NRCS Natural Resources Conservation Service

Grassed Waterway
and Vegetated Filter
Conservation Practice Guidance Document 412

Definition

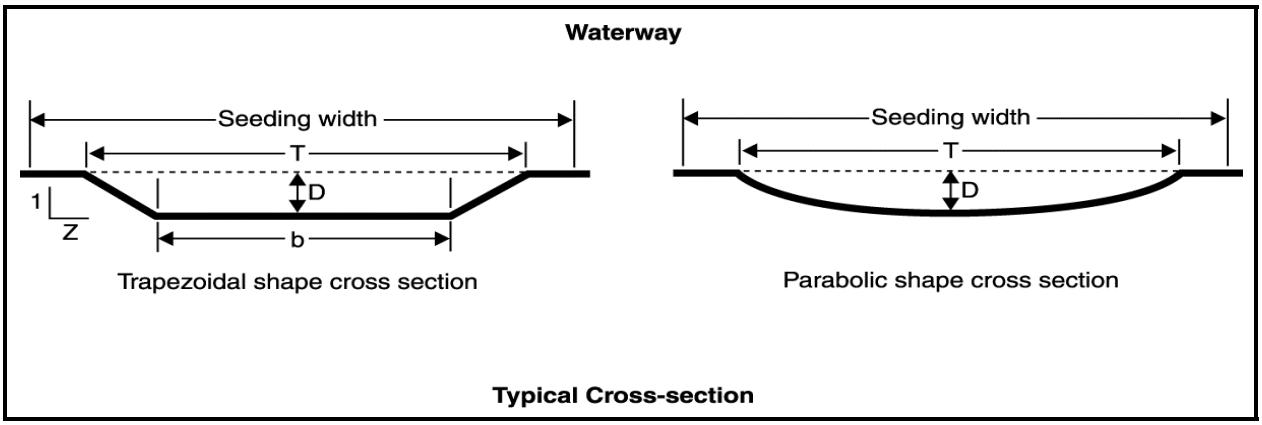
A grassed waterway and vegetated filter consist of a natural or constructed vegetated channel that is shaped or graded and vegetated to carry surface water at a non-erosive velocity to a stable outlet that, in turn, spreads the flow of water before the water enters the vegetated filter. (The vegetative filter uses guidance from Filter Strip, 393, which is integrated with a grassed waterway.)

Purpose

Grassed waterways convey runoff from terraces, diversions, or other water concentrations without causing soil erosion or flooding. Vegetation in the waterway protects the soil from erosion caused by concentrated flows while carrying water downslope. The stable outlet is designed to slow and spread the flow of water before it enters a vegetated filter. The vegetated filter is designed to trap sediment and increase infiltration so that other pollutants, such as pesticides and nutrients, can be removed from surface runoff. Depending upon the selection of vegetation and management practices, grassed waterways can offer diversity and cover for wildlife.

Where used

A grassed waterway and vegetated filter are used in areas where added water conveyance capacity and vegetative protection are needed to control soil erosion resulting from concentrated runoff. Such areas commonly include draws and other low-lying areas or outlets for other conservation practices (e.g., diversions and terraces). The minimum capacity of a waterway conveys the peak runoff expected from a storm of 10-year frequency, 24-hour duration. In some areas, a combination of high peak runoff and steep slopes may cause water velocities that preclude the use of a grassed waterway.



A grassed waterway can have a cross-section configuration that is trapezoidal or parabolic. Side slopes are constructed to be no steeper than a ratio of two horizontal to one vertical. The intent is to accommodate maintenance and tillage/harvesting equipment that will cross the waterway. Waterways are generally less than 100 feet wide to control the tendency of low flows to meander.

Vegetation establishment

Establish the waterway vegetation according to Critical Area Planting (342). For the stable, spreading-type outlet, select perennial plant species (native species are encouraged where possible) that are sod-forming plants having stiff, upright stems that act as a dense filter. Use the recommendations for filter strips for the area below the outlet. Establish vegetation before allowing water to flow in the waterway. Use irrigation and mulch to hasten establishment of vegetation as necessary. Use mulch, anchoring, a nurse crop, rock, hay-bale dikes, filter fences, or runoff diversions to protect the vegetation until established. Establish the vegetated filter vegetation according to Filter Strip (393).

Operation and maintenance

Align tillage and row directions so they are perpendicular to the grassed waterway to allow surface drainage into the waterway and to prevent flow along the edges of the waterway. Provide stabilized machinery crossings, where needed, to prevent rutting. Protect vegetation from direct herbicide sprays, and use plant species tolerant of chemicals used at the site. Minimize damage to vegetation by excluding livestock during periods of soil wetness. The grassed waterway outlet should be kept as wide and shallow as possible to slow the velocity of water, increase infiltration, and spread flows evenly across a wide area before entering a vegetated filter. Inspect grassed waterways regularly, especially following heavy rains. Damaged areas will need to be filled, compacted, and seeded immediately. Remove sediment deposits to maintain the capacity of the waterway. Control noxious weeds.

Conservation management system

A grassed waterway and vegetated filter are used with other conservation practices, such as contour buffers, terraces, crop residue management, and nutrient and pesticide management. Waterways located below areas of high sediment production need special design and additional maintenance.

Wildlife

The grassed waterway and vegetated filter can enhance wildlife objectives, depending on the vegetative species used and management practiced. Consider using native or adapted vegetative species that can provide food and cover for important wildlife. Delay mowing of the waterway and filter area until after the nesting season. Prescribed burning, or other disturbance practice, may be appropriate to enhance wildlife values, but burning must be conducted to avoid critical nesting seasons or to reduce winter cover.

Specifications

Site-specific requirements are listed on the specifications sheet. Additional provisions are entered on the job sketch sheet. Specifications are prepared in accordance with the NRCS Field Office Technical Guide. See practice standards Grassed Waterway (412) and Filter Strip (393).

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Landowner_____ Field number_____

Purpose (check all that apply)	
☐ Convey concentrated flow runoff	☐ Other (specify):
☐ Reduce gully erosion	
☐ Protect/improve water quality	

Layout		
Waterway shape:	☐ Parabolic	☐ Trapezoidal

Grassed Waterway	**1**	**2**	**3**
Waterway number			
Reach number			
Grade (%)			
Depth-D (ft)			
Top width-T (ft)			
Bottom width-b (ft)*			
Side slopes (Z:1)*			
Length (ft)			
Seeding width (ft)			
Seeding area (acres)			
Plant establishment			
Species**			
Seeding rate (PLS) (lb/ac)			
Lime (tones/acre)			
N (lb/acre)			
P2O5 (lb/acre)			
K2O (lb/acre)			

*Trapezoidal only

Vegetated Filter			
Waterway number			
Strip width (ft)			
Strip length (ft)			
Area of filter strip (ac)			
Slope (%)			
Specials**			
Seeding rate (PLS) (lb/ac)			
Lime (lb/acre)			
N (lb/acre)			
P2O5 (lb/acre)			
K2O (lb/acre)			

**For multiple species separate with a "/" (e.g., *species 1/species 2/species 3*)

Site Preparation
Prepare firm, weed-free seedbed. Apply lime and fertilizer according to standard. Additional requirements:
Planting Methods(s)
Establish stand of vegetation according to specified seeding rate. Drill grass and legume seed ___ inches deep uniformly over area. If necessary, mulch newly seeded area with ___ tons per acre of mulch material. Drill and seed small grain as a companion crop, as necessary, at the rate of ___ pounds per acre, but clip or harvest before plants head out. Additional requirements:
Operation and Maintenance
Maintain original width and depth of the grass area. Regularly remove debris and sediment from waterway and filter area. Harvest, mow, reseed, and fertilize to maintain vigorous vegetation. Inspect periodically and, after major storms, repair eroding or bare areas. Additional requirements:

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If needed, an aerial view or a side view of the practice can be shown below. Other relevant information, complementary practices and measures, and additional specifications may be included.

Scale 1"=_____ ft. (NA indicates sketch not to scale: grid size=1/2" by 1/2")

Additional Specifications and Notes:

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