**NATURAL RESOURCES CONSERVATION SERVICE**

**CONSERVATION PRACTICE STANDARD**

# CRITICAL AREA PLANTING

**(Ac.)**

**CODE 342**

## DEFINITION

Establishing permanent vegetation on sites that have, or are expected to have, high erosion rates, and on sites that have physical, chemical or biological conditions that prevent the establishment of vegetation with normal practices.

## PURPOSE

- Stabilize stream and channel banks, and shorelines.
- Stabilize areas with existing or expected high rates of soil erosion by wind or water.
- Rehabilitate and revegetate degraded sites that cannot be stabilized using normal establishment techniques.
- Stabilize coastal areas, such as sand dunes and riparian areas.

## CONDITIONS WHERE PRACTICE APPLIES

This practice applies to highly disturbed areas such as:

- active or abandoned mined lands;
- urban conservation sites;
- road construction areas;
- conservation practice construction sites;
- areas needing stabilization before or after natural disasters such as floods, hurricanes, tornados and wildfires;
- eroded banks of natural channels, banks of newly constructed channels, and lake shorelines;
- other areas degraded by human activities or natural events.

## CRITERIA

### General Criteria Applicable To All Purposes

**Site Preparation**:

A site investigation shall be conducted to identify any physical, chemical, or biological conditions that could inhibit successful establishment of vegetation.

Areas to be planted will be cleared of unwanted materials and smoothed or shaped, if needed, to meet planting and landscaping purposes.

A suitable seedbed shall be prepared for all seeded species. Compacted layers will be ripped and the soil re-firmed prior to seedbed preparation.

The soil will be amended with compost, lime, fertilizer, etc. as necessary to ameliorate or eliminate physical or chemical conditions that inhibit plant establishment and growth. Soil acidity (pH) adjustment and additions of phosphorous (P) and potassium (K) should be based on a soil test.

**Species Selection**:

Species selection and associated planting specifications (seeding rates, dates, depths, and methods) shall be consistent with the Plant Establishment Guide for Virginia or other Virginia technical notes and approved guidance.

Selected species shall be suited to current site conditions and intended uses, and be resistant to diseases or insects common to the site or location.

Selected species will have the capacity to achieve adequate

Conservation practice standards are reviewed periodically and updated if needed. To obtain the current version of this standard, contact your Natural Resources Conservation Service State Office or visit the Field Office Technical Guide.

density and vigor to stabilize the site within an appropriate period.

No plants on the Federal or state noxious weeds list shall be planted.

**Establishment of Vegetation:**

Establishment method and associated details (rates, depth, and timing of seeding or planting, minimum quality of planting stock, etc.) shall be specified before practice implementation.

Planting will be conducted using the method and timing best suited to the species and site and soil conditions.

Only viable, high quality seed or planting stock will be used.

Sod placement shall be limited to areas that can naturally supply needed moisture or sites that can be irrigated during the establishment period. Sod will be properly placed and anchored to ensure that it remains in place until established.

Plantings shall be mulched as necessary to ensure establishment and disturbed areas shall be mulched as necessary to prevent erosion.

What constitutes successful establishment (e.g. minimum percent ground/canopy cover, percent survival, stand density) shall be specified before practice implementation. Acceptable targets for long-term performance shall be no less than 80% cover or canopy year-round for herbaceous species and no less than 60% survival for trees and shrubs.

**Additional Criteria to Stabilize Stream and Channel Banks and Shorelines**

When slopes are modified for seeding, topsoil will be stockpiled until grading is complete, then spread over areas to be planted as needed.

**Bank and Channel Slopes**:

Channel side slopes shall be shaped so that they are stable and allow establishment and maintenance of desired vegetation.

Slopes steeper than 2:1 shall not be stabilized using vegetation alone. A combination of vegetative and structural measures will be used on these slopes to ensure adequate stability.

**Species Selection:**

Plant material used for this purpose shall:

- be adapted to the hydrologic zone (see Fig. 1) into which they will be planted.
- be adapted and proven in the regions in which they will be used.
- when mature, produce plant communities that are compatible with those in the area.
- protect the channel banks but not restrict channel capacity.

**Establishment of Vegetation**:

The species used, planting rates, spacing, and methods and dates of planting shall be based on plant materials program trials or other technical guidance.

Identify, mark, and protect desirable existing vegetation during practice installation.

A combination of vegetative and structural measures using living and inert material shall be used when flow velocities, soils, and bank stability preclude stabilization by vegetative establishment alone.

If the existing vegetation on a site will compete with species to be established, it will be controlled in a manner that ensures the successful establishment of the planted species.

**Site Protection and Access Control:**

Grazing animal access to planted areas will be controlled for a minimum of two growing seasons during the establishment period.

All areas to be grazed will have a grazing plan that meets the criteria in the local Field Office Technical Guide.

Grazing shall be permanently excluded on high hazard sites, such as cut banks, areas of seepage or other potentially unstable areas.

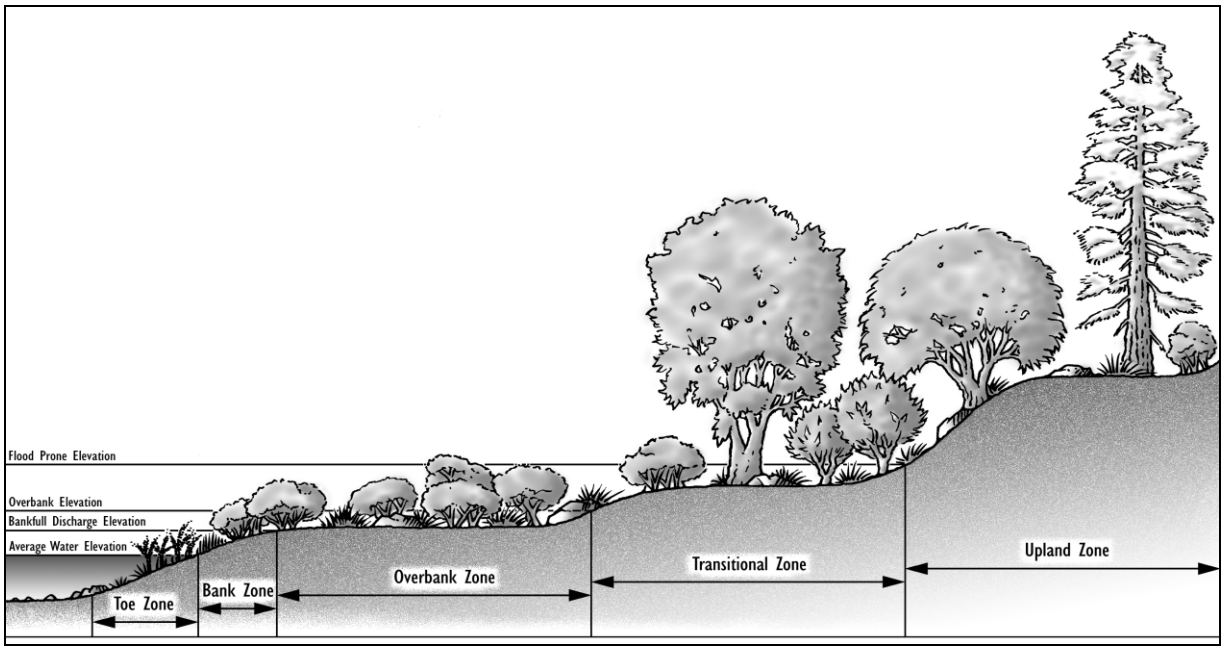


Figure 1. Location of hydrologic zones along a channel or shoreline.

Definitions and descriptions of hydrologic zones used for channels and shorelines:

Bankfull Discharge Elevation - In natural streams, it is the elevation at which water fills the channel without overflowing onto the flood plain.

Bank Zone - The area above the Toe Zone located between the average water level and the bankfull discharge elevation. Vegetation may be herbaceous or woody, and is characterized by flexible stems and rhizomatous root systems.

Overbank Zone - The area located above the bankfull discharge elevation continuing upslope to an elevation equal to two thirds of the flood prone depth. Vegetation is generally small to medium shrub species.

Toe Zone - The portion of the bank that is between the average water level and the bottom of the channel, at the toe of the bank. Vegetation is generally herbaceous emergent aquatic species, tolerant of long periods of inundation.

Transitional Zone - The area located between the overbank zone, and the flood prone width elevation. Vegetation is usually larger shrub and tree species.

Upland Zone – The area above the Transitional Zone; this area is seldom if ever saturated.

Note: some channels or shorelines have fewer than four hydrologic zones because of differences in soils, topography, entrenchment and/or moisture regime.

**Additional Criteria to Rehabilitate and Revegetate Degraded Sites that Cannot Be Stabilized through Normal Farming Practices.**

If gullies or deep rills are present, they will be filled and leveled as necessary to allow equipment operation and ensure proper site and seedbed preparation.

**Additional Criteria to Restore Coastal Areas, such as Sand Dunes and Riparian Areas**

Plants for sand dunes and coastal sites must be able to survive being buried by blowing sand, sand blasting, salt spray, salt water flooding, drought, heat, and low nutrient supply.

Sand trapping devices such as sand fences or brush matting shall be included in vegetation / stabilization plans where applicable.

## CONSIDERATIONS

Species or mixes that are adapted to the site and have multiple values should be considered. Native species may be used when appropriate for the site.

To benefit pollinators and other wildlife, flowering shrubs and wildflowers with tough root systems and good soil holding capacity also should be considered for incorporation as a small percentage of a larger grass-dominated planting. Where appropriate consider a diverse mixture of legumes and forbs to support pollinator habitat.

Avoid species that may harbor pests. Species diversity should be considered to avoid loss of function due to species-specific pests.

Planning and installation of other conservation practices such as Virginia Conservation Practice Standards *Diversion (Code 362), Obstruction Removal (code 500), Subsurface Drain (Code 606),* or *Underground Outlet (Code 620)* may be necessary to prepare the area or ensure vegetative establishment.

Areas of vegetation established with this practice can create habitat for various type of wildlife. Maintenance activities, such as mowing or spraying, can have detrimental effects on certain species. Perform management activities at the times and in a manner that causes the least disruption to wildlife.

## PLANS AND SPECIFICATIONS

Specifications for implementation of this practice shall be prepared for each field or CMU (Conservation Management Unit).

Customize the language and level of detail in specifications as needed for each particular case. Focus above all on providing the client with the practical guidance needed to effectively put the practice on the ground.

Specifications shall be recorded and conveyed to the client using approved job sheets and/or narrative statements in the conservation plan.

Specifications shall at a minimum include all of the following elements:

1. Identification / description and site map of the field(s) and/or CMU(s) where critical area planting will take place.
2. List of the purpose(s) for which the standard is being implemented.
3. Requirements and/or recommendations for vegetation establishment addressing the following issues, as applicable:
   - Site preparation, including removal of unwanted materials and grading.
   - Instructions for topsoil management (stockpiling, spreading, etc.)
   - Soil testing and soil amendment with compost, lime, fertilizer, etc.
   - Method of seeding/planting, including seedbed / planting area preparation.
   - Species selection.
   - Quality of seeding/planting materials, including seed/plant sources if applicable.
   - Time of seeding/planting
   - Seeding rate/plant spacing
   - Mulching
   - Supplemental water needed for establishment
   - Protection of plantings
4. A statement of what constitutes successful establishment (targets for long-term performance may be no lower than 80% cover for canopy year-round for herbaceous species and no lower than 60% survival for trees and shrubs).
5. Any additional recommendations related to installation of erosion control and other measures that will increase likelihood of successful practice implementation.

## OPERATION AND MAINTENANCE

Requirements and recommendations for operation and maintenance (O&M) of this practice shall be provided to every client.

Customize the choice of language and level of detail as needed for each particular case. Focus above all on providing the client with the practical guidance needed to ensure the long-term effectiveness of the practice.

O&M recommendations shall be recorded and conveyed using approved job sheets and/or narrative statements in the conservation plan.

Provide at a minimum the following O&M recommendations:

1. Restrict access to and use of the area as long as necessary to ensure vegetation is fully established and site is stabilized.
2. Inspect the treated area regularly, especially after heavy rain or other potentially damaging events, until plantings become well established. Repair and replant as needed in response to erosion damage, herbicide damage, etc. to ensure specified targets for long-term plant establishment are achieved.
3. Implement a maintenance plan to ensure that this practice functions as intended throughout its expected life. Key maintenance elements typically include: periodic inspection, grazing and traffic management, soil testing and fertilization, mowing or other control of competing vegetation, and reseeding or replanting as needed.
4. Carry out any additional site-specific O&M measures deemed necessary.

**REFERENCES**

Federal Interagency Stream Restoration Working Group. 1998. Stream corridor restoration: principles, processes, and practices.

USDA-NRCS. National Engineering Handbook, Part 653.

USDA-NRCS. 2007. National Engineering Handbook, Part 654. Stream restoration guide.

USDA-NRCS. 2010. The PLANTS Database (http://plants.usda.gov, checked September 2010). National Plant Data Center.

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