



Article 27

Chapter 2 from *The Rapid Watershed Planning Handbook*

The Tools of Watershed Protection

In this article, we outline a watershed protection approach that applies eight tools to protect or restore aquatic resources in a subwatershed. These tools are as follows:

Tool 1. Land Use Planning

Tool 2. Land Conservation

Tool 3. Aquatic Buffers

Tool 4. Better Site Design

Tool 5. Erosion and Sediment Control

Tool 6. Stormwater Best Management Practices

Tool 7. Non-Stormwater Discharges

Tool 8. Watershed Stewardship Programs

The practice of watershed protection is about making choices about what tools to apply, and in what combination. The eight watershed protection tools roughly correspond to the stages of the development cycle from initial land use planning, site design, and construction through home ownership (see Figure 1). As a result, a watershed manager will generally need to apply some form of all eight tools in every watershed to provide comprehensive watershed protection. The tools, however, are applied in different ways depending what category of subwatershed is being protected.

The remainder of this article describes the nature and purpose of the eight watershed protection tools, outlines some specific techniques for applying the tools, and highlights some key choices a watershed manager should consider when applying or adapting the tools within a given subwatershed. Each of these tools is an essential element of a comprehensive watershed protection approach and their goal is to provide local communities with a realistic approach for maintaining a quality environment for future generations.

Tool #1: Land Use Planning

Since impervious cover has such a strong influence on subwatershed quality, a watershed manager must critically analyze the degree and location of future development (and impervious cover) that is expected to happen in a watershed. Consequently, land use planning ranks as perhaps the single most important watershed protection tool. When preparing a watershed plan, a watershed manager needs to do the following:

- Predict what will happen to water resources in the face of future land use change.
- Obtain consensus on the most important water resource goals for the watershed.
- Develop a future land use pattern for the subwatersheds within the watershed that can meet those goals.
- Select the most acceptable and effective land use planning technique to reduce or shift future impervious cover.
- Select the most appropriate combination of other watershed protection tools to apply to individual subwatersheds.
- Devise an ongoing management structure to adopt and implement the watershed plan.

Land Use Planning Techniques

Watershed planning is best conducted at the subwatershed scale, where it is recognized that stream quality is related to land use and consequently impervious cover. One of the goals of watershed planning is to shift development toward subwatersheds that can support a particular type of land use and/or density. The basic goal of the watershed plan is to apply land use planning techniques to redirect development, preserve sensitive areas, and maintain or reduce the impervious cover within a given subwatershed.

A wide variety of techniques can be used to manage land use and impervious cover in subwatersheds. Some of these techniques include the following:

- Watershed based zoning
- Overlay zoning
- Urban growth boundaries
- Large lot zoning

Local officials face hard choices when deciding which land use planning techniques are the most appropriate to modify current zoning. These techniques have been employed in a wide variety of watershed applications by many local governments across the country.

Watershed-based Zoning: This specialized technique is the foundation of a land use planning process using subwatershed boundaries as the basis for future land use decisions. Watershed based zoning involves defining existing watershed conditions, measuring current and potential future impervious cover, classifying