The Scientific Justification for Stream Buffers

Paul Mitchell
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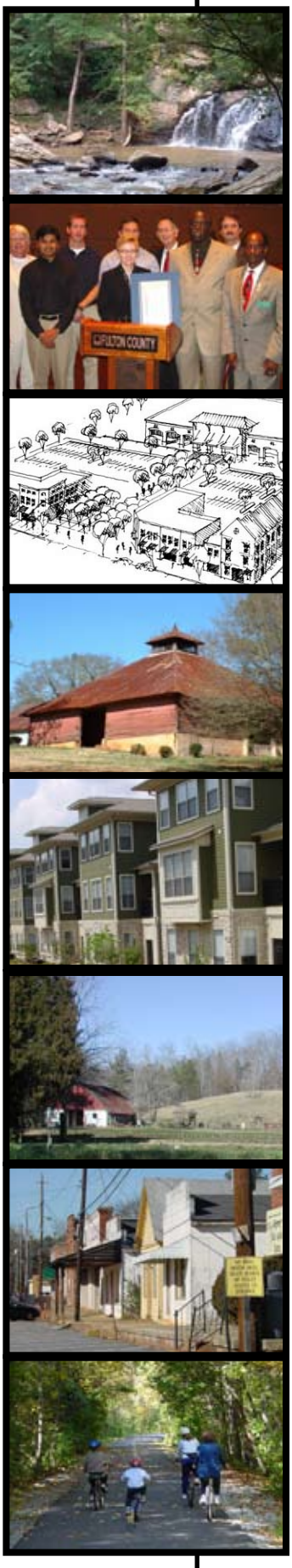

Land Use Clinic

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The **UGA Land Use Clinic** provides innovative legal tools and strategies to help preserve land, water and scenic beauty while promoting creation of communities responsive to human and environmental needs. The clinic helps local governments, state agencies, landowners, and non-profit organizations to develop quality land use and growth management policies and practices. The clinic also gives UGA law students an opportunity to develop practical skills and provides them with knowledge of land use law and policy.

For more information about the UGA Land Use Clinic contact:

Jamie Baker Roskie, Managing Attorney
UGA Land Use Clinic
110 Riverbend Road, Room 101
Athens, GA 30602-1510
(706) 583-0373 • Fax (706) 583-0612
jroskie@uga.edu

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For more information about the IWE, contact:

Christine Rodick, Project Manager
UGA River Basin Center
110 Riverbend Road, Room 101
Athens, GA 30602-1510
(706) 542-9745 • Fax (706) 583-0612
christine.rodick@gmail.com

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Author: Paul Mitchell

Editor: Jamie Baker Roskie
University of Georgia Land Use Clinic

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Stream buffers (a.k.a. riparian buffers) have been a source of controversy in Georgia. Although some say there is no sound science behind stream buffer requirements, some 890 scientific studies, articles, and books demonstrate the value of stream buffers. Stream buffers play a crucial role in promoting public health and protecting the environment.

A riparian buffer is a band of vegetation bordering a body of water; riparian buffers improve water quality, wildlife, and property value. Buffers provide a range of environmental services, including trapping and removal of sediment and other contaminants in stormwater as well as maintenance of fish and wildlife habitat. Scientific studies on buffer function demonstrate that, to provide these services effectively, buffers must be **at least 50 feet wide**. Wider buffers provide greater benefits and additional services. To be most effective, however, buffers should be coupled with on-site management of pollutants, including good stormwater management, erosion and sedimentation control, and proper agricultural and forestry practices.

Stream buffers address the following problems:

Sediment often causes more damage than any other pollutant in many streams and rivers. Vegetative buffers reduce the amount of sediment entering streams and rivers; they also reduce channel erosion.

A 100-foot buffer will trap sediments under most circumstances, but the steeper the slope, the wider the buffer must be. Buffers must extend along all streams—including intermittent and ephemeral channels—to be most effective. Both grassed and forested buffers are effective at trapping sediment, but forested buffers have other benefits as well. Finally, buffers alone are insufficient; sediment must also be managed effectively at its source. Even the best buffer can be overwhelmed by excessive sediment.

Phosphorus and **Nitrogen** threaten water quality. Vegetative buffers act as short-term sinks for phosphorus, and they also help control the amount of nitrogen and nitrates entering rivers and streams.

In most cases, 100-foot buffers should provide good control of phosphorus and nitrogen, and 50-foot buffers may be sufficient in many conditions. Although buffers help control phosphorus during the short-term, long-term management requires effective on-site control. Wetlands are especially important in controlling nitrogen.

Wildlife suffers without sufficient riparian buffers.

In order to maintain aquatic habitats, research indicates that 35-100 foot buffers of native forest should be preserved or restored along all streams. Buffers provide streams with the temperature control and woody debris and other organic matter necessary for aquatic organisms. 300-foot buffers of native forest are necessary to protect land animals that live near streams.

Trout streams need buffers that are at least 100 feet wide to maintain viable trout populations. In a sampling of 35 streams, when buffers were reduced from 100 feet wide to 50 feet wide, the percentage of streams that could support trout fell from 63% to only 9%. This translates into an 80% reduction in the number of young trout.

Buffers should consist of native forest and plants. All major sources of contamination should be excluded from the buffer, including construction that results in major land disturbance, impervious surfaces (such as roads), logging roads, mining activities, septic tank drain fields, agricultural fields, waste disposal sites, livestock, and clear cutting of forests. Application of pesticides and fertilizer should be prohibited, except as may be needed for buffer restoration.

For buffers to be most effective, efforts are needed to reduce impervious surfaces, effectively manage pollutants on-site, and minimize buffer gaps.

In summary, a stream buffer is a strip of naturally vegetated land along a stream or river that provides a range of social, economic, and environmental benefits. In addition to the above-mentioned benefits, buffers:

- Stabilize stream banks and reduce channel erosion
- Trap and remove contaminants
- Store flood waters, thereby reducing property damage
- Improve aesthetics, thereby increasing property values
- Offer recreational and educational opportunities

Sources consulted

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