Riparian Buffers

In a Nutshell

Riparian buffers are simply protected corridors along rivers, streams, lakes and other bodies of water that prohibit urbanized development. These buffers protect the environment by preventing erosion and pollution of a natural body of water. Riparian buffers also play a vital role in floodplain management and water runoff containment.

The “How To”

Riparian buffers are made up of vegetation, ranging from grass to trees. The vegetation serves as a natural barrier between the stream and urbanization, and a protected haven for wildlife. The real benefit though is the preventation of erosion and pollution in the water.

The University of Maryland's Agriculture & Natural Resources department provides information on riparian forest buffers.

Planning & Zoning

How to Start a Program in Your Community

1. *Step One:* The first step is mapping all of the streams, creeks, rivers, and other waterways in your community. From there, identify the parcels, properties, land use, and ownership along these corridors. Ultimately a city or county will need to work with these private property owners to achieve such goals. GIS software can be helpful in creating these maps.
2. *Identify streams to protect:* This can be more complicated for a city or county than it seems. The most straightforward way to do so is U.S. Geological Survey (USGS) determinations. Their WaterWatch service (and local USGS offices) can help your community determine whether or not a waterway is consistent enough to consider for a riparian buffer. However, if your local community feels a waterway is important to protect using a buffer (even if it only flows during floods or high-stages), you certainly can do so.
3. *Designing a Program Structure:* Next the local government will have to determine its programmatic approach. The Environmental Protection Agency (EPA) provides a walk-through evaluation of model ordinance language and different buffer policies. The EPA also provides detailed information on implementing policies, including a model ordinance and examples from various local governments across the United States.
4. *Adopting the Legislation:* Baltimore County's ordinance and program are often cited as a best practice and could be used as a model. Such language is technical and should be prepared using urban planning staff, city engineers, city attorneys, and stormwater management professionals.

5. *Constructing the Buffer:* If your community decides to build buffers, Penn State University provides information on how to design them. You will want to consult with an environmental engineer and stormwater management professional in your design.
6. *More Research:* The Natural Resources Conservation Service provides a best practice guide on establishing riparian buffers.
7. *Plan Review:* Metropolitan St. Louis Sewer District has a Site Design Guidance document that provides an overview of key issues.

Dollars & Cents

Economic Benefits of Riparian Buffers

Iowa's Department of Natural Resources provides an overview of the economic benefits of riparian and forested buffer zones. The University of Maryland offers analysis on the economic benefits as well. A comprehensive, scientific evaluation of the benefits was written by Scott Howard Stoodley, which reviews the policy in a specific case study in Oklahoma in a one-hundred, fifty page document.

Communities in the St. Louis region have spent millions of dollars to stabilize stream banks when homes have been built too close to streams. Other communities have had significant problems with homes being flooded because they were built too close to the stream channel and in the flood zone. Such communities have spent millions of dollars in federally subsidized property buyout programs. Developers can be encouraged to set aside stream buffer areas, especially if local governments are willing to allow some flexibility on lot size and density.

Especially when new subdivisions are planned, municipalities can save significant long term channel maintenance costs when they require that developers provide significant buffers along even small streams.

Cost to a Local Government Program

Some city or county efforts can be simple, such as adding required buffers in new construction development through the zoning and development codes. Such efforts require mainly staff time and would not generate "hard costs." However, significant cost comes with establishing a buffer program in many of the communities in the St. Louis region that are already substantially built-up. The major components of establishing a buffer are (from a cost-analysis by Clemson University):

- Project Administration (including permit approvals, etc)
- Analysis of Riparian Corridor
- Acquisition of Property/Property Rights
- Pre-Engineering Costs
- Construction/Project Management
- Construction Activities
- Monitoring
- Maintenance & Stewardship

The acquisition of property is expensive. Furthermore, depending on what has been built or maintained in the proposed buffer, demolition and remediation work may be extensive and costly. A local government could work with private property owners by creating tax incentive programs in a model where the private actor installs the buffer vegetation themselves; this can help control cost while the property owner retains legal

possession of the ground. Regardless, establishing riparian buffers in existing areas can be an extensive, years-long project for a local government. The Clemson University study arrived at approximately $250 per linear foot, based on specifics in the Carolinas. Ohio State University provides detailed information on installation costs, based on vegetation type, acreage, bank slope, and other factors.

Once a buffer is established, there is very little maintenance cost, which can be absorbed into existing public works operations.

Measuring Success

Scientific review of water quality, species diversity, wildlife counts, and other environmental evaluations may need to be performed by personnel outside of the city or county. Government resources such as state Departments of Natural Resources may be a resource. Various non-profits may also be willing to study the long-term impacts of a riparian buffer. But a city or county can track simple metrics such as total linear miles or total acreage of buffers within the community. Stormwater calculations may be able to be gathered locally to identify a reduction. Even a factor such as homeowner satisfaction in a residential area featuring backyard buffers could be gathered via a survey instrument.