Why Watershed Conservation?

The Watershed Approach

A watershed approach is a coordinating framework for environmental management involving diverse stakeholders and using sound science to focus resources on high priority issues within areas defined by their water system. A successful watershed approach promotes collaboration and communication between stakeholders with a variety of perspectives, from habitat preservation to hydropower generation. This fact sheet provides an outline of the watershed approach–a blueprint for watershed management.

These fact sheets address the effects of typical development on water resources and outline the steps a community can take to reduce the impacts of development. Few communities are alone in a watershed. Instead, they are affected by the activities of adjacent political jurisdictions–upstream or downstream, uphill or downhill–in a common watershed.

Unless issues are addressed together on a watershed basis, efforts will only have limited effects. Community officials are learning to look at their waterways as an interconnected system and recognize the need to work with their watershed neighbors and find comprehensive solutions that meet all their needs. Preventing negative impacts in the first place is the most effective (and cost effective) approach and should always be emphasized.

What Are the Impacts of Development?

When development occurs, the resulting alteration to the land can lead to dramatic changes to the hydrology, or the way water is transported and stored. Development generally brings an increase in impervious surfaces–parking lots, roads, roofs, compacted soils or any surface that prevents the natural penetration of rainfall into the ground. Impervious surfaces and compacted soil associated with development create a barrier to the percolation of rainfall into the soil, increasing surface runoff and decreasing groundwater infiltration. This disruption of the natural water cycle leads to a number of changes, including:

- increased volume and speed of stormwater runoff;
- increased frequency and severity of flooding;
- peak (storm) flows many times greater than in natural basins;
- loss of natural runoff storage capacity in vegetation, wetland and soil;
- reduced groundwater recharge; and
- decreased base flow, the groundwater contribution to stream flow.

As more stormwater gushes into streams, over land or through stormwater systems, streams become deeper, wider and straighter. This rapid flush of water tears away streamside vegetation, fills important habitat with sediment and causes extreme temperature fluctuations, killing aquatic species unable to survive in the harsher conditions. With less groundwater, normal seasonal low flows become lower or non-existent, further limiting plant and wildlife survival.

Water is the force of life that binds a community and a landscape with rivers, streams and watersheds. Getting to know and understand your local watershed is important to land use, as well as natural resources. This series of fact sheets is designed to help you learn about water issues in your community–water quality, development impacts, stormwater and waterway habitat–and to live in harmony with water resources.

Watershed Resources Fact Sheet Series

#1: Why Watershed Conservation?

#2: Nonpoint Source Water Pollution

#3: Impacts of Development on Waterways

#4: Strategies for Coping with Stormwater

#5: How to Get Started: Protecting Your Community Water Resources

#6: Asking the Right Questions: Raising the Issue of Stormwater at a Public Meeting

#7: Reviewing Site Plans for Stormwater Management

#8: Conservation Subdivisions: A Better Way to Protect Water Quality, Retain Wildlife and Preserve Regional Character

#9: Carving Up the Landscape: Habitat Fragmentation and What To Do About It

#10: Flooding and Floodplain Development

#11: Special Landscapes: How to Identify and Care for Them

#12: Websites and Other Helpful Resources

Missouri Watersheds

- Missouri
- Mississippi
- White
- St. Francis

Nested within these watersheds or basins are smaller watersheds, often referred to as sub-basins.

As stormwater flows across the land it picks up pollutants. These pollutants (called nonpoint source pollution because they are not from a single source) include pathogens from animal waste, nutrients from fertilizers, sediment from development sites, toxic contaminants like motor oil and debris. In most natural areas, the vegetation, wetlands and soil filter out pollutants as water percolates through to groundwater. Nearly 75 percent of Missouri's counties contain karst areas where water has dissolved rock to form sinks, underground streams and caverns. In karst, pollutants are not always filtered out by the soil. Fissures in the rock provide a direct path for pollutants to enter the groundwater and the pollutants may even travel through fissures to other watersheds. These groundwater expressways can speed pollutants to streams, lakes or groundwater. Contaminants in karst areas should be reduced or eliminated.

Without proper controls, the stormwater in developed and developing areas will carry pollutants directly into streams and lakes. There they contaminate fish, prevent swimming, kill aquatic life, destroy habitat and ruin our drinking water.

A Watershed Conservation Blueprint

Seven themes of watershed management are a blueprint for new efforts:

- increasing public education and awareness,
- developing new partnerships and coordinating efforts,
- collecting necessary information through monitoring and research,
- establishing appropriate plans and priorities,
- obtaining funding and technical assistance,
- implementing projects for solutions and
- evaluating the results.

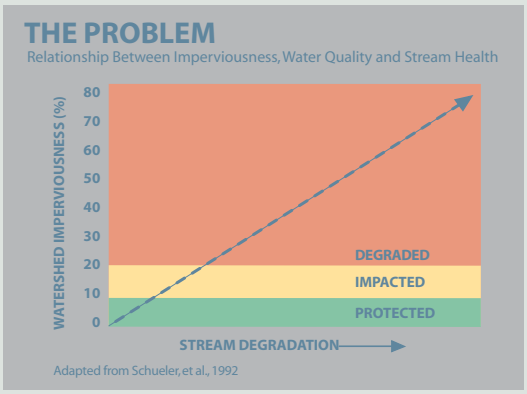
Public Education and Awareness

Citizens, businesses and governments need information to understand how watershed health and management activities can address watershed threats. Education programs create an awareness of the cumulative impact of individual decisions on watershed health. This understanding is a connection between individual decisions and the long-term quality of life. Programs also foster motivation to take necessary action.

Partnerships and Coordination

Effective partnerships and coordination form the cornerstone of all successful watershed efforts. Most partnerships include a range of watershed stakeholders, since they all have a vested interest in the actions and success of the effort. Broad stakeholder participation provides a greater base of knowledge, increases credibility, reduces duplication of effort and maximizes results from human and financial resources. Stakeholders include:

- Landowners and homeowners
- Elected officials
- Local, state and federal government agencies
- Agricultural organizations
- Business organizations
- Environmental organizations
- Recreational groups



If more than 20 percent of a watershed is made up of impervious surfaces (roads, roofs and parking lots), then the stream will be degraded.

- Student and senior citizen organizations
- Contractors and developers

Because of their divergent interests, trust and cooperation among stakeholders will take care and time to develop. Considering the opportunity for more effective resource use and better decisions, the investment is well worth the time and effort.

Monitoring and Research

Chemical, physical and biological characteristics provide measures of current water resource health and the effects of human actions, for better or worse. Water chemistry is the most common form of monitoring. Because of the time and money required, monitoring the physical characteristics (such as sediment or channel stability) and biological characteristics (such as the presence of sensitive macroinvertebrates or fish species) is less common now, but growing in usage.

Watershed research develops an understanding of how watersheds function. For instance, research provided confirmation of the role of impervious surfaces in the degradation of water resources (see above).

Significant gaps exist in both monitoring and research. Where gaps exist, analyzing trends, causes and effects becomes more difficult. Watershed practitioners need research and monitoring that focus on individual watershed projects, so the long-term effects of protection and restoration projects can be assessed. That information will also guide future projects, further improving watershed management effectiveness.

Plans and Priorities

Planning and prioritization guide public and private action and, used well, ensure effective and efficient watershed management. Unified Watershed Assessments, conducted nationwide in 1998 and 1999, identified the watersheds most in need of restoration. These assessments considered impaired and threatened waters, federal and state endangered species and other data. Plans and priorities for watershed management activities should take these issues into consideration, along with a host of other concerns and goals–cultural, recreational, social and economic.

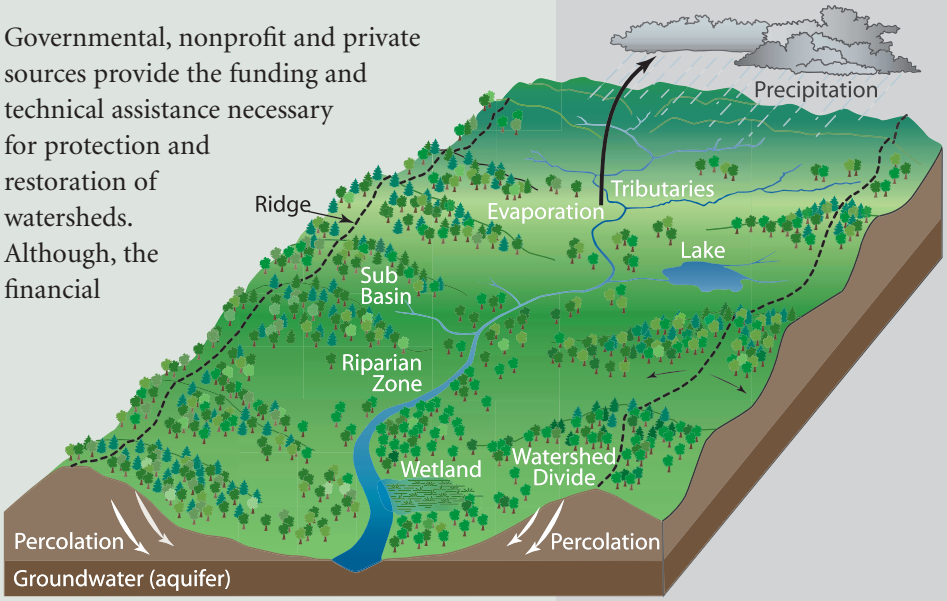
Watershed protection is more cost-effective and more likely to succeed than watershed restoration. Also, a restored natural system is rarely as diverse or ecologically valuable as one without damage. So, despite the seeming urgency of restoration work, protection must play at least an equally important role.

The tie between evaluation and planning cannot be overlooked. Goals and measurements must be coordinated closely with technical advisors to ensure success can be achieved and measured.

Funding and Technical Assistance

Governmental, nonprofit and private sources provide the funding and technical assistance necessary for protection and restoration of watersheds. Although, the financial

A watershed is an area of land that drains to a single body of water such as a stream, lake or pond. Few communities are alone in a watershed. Instead, they are affected by activities of adjacent political jurisdictions–upstream or downstream, uphill or downhill–in a common watershed.



resource possibilities and technical information sources can be overwhelming.

A key goal of watershed conservation is to distill this information, organize the resources and make it all readily available to local users through their governments. *Fact Sheet #5 How to Get Started* provides essential information on funding and technical assistance sources.

Implementation

The only aspect of a project more rewarding than implementation is seeing actual results. Depending on the plans and priorities, implementation may include a range of projects from pollution prevention to wetland restoration and critical habitat protection. Local planning and zoning decisions significantly affect watershed health. For that reason, this fact sheet series addresses the potential threats inherent in conventional development and some alternative approaches to development–critical factors in determining future watershed health.

Evaluation

Evaluation assesses the success of a project and guides future efforts. Effective projects are then repeated and less effective or unsuccessful projects and programs are eliminated or modified. The method of evaluation must be established as part of the planning process; modifications of the project or the measuring tool at the outset may be necessary to ensure accurate results are measured.

The factors affecting watershed health are complex, sometimes making cause and effect difficult to establish. The larger the size of the watershed, the more difficult it may be to establish a connection between actions taken and results or lack thereof. Technical members of or advisors to the watershed team can help guide decisions to ensure proper evaluation takes place.

Adapted from: U.S. Environmental Protection Agency Protecting and Restoring America's Watersheds: Status, Trends, and Initiatives in Watershed Management, June 2001.

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