

NATURAL RESOURCES CONSERVATION SERVICE
CONSERVATION PRACTICE STANDARD

GRASSED WATERWAY

(Acre)
Code 412



Impact to cultural resources, wetlands and Federal and state protected species shall be evaluated and avoided or minimized to the extent practicable during planning, design and implementation of this conservation practice in accordance with established National and Florida policy, General Manual (GM) Title 420-Part 401; Title 450-Part 401, Title 190-Parts 410.22 and 410.26, National Planning Procedures Handbook (NPPH) Florida Supplements to Parts 600.1 and 600.6, National Cultural Resources Procedures Handbook (NCRPH), National Food Security Act Manual (NFSAM), and the National Environmental Compliance Handbook (NECH).

DEFINITION

A shaped or graded channel that is established with suitable vegetation to carry surface water at a non-erosive velocity to a stable outlet.

PURPOSES

- To convey runoff from terraces, diversions, or other water concentrations without causing erosion or flooding.
- To reduce gully erosion.
- To protect/improve water quality.

CONDITIONS WHERE PRACTICE APPLIES

In areas where added water conveyance capacity and vegetative protection are needed to control erosion resulting from concentrated runoff.

CRITERIA

General Criteria Applicable To All Purposes

Plan, design, and construct grassed waterways to comply with all Federal, state, and local laws and regulations.

Capacity. The minimum capacity shall convey the peak runoff expected from a 10-year frequency, 24-hour duration storm. Capacity shall be increased as needed to account for potential volume of sediment expected to accumulate in the waterway between planned maintenance activities. When the waterway slope is less than 1 percent, out-of-bank flow may be permitted if such flow will not cause excessive erosion. At a minimum, the design capacity shall remove the water before crops are damaged.

Stability. Determine the minimum depth and width requirements for stability of the grassed waterway using the procedures in the NRCS National Engineering Handbook, Part 650, Engineering Field Handbook, Chapter 7, Grassed Waterways; Agricultural Research Service (ARS) Agriculture Handbook 667, Stability Design of Grass-Lined Open Channels; or other equivalent method.

Width. Design the bottom width of trapezoidal waterways to be less than 100 feet unless multiple or divided waterways or other means are provided to prevent meandering of low flows.

Side Slopes. Keep the side slopes flatter than a ratio of two horizontal to one vertical (2:1).

Conservation practice standards are reviewed periodically, and updated if needed. To obtain the current version of this standard, contact the Natural Resources Conservation Service.

Accommodate the equipment anticipated to be used for maintenance and tillage/harvesting equipment that will cross the waterway in the designed width.

Depth. The capacity of the waterway must be large enough so that the design water surface of the waterway is below the water surface of the tributary channel, terrace, or diversion that flows into the waterway at design flow.

Provide a minimum of 0.2 foot of freeboard above the designed depth when flow must be contained to prevent damage. Provide freeboard above the designed depth when the vegetation has the maximum expected retardance.

Drainage. When needed to help or keep vegetation established on sites having prolonged flows, high water tables, or seepage problems, include Florida NRCS conservation practice standards Subsurface Drains, Code 606, Underground Outlets, Code, 620, stone center waterways, or other suitable measures in waterway designs.

Outlets. Provide a stable outlet with adequate capacity. The outlet can be another vegetated channel, an earthen ditch, a grade stabilization structure, filter strip, or other suitable outlet.

Vegetative Establishment. Grassed waterways shall be vegetated in accordance with Florida NRCS conservation practice standard Critical Area Planting, Code 342. Species selected shall be suited to the expected site conditions and intended uses. Selected species will have the capacity to achieve adequate density, height, and vigor within an appropriate time frame to stabilize the waterway.

Establish vegetation as soon as conditions permit. Use mulch anchoring, nurse crop, rock, straw or hay bale dikes, fabric checks, filter fences, or runoff diversion to protect the vegetation until it is established. Planting of a close growing crop, e.g. small grains or millet, on the contributing watershed prior to construction of the grassed waterway can also significantly reduce the flow through the waterway during establishment.

CONSIDERATIONS

Consider establishing an appropriate width of vegetation on one or both sides of the waterway

or add other sediment control measures above the waterway such as residue management to improve water quality and reduce sediment deposition in the waterway. Consider increasing the channel depth and/or designing areas of increased width or decreased slope to trap and store sediment to reduce the amount of sediment that leaves a field. Be sure to provide for regular cleaning out the waterway when trapping sediment in this manner.

Avoid areas where unsuitable subsurface, subsoil, or substratum material that limits plant growth, such as salts, acidity, root restrictions, etc., may be exposed during implementation of the practice. Where areas cannot be avoided, seek recommendations from a soil scientist for ameliorating the condition or, if not feasible consider over-cutting the waterway and add topsoil over the cut area to facilitate vegetative establishment.

Avoid or protect if possible important wildlife habitat, such as woody cover or wetlands when determining the location of the grassed waterway. If trees and shrubs are incorporated, they should be retained or planted in the periphery of grassed waterways so they do not interfere with hydraulic functions. Medium or tall bunch grasses and perennial forbs may also be planted along waterway margins to improve wildlife habitat. Waterways with these wildlife features are more beneficial when connecting other habitat types; e.g., riparian areas, wooded tracts and wetlands. When possible, select species of vegetation that can serve multiple purposes, such as benefiting wildlife, while still meeting the basic criteria needed for providing a stable conveyance for runoff.

Water-tolerant vegetation may be an alternative to subsurface drains or stone center waterways on some wet sites.

Use irrigation in dry regions or supplemental irrigation as necessary to promote germination and vegetation establishment.

Provide livestock and vehicular crossings as necessary to prevent damage to the waterway and its vegetation. Use fencing as needed for livestock crossings.

Consider including diverse legumes or other forbs that provide pollen and nectar for native pollinators. In dry regions, these sites may be able to support flowering forbs with higher water

requirements and thus provide bloom later in the summer.

PLANS AND SPECIFICATIONS

Prepare plans and specifications for grassed waterways that describe the requirements for applying the practice according to this standard. As a minimum, the plans and specifications shall include, but not limited to, the following items:

- Location of waterway.
- A plan view of the waterway layout.
- Profiles and typical cross section(s) of waterway.
- Disposal requirements for excess soil material.
- Site specific construction specifications that describe, in writing, the installation of the grassed waterway. Include specification for control of concentrated flow during construction and vegetative establishment.
- Vegetative establishment requirements.

OPERATION AND MAINTENANCE

An operation and maintenance (O&M) plan shall be provided to and reviewed with the landowner. The O&M plan shall be established to maintain waterway capacity, vegetative cover and outlet stability.

The plan shall include, but not limited to, the following items and others as appropriate.

- Establish a maintenance program to maintain waterway capacity, vegetative cover, and outlet stability. Repair damaged vegetation promptly.
- Protect waterway from concentrated flow by using diversion of runoff or mechanical means of stabilization such as silt fences, mulching, hay bale barriers and etc. to stabilize grade during vegetation establishment.
- Minimize damage to vegetation by excluding livestock whenever possible, especially during wet periods. Plan grazing in the

waterway only when a prescribed grazing system is being implemented.

- Inspect grassed waterways regularly, especially following heavy rains. Fill, compact, and reseed damaged areas immediately. Remove sediment deposits to maintain capacity of grassed waterway.
- Avoid use of herbicides that would be harmful to the vegetation in and adjacent to the waterway area.
- Avoid using waterways as turn-rows during tillage and cultivation operations.
- Mow or periodically graze vegetation to maintain capacity and reduce sediment deposition. Mowing may be appropriate to enhance wildlife values, but must be conducted to avoid peak nesting seasons and reduced winter cover.
- Apply supplemental nutrients as specified from a soil test to maintain the desired species composition and stand density of the waterway.
- Control noxious weeds.
- Do not use waterways as a field road. Avoid crossing with heavy equipment when wet.

REFERENCES

- ARS Agricultural Handbook 667
- Florida NRCS Conservation Practice Standards, Critical Area Planting, Code 342
- Subsurface Drain, Code 606
- Underground Outlets, Code 620
- General Manual
 - Title 420-Part 401
 - Title 450-Part 401
 - Title 190-Parts 410.22 and 410.26
- National Cultural Resources Handbook
- National Engineering Handbook, Part 650, Engineering Field Handbook, Chapter 7
- National Environmental Compliance Handbook
- National Food Security Act Manual
- National Planning Procedures Handbook
 - Florida Supplements to Parts 600.1 and 600.6