# Stormwater Best Management Practice

# Vegetated Buffers

**Minimum Measure:** Construction Site Stormwater Runoff Control
**Subcategory:** Sediment Control

## Description

Vegetated buffers are areas of natural, existing or established vegetation that protect the water quality of neighboring areas and waterbodies during construction. Buffer zones provide an area where stormwater can permeate the soil and replenish the groundwater (WES, 2008). They also slow the flow of stormwater, which helps to filter sediment, decrease soil erosion and prevent streambank collapse.

## Applicability

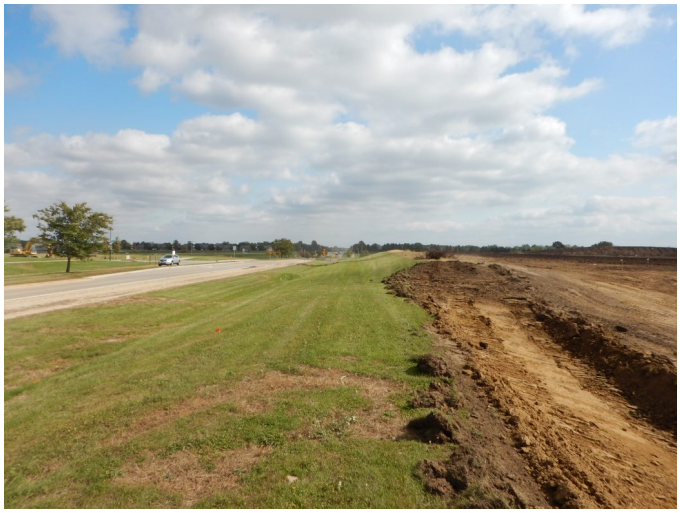
Vegetated buffers are applicable in most areas able to support vegetation. They are most effective and beneficial on floodplains, near wetlands, along streambanks and on unstable slopes. Local requirements or a construction general permit may require natural vegetated buffers based on a site's proximity to waterbodies or if a site discharges to a sensitive water, such as impaired waters, exceptional waters or wetlands.

## Siting and Design Considerations

When siting vegetated buffers, design engineers should first identify existing and proposed natural buffer zones on a site map (MDE et al., 2011). Prior to construction, construction staff should mark clearing limits to keep all construction activities out of natural buffer zones and limit damage to vegetation (Washington Department of Ecology, 2019).

It is important to not overwhelm vegetated buffers with fast, erosive, and/or concentrated flows. If upstream flowpaths generate concentrated flows, design engineers should incorporate other practices such as sediment traps or check dams to moderate discharges onto buffers. Design engineers can also use level spreaders upstream of buffers to reestablish sheet flow conditions.

Additional siting and design considerations include:



Using a vegetated buffer along the perimeter of a construction site can deter sediment from moving off site.
Photo Credit: Steven Chase for USEPA

- Preserving natural, existing or established vegetation in clumps, block or strips.
- Preserving natural, existing or established vegetation on unstable, steep slopes.
- Making sure slopes are shallow enough to allow establishment of vegetation.
- Making sure soils are not compacted.
- Where possible, intermixing layers of vegetation (native vegetation in particular), including grasses, deciduous and evergreen shrubs, and understory and overstory trees.

## Limitations

Adequate land should be available for a vegetated buffer. If land costs are high, a buffer zone may not be the most cost-effective practice. Vegetated buffers work well with sheet flow, but they are not appropriate for mitigating concentrated stormwater flows. In addition, construction staff should maintain adequate vegetative cover to keep buffers effective.



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## Maintenance Considerations

Keeping buffer vegetation healthy requires routine maintenance. Maintenance needs depend on vegetation species, soil type and climatic conditions. Maintenance can include weed and pest control, mowing, fertilizing, liming, irrigating, and pruning. Inspection and maintenance are most important during buffer installation. Following establishment, vegetated buffers only require routine maintenance and periodic inspections. Construction staff should inspect them after heavy rainfall and at least once a year. Inspections should focus on encroachment, erosion, vegetation density, evidence of concentrated flows, and any damage from foot or vehicular traffic.

## Effectiveness

The effectiveness of vegetated buffers depends on buffer width, buffer slope, vegetation type, soil conditions and geographic location. For 50-foot natural buffers in combination with perimeter controls, the EPA's Construction General Permit Appendix G reports sediment removal efficiencies ranging from approximately 25 to 90 percent.

## Cost Considerations

A vegetated buffer can be a low-cost practice when there is adequate area for preserving natural, existing or established vegetation. Establishing a vegetated buffer includes the cost of clearing, plants or seeding, and maintenance.

**Additional Information**

Additional information on related practices and the Phase II MS4 program can be found at EPA's National Menu of Best Management Practices (BMPs) for Stormwater website

## References

Maryland Department of the Environment (MDE), Natural Resources Conservation Service, & Maryland Association of Soil Conservation Districts. (2011). *2011 Maryland standards and specifications for soil erosion and sediment control*. Maryland Department of the Environment.

U.S. Environmental Protection Agency (U.S. EPA). (2017). *2017 Construction general permit (CGP) (as modified).*

Washington Department of Ecology. (2019). *2019 Stormwater management manual for western Washington*.

Water Environment Services (WES). (2008). *Erosion prevention and sediment control: Planning and design manual*.