

A. The Tennessee Urban Riparian Buffer

A riparian buffer is a transitional area between land and water that contains a mix of trees, shrubs, grasses and wildflowers.

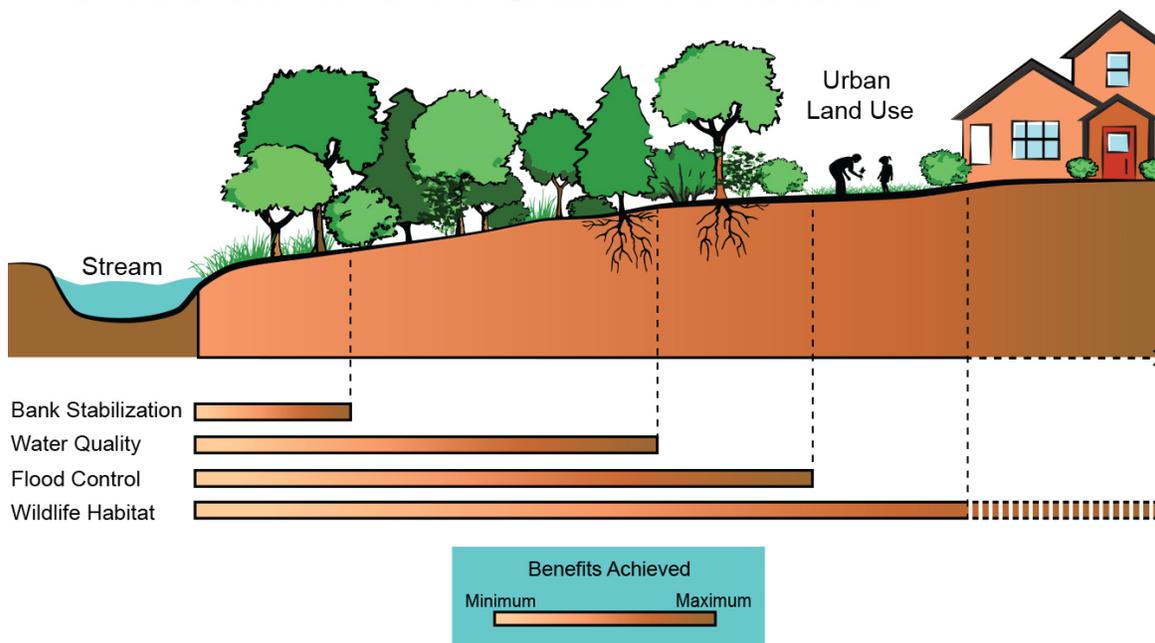
Healthy riparian buffers are the first natural line of defense in protecting our waterways. The state of Tennessee has over 60,000 miles of streams and rivers that are increasingly being threatened by a rapidly developing landscape. In neighborhoods, commercial areas and even parks buffers have often been reduced or eliminated. This handout introduces buffers—their vital functions, how they change over time, and an approach to re-establishing them within our communities.

The Functions of Buffers

Healthy riparian buffers provide a range of environmental, economic, and social functions that are of significant benefit to our communities.

- Stabilizes banks: Roots bind soils, reducing erosion that can result in property loss and sediment input that can harm our waterways
- Improves water quality: Plants slows down and trap stormwater pollutants like sediment, pathogens, and nutrients, creating healthier waterways for aquatic life and recreation.
- Manages flood control: Green space provides storage for water during heavy rains, reducing local flood damage.
- Creates aquatic and terrestrial habitat: Overhanging branches create shade that cools the water and contributes organic materials that are used as in-stream food sources. On land, plants provide food and shelter for birds and other wildlife. Both on land and in the waterway, biodiversity is increased.

The Wider the Buffer the Greater the Benefits



The Ecology of Buffers: Succession

A riparian buffer changes in appearance and functions over time through a process referred to as ecological succession. From planting to maturity, these changes can be placed into three stages:

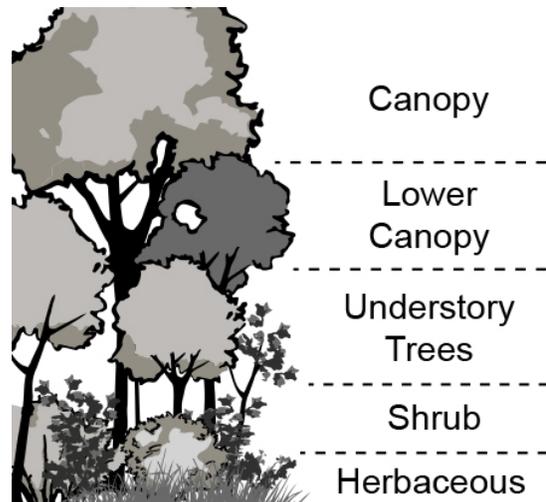
1. Early: Soon after installing tree and shrub seedlings in an open sunny streamside area, many opportunistic plants will seek to establish themselves, competing for space, nutrients and sun. This will include herbaceous unwanted plants (a.k.a. weeds) that result in an “unkept” or “wild and wooly” appearance.



2. Middle: As the installed shrubs and trees gain height, they will begin to provide shade. The shade will help to suppress weed growth, providing the shrubs and trees with a competitive edge.

3. Late: After eight to ten years, the buffer will begin to take on more of the characteristics of a mature and healthy woodland, with distinctive vegetative layers.

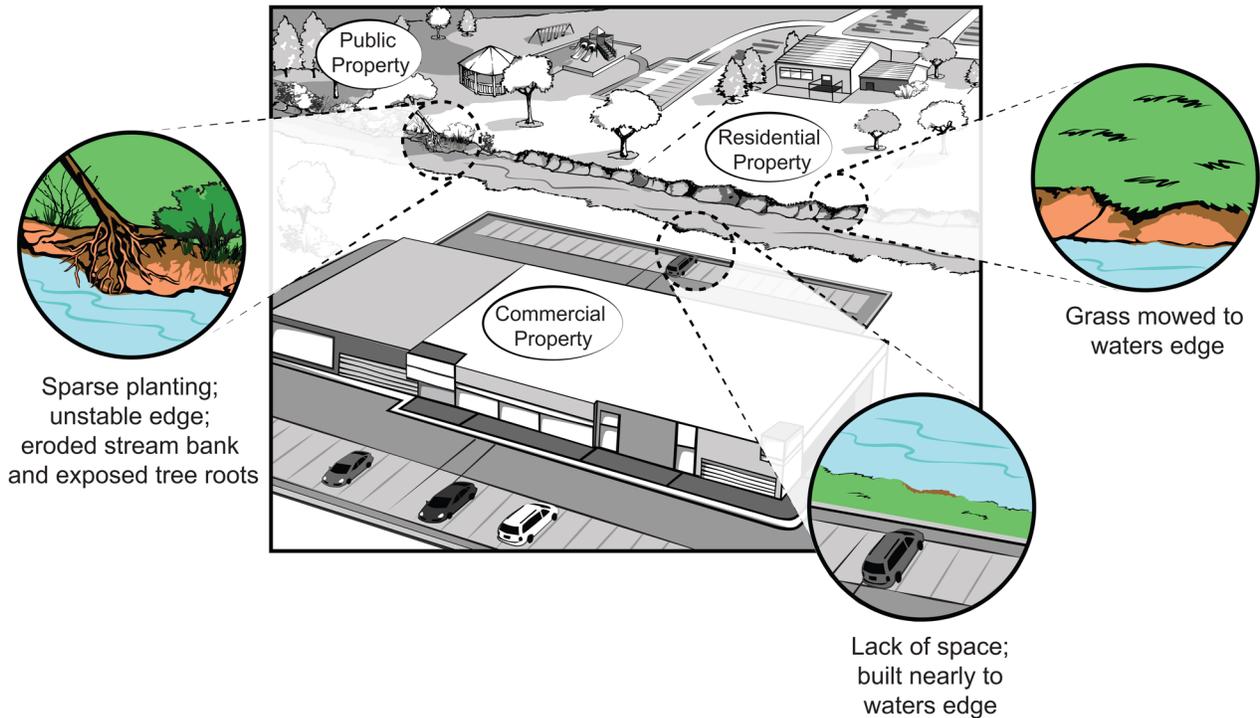
- The upper layer or canopy serves the critical function of providing shade for the adjacent waterbody, cooling water temperatures needed for healthy aquatic life.
- The canopy and subcanopy (lower canopy) layers provide an environment for the understory tree and shrub species that require less light. The diversity of plants with varying heights create habitat for native bird and other wildlife.



Over time, the riparian soils will become more enriched in organic matter from decaying leaves and other detritus. The fertile ground will more readily germinate new growth and contain more microbes that can help breakdown stormwater contaminants. The high levels of organics will also serve as a sponge to help absorb stormwater overland flow.

Challenges to Creating Riparian Buffers in Urban Environments

Urban areas present a range of challenges for establishing buffers, and the model buffer may not be feasible. In older developed areas, waterside development may have occurred before there were any building restrictions, allowing minimal space for re-establishing a buffer. Past land management practices such as the installation and mowing of turf grass along the water's edge may have created unstable and eroding stream banks. High flashy flows may have damaged streamside areas that were sparsely planted.



Although they may not be ideal, there are many opportunities in urban settings to re-establish buffers. Consider three important tenets in these situations:

- 1. Some buffer is better than no buffer.**
- 2. The wider the buffer, the more benefits the buffer will provide.**
- 3. Not all buffers are created equal.**

The types of plants make a difference in how effectively buffers can function. For example, vegetation comprised solely of grasses will not adequately protect the streambank against erosion, while one comprised of shrubs will not provide sufficient shading for the adjacent waterbody.



Approaches to Installing Buffers

There are two ways to consider establishing a buffer. The **passive** approach is more hands-off. It is where the riparian area is allowed to naturally colonize and mature into a forested area through ecological succession. This is done generally by creating a “no mow zone” area through signage or fencing. Benefits include:

- No planting is done.
- Requires less time and monetary resources.

A buffer can also be more **actively established** by intentionally planning and implementing its installation. Although it takes more resources, its benefits include:

- Greater control over the composition of the buffer and its appearance.
- More assurance it will function to its greatest capacity.

A community group approach to planting buffers can save time and resources and also offer a way to involve the public in the protection of our state’s waterways. Information on how to plan and conduct a riparian buffer community event can be found in the **The Tennessee Urban Riparian Buffer Handbook**.

Community Group Establishing an Urban Riparian Buffer



The Tennessee Urban Riparian Buffer Handbook Series

This handout is one of a series of supporting appendices to the **Tennessee Urban Riparian Buffer Handbook**. To download go to: <http://tn.gov/agriculture/topic/ag-forests-urban>

- A. The Tennessee Urban Riparian Buffer
- B. Tennessee Riparian Buffer Site Assessment
- C. Creating a Tennessee Urban Riparian Buffer
- D. Tennessee Native Riparian Plants List
- E. The Threat of Invasive Plants to Tennessee Urban Riparian Buffers
- F. Organizing and Conducting a Riparian Buffer Community Planting
- G. Properly Installing Plants: How to Plant Trees and Shrubs