Multi-Zone Filter Strip

Description

A traditional filter strip is a grass area that is intended to treat sheet flow from adjacent impervious areas. Sheet flow is runoff that flows over land with no defined channels. Filter strips function by slowing runoff velocities and filtering out sediment and other pollutants, and providing some infiltration into underlying soils.

A multi-zone filter strip provides a similar function but incorporates trees and shrubs into the design. A multi-zone filter strip features several vegetation zones that provide a gradual transition from turf to forest (Figures 31 and 32). The zones are turf, meadow, shrub, and forest. The multi-zone filter strip can be effectively designed as a transition filter zone to an existing forest area. Additional benefits provided by a multi-zone filter strip include evapotranspiration, wildlife habitat, and infiltration promoted by macropore formation.

Multi-zone filter strips may be used as follows:

- ☐ In linear areas such as stream buffers and transportation corridors.
- ☐ As pretreatment for a stream buffer or other storm water treatment practice.
- ☐ Where runoff is present as sheet flow and travels over short distances (a maximum of 75 feet of impervious area, or 150 feet of pervious area).
- ☐ Where safety and visibility are concerns (e.g., next to parking lot or public area)

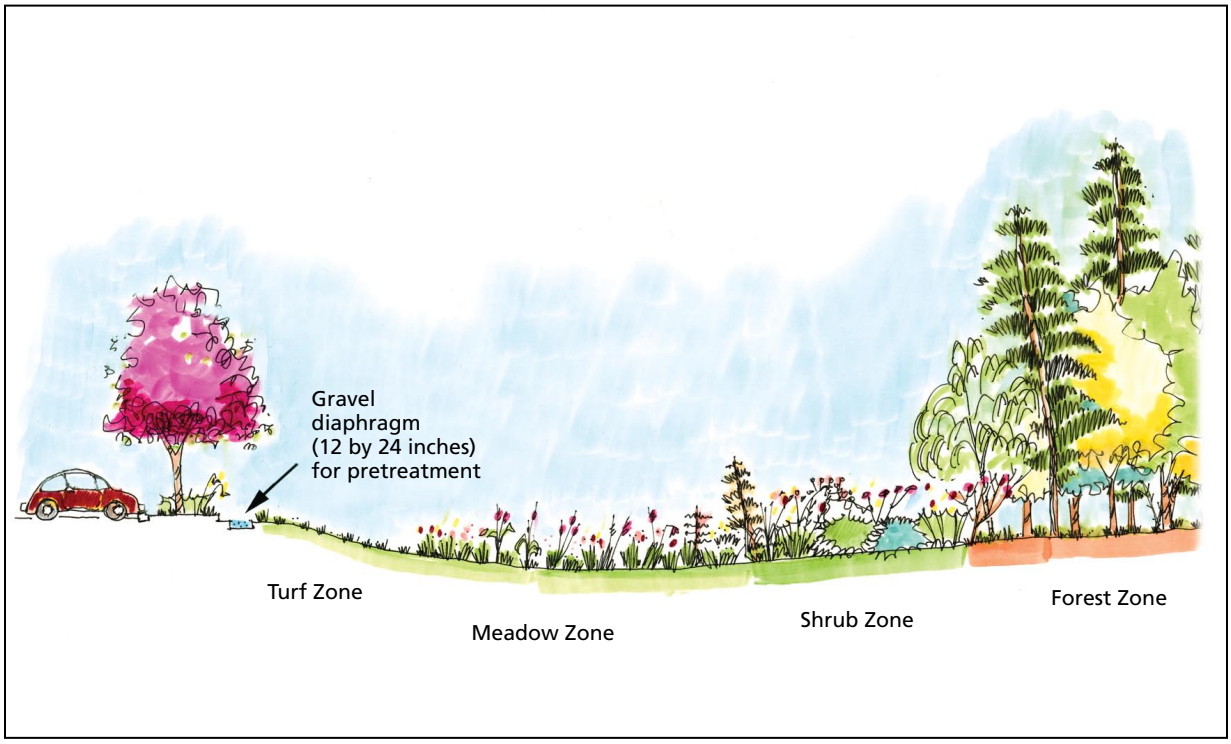

Figure 1. A multi-zone filter strip (profile) includes four successive vegetation zones.

Design Modifications	☐	Use curb stops or parking stops to keep cars from driving on the grass area, if next to a parking lot.
	☐	Use a gravel diaphragm for pretreatment.
	☐	Minimum width of filter strip should be 25 feet.
	☐	When a significant volume of stormwater runoff is expected, a small berm and ponding area may be incorporated as described in the Forested Filter Strip.
Species Selection	Existing trees should be incorporated where possible. Otherwise, select and plant a minimum of three native species with these characteristics:	
	☐	Tolerant of inundation
	☐	Tolerant of salt
General Planting Guidance	☐	Plant each zone with the desired vegetation. Widths of each vegetative zone may vary. Shrub zone may ultimately become a tree zone.
	☐	Conserve existing soil, if undisturbed, and use soil amendments if compacted.
	☐	Overplant with seedlings for fast establishment and to compensate for mortality, or plant larger stock at desired spacing intervals (35-50 feet for large and very large trees) using random spacing.
Maintenance	☐	Use mulch to retain moisture.
	☐	Use tree shelters to protect seedlings.
	☐	Mow turf zone regularly and reseed as needed.
	☐	Mow meadow zone twice a year.

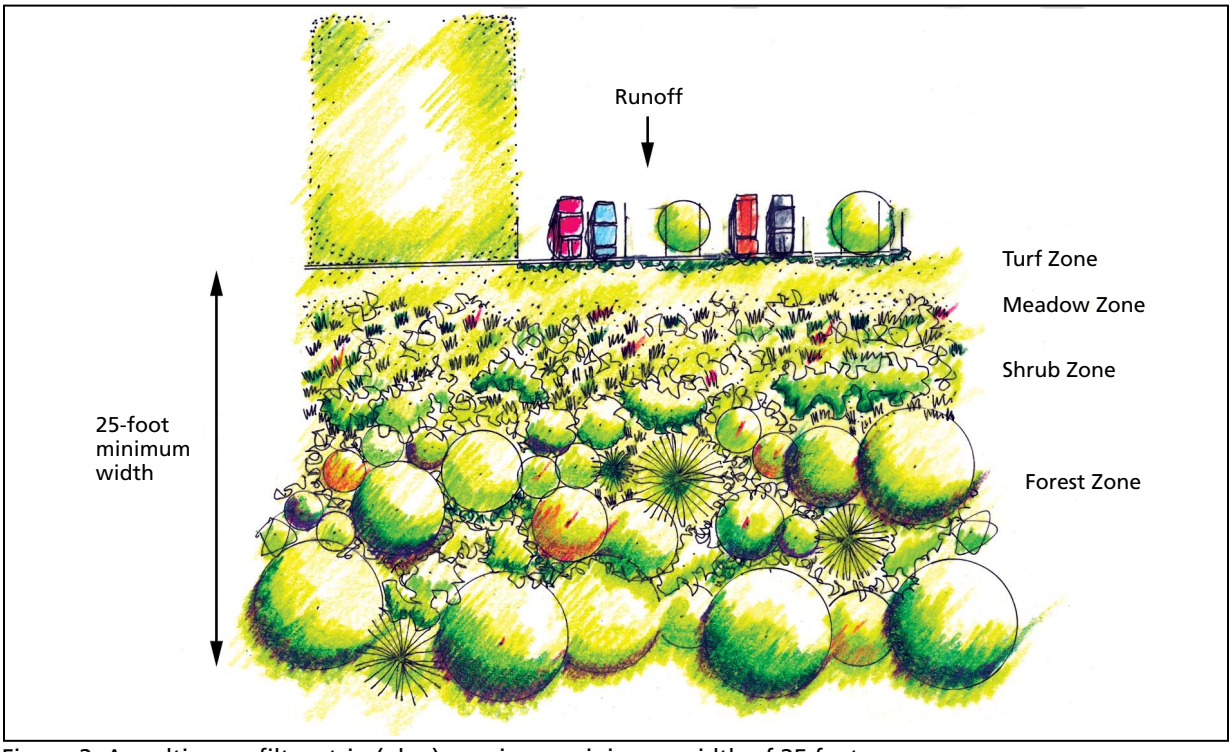

Figure 2. A multi-zone filter strip (plan) requires a minimum width of 25 feet.

Topics for Future Research

- ☐ Quantify additional pollutant removal due to trees in filter strip.

Further Resources

Center for Watershed Protection. 1996. Design of stormwater filtering systems. Ellicott City, MD.

Maryland Department of the Environment. 2000. Maryland stormwater design manual. Baltimore, MD.

This fact sheet was excerpted from:

Cappiella, Karen; Schueler, Tom; Wright, Tiffany. 2006. Urban Watershed Forestry Manual. Part 2: Conserving and Planting Trees at Development Sites. NA-TP-01-06, Newtown Square, PA: p 46-48. USDA Forest Service, Northeastern Area State and Private Forestry.

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