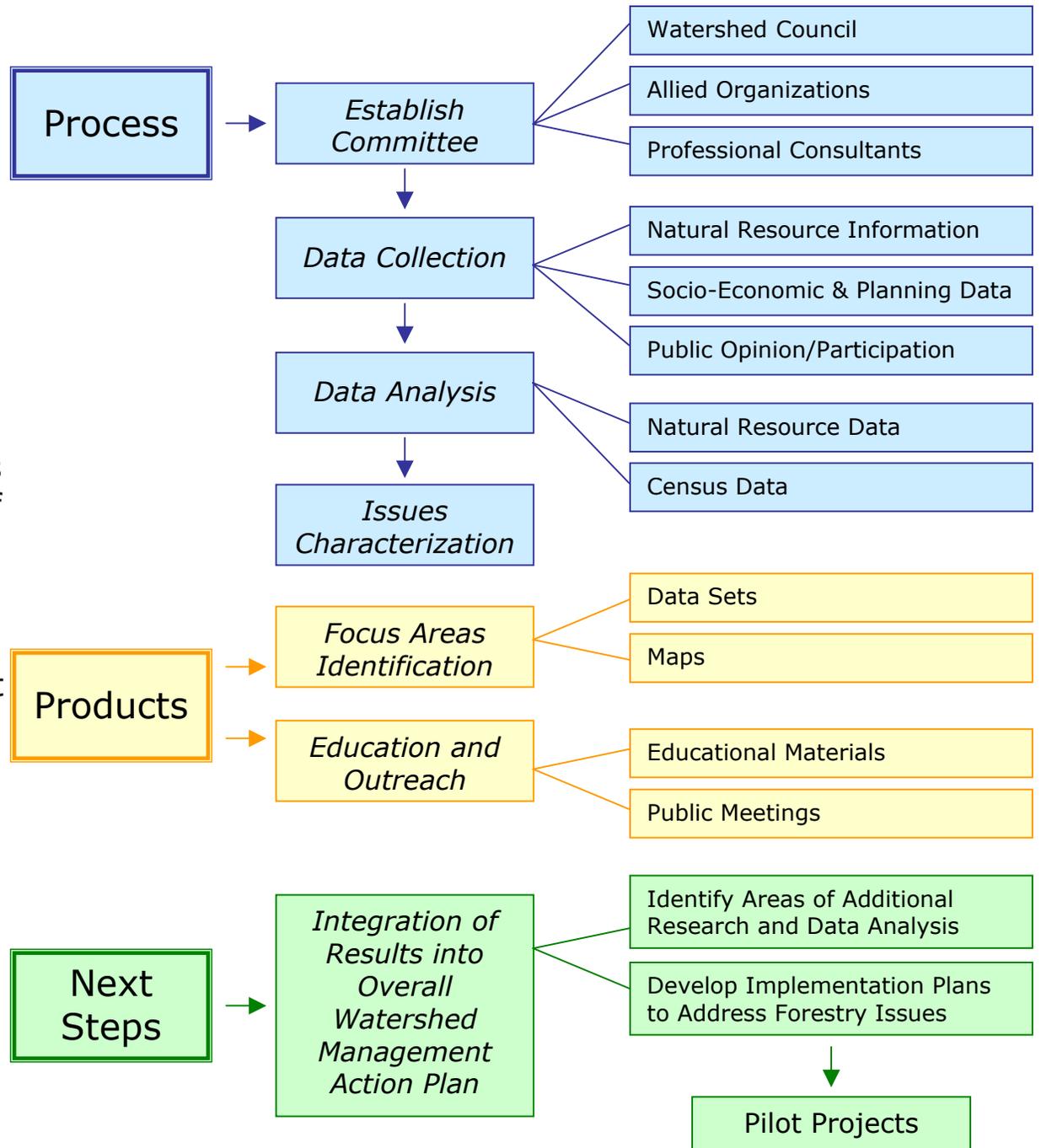
- ❖ Developing watershed management, strategic, and action plans
- ❖ Assisting with organizational development
- ❖ Initiating immediate positive impacts in the watershed
- ❖ Identifying networking opportunities and developing alliances
- ❖ Educating the public about watershed issues

# Project Flow Chart

This flow chart represents the project's process and work products.

The manual, prepared primarily for watershed councils, explains the details, important considerations, and lessons learned during each step of the process.

The companion *Reference Documents for What's In Your Watershed?* document includes supporting documents, examples of each step of the process, and work products.



## Section 1. Process

### 1.1 Steering Committee Establishment

Watershed councils by design are collaborative in nature. The partnerships developed in the creation of the council are valuable assets to embark upon a project to determine the forest and natural resource issues in the watershed.

Since partnerships are key to the success of a watershed council and this issue-specific project, collaboration should be reflected in the management of the project. Therefore, it is recommended that a steering committee be formed.

#### Membership

The members should represent, at a minimum, the major stakeholders in the watershed, as well as those with knowledge and/or access to required data and information. This typically includes members of the watershed council, representatives of allied organizations, and professional forestry and natural resource consultants. The steering committee should be as inclusive as possible, but should also be limited to a reasonable amount of people to facilitate meetings, accomplish tasks, and make consensus-based decisions. Many other people and organizations can and will be a part of project, but will not be part of the steering committee. ([Reference Document 1.1](#))

Throughout the process project's, other important partnerships on an informal basis may include:

- ❖ Political jurisdictions within the watershed
- ❖ Local, county, and state elected officials
- ❖ Print, television, and radio media
- ❖ Other environmental and citizen advocacy groups
- ❖ Local universities and schools
- ❖ Land development community

#### ***Suggested Steering Committee Representation***

##### **Watershed Council**

Executive Director  
Public Relations Specialist  
Community Liaison  
Resource Professional

##### **Allied Organizations**

Urban Forestry Councils  
State Forestry Agency  
Planning Commission Staff  
Stormwater Management Agency  
State/Regional Watershed Groups  
Soil and Water Conservation Districts  
Land Conservancies  
County Extension Office

##### **Professional Consultants**

Natural Resource Management  
Forestry  
Geographic Information Systems

## Getting Started

Once the members of the steering committee are selected, it is advisable to create a project overview document and hold a kick-off meeting.

The project overview document orients each member with the goals and needs of the project, establishes the timetable for accomplishing tasks, and provides copies of required paperwork or administrative details. ([Reference Document 1.2](#))

At the kick-off meeting, committee members become acquainted with each other and receive important project and contact information. This is also an excellent opportunity to discuss the timetable, need for additional representation, ultimate work products, and project's first steps. ([Reference Document 1.3](#))

## Steering Committee Responsibilities

The steering committee provides project funding, oversees progress of the project, collects and analyzes data, identifies issues, and develops and distributes public education and outreach tools.

### Project Funding

Many components of this watershed project can be accomplished without an actual outlay of cash. Much of the information needed throughout the project is public information, available for free if proper request protocols are followed. Also, due to the composition of the steering committee, the resources necessary to complete the project may be available as in-kind contributions. However, services of a professional consultant, production of public education materials, general supplies for public meetings, and other such items may require direct funding.

Sources of funding may include: grants from local, state, and federal governments; monetary contributions from allied organizations and private businesses or donors; and/or watershed council funds generated from fund-raising events and membership dues.

Regardless of the source, whether in-kind contributions or cash outlays, the steering committee should assign one of its members to oversee and manage all accounting tasks throughout the project.

## **Project Oversight**

Components of project oversight include recording and distributing the minutes of meetings, creating and enforcing a timetable for work, creating communication methods, and maintaining electronic and paper files of information collected (e.g., maps, data, references, and contact information). (Reference Documents 1.4)

A website dedicated for the project can be a useful communication tool for the steering committee. Documents, such as administrative forms, meeting minutes, and work products, can be made available through the website. In addition, it can be used to distribute maps, data, photographs, and other electronic items collected throughout the project. This website may be a stand-alone site with a unique internet address or an addition to an existing website, such as the watershed council's site. The use of a website not only benefits steering committee members but also serves to inform the public. (Reference Document 1.5)

## **Data Collection and Analysis**

A variety of data from a multitude of sources likely exists for the project. All steering committee members should be involved with obtaining these data. As representatives of various key agencies or because of existing relationships with organizations, steering committee members are uniquely positioned to obtain data and other necessary information. If certain information is not readily available or does not exist, then the steering committee is responsible for seeing that this information is obtained or developed.

After the data is obtained, it must be properly analyzed. Not all steering committee members may be trained or experienced in this type of work. Those that are should take the lead in this part of the process. A consultant may also be valuable for this stage of the project.

A single organization that is a member of the steering committee, project partner, or consultant with experienced staff, advanced computer systems and other resources should be identified to accept, hold, and manage all data collected. This data clearinghouse is critical to the organization and safeguarding of all data.

More detailed data collection and analysis steps are described in Sections 1.2 and 1.3 of this document.

## **Issues Identification**

The next step of the process is to identify issues in the watershed based on the data generated and analyzed using steering committee members' unique knowledge and experiences in the watershed.

These issues will be the basis of the recommendations to the watershed council for their consideration, prioritization, and action. They will also be used in the development of public education and outreach materials, as well as for the watershed council's future strategic and action plans and efforts.

Detailed processes used to identify issues are described in Section 1.4 of this document.

## **Public Outreach and Education**

Based on the issues and priorities identified by the steering committee, a series of education and public outreach materials and tools will be created. These can be created and distributed in a variety of formats; some examples include the following:

- ❖ PowerPoint presentations about the project and findings
- ❖ Instructional manuals for property owners
- ❖ Brochures on urban forestry best management practices in the watershed
- ❖ Video programs about the findings and recommendations to use for presentations and as Public Service Announcements (PSAs)
- ❖ Web-based templates of issue-based fact sheets that can be customized and used by a wide variety of organizations

Developing and distributing public education and outreach materials is described in more detail in Section 2.2 of this document.

## 1.2 Collect Data and Other Information

To effectively and efficiently manage a watershed, you must first identify and understand what is happening in your watershed.

The effectiveness of forests in determining water resource management successes and failures are the result of the interconnectedness of many factors and features in a watershed. Watersheds are dynamic natural ecosystems that incorporate the built environment.

Therefore, the next step in this process is to collect data—or take an inventory—of *what's in your watershed*. These data likely exist and are owned or managed by various entities. The goals of this step are:

- ❖ Identify the data needed
- ❖ Identify the organizations that have the data
- ❖ Identify key data that is missing
- ❖ Determine the best course of action to obtain or develop missing data

You can't go where  
you want to go if  
you don't know  
where you are!

To assess the condition and characteristics of the watershed upon which the issues can be ultimately be identified, there are three primary data categories to focus on: natural resource data, socioeconomic and planning data, and public opinion information. Depending on your watershed's unique characteristics, other data or information may be necessary for your watershed inventory.

These data may be in many formats—electronic, paper, and verbal. The steering committee should be prepared to accept these data formats and deliver them to a single partner organization or a consultant for proper storage and synthesis. Ideally, the keeper of the information is also capable of performing most of the analysis and producing the final products. Therefore, it is recommended that the local or county planning agency, a long-standing local organization with available resources, or a qualified consulting company play this lead role during the project.

## Natural Resource Data

Information obtained in this data category is fundamental and critical to understanding the watershed. No rational actions or plans can be accomplished without having the answers to questions like: How many steep slopes are in the watershed? What are the types and extents of various soil types? What are the characteristics of the riparian corridors? Where is the forest and other vegetation cover?

To answer these questions, gather the following natural resource data and related information and identify sources of the data ([Reference Document 2.1](#)):

<b>Data Types</b>	<b>Potential Sources</b>	<b>Comments</b>
<ul style="list-style-type: none"> <li>▪ Soils</li> <li>▪ Wetlands</li> <li>▪ Hydrology</li> <li>▪ Floodplains</li> <li>▪ Topography</li> <li>▪ Vegetative Cover</li> <li>▪ Watershed Boundary</li> <li>▪ Impervious Surfaces</li> </ul>	<ul style="list-style-type: none"> <li>▪ Local/Regional Planning Agency</li> <li>▪ State Division of Forestry</li> <li>▪ Conservation District Office</li> <li>▪ U. S. Army Corps of Engineers</li> </ul>	<ul style="list-style-type: none"> <li>▪ GIS format preferred</li> </ul>
<ul style="list-style-type: none"> <li>▪ Orthophotographs</li> <li>▪ Aerial Photographs</li> </ul>	<ul style="list-style-type: none"> <li>▪ Local/Regional Planning Agency</li> <li>▪ Conservation District Office</li> <li>▪ Commercial Companies</li> </ul>	<ul style="list-style-type: none"> <li>▪ Digital, ortho-rectified format preferred</li> <li>▪ Leaf-off views preferred</li> <li>▪ Color or black/white</li> </ul>
<ul style="list-style-type: none"> <li>▪ Water Quality Data</li> <li>▪ Water Quantity Data</li> </ul>	<ul style="list-style-type: none"> <li>▪ Regional or State EPA offices</li> <li>▪ Local Sewer and Stormwater Management Agencies</li> </ul>	<ul style="list-style-type: none"> <li>▪ Impaired stream classifications</li> <li>▪ Pollutant levels</li> <li>▪ Stormwater discharge amounts</li> </ul>
<ul style="list-style-type: none"> <li>▪ In-stream Blockages</li> <li>▪ Landslides/Slippages/Erosion Sites</li> <li>▪ Point Source Pollution Locations</li> </ul>	<ul style="list-style-type: none"> <li>▪ Conservation District Office</li> <li>▪ City/County Engineering Agencies</li> <li>▪ Regional or State EPA offices</li> <li>▪ U. S. Army Corps of Engineers</li> </ul>	<ul style="list-style-type: none"> <li>▪ GIS format preferred</li> <li>▪ Address location acceptable</li> <li>▪ Type of problem</li> </ul>
<ul style="list-style-type: none"> <li>▪ Combined Sewer Overflows</li> <li>▪ Direct Pipe Outfalls</li> <li>▪ Septic Systems</li> </ul>	<ul style="list-style-type: none"> <li>▪ Regional or State EPA offices</li> <li>▪ Local Sewer and Stormwater Management Agencies</li> </ul>	<ul style="list-style-type: none"> <li>▪ GIS format preferred</li> <li>▪ Types identified</li> </ul>
<ul style="list-style-type: none"> <li>▪ Solid and Hazardous Waste Dump Sites</li> <li>▪ Brownfield Sites</li> </ul>	<ul style="list-style-type: none"> <li>▪ Regional or State EPA offices</li> <li>▪ Local Public Works department</li> <li>▪ Planning Commission</li> </ul>	<ul style="list-style-type: none"> <li>▪ GIS format preferred</li> <li>▪ Address location acceptable</li> <li>▪ Type and materials</li> </ul>

## Socioeconomic and Planning Data

The watershed characteristics and issues ultimately revealed by this process have a strong foundation in the existing natural resources. However, since the time of settlement, humans have been reshaping, influencing, and otherwise affecting the watershed. Therefore, the analysis must also include human resource data to understand these factors and how they affect your watershed. These data will assist you with educating and presenting solutions to the people making the decisions that impact the urban and rural forests and the watershed.

The following data are recommended to be collected ([Reference Document 2.2](#)):

<b>Data Types</b>	<b>Sources</b>	<b>Comments</b>
<ul style="list-style-type: none"> <li>▪ Roads</li> <li>▪ Buildings and Improvements</li> <li>▪ City, County, and State Boundaries</li> </ul>	<ul style="list-style-type: none"> <li>▪ Local/regional planning agency</li> <li>▪ Private GIS data companies</li> </ul>	<ul style="list-style-type: none"> <li>▪ GIS format preferred</li> </ul>
<ul style="list-style-type: none"> <li>▪ Zoning Boundaries</li> <li>▪ Current and Future Land Use Classifications, Definitions, and Maps</li> <li>▪ Comprehensive Plan information</li> </ul>	<ul style="list-style-type: none"> <li>▪ Local/regional planning agency</li> </ul>	<ul style="list-style-type: none"> <li>▪ GIS format preferred</li> <li>▪ Printed maps acceptable</li> </ul>
<ul style="list-style-type: none"> <li>▪ Parcel Boundaries</li> <li>▪ Private and Public Ownership Data</li> </ul>	<ul style="list-style-type: none"> <li>▪ Local/regional planning agency</li> <li>▪ Local auditor/assessor offices</li> </ul>	<ul style="list-style-type: none"> <li>▪ GIS format preferred</li> </ul>
<ul style="list-style-type: none"> <li>▪ Population Densities</li> <li>▪ Income Levels</li> <li>▪ Education Levels</li> <li>▪ Ethnicity</li> <li>▪ Home Ownership Percentages</li> </ul>	<ul style="list-style-type: none"> <li>▪ U. S. Census Bureau</li> <li>▪ Local/regional planning agency</li> </ul>	<ul style="list-style-type: none"> <li>▪ GIS format preferred</li> <li>▪ Electronic spreadsheet format acceptable</li> </ul>

## Public Opinion/Participation Information

Natural resource, socioeconomic, and planning data gathered only tell part of the story. To have all the facts, the people who live and work in the watershed must be able to inform the watershed council of the issues, characteristics, problems, and assets of the watershed as they see them every day.

A public meeting should be held before the data analysis is completed to provide local citizens and other stakeholders a forum to identify issues and problems they have observed throughout the watershed and in their urban and rural forests. These additional facts and opinions about the watershed and forestry issues can provide valuable insight for the development of educational materials and the watershed management plan. (Reference Documents 2.3)

This public meeting serves many purposes and accomplishes many tasks and goals:

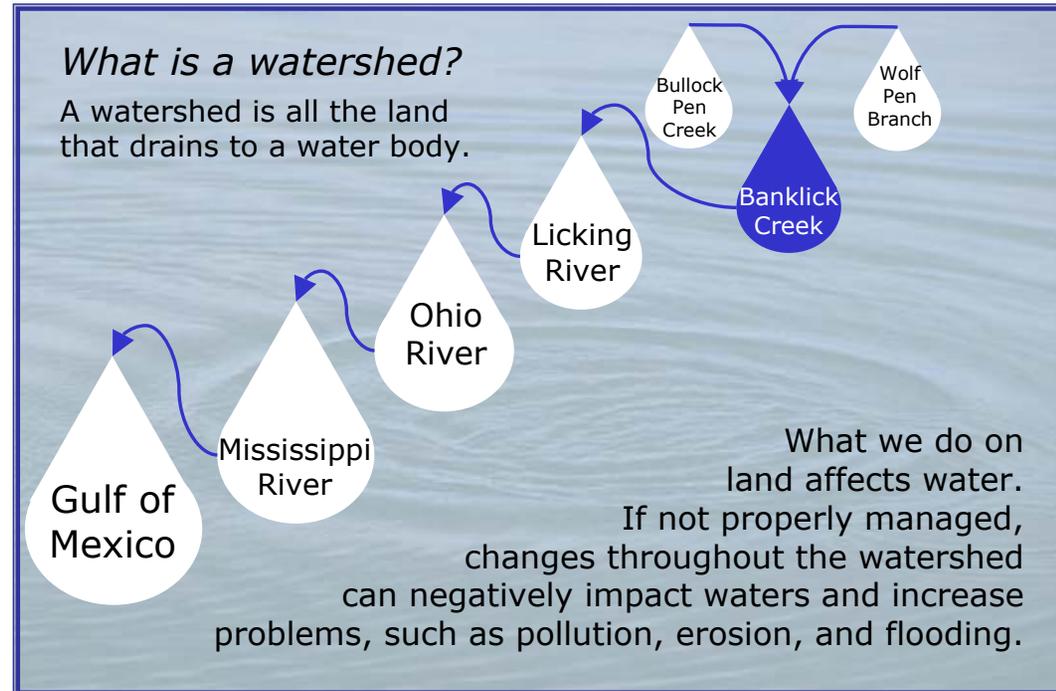
- ❖ A source of unique and current information about issues in the watershed
- ❖ An opportunity for the watershed council to understand and gauge the level of interest and/or concern about specific and general issues in the watershed
- ❖ Establish a basis upon which to build acceptance of the final outreach and action plans
- ❖ Provide a public relations and awareness event for the watershed council
- ❖ Generate additional public support for future watershed council plans and projects



## Other Information Needs

Examples of other information needs throughout the project include:

- ❖ **Graphics**, such as agency logos and diagrams representing forest, watershed, and water quality/quantity concepts and principles, will be a necessary component of education and outreach materials.
- ❖ **Photographs** should be high-quality and well-composed in color and/or black-and-white. Photographs will be used in presentations, for education and outreach efforts, and for issue documentation. Throughout the project, steering committee members should take photographs and cataloging existing photographs of various conditions, problems, and assets in the watershed. Be mindful of the seasons and be sure to photograph throughout the year.
- ❖ **References** used throughout the project must be documented. As members receive information and data, research issues, and prepare reports, all references should be standardized and organized in a single location. This reference list will be valuable when the final products are produced, when making public presentations and answering questions, and for future use of the watershed council and its supporters. ([Reference Document 2.4](#))



## 1.3 Data Analysis

Once the data has been gathered, it must be compiled and analyzed to create maps and statistics that will characterize the watershed and aid in the identification of issues. Each type of data—natural resource, socioeconomic, planning, and public opinion—requires different types of analyses. As in previous steps, experienced professionals can help in this process to ensure efficiency and accuracy. However, it is also important for the steering committee to collaborate and agree on the analysis.

### Geographic Information Systems Analysis to Identify General Watershed Characteristics

The scope, availability, and ease of use of Geographic Information Systems (GIS) data are expanding locally and nationally at astounding rates. The natural resource, socioeconomic, and planning data recommended for this project should be available in a GIS format. In this format, detailed and accurate data analyses can be performed and maps and the data can be created. Therefore, before initiating the analysis, determine as precisely as possible your data information and analysis needs.

At a minimum, the following GIS data analysis should be performed. It will be useful to chart, as below, the anticipated output and intended use as a means to help ensure that all efforts are maximized.

<b>Data</b>	<b>Output</b>	<b>Intended Use(s)</b>
<ul style="list-style-type: none"><li>▪ Orthophotographs</li><li>▪ Watershed boundary</li><li>▪ Political boundaries</li></ul>	<ul style="list-style-type: none"><li>▪ Location Map</li></ul>	<ul style="list-style-type: none"><li>▪ Project overview</li><li>▪ Educational products</li></ul>
<ul style="list-style-type: none"><li>▪ Hydrology</li><li>▪ Floodplains</li><li>▪ Watershed boundary</li></ul>	<ul style="list-style-type: none"><li>▪ Riparian corridors</li><li>▪ Wetlands</li><li>▪ Ponds and lakes</li><li>▪ Maps</li><li>▪ Quantity calculations</li></ul>	<ul style="list-style-type: none"><li>▪ Educational products</li><li>▪ Component of data analysis</li></ul>

<b>Data</b>	<b>Output</b>	<b>Intended Use(s)</b>
<ul style="list-style-type: none"> <li>▪ Topography</li> </ul>	<ul style="list-style-type: none"> <li>▪ Steep slopes</li> <li>▪ Map</li> <li>▪ Quantity calculations</li> </ul>	<ul style="list-style-type: none"> <li>▪ Component of data analysis</li> </ul>
<ul style="list-style-type: none"> <li>▪ Forest canopy</li> <li>▪ Vegetation cover</li> </ul>	<ul style="list-style-type: none"> <li>▪ Location maps</li> <li>▪ Quantity calculations</li> </ul>	<ul style="list-style-type: none"> <li>▪ Educational products</li> <li>▪ Component of data analysis</li> </ul>
<ul style="list-style-type: none"> <li>▪ Soil types</li> </ul>	<ul style="list-style-type: none"> <li>▪ Hydric soil</li> <li>▪ High erosion potential soils</li> <li>▪ Maps and</li> <li>▪ Quantity calculations</li> </ul>	<ul style="list-style-type: none"> <li>▪ Component of data analysis</li> </ul>
<ul style="list-style-type: none"> <li>▪ Land use</li> <li>▪ Soils</li> <li>▪ Slopes</li> </ul>	<ul style="list-style-type: none"> <li>▪ Index to predict relative stormwater runoff potential</li> </ul>	<ul style="list-style-type: none"> <li>▪ Component of data analysis</li> </ul>
<ul style="list-style-type: none"> <li>▪ Impervious surfaces</li> </ul>	<ul style="list-style-type: none"> <li>▪ Maps</li> <li>▪ Quantity calculations</li> </ul>	<ul style="list-style-type: none"> <li>▪ Component of data analysis</li> </ul>
<ul style="list-style-type: none"> <li>▪ Solid waste/hazardous dump sites</li> <li>▪ Combined sewer overflows and other direct pollutant discharge sites</li> <li>▪ Landslides</li> <li>▪ Erosion sites</li> <li>▪ Channelized stream locations</li> </ul>	<ul style="list-style-type: none"> <li>▪ Point data map of specific issues in the watershed</li> </ul>	<ul style="list-style-type: none"> <li>▪ Educational products</li> <li>▪ Component of data analysis</li> </ul>
<ul style="list-style-type: none"> <li>▪ Current land use</li> <li>▪ Future land use</li> </ul>	<ul style="list-style-type: none"> <li>▪ Predicted changes over time</li> <li>▪ Maps</li> <li>▪ Quantity calculations</li> </ul>	<ul style="list-style-type: none"> <li>▪ Educational products</li> <li>▪ Issues characterization</li> <li>▪ Next step analysis and discussion</li> </ul>
<ul style="list-style-type: none"> <li>▪ Census data</li> <li>▪ Socioeconomic data</li> </ul>	<ul style="list-style-type: none"> <li>▪ Maps</li> <li>▪ Quantity calculations</li> </ul>	<ul style="list-style-type: none"> <li>▪ Customized and targeted educational materials</li> <li>▪ Issues characterization</li> </ul>

This GIS analysis of the data is performed to generally classify and describe the watershed, including its natural features and developed areas. The analysis also identifies areas of concern and trends, such as the lack of forest cover and riparian buffers, the amount of forests and riparian corridors in various land use types, and the locations of future development in the watershed. The results and discussion of this analysis are ultimately used to identify the characteristics and significant issues in the watershed. (Reference Documents 3.1, 3.2, and 3.3)

## **Geographic Information Systems Analysis to Identify Critical Areas**

GIS analysis allows the user to easily overlay many layers of data to reveal crucial intersections of data. After all GIS data layers have been obtained and/or developed, the next step is to use that information to assist the watershed council in determining the issues and areas that need action, education, and further study.

The goal at this point is to *generally* identify and locate physical and natural characteristics of the watershed that contribute to the enhancement or degradation of water quality and moderation of water quantity in the watershed. This analysis is used for broad conclusions to indicate the need for further study, for formulating watershed council action plans, and for identification of issues for public education. It is not intended to be the basis for proposing guidelines or enacting legislation.

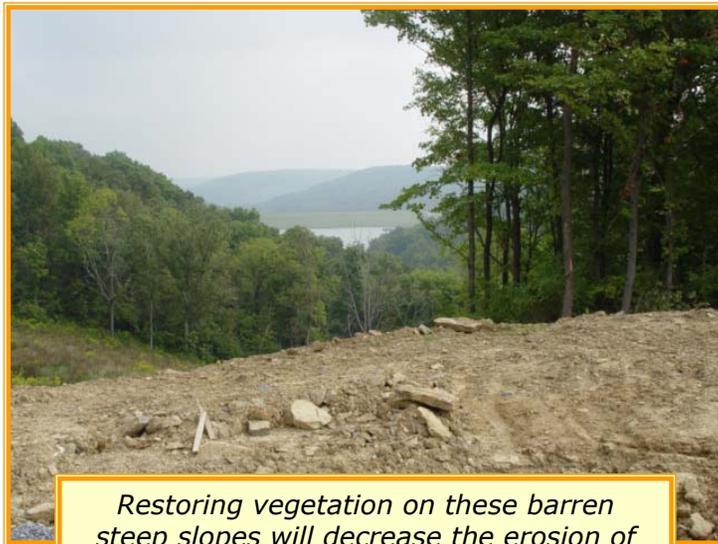
The GIS data obtained can be used to identify forested areas that are functioning to maintain high water quality and moderate water quantity. In addition, areas where little or no forest cover is present and water quality and quantity is compromised can also be identified. These *critical areas* for either *protection* or *restoration* in the watershed are a key component to the data analysis in the watershed.

The following methods can be used to make the determination of both types of critical areas.

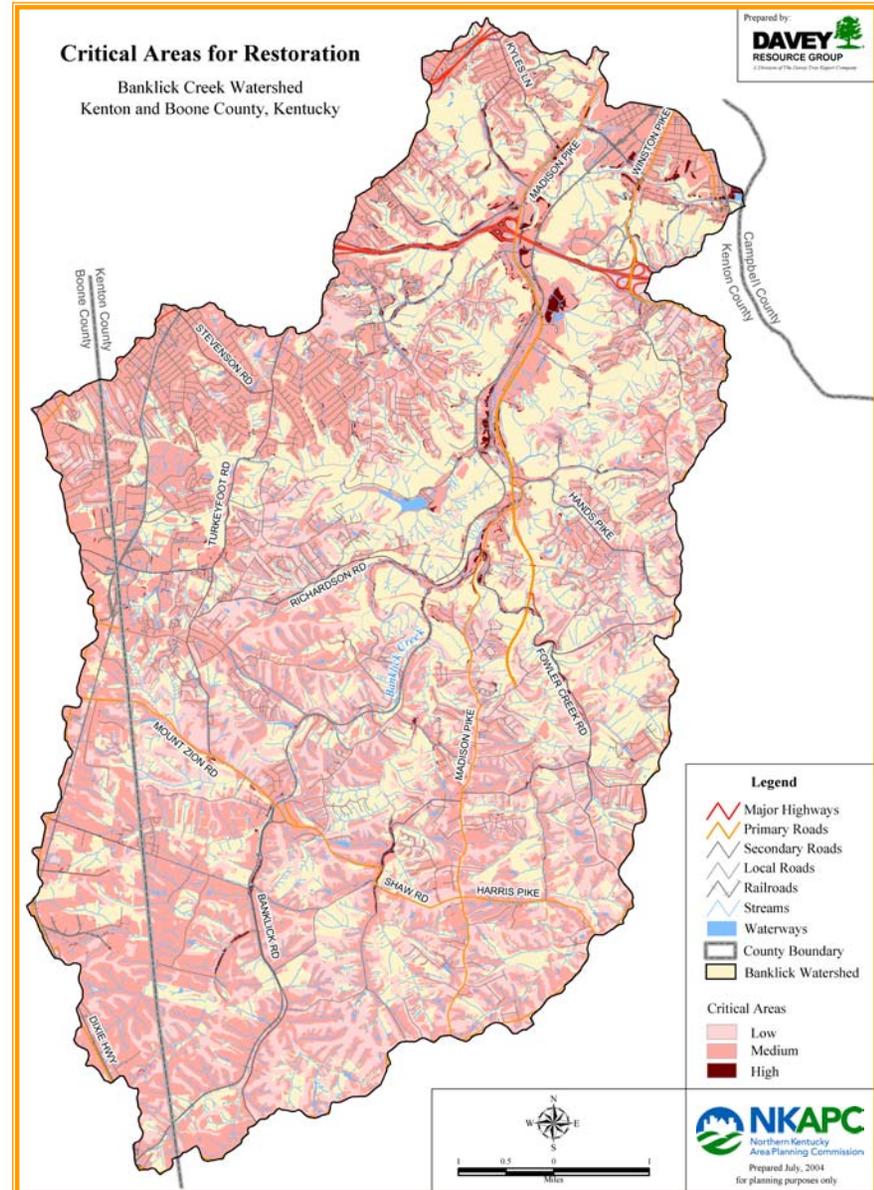
## Critical Areas for Restoration

To determine the locations of lands within the watershed where water quality and quantity are compromised and restoration efforts should be focused, a scoring system to analyze areas *without* canopy cover used the following factors and their associated metrics (Reference Document 3.4):

- ❖ Presence of steep slopes
- ❖ Location within the floodplain
- ❖ Location within the observed riparian corridor
- ❖ Runoff potential
- ❖ Proximity to impervious surfaces



*Restoring vegetation on these barren steep slopes will decrease the erosion of soils into receiving waters.*



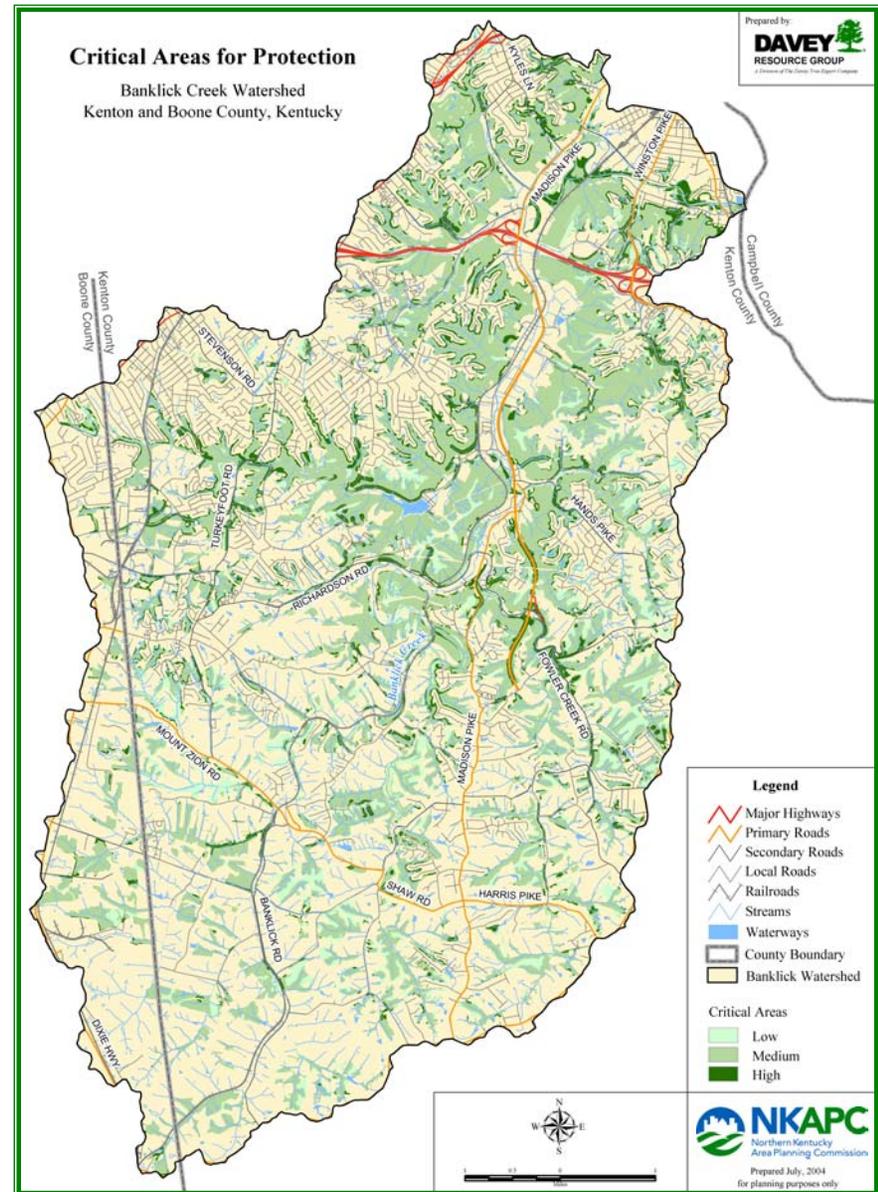
## Critical Areas for Protection

To determine the locations of high-quality forested areas where features are present that significantly contribute to protecting water quality and moderating water quantity in the watershed and where protection efforts should be focused, a scoring system to analyze areas *with* forest canopy cover used the following metrics (Reference Document 3.4):

- ❖ Location within the floodplain
- ❖ Location within the riparian corridor
- ❖ Runoff potential
- ❖ Proximity to impervious surfaces



*The trees along this stream play a vital role in protecting this waterway.*



The next step for the steering committee is to synthesize this information and define the overarching issues and characteristics of the watershed. The combination of maps, data analysis, and other information gathered throughout these initial steps of the process will assist the committee with describing the issues in the watershed.

### **Limitations of the Data Analysis**

The process described above is based on facts and sound scientific methodologies. However, it is important to note that it is common for studies to have limitations. Any limitations should be acknowledged and noted throughout the project.

Limitations in the Banklick Creek watershed case study included:

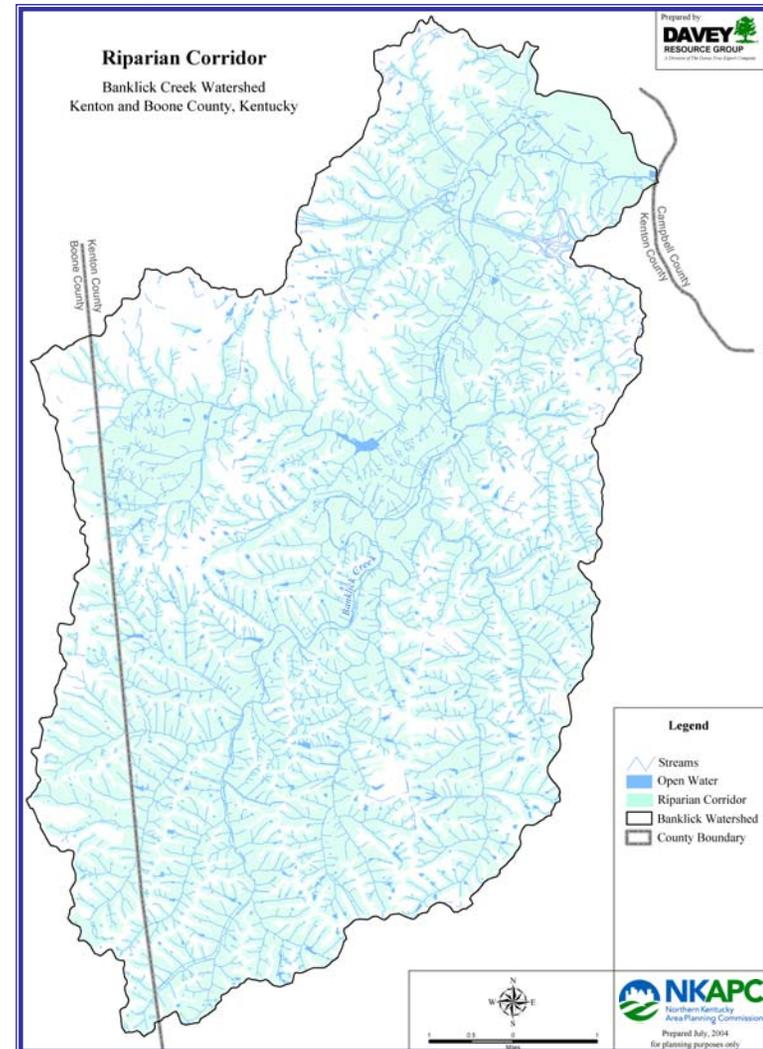
- ❖ **Depth of analysis:** It is important to remember to stay focused on the goal—*can* does not equal *should*. The primary goal of the case study was to define basic characteristics and issues in the watershed that may lead to or require further analysis and/or action. For example, location data on polluted and impaired waterways within the watershed is important information for this project. However, determining reasons for impairment and levels of pollutants are present in the waterways is a recommended next step of the project.
- ❖ **Accuracy of the data:** Although data used in this analysis was obtained from credible, dependable sources, it may not reflect the most current conditions in the watershed. For example, forest canopy cover was determined by analyzing aerial photographs from 2002; therefore, it is reasonable to assume that some canopy cover may not exist due to recent land development projects.
- ❖ **Synergy of the data:** Since watersheds typically cross political boundaries, data may be obtained from a variety of sources. Similar data and map information may come from agencies that use dissimilar data processing formats or quality. When it is time to tie all the pieces together, these differences may need to be resolved. In addition, some jurisdictions may have information that others do not have, resulting in data gaps.

## 1.4 Issues Characterization

The next step of the process is for the steering committee to identify issues in the watershed based on the data generated and analyzed using committee members' professional and intimate knowledge of the local area. Before initiating this step, the steering committee should review and discuss the watershed maps, data, and statistical analyses generated in the previous steps.

This project has produced many items the steering committee members should consult and consider when formulating their opinions of the issues:

- ❖ Natural resource maps
  - Riparian corridors
  - Steep slopes
  - Canopy cover
  - Hydrology/drainage
  - Prioritization of areas for restoration
  - Prioritization of areas for protection
- ❖ Landuse and planning maps
  - Landuse
  - Canopy cover overlay maps
  - Comprehensive Plan information
  - Existing and special overlay districts
- ❖ Public meeting response synopses
- ❖ Demographic/socioeconomic data analysis
- ❖ Canopy cover statistical analysis
- ❖ Individual and local knowledge
- ❖ Other data or local information



The issues identified in this step will be the basis for conclusions and recommendations of the project to the watershed council for their consideration, prioritization, and action. They will also be used for the development of public education and outreach materials, as well as for the watershed council's future educational efforts.

These issues can be general, such as "there is a lack of forest cover in the southern portion of the watershed." They can also be specific and based on local knowledge, such as "the Route 17 Corridor Project needs to consider the critical areas within it." Issues can be good or bad, large or small, and can be in the environmental, political, social, and economic realms.

It is recommended that a questionnaire ([Reference Document 4.1](#)) be developed and used. A questionnaire is useful to:

- ❖ Stimulate committee members' thoughts and opinions
- ❖ Organize the many issues, sub-issues, comments, and ideas produced by this part of the process
- ❖ Aid and guide the steering committee in developing watershed issues that will assist the watershed council in taking the next steps in developing a watershed management plan and specific project implementation plans

It is important to instruct steering committee members to list *all* issues they believe are important and relevant. An inclusive list should be maintained and kept for future use and reference. ([Reference Document 4.2](#))

The next step is for steering committee members to determine the overarching, main issues from the compilation of members' responses. This can be best accomplished by sorting the issues submitted by general topics. This process will help identify common themes such as forestry, water quality/quantity, land use and planning, and legislation and government responsibilities.

After the issues are classified by common themes, the steering committee should reconsider and prioritize the issues. It is recommended that no more than four to six key issues be selected for the next step of the process. These overarching issues will then become the basis for the watershed council to develop a plan of work for forestry projects and determining where pilot projects should be performed. ([Reference Document 4.3](#))

## **Section 2. Products**

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At this point, the steering committee has created and compiled a large amount of useful and important information. This information ranges from natural resource maps to socioeconomic data. These products will be used to create the educational and outreach materials and to provide data for the watershed council as it moves forward with action plans and strategic planning efforts.

### **2.1 Data and Maps**

Throughout the project, various products have been created or compiled. An inventory of these products should be maintained and accessible to the watershed council.

#### **Data**

Forest Canopy Cover Statistics  
Slopes Statistics  
Riparian Corridor Quantities  
Impervious Surface Quantities  
Water Quality Data  
Soil Types and Quantities  
Point Source Pollution Locations  
Floodplain Quantities  
Sewer and Septic System Locations  
Current and Future Land Use Data  
Demographic and Socioeconomic Data

#### **Maps**

Project Location/Overview  
Aerial Photographs  
Floodplains  
Hydrology  
Slopes/Topography  
Soils/Erosion Potential  
Forest/Vegetation Cover  
Impervious Surfaces  
Riparian Areas  
Point Sources of Concern  
Existing and Future Land Use  
Demographics/Socioeconomics  
Critical Areas for Restoration and Protection

## 2.2 Critical Areas Identification

The primary result of the data analysis is the identification of the critical areas within the watershed. These areas include those with trees and forest cover that provide multiple benefits to the watershed by protecting water quality and mitigating water quantity, as well as areas without forest cover where restoration will be necessary to gain the benefits trees provide. These critical areas should be the focus of future council actions, such as pilot projects and public awareness programs.

## 2.3 Education and Outreach

Once the characteristics of the watershed have been documented and the overarching issues have been identified, it is time to reach out to citizens, communities, businesses, and other key stakeholders in the watershed and inform them of the findings and the importance of forests in improving water quality and reducing excess volume. Sharing this information in an educational, non-confrontational manner with the people living in the watershed will provide the watershed council with public support and assistance to achieve the council's goals.

Conducting public meetings and using a variety of media best accomplish education and outreach activities.

### Educational Materials

Educators are finding that people learn at different rates and prefer to receive new information in a variety of formats. The key to educating the most people then is to develop an effective message delivered in a variety of ways.

Developing a motto and mission statement is a good place to start. These simple and short messages can be repeated in all education and outreach materials and provide consistency and repetition throughout the project.

**Motto**  
Forests First; Water Wins!

**Mission Statement**  
Establishing the links between forests, water, and people to benefit the health and safety of built and natural environments.

The motto and mission statement should relate specifically to the forestry/watershed project; although it may be similar to the watershed council's statement, it should still be unique and project specific. These should be incorporated into all educational materials. The following are suggestions for types of educational materials and formats.

### **Community Access Cable Television Programs and Public Service Announcements**

Most communities are regionally served by cable television companies who provide television programming production resources at no cost for public issues and topics. Typically, these companies have channels that broadcast live and taped interview programs, short video story productions, and brief graphic announcements on a repeating schedule. It is recommended that this no- or low-cost media outlet be used to convey the educational issues and messages that have been revealed by the project. The professional production staff of the cable television companies can assist in this effort with graphic and information support from the steering committee and/or watershed council. The final products, such as programs in video and DVD formats, can be reproduced and distributed locally to other educational outlets. (Reference Document 5.2)

Most radio, television, and print media will provide support and promotion of non-profit, public service announcements. This outreach outlet again has little direct cost to the watershed council. A brief written statement about the council and their project can be developed for radio, television, newspapers, and even billboard companies. With some persuasive and creative messages, the watershed council can use these resources to further the cause of protecting and promoting the watershed through good forest management.

### **Web-Based Products**

The Internet is a major source of information for many people. The watershed council should have a unique website or share a space with an allied organization. Many educational products can be converted into formats that are easily printed or used for electronic distribution. This use of computer technology for public education and outreach has many advantages: almost unlimited public access to the watershed issues information; no printing costs for the council; easily updated and changed as new information is discovered; and ability to share the educational materials with other groups as links with their websites for even broader distribution and promotion. (Reference Document 5.3)

## **Brochures**

These simple, printed publications are easy to develop and produce. Because of the limited space available, the messages within them may not be concise, yet must be informative. Brochures are a good format to convey the basic, overarching issues identified in the watershed and to let people know who the watershed council is and how to get further information. This educational piece functions both as a means for promoting the findings of the project and a marketing tool for the watershed council. (Reference Document 5.4)

## **Stewardship Handbook**

This multi-page publication allows more in-depth explanations of the issues and more space for supporting graphics such as photographs, maps, charts, and tables. There is also ample space to include specific action steps the reader can take to help protect or restore the forests and watershed on their property and in their community. (Reference Document 5.5)

## **Public Meetings**

Just as a public meeting was held at the beginning of this project, one or more public meetings should be held at the conclusion of this project. The meetings can be presented to citizens, legislative bodies, and other interested, affiliated organizations. One purpose of these meetings is to inform the citizens and decision-makers in the watershed of the findings and the overarching issues that were discovered.

Many of the findings are scientific in nature. This is an opportunity to explain natural processes, chemical reactions, and physical characteristics of the watershed in terms the layperson can understand. Additionally, the characteristics, locations, quantity, and functions of urban and rural forests in the watershed should be emphasized. People will also be interested in the socioeconomic findings and the implications of the area's comprehensive plan in the watershed. These facts should also be presented in a proper format, such as a PowerPoint presentation. (Reference Document 5.6)

The presentation of the critical areas for protection and restoration resulting from the data analysis will likely generate a high level of interest. People naturally are interested in information about areas where they live, work, and play. With the identification of the critical areas, the watershed council can tell the

public with confidence that efforts, resources, and funds will be targeted to precise locations that will provide the most benefits to the watershed. The public also responds favorably to agencies with a clear, unbiased plan of action and focus based on facts and not political, emotional, or otherwise biased reasoning.

At this meeting, the watershed council should be prepared to do these things:

- ❖ Present the relevant technical and demographic findings
- ❖ Describe the analysis process
- ❖ Display the maps produced
- ❖ Present the conclusions, critical areas, and overarching issues
- ❖ Provide educational materials
- ❖ Present the council's plan of action related to the findings of the project
- ❖ Inform the attendees of their role and/or assistance needed in accomplishing the plans

By doing these things, the public meetings will present the big picture to the attendees, prepare them for understanding the overarching issues and the next steps, and even encourage their participation in the council's efforts.

## **Section 3. Next Steps**

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The primary goal of this *Watershed Analysis and Issues Characterization for Education and Outreach* project was to systematically and scientifically analyze the specific existing conditions in the watershed in relation to forest resources, identify issues, and prepare appropriate public education materials distributed through a variety of outreach efforts.

Secondary, but equally important, goals are to use the preliminary data and analysis to determine:

- ❖ Where further, more focused studies should be performed
- ❖ Where implementation actions/projects should be performed
- ❖ How the existing educational materials should be refined
- ❖ Additional education and outreach needs based on the issues and planned actions

....all within the context of rural and urban forestry.

### **3.1 Integrate Results into the Watershed Management Action Plan**

Clearly, there are other non-forestry related issues in your watershed. The watershed council should have or be developing an overall *Watershed Management Action Plan*. The information derived from this project is the basis for a part of this plan. The presence or absence of trees in critical areas of a watershed can have dramatic impacts on water quality and quantity. Therefore, the overall *Watershed Management Action Plan* should address the need for specific actions related to understanding these impacts and using trees and forests to improve the watershed and quality of all life within it.

### **3.2 Identify Areas of Additional Research and Data Analysis**

The preliminary data analysis answered basic questions and described general characteristics of the watershed and forest cover. As in any comprehensive and scientific inquiry, the answers to one set of questions can lead to the need for answers to another set. Generally, action plans cannot and should not be developed without more specific and precise information. Examples of additional research and data analysis needs follows. ([Reference Document 6](#))

## **Forestry and Other Natural Resources**

- ❖ What are the size characteristics and quality of the forest cover in the watershed?
- ❖ What is the percent canopy cover in various governmental units or land use types?
- ❖ What stormwater mitigation value do trees in the watershed provide as calculated by formulas used in CityGreen, UFORE, and other tree benefits computer software models?
- ❖ Can the natural resource data be analyzed in conjunction with the social data to answer questions such as: Which census tract has the most problems? Which census tract has the most forest canopy cover?

## **Socioeconomic**

- ❖ What is the correlation between ethnicity, education, income, political units, and home ownership, and how does that compare to the watershed and the issues identified in it?
- ❖ Should an experienced sociologist be used to interpret the data?
- ❖ What are the specific demographics related to the critical areas for protection and restoration, and how does that impact or influence watershed council's education, outreach, and actions?

## **Land Use and Planning**

- ❖ Where are the critical areas for protection and restoration located in terms of various current land uses and future land uses according to the area's comprehensive plan?
- ❖ What current local legislation and policies are in place that hinder or help the goals of the watershed council?

### **3.3 Implementation Plans**

Although the information obtained through this project's process is general and basic in nature, it is still sufficient to develop implementation plans to address urban and rural forestry issues. Using the critical areas maps and data, projects can be developed to protect or enhance trees and forests in the watershed. For instance:

- ❖ Reforestation plans can be developed based on the critical areas for restoration data.
- ❖ Targeted forest management education programs can be developed for property owners and tree preservation policies can be explored and promoted to the cities or county where they occur based on the critical areas for protection data.
- ❖ An inventory of prioritized needs within the watershed could be created and used to track the accomplishments of the watershed council.

### **3.4 Pilot Projects**

Pilot projects are an excellent way to gather more site-specific information, test implementation methods, and create local partnerships. These projects tend to be smaller in scope; therefore, they are also usually easier for the watershed council to fund, implement, administer, and evaluate.

Pilot projects can also create a public relations opportunity for watershed council. By completing a small project(s), the council can demonstrate action to the community, dependability to the local potential partners, and show a real response to the input and opinions expressed at the public meetings.

Examples of manageable pilot projects based on the data and issues identified by this project could include:

- ❖ Coordinating with the local solid waste agency to clean up and plant trees on one or more of the local dump sites
- ❖ Planting trees on a scarred area such as a brownfield or road construction project
- ❖ Planting and maintaining trees on city streets or in a park
- ❖ Partnering with a local school, scout troop, or other youth organization on an educational and awareness project

## ***Section 4. Conclusion***

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This manual has been produced with the understanding and protection of our vital watersheds in mind. The intent is provide a resource that helps watershed councils as they make decisions concerning the management of the natural, built, and human resources within their watersheds.

The stewardship of the forests and natural resources in a watershed is forever linked with the sustainability and livability of our communities. When watershed councils have more information about their watersheds and forests, they can make better decisions for action and education.

Economic growth and development in a watershed and protection of forests and natural resources are not mutually exclusive goals; however, rational decisions cannot be made unless basic facts and conditions are known. The citizens of the watershed need the leadership of the watershed council to demonstrate and educate them about the best ways to protect their water quality, minimize damage from flooding, and manage forests for the benefit of all.



**Banklick Watershed Council**

322 East Third Street  
Covington, Kentucky 41012  
859-261-3880  
www.banklick.org

**Northern Kentucky Urban and Community Forestry Council**

6028 Camp Ernst Road  
Burlington, Kentucky 41005  
www.nkyurbanforestry.org



**Northern Kentucky Area Planning Commission**

2332 Royal Drive  
Ft. Mitchell, Kentucky 41017  
859-331-8980  
www.nkapc.org

**Sanitation District No. 1**

1045 Eaton Drive  
Ft. Wright, Kentucky 41017  
859-578-7450  
www.sd1.org

*Contact any of the following project partners to learn how you can help protect the Banklick Creek watershed:*

**Boone County Planning Commission**

2995 Washington Street  
Burlington, Kentucky 41005  
859-334-2196  
www.boonecountyky.org

**Davey Resource Group**

jgulick@davey.com  
Walton, Kentucky 41094  
859-384-8258  
www.davey.com

*Numerous other information resources exist to assist you with watershed and forestry management and protection. Contact any of the following organizations for assistance in your watershed:*

**Kenton County Conservation District**

6028 Camp Ernst Road  
Burlington, Kentucky 41005  
859-586-7903  
www.kentoncounty.org

**The Kenton Conservancy**

2332 Royal Drive  
Fort Mitchell, Kentucky 41017  
859-392-8358  
www.kentonconservancy.org

**Boone County Conservation District**

6028 Camp Ernst Road  
Burlington, Kentucky 41005  
859-586-7903  
www.boonecountyky.org

**The Boone Conservancy**

P.O. Box 416  
Burlington, Kentucky 41005  
859-689-0834  
www.thebooneconservancy.org

**Kentucky Division of Forestry**

627 Comanche Trail  
Frankfort, Kentucky 40601  
502-564-4496  
www.forestry.ky.gov

**Kentucky Waterways Alliance**

854 Horton Lane  
Munfordville, Kentucky 42765  
www.kwalliance.org

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