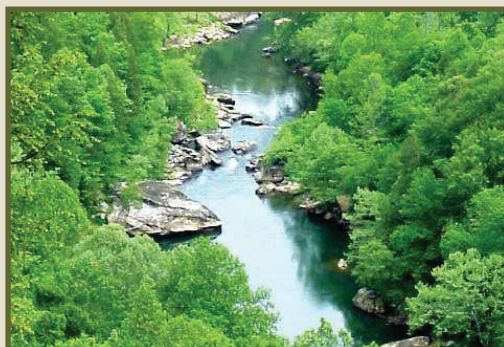


# Watershed Planning Guidebook for Kentucky Communities



**1st Edition  
2010**

**Kentucky Waterways Alliance  
Kentucky Division of Water**

**This page intentionally left blank**

## TABLE OF CONTENTS

<b>Guidebook Introduction .....</b>	<b>1</b>
A Watershed Approach	
How to Use This Guidebook	
Other Watershed Planning Resources	
Contracting for Services	
Qualifying for Nonpoint Source Section 319(h) Funds	
<b>1. Getting Started.....</b>	<b>9</b>
<b><i>Selecting Your Watershed and Getting Help</i></b>	
1.1 Why Collaborative Planning?	
1.2 Selecting Your Watershed	
1.2.1 Scale	
1.2.2 Regulatory Status	
1.2.3 Public Interest	
1.3 Enlisting Support and Help	
1.3.1 Partners	
1.3.2 Stakeholders	
1.3.3 Concerned Citizens	
1.3.4 The General Public	
1.4 Starting Your Planning Team	
1.4.1 Contacting Potential Members	
1.4.2 Initial Meetings	
1.4.3 Effective Group Collaborations	
1.4.4 Specialized Roles and Skills	
1.5 Kentucky's Watershed Management Initiative	
1.6 Group Vitality	
Active Options	
Write It Down	
<hr/>	
<b>Watershed Basics .....</b>	<b>25</b>
<b><i>Stream Systems and Human Influences</i></b>	
Part I: Watersheds and Stream Systems	
I-A Why Clean Water Is Important	
I-B The Water Cycle	
I-C What Is a Watershed?	
I-D Your Watershed Address	
I-E Erosion	
I-F Groundwater	
I-G Wetlands	
Part II: People and Watersheds	
II-A Land Use	
II-B Dams and Hydromodification	
II-C Water Extraction	
Part III: The Regulatory World	
III-A The Clean Water Act and Designated Uses	

- III-B Special Uses
  - III-C Required Reporting for Streams
  - Part IV: How Is Stream Health Evaluated?
    - IV-A Water Chemistry and Physical Properties
    - IV-B Habitat Assessment
    - IV-C Biological Assessment
- 

**2. Exploring Your Watershed .....55**

***Inventory Available Data and Information***

- 2.1 Collecting Data and Information
    - 2.1.1 Data Inventory
    - 2.1.2 Maps, With and Without GIS
  - 2.2 Finding Water Resources Data and Information
    - 2.2.1 Watershed Boundary
    - 2.2.2 Hydrology
    - 2.2.3 Groundwater-Surface Water Interaction
    - 2.2.4 Flooding
    - 2.2.5 Regulatory Data and Status of Waterways
    - 2.2.6 Other Water Data
    - 2.2.7 Geomorphologic Data
  - 2.3 Finding Natural Features Data and Information
    - 2.3.1 Geology and Topography
    - 2.3.2 Soils
    - 2.3.3 Ecoregions
    - 2.3.4 Riparian/Streamside Vegetation
    - 2.3.5 Rare and Exotic/Invasive Plants and Animals
  - 2.4 Finding Data and Information About Human Influences and Impacts
    - 2.4.1 Water Use
    - 2.4.2 General Land Use
    - 2.4.3 Other Water Disturbances
    - 2.4.4 Land Disturbances That Can Impact Waterways
    - 2.4.5 Hazardous Materials
  - 2.5 Finding Data and Information About Demographics and Social Issues
  - 2.6 Making Your Own Observations
    - 2.6.1 Visual Surveys
    - 2.6.2 Stream Surveys
- Active Options  
Write It Down

**3. Learning More .....78**

***Monitoring to Secure New Data***

- 3.1 Determining Additional Monitoring Data Needs
- 3.2 Obtaining Additional Data Through Monitoring
  - 3.2.1 Monitoring and Data Analysis for 319-Funded Watershed Plans
  - 3.2.2 Phase 1 Monitoring

3.2.3 Phase 2 Monitoring

3.2.4 Other Monitoring Options for Non-319-Funded Watershed Plans

Active Options

Write It Down

**4. Analyzing Results .....91**

***Identifying Sources and Targeting Efforts***

4.1 Understanding the Goal of the Analysis

4.2 Data Analysis Requirements for 319-Funded Watershed Plans

4.2.1 Phase 1 – Analysis

4.2.2 Phase 1 – Prioritization

4.2.3 Phase 2 – Analysis

4.3 Other Analysis Options for Non-319-Funded Watershed Plans

Active Options

Write It Down

**5. Finding Solutions .....105**

***Exploring BMP Options***

5.1 Overview of Best Management Practices

5.1.1 Best Management Practices for Specific Land Uses

5.1.2 Regulatory Programs

5.1.3 Education As a Best Management Practice

5.2 Selecting Best Management Practices for Your Watershed

Active Options

Write It Down

**6. Strategy for Success .....119**

***On the Path to Implementation***

6.1 BMP Feasibility

6.1.1 Feasibility Factors

6.2 Developing a Plan of Action

6.2.1 Developing Action Items

6.2.2 Plan Examples

6.3 Finding the Resources

6.3.1 Potential Resources

Active Options

Write It Down

**7. Making It Happen .....131**

***Staying on Track for Your Watershed's Future***

7.1 Advocating for Your Plan

7.1.1 Reach Out

7.1.2 Communication Alternatives

7.2 Securing and Managing Financial Resources

7.3 Implementation Functions and Roles

7.4 Adapting to Changes and Challenges

- 7.5 Measuring Progress and Success
  - 7.5.1 Tracking Progress
  - 7.5.2 Improvements in Watershed Health or Practices
  - 7.5.3 Improvements in Water Quality
- 7.6 Group Vitality
  - Active Options
  - Write It Down

**Appendices ..... 141**

A. Watershed Plan Outline .....	141
B. EPA’s Elements of a 319(h) Watershed Plan .....	147
C. Sample Team Invitation and Brochure .....	151
D. Resources for Team Development .....	155
E. Habitat Assessment (EPA Rapid Bioassessment Protocol Scoring Sheet) ..	157
F. Potential Pollutant Sources .....	161
G. Glossary .....	165

## Guidebook Introduction

This section will help you:

- Understand why watershed planning is so important
- Learn how to use this Guidebook
- Become familiar with the icons used in the Guidebook
- Use website references
- Envision a successful contract for technical services
- Understand the implications of 319(h) funding

Kentucky is a state blessed with abundant waterways. In a 1998 survey performed by the University of Kentucky's Department of Economics, Kentuckians ranked water quality first among all environmental issues. Kentucky's underground streams, like the tributaries of the Green River that created Mammoth Cave, are internationally-recognized preserves for unique biological communities. Kentucky communities value their waterways and want to make plans that preserve their vitality.

This Watershed Planning Guidebook for Kentucky Communities was created to help Kentuckians work together to improve the waterways they appreciate and use. It provides a step-by-step process that Kentucky communities may use to create an effective watershed plan. It has been tested by several Kentucky planning teams, who learned from experience and want to make it easier for others.

Effective watershed planning requires participation from people who do not necessarily have technical expertise. This Guidebook provides explanations for those who are not familiar with waterway and water use terms and dynamics. By increasing your understanding of what is happening to and in your watershed, using this Guidebook will change how you think about your stream, how you talk about it to others, and how you and your community act towards it.

### Why Water Quality and Watershed Health Matters

#### **To your community:**

Clean water means improved public health and a wider range of healthful outdoor recreation activities for all ages.

#### **To your quality of life:**

Fishing, swimming, boating, in-stream baptisms, and community events centered on your local waterway are central to a high quality of life.

A healthy stream can be appreciated for its cultural, historical, and spiritual significance to the community.

#### **To economic development:**

Clean waterways and healthy watersheds attract new investment. Modern employers are looking for attractive surroundings, including natural settings, as a benefit for top-notch employees and families.

Cleaner raw water for drinking water treatment reduces treatment costs. Tourism benefits from the attraction of natural areas with healthy waterways.

Clean water also allows your community to comply with regulations. This can prevent large fines that may lead to increased taxes and utility rates.

Effective watershed planning requires exploration and analysis of many factors related to your watershed and waterways' health and the activities that take place in the watershed. This Guidebook can lead anyone to find out many, many aspects of waterways and human impacts on them. Using this Guidebook will change how your community thinks about decisions impacting your waterways.

Words in **bold type** face are defined in the Guidebook glossary.

Effective watershed planning also requires some technical expertise. In many cases, and especially if your plan is conducted using **319(h) watershed funds** ("319"), the amount of technical expertise required is significant. This Guidebook helps clarify how to find technical assistance, what might be needed, and what to look for when contracting for technical assistance. Using this Guidebook can help avoid ineffective use of precious funds and information.

Effective watershed planning requires collaborative work and documentation of the work done and conclusions reached. This Guidebook can help you keep a planning team together and make your team work fun as well as productive; plus, it clarifies what kinds of information should be documented. Using the Guidebook will help your community come together to protect and improve your waterways and make better decisions about them.

This Guidebook offers advice for maintaining the vitality of your planning team and its links to the community. The team must remain involved and relevant if it is to continue to lead your community along the watershed management path. Using the Guidebook will not only lead you to a watershed plan that accurately and effectively guides your activities, but a plan that is marketable to those who can make the changes needed to protect and improve your waterways.

The watershed planning process is dynamic, iterative and adaptive. One reason this adaptive approach is necessary is because planning groups must often make decisions and take action based on imperfect information - while taking steps to get better information. Another reason is that targeted actions might not result in complete success during the first or second cycle. In fact, conditions always change, and effective planning is never linear but always adaptive, iterative. As a planning team gains experience and knowledge, decisions made in earlier steps are revised.

#### **Why Use a Watershed Approach?**

Since the 1972 enactment of the federal Clean Water Act, American communities have cleaned up much of the pollution that had been discharged into our waterways. Unfortunately, many waterways remain polluted.

One reason for a watershed approach is that **nonpoint source pollutants**, the result of human practices on the landscape, threaten waterway health.

Second, some piecemeal efforts to improve water quality have resulted in expensive but ineffective solutions.

Third, waterway protection has been neglected.

Since the late 1980s, in response to these shortcomings, citizens and governments have begun managing water quality with a watershed approach.



Using this Guidebook can sustain the long-term focus needed to continue to protect and improve the quality of water in your community.

## **A Watershed Approach**

A watershed approach is a flexible framework for managing water resource quality and quantity within specified drainage areas or watersheds. This holistic approach engages diverse individuals and groups and emphasizes the use of management practices supported by science and technology. The watershed approach to planning uses a series of cooperative, iterative steps to characterize existing conditions, identify and prioritize problems, define objectives, develop protection or remediation strategies, and implement and adapt selected actions as necessary. The outcomes of this process are documented in a watershed plan.

A watershed plan is a strategy that provides assessment and management information for a geographically-defined watershed, including the analyses, actions, participants, and resources for developing and implementing the plan.

A watershed plan will help you to clean up and protect your waterways and plan for your community's future. A plan can also improve your chances of securing funds to restore and protect your waterways. A plan is necessary if you seek 319 funding from US Environmental Protection Agency (EPA).

## **How to Use This Guidebook**

This Guidebook is organized into seven chapters that represent components of the watershed planning process. For best results, familiarize yourself with the entire book, and then use the chapters during your planning. Documentation of work and draft sections of the watershed plan should be completed as the planning team progresses through each chapter, as described at the end of that chapter.

Here's an overview of the contents of the chapters of this Guidebook:

Chapter 1—**Getting Started**—This chapter helps you select your watershed planning area, identify who should be involved in the planning process, organize your planning team and understand Kentucky's statewide approach to watershed protection and planning.

### **Who Will Use This Guidebook?**

Your planning team should follow the Guidebook carefully throughout the planning and implementation process. In addition, supporters and contractors will benefit from reading it.

Ideally, everyone involved in your watershed plan will understand how the planning process works and will become familiar, over time and more or less, with the Guidebook's contents.

Some key participants may need a copy for themselves; others will only need an introduction.

Many participants will benefit from Guidebook excerpts when technical information must be presented.

**Watershed Basics** – This section provides an overview of watersheds, water quality and how our actions affect the health of our watersheds. This section can also act as an educational resource for members of your planning group.

Chapter 2—**Exploring Your Watershed**—This chapter provides resources for collecting existing data and information for your watershed and includes guidance for managing and organizing this information.

Chapter 3—**Learning More**—This chapter helps you identify monitoring data gaps and provides instruction on how to develop a phased monitoring program to fill these gaps. This chapter should be used with Chapter 4 to complete the phases of monitoring and assessment for your watershed.

Chapter 4—**Analyzing Results**—This chapter helps you understand what the data and information collected tell you about the watershed and how to use this information for source determination.

Chapter 5 – **Finding Solutions** – This chapter provides an overview of Best Management Practices (BMPs) and how to perform targeted BMP selection.

Chapter 6 – **Strategy for Success** - This chapter helps you understand the connection between BMPs and water quality, select BMPs based on realistic factors in your watershed, and organize a detailed plan of action.

Chapter 7—**Making It Happen**—This chapter helps you market your plan, find resources to implement your plan, and evaluate and adjust your plan for long-term success.

Each chapter includes:



**Active Options** – These sections offer ideas to help keep your planning team together, productive, and enjoyable.



**Write It Down** – These sections clarify how the chapter’s work is described in the plan and what other documentation is appropriate. Any project using 319 funds is expected to provide all the information mentioned in the Write It Down sections.



**Website references** – The Guidebook refers to helpful information available on the Internet. To facilitate access and updates, the Kentucky Division of Water (KDOW) has established a gateway to these sites. Each website icon refers to a site on that gateway website. In the electronic version of the document, these icons refer to direct links in a list on the gateway website. This gateway website address is <http://water.ky.gov/watershed/Pages/WatershedPlanningGuidebook.aspx>

## Appendices

A. Watershed Plan Outline – This appendix combines the outlines from the Write It Down section of each chapter.

B. EPA's Elements of a 319(h) Watershed Plan – EPA has identified nine elements (a through i) required for a watershed plan qualifying for 319 funding, and these are provided in this appendix.

C. Sample Team Invitation and Brochure – This appendix offers samples groups can use to inspire invitations to potential team members and brochures.

D. Resources for Team Development – This appendix provides useful links and references to help your team be dynamic and productive.

E. Habitat Assessment (EPA Rapid Bioassessment Protocol Scoring Sheet) – This appendix provides a tool planning groups can use for evaluating habitat conditions at selected sites on your waterways.

F. Potential Pollutant Sources – This appendix is a chart to help identify the sources of any pollutant identified by data or information collected by a planning team.

G. Glossary – The glossary defines watershed terms that are printed in bold typeface throughout the Guidebook.

## **Other Watershed Planning Resources**

The Watershed Basics section is a comprehensive primer and reference for understanding watersheds and water quality. In addition, there are other key references available.

### **US EPA Resources**

Watershed Central is an EPA website designed to assist you with your watershed planning . The site includes guidance, case studies, and, scientific tools used for watershed modeling and assessment. In addition, useful water databases may be found on the site. The Watershed Central wiki, just like Wikipedia, allows registered user to submit and edit information that may be shared and updated by others.

The Kentucky Watershed Planning Guidebook will frequently refer to another tool found on the website, the US EPA Handbook on Developing Watershed Plans to Protect and Restore Our Waters, as well as its complimentary "Watershed Plan Builder," that help outline your watershed planning process."

### **Kentucky Resources**

Kentucky has developed its own *Kentucky Watershed Leadership Academy*, which provides training for groups that are developing watershed plans .

The *Kentucky Watershed Watch* program has designed overviews of stream science and watersheds for its adult citizen volunteers. These brief PowerPoint presentations may be helpful to you as you organize your planning team, particularly when the subject matter of your planning requires some basic understanding. These training materials are available at .

The *Kentucky Watershed Viewer* is an online mapping tool with information about land cover, pollutants, and protections .

The *Commonwealth Water Education Project* provides a website in support of its training and educational programs aimed at helping communities protect water resources as they grow .

## Contracting for Services

This Guidebook will also serve as a valuable tool if you hire others to assist in the plan development. While contracting for technical services can be rewarding and is often necessary to develop a plan, there are also many potential pitfalls in contracting. The Guidebook will help you identify what you require from a contractor. Detailed contracts are necessary to ensure that you receive the product you need. Furthermore, the contractor should read related sections so that they are familiar with the requirements outlined in this Guidebook.

## Qualifying for “Nonpoint Source Section 319(h)” Funds

There are many sources of funds for watershed planning and plan implementation, described in Chapter 6. However, the predominant source of comprehensive funding is the KDOW, which administers EPA funds provided under Section 319(h) of the Clean Water Act (written simply as “319” throughout the Guidebook). These funds are distributed through KDOW’s **Nonpoint Source program**.

Here’s a brief summary of the **nine key elements** of watershed plans, as defined by EPA:

- Identify causes and sources of pollution
- Estimate load reductions expected
- Describe management measures and target critical areas
- Estimate technical and financial assistance needed
- Develop education component
- Develop project schedule
- Describe interim, measurable milestones
- Identify indicators to measure progress
- Develop a monitoring component

For the KY Division of Water to use 319 funds to implement a watershed plan, that plan must meet all the requirements described in this Guidebook. Fortunately, the 319 program also currently funds the development of watershed plans that meet program criteria.

This Guidebook provides the watershed planning requirements for 319-funded plans in Kentucky. Some chapters contain 319-specific sections for portions of the planning process that contain detailed requirements. This Guidebook will be helpful in understanding the amount of work involved in developing an acceptable plan so that an appropriate budget can be prepared.

When considering an application for 319 program funding, you should familiarize yourself with the grant program and its requirements. This information can be found in the Grant Guidance document located on the Kentucky Division of Water website .

If you are considering applying for 319 program funds, you should consult with the Nonpoint Source Program at the Kentucky Division of Water: or 502-564-3410.

To qualify for 319 program funds, the watershed plan must adequately address the nine elements specified by the EPA. If you follow the steps in this Guidebook, you should meet these nine requirements. But you'll want to check whether the parts of your plan meet the specific 319 program requirements before you finalize your plan. They are listed in the

"Nine Minimum Elements to be Included in a Watershed Plan for Impaired Waters Funded Using Incremental Section 319 Funds" in Appendix B.

Once a watershed plan has been developed that meets EPA specifications, sponsors can request 319 funds to implement strategies identified in the watershed plan.

To properly cite this document, use the following: Kentucky Waterways Alliance and the Kentucky Division of Water. 2010. *Watershed Planning Guidebook for Kentucky Communities*. 1<sup>st</sup> ed. Kentucky Waterways Alliance and the Kentucky Division of Water.

**This page intentionally left blank**