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Community-Based Watershed Management

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We often think of rivers as simply water flowing through a channel, but river systems are complex and intimately connected to and affected by the characteristics of their surrounding watersheds – the land that water flows over and under on its way to the river. Everyone is an integral part of the watershed in which he or she lives. Many human activities that occur on the land, such as agriculture, transportation, mining, and construction, affect our river systems and how they function.

The purpose of this publication is to help the reader gain a better understanding of how communities are organizing at the watershed level to lessen the impact of human activities on Ohio's rivers, lakes, streams, and groundwater. A reference list is provided for those seeking more in-depth information on this topic.

Watershed Functions

Because they convey the water that runs over the land and into the ground, watersheds provide many vital ecological and hydrological functions. Hydrologically, watersheds collect water from rainfall and snowmelt, storing some of this precipitation in wetlands, soils, trees, and other vegetation, and underground in aquifers. The floodplain along the banks of a river also serves as an important storage site for water during periods of heavy runoff. These natural storage sites help eliminate contaminants as suspended particles settle out and as water infiltrates into the soil where biological and chemical reactions can break down impurities. Some of this stored water eventually flows into streams, rivers, and

lakes as runoff.

Ecologically, watersheds provide critical habitat for many plant and animal species, as well as transport paths for sediment, nutrients, minerals, and a variety of chemicals. Watersheds also provide water to human communities for drinking, cleaning, recreation, navigation, hydroelectric power, and manufacturing.

Human Activities That Alter Watershed Functions

Like all organisms, humans are an integral part of the watersheds in which they live. Therefore, human activities, both in the water and on the land, can have a great impact on the watershed functions described previously. The creation of buildings, parking lots, and roads; the draining of wetlands; mining; deforestation; and agricultural activities can all alter the quality and quantity of water that flows over and infiltrates into the ground. These changes can alter watershed functions by eliminating critical water storage sites (e.g., wetlands and floodplains) and by contributing additional sediments and chemicals to runoff. Human activities can also eliminate critical natural habitat sites, thereby limiting biodiversity in the watershed.

Watershed Management

Watershed management consists of those coordinated human activities aimed at controlling, enhancing, or restoring watershed functions. In the past, watershed management in Ohio was viewed largely as the responsibility of government agencies and conservancy districts and was focused primarily on controlling the flow of water through the construction of dams and levees to protect human communities from flooding, store water for times of drought, and provide opportunities for water-related recreation.

But this emphasis on structural solutions to water storage and flooding problems has given way to a new approach that recognizes the multitude of functions watersheds provide and the need to meet multiple objectives such as flood prevention, erosion control, wildlife habitat, and provision of recreation. There has also been increasing awareness that watershed management is not solely the responsibility of government agencies and conservancy districts.

A Community-Based Approach to Watershed Management

Since passage of the federal Clean Water Act in 1972 and the Safe Drinking Water Act in 1974, great progress has been made in reducing the amount of pollutants discharged into Ohio's waters from point sources such as wastewater treatment plants and industries. But as point sources of pollution were reduced, other forms of pollution, called non-point source or diffuse pollution, came to the forefront. Non-point source pollution results from human land-use practices such as agriculture, mining, forestry, home septic systems, and contaminated runoff from urban landscapes. Now these non-point sources of pollution, combined with the physical destruction of aquatic habitat, are the major remaining sources of impairment of Ohio's rivers and lakes.

Ohio EPA has limited regulatory authority to control land-use practices that alter aquatic habitat and cause non-point source pollution. Consequently, throughout Ohio, government agency representatives, public officials, educators, scientists, concerned citizens, and other private interests are joining together to identify and address land-use practices and other human activities that pollute local water resources or otherwise alter watershed functions.

Community-based watershed management is an approach to water-resource protection that enables

individuals, groups, and institutions with a stake in management outcomes (often called stakeholders) to participate in identifying and addressing local issues that affect or are affected by watershed functions. In Ohio, some key stakeholders include those people who have the authority to make land-use decisions, such as individual landowners, farmers, and local government officials. Other stakeholders may include representatives from environmental and community groups, schools, Ohio EPA, Ohio Department of Natural Resources, the local Soil and Water Conservation Districts, and Ohio State University Extension.

Proponents of community-based watershed management maintain that involving local stakeholders results in more locally relevant solutions that take into account each community's unique social, economic, and environmental conditions and values. Stakeholder participation is also thought to create a sense of local ownership of identified problems and solutions, thus ensuring long-term support for resulting management plans.

Characteristics of Community-Based Watershed Management

Changing Roles and Relationships: As local communities participate more actively in watershed management, the roles and relationships of resource managers and stakeholders will change. Traditionally, resource managers were viewed as experts who were uniquely qualified to identify and implement watershed management strategies. But community-based watershed management recognizes that all stakeholders have a critical role to play in the management planning process. Resource managers and other stakeholders can contribute in many different ways, but all must work collaboratively to understand and address watershed issues when a community-based approach is used.

Whole-System Perspective: Watershed management is not a single strategy, but is a general approach to water resource protection that recognizes the interconnectedness of all the physical and biological components of the landscape, including human communities. A community-based approach considers not only the physical characteristics of a watershed, but it also takes into account the social and economic factors associated with watershed issues. The goal of community-based watershed management is to protect and restore watershed functions while considering the variety of social and economic benefits of those functions.

Integration of Scientific Information and Societal Values: Watershed management decisions should be based on sound scientific information, both in terms of identifying problems and selecting options for addressing those problems. However, resource managers have learned that management decisions that are based on scientific evidence alone often fail in the long-run because they conflict with a community's economic or other social values. Community-based approaches to watershed management attempt to incorporate a broad range of values in the management process by involving representatives from a diverse cross-section of the community throughout the management planning process. In some cases, by involving diverse interests early on, value conflicts can be resolved during the planning process, thereby avoiding more costly battles once plans are put into action.

Adaptive Management Style: Addressing environmental, social, and economic issues at the watershed scale is complex, and often there is a high level of uncertainty regarding the outcomes of management decisions. Effective community-based watershed management entails an experimental approach to management in the sense that participants must be prepared to learn from their mistakes and to adapt their management strategies to changing conditions. In many ways, watershed management planning is never complete, because as old issues are resolved, new ones arise. For this reason, the long-term commitment of the stakeholders involved in a community-based watershed-management project is critical to its success.

What Is a Watershed Management Plan?

Watershed management plans generally include the elements listed here (adapted from Ohio EPA's *Guide to Developing Local Watershed Action Plans in Ohio*):

- Definition of the area of concern, the purpose of the plan, and who was involved in developing the plan.
- Description of the physical, ecological, and social characteristics of the watershed and the communities within its boundaries.
- Description of the problems that affect watershed functions.
- Identification of responsible parties and of planned activities for addressing identified problems and responsible parties.
- Explanation of how progress will be measured once implementation of a plan begins.

Challenges Associated With Community-Based Watershed Management

Community-based watershed management is not easy, nor is it always effective at protecting or restoring watershed functions. Some of the challenges faced by those who adopt a community-based approach include the following:

- Watersheds may cover thousands of acres of public and privately owned land. Developing even a basic understanding of how human activities affect watershed functions is a major undertaking.
- Some key stakeholders may lack the time, motivation, skills, or resources to participate effectively throughout the management planning process.
- Resource management professionals may be reluctant to give up their role as experts and to share authority with lay persons regarding resource management issues.
- Conflicts between stakeholders over management goals and the means to accomplishing those goals are inevitable, and resource management professionals are often ill-prepared to facilitate constructive dialogue to resolve these conflicts.
- Community-based approaches require time and resources to generate interest and to build relationships between stakeholders. Funding agencies and stakeholders may grow impatient with the lack of observable outcomes.

Keys to Success

There is no easy formula for successful community-based watershed management. However, experience from efforts around the country and in Ohio suggests that several key factors, such as those listed here, are common to many successful projects.

- Involve stakeholders in the management planning process in a way that is meaningful to them and that allows them to use their particular skills and knowledge most effectively.

- Don't be discouraged if some stakeholders choose not to participate initially. Begin by educating and informing key audiences about the values of the watershed to the community, the watershed management process, and specific actions they can take to get involved.

- Determine the appropriate scale for addressing watershed problems. Actions aimed at changing land-use practices are easiest to implement at the local level and become more difficult to manage on a larger scale.

- View the watershed management plan as a starting point and not the end product. Be prepared to adapt the plan as conditions change and groups learn from their mistakes.

- Make management decisions, when possible, based on a consensus of a broad range of stakeholders. Efforts to resolve conflicts before management decisions are made pay dividends in the long run.

- Focus on desired outcomes (e.g., clean water), which can often be more helpful and motivating for participants than emphasizing problems and who is causing them.

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For More Information

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