U.S. Environmental Protection Agency

National Pollutant Discharge Elimination System (NPDES)

Menu of BMPs Home

BMP Background

Public Education & Outreach on Stormwater Impacts

Public Involvement/ Participation

Illicit Discharge Detection & Elimination

Construction Site Stormwater Runoff Control

Post-Construction Stormwater Management in New Development & Redevelopment

Pollution Prevention/Good Housekeeping for Municipal Operations

Measurable Goals

Stormwater Home

Vegetated Buffers

Click here to comment on this fact sheet

Minimum Measure: Construction Site Stormwater Runoff Control

Subcategory: Sediment Control

Description

Vegetated buffers are areas of natural or established vegetation maintained to protect the water quality of neighboring areas. Buffer zones slow stormwater runoff, provide an area where runoff can permeate the soil, contribute to ground water recharge, and filter sediment. Slowing runoff also helps to prevent soil erosion and streambank collapse.

Buffers at the perimeters of construction sites are similar to agricultural buffers in that they trap sediments and remove pollutants in runoff from exposed areas (Source: Nova Scotia Department of Agriculture and Fisheries, 2000)

Applicability

Vegetated buffers can be used in any area able to support vegetation. They are most effective and beneficial on floodplains, near wetlands, along streambanks, and on unstable slopes.

Siting and Design Considerations

To establish an effective vegetative buffer, follow these guidelines:

- Make sure soils are not compacted.
- Make sure slopes are less than 5 percent unless temporary erosion control mats are also used.
- Determine buffer widths after carefully considering slope, vegetation, soils, depth to impermeable layers, runoff sediment characteristics, type and amount of pollutants, and annual rainfall.

- Make sure buffer widths increase as slope increases.
- Intermix zones of vegetation (native vegetation in particular), including grasses, deciduous and evergreen shrubs, and understory and overstory trees.
- In areas where flows are concentrated and fast, combine buffer zones with other practices such as level spreaders, infiltration areas, or diversions to prevent erosion and rilling.

Limitations

Adequate land must be available for a vegetated buffer. If land cost is high, buffer zones might not be cost-effective. In addition, adequate vegetative cover must be maintained in the buffer to keep it effective. Vegetated buffers work well with sheet flows, but they are not appropriate for mitigating concentrated stormwater flows.

Maintenance Considerations

Keeping vegetation healthy in vegetated buffers requires routine maintenance. Depending on species, soil types, and climatic conditions, maintenance can include weed and pest control, mowing, fertilizing, liming, irrigating, and pruning. Inspection and maintenance are most important when buffer areas are first installed. Once established, vegetated buffers do not require maintenance beyond the routine procedures and periodic inspections. Inspect them after heavy rainfall and at least once a year. Focus on encroachment, gully erosion, the density of the vegetation, evidence of concentrated flows through,the areas, and any damage from foot or vehicular traffic. If more than 6 inches of sediment has accumulated, remove it.

Effectiveness

Several studies indicate greater than 90 percent reductions in sediment and nitrate concentrations when vegetated buffers are used. Buffer/filter strips do a reasonably good job of removing phosphorus attached to sediment, but they are not so effective at removing dissolved phosphorus (Gilliam, 1994).

References

Gilliam, J.W. 1994. Reparian Wetlands and Water Quality. *Journal of Environmental Quality* 23:896-900. Cited in Michigan Department of Environmental Quality. 1998. *Guidebook of Best Management Practices for Michigan Watersheds*. Michigan Department of Environmental Quality, Surface Water Quality Division, Lansing, MI.

Nova Scotia Department of Agriculture and Fisheries. 2000. *Awareness and Communication Project Reports*, Appendix E: Photographs[http://gov.ns.ca/nsaf/ EXIT Disclaimer]. Accessed December 1, 2005.

USEPA (U.S. Environmental Protection Agency). 1992. *Stormwater Management for Industrial Activities: Developing Pollution Prevention Plans and Best Management Practices.* EPA 832-R-92-006. U.S. Environmental Protection Agency, Office of Water, Washington, DC.

USEPA (U.S. Environmental Protection Agency). 1996. *Protecting Natural Wetlands: A Guide to Stormwater Best Management Practices.* EPA 843-B-96-001. U.S. Environmental Protection Agency, Office of Water, Washington, DC.

Click here to comment on this fact sheet

Last updated on May 22, 2006 8:28 AM

URL:http://cfpub.epa.gov/npdes/stormwater/menuofbmps/index.cfm