

# E. The Threat of Invasive Plants to Tennessee Urban Riparian Buffers

---

**Native plants are those that naturally occur in a region or habitat and have co-evolved over geologic time with other plants and animals to develop specialized ecological relationships.**

---

Riparian buffers are increasingly being encroached upon by nonnative plants that are invasive (see Figures E-1& E-2). This is partially due to buffers being located along waterways that attract more seed-carrying wildlife. However, invasive plants also tend to establish in disrupted habitats. Buffers in many urban areas have commonly had their structure and composition dramatically altered, providing a prime area for invasive plants to establish.

## **Impacts of Nonnative, Invasive Plants**

A healthy riparian buffer contains native plants that create an ecologically balanced forest community. This balance is disrupted when nonnative plants predominate and the impacts can be extensive.

- 1. Native plants are crowded out:** Buffers provide food, cover, water and breeding areas for a wide range of birds and other wildlife. Invasive plants can reduce host plants needed for local fauna, reducing food sources and breeding grounds.
- 2. Dense subcanopy layers are created:** The healthy mix of subcanopy species created by a native plant community is replaced by one or two invasive species. This change in subcanopy structure dramatically reduces habitat types including those needed by birds for safe nesting.
- 3. Dense physical and visual barriers are created:** Urban riparian buffers serve as corridors, allowing for movement of wildlife. This is disrupted with thickets of invasive plants. It can also present problems for upland adjacent property owners who wish to visually or physically access the waterway.

### **Two Nonnative Plants that Commonly Invade Riparian Buffers**



Figure E-1. Chinese privet and a closeup of its leaves and berries



Figure E-2. Bush honeysuckle (*Lonicera spp.*) and a close-up of its leaves and berries.

**Invasive plant impacts can be worsened when a buffer is limited in width.** In this situation, the light along the buffer edges can easily penetrate throughout the vegetation, disrupting the canopy layers from shading out unwanted plants. This phenomenon is referred to as the “edge effect” and can be reduced by planting wider buffers that result in more natural forest layers.

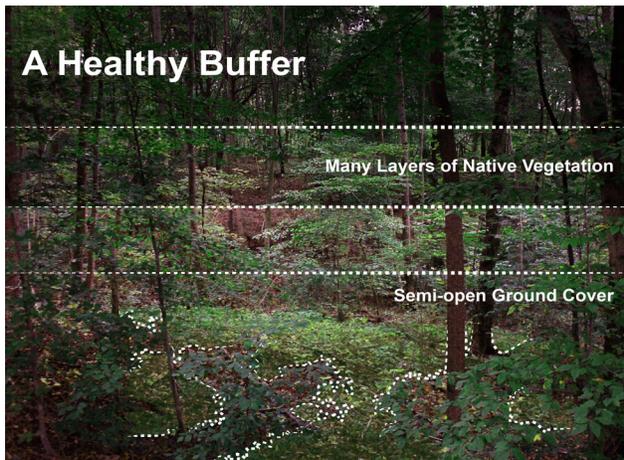


Figure E-3. A healthy buffer containing native plants that creates a multi-layer forest strata

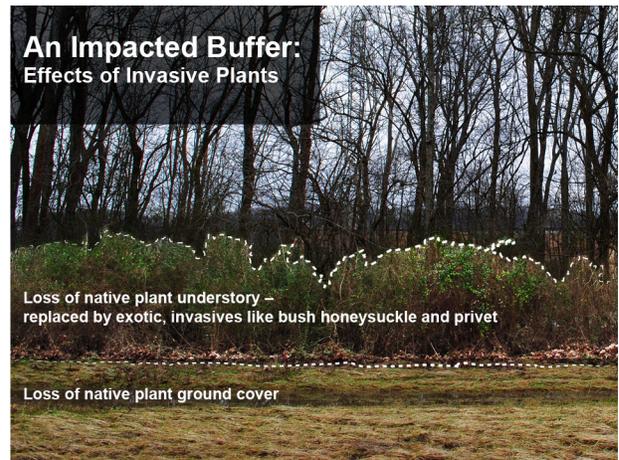


Figure E-4. A buffer impacted by noninvasive plants; forest layers are lost, reducing habitat and food sources for native animals

## Approaches to Removing Invasive Plants

There are a range of control methods for invasive species, but care should be taken when selecting one to ensure it is appropriate for the targeted plant species. The Nature Conservancy has an online “weed control” handbook that offers a wealth of information on the general approaches that can be taken to for invasive removal, <http://www.invasive.org/gist/handbook.html>.

Additional resources on general and invasive plant-specific removal strategies can be found in the Supplementary Resources section in the **Tennessee Urban Riparian Buffer Handbook**.

Two commonly used invasive plant removal methods are manual or mechanical control and cut/stump herbicide treatment:

**Manual or Mechanical Control:** Manual or mechanical control can include hand pulling or using a pulling-tool such as a Weed Wrench™.

- Hand pulling can be effective on some young shrubs and tree saplings, but care should be taken not to break off the stem and leave root fragments that can resprout.
- A Weed Wrench™ has a specialized claw to grip the stem and provides a lever to pull the plant up and out. There are varying sizes of weed wrenches based on the stem size. The challenge with using weed wrenches in riparian areas is that they work best on firm ground and not soft substrate as is often the case in these areas. Weed Wrenches are no longer being manufactured but used ones are available online and similar alternatives are now on the market. Local municipal departments or Extension offices may have them available for loan.



Figure E-5. Weed Wrench™

It is important to not mechanically remove plants immediately adjacent to a waterway when the plants' root systems are serving to stabilize the waterway's bank. In situations like this, it may be necessary to keep the plant pruned back until the installed natives have matured enough to provide the needed bank stability.

**Cut Stump Herbicide Treatment:** This method involves cutting the plants' stems and applying an herbicide to each stem by spraying or painting the stems' end (see Figure E-6).

The appropriate herbicide must be selected. For example, with Chinese privet, a 25 percent concentrate of glyphosphate may be used. As with all herbicide applications, all application directions should be strictly followed.

The best time to apply an herbicide is determined by the physiology of the plant, so it is important to reference plant-specific guidelines. A dye may be mixed with the herbicide to ensure the herbicide is being appropriately placed and to easily see which plants have been treated.



Figure E-6. Application of herbicide with dye to tree stump

The Nature Conservancy's Weed Control Handbook provides directions to make an inexpensive PVC herbicide applicator (see Figure E-7). The sponge-tip applicator stores herbicide in its PVC pipe chassis (A). A ball valve (B) supplies the herbicide to the sponge reservoir (C). Herbicide in this small chamber (C) leaks through a flow restricting drip plate (D), and moistens the applicator sponge (E). When the sponge reservoir is depleted of herbicide during use, turning the valve will recharge it. Rubber gaskets (shown in grey) let the wand be refilled or disassembled for cleaning.

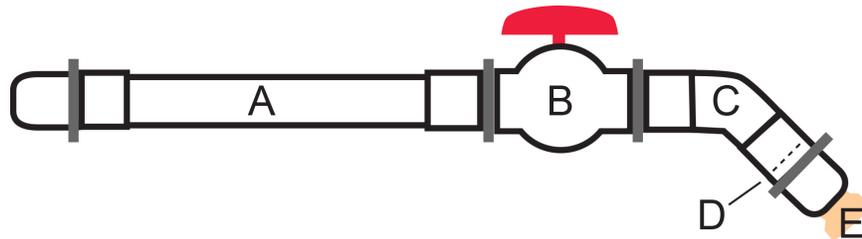


Figure E-7. Le wand, <http://www.invasive.org/gist/tools/wand.html>

### 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