An Integrated Framework to Restore Small Urban Watersheds

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Chapter 1

Organizing to Restore Urban Watersheds

Each watershed restoration partnership is unique, both in terms of the goals that guide it and the stakeholders that participate in it. The five parts of this chapter explore how to organize the partnerships needed to effectively restore urban watersheds.

The first part of Chapter 1 defines the basic terminology used to talk about watersheds and restoration. The second part examines the key trends driving the rapid growth in urban watershed restoration in communities across the country. The third part explores possible goals that can guide watershed restoration efforts and outlines how communities can develop the most appropriate and achievable goals. The fourth part describes the broad groups of stakeholders that must be involved in restoration plan development, while the fifth part outlines practical strategies for organizing stakeholders toward a common purpose.

1.1. Getting the Terminology Right

The words “urban,” “watershed” and “restoration” can mean many things to many people, and when they are combined, it can be a recipe for confusion. So, from the outset, we want to carefully define how each of these terms is used throughout this course.

Urban is defined as any watershed or subwatershed with more than 10% total impervious cover.

Watersheds are land areas that drain surface and groundwater to a downstream water body, such as a river, lake or estuary. Watershed drainage areas are large, ranging from 20 to 100 square miles or more. Given their size, they may encompass many political jurisdictions, contain a mix of land uses (forest, agricultural, rural, suburban, urban), and have a broad range of pollution sources. Each watershed is composed of several smaller watersheds called “subwatersheds.”

Subwatersheds, as a general rule of thumb, have a drainage area of five to 10 square miles or less, and are the primary restoration unit in the context of this course. The small size of

subwatersheds makes them ideal restoration candidates for several reasons. First, subwatersheds can be rapidly mapped and assessed for restoration potential in a matter of months, with an initial restoration strategy following soon after. The small scale of a subwatershed also allows restoration practices to be designed, constructed and assessed within a few years. Also, most subwatersheds are contained within a single political jurisdiction, making it easier to coordinate local stakeholders. In our view, watershed restoration can only be effectively implemented at the subwatershed scale, although many subwatersheds may require restoration to achieve watershed goals.

Each urban subwatershed is drained by a network of perennial streams, each of which can be classified based on its relative order in the network. For example, a small stream with no tributaries or branches is defined as a first-order stream. When two first-order streams combine, they form a second-order stream.

Similarly, when two second-order streams join, they create a third-order stream, and so on.

Given their relatively small drainage area, most urban subwatersheds only contain streams that range from first to third order. The health of these smaller headwater streams is the major focus of urban restoration efforts.

The stream corridor and upland areas are the two parts of a subwatershed. Stream corridors include the existing network of stream channels and the lands that surround them.

Upland areas include the remaining subwatershed area that drains to the stream corridor. The relationship between the stream corridor and upland areas is depicted in Figure 1. As subwatersheds urbanize, both the length and width of the stream corridor decline and upland areas begin to dominate the landscape.

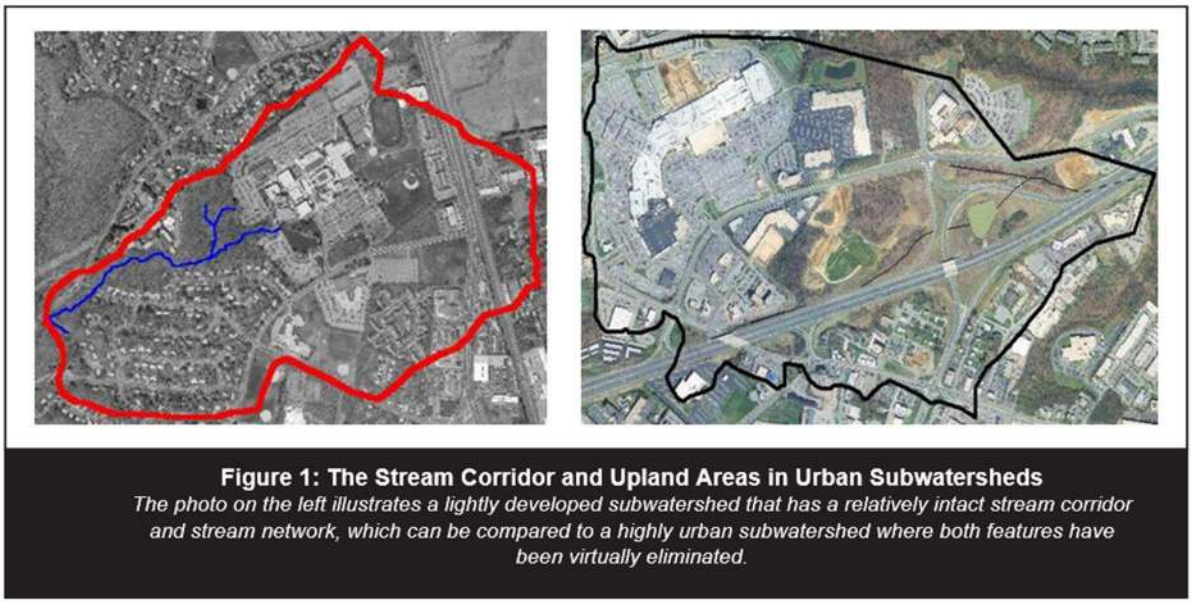

Figure 1: The Stream Corridor and Upland Areas in Urban Subwatersheds
The photo on the left illustrates a lightly developed subwatershed that has a relatively intact stream corridor and stream network, which can be compared to a highly urban subwatershed where both features have been virtually eliminated.

Figure 1

Restoration is used throughout this course in its broadest sense and is defined as the application of any combination of restoration practices that can improve stream health, as measured by improvements in physical, hydrological, chemical, ecological or social indicators of stream quality. Alternative terms such as “recovery,” “repair,” “rehabilitation,” or “enhancement” were considered, but found inadequate. However, the use of the term “restoration” does not imply that full ecological restoration of urban streams is always possible.

Restoration practice is used to describe the seven broad groups of practices used to restore urban subwatersheds. Four groups of restoration practices — stormwater retrofits, stream restoration, riparian management and discharge prevention — are generally applied within the urban stream corridor. The remaining three groups of practices — pollution source control, previous area management and municipal stewardship — are normally applied to upland areas of a subwatershed.

Stakeholders are defined as any agency, organization or individual involved in or affected by the decisions made in a subwatershed restoration plan. From a practical standpoint, it helps to think of four broad groups of stakeholders in each restoration effort: agencies, the public, watershed

partners and potential funders. Each of these four stakeholder groups is further defined later in this chapter.

1.2. Trends Driving Growth in Urban Watershed Restoration

The remarkable growth in urban watershed restoration efforts has been fueled by several intersecting trends affecting thousands of communities across the nation: the need to control nonpoint source pollution, new regulatory mandates, increased municipal restoration capability, growth in urban watershed organizations, and greater public expectations for cleaner and greener neighborhoods.

Need to Control Nonpoint Pollution Sources

Most communities have clamped down on point sources of pollution to the furthest extent possible (e.g., sewage treatment plants and industrial discharges). Despite a multi-billion-dollar investment over the last three decades, however, many urban streams and rivers still do not meet water quality standards and continue to experience severe habitat degradation.

Consequently, communities are now shifting their control efforts to reduce nonpoint sources of pollution in order to meet clean water goals. In urban watersheds, nonpoint source control usually means better treatment of urban stormwater runoff, which is best accomplished at the watershed or subwatershed scale.

Emerging Regulatory Drivers

A series of state and federal regulations are also prompting many communities to restore their urban watersheds. For example, when urban waters do not meet water quality standards prescribed under the Clean Water Act, agencies must develop pollutant reduction plans that show how these standards can be attained in the future. These plans, known as Total Maximum Daily Loads (or TMDLs), may require communities to implement restoration practices to reduce nonpoint source pollutant loads by specific amounts over a defined timetable.

Purchase this course to see the remainder of the technical materials.