

**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

This practice supports one or more of the following purposes:

- Stabilize stream and channel banks, pond and other shorelines – Resource concern (SOIL EROSION– Excessive bank erosion from streams shorelines or water conveyance channels).
- Stabilize areas with existing or expected high rates of soil erosion by wind or water – Resource concern (SOIL EROSION – Concentrated flow erosion and/or SOIL EROSION - Sheet, rill, & wind erosion and/or SOIL QUALITY DEGRADATION – Concentration of salts or other chemicals).
- Stabilize areas, such as sand dunes and riparian areas – Resource concern (SOIL EROSION – Concentrated flow erosion and/or SOIL EROSION - Sheet, rill, & wind erosion).

CONDITIONS WHERE PRACTICE APPLIES

This practice applies to highly disturbed areas such as active or abandoned mined lands; urban restoration sites; 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 affect the 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.

As site conditions dictate, when grading slopes, stockpile topsoil to be redistributed over area to be planted

Species Selection. Species selected for seeding or planting shall be suited to local site conditions and intended uses, and be common to the site or location. Refer to Critical Area Planting Design Procedures (342DP) and Herbaceous Vegetation Design Procedures (550DP) for detailed guidelines on species selection, seeding rates, site preparation and other details.

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

Selected species will have the capacity to achieve adequate density and vigor to stabilize the site sufficiently to permit suited uses with ordinary management activities.

Establishment of Vegetation. Seeds will be planted using the method or methods best suited to site and soil conditions.

Sod placement shall be limited to areas that can naturally supply needed moisture or sites that can be irrigated during the establishment period.

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](#).

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Sod will be placed and anchored using techniques to ensure that it remains in place until established.

Species, rates of seeding or planting, minimum quality of planting stock (e.g. pure live seed (PLS) or stem caliper), method of seedbed preparation, and method of establishment shall be specified before application. Only viable, high quality seed or planting stock will be used.

Seeding or planting shall be done at a time and in a manner that best ensures establishment and growth of the selected species.

Planting dates shall be scheduled during approved dates for the species and to optimize soil moisture for germination and/or establishment.

All fertilizers and soil amendments will be applied in accordance with soil analysis and plant requirements, following the criteria in the Nutrient Management standard (590).

Plantings shall be protected from pests (e.g. weeds, insects, diseases, livestock, and wildlife) as necessary to ensure stand establishment.

All disturbed areas will be mulched as necessary. Mulch will be applied and anchored according to the criteria in the Mulching standard (484).

The amount of plant biomass and cover needed to reduce wind and water erosion to the planned soil loss objective shall be determined using the current approved wind and/or water erosion prediction technology.

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 Prescribed Grazing standard (528).

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

Tree guards will be placed around landscaped areas as needed to protect against animal damage.

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Additional Criteria to Restore Eroded Sites

If gullies or deep rills are present, they will be treated, if feasible, to allow equipment operation and ensure proper site and seedbed preparation.

Based on a soil test, soil amendments will be added as necessary to ameliorate or eliminate physical or chemical conditions that inhibit plant establishment and growth. Required amendments, such as compost or manure to add organic matter and improve soil structure and water holding capacity; agricultural limestone to increase the pH of acid soils; or elemental sulfur to lower the pH of calcareous soils shall be included in the site specification with amounts, timing, and method of application.

Additional Criteria to Stabilize Stream and Channel Banks, Pond and other Shorelines

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

A combination of vegetative and structural measures may be necessary on slopes steeper than 2:1 to ensure adequate stability.

Banks and shorelines to be used for public access (fishing, swimming and related activities) will have side slopes no steeper than a ratio of 4 horizontal to 1 vertical (4:1).

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.
- be compatible with existing vegetation 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 local planting guides or technical notes.

Identify and protect desirable existing vegetation during practice installation.

A combination of vegetative and structural practices 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 vegetatively (e.g. bare-root, containerized, ball-and-burlap, potted), it will be controlled in a manner that

ensures the successful establishment of the planted species.

Streambank stabilization plantings shall be in accordance with the NRCS Engineering Field Handbook Part 650, Chapter 16 (Streambank and Shoreline Protection) and Chapter 18 (Soil Bioengineering for Upland Slope Protection & Erosion Reduction).

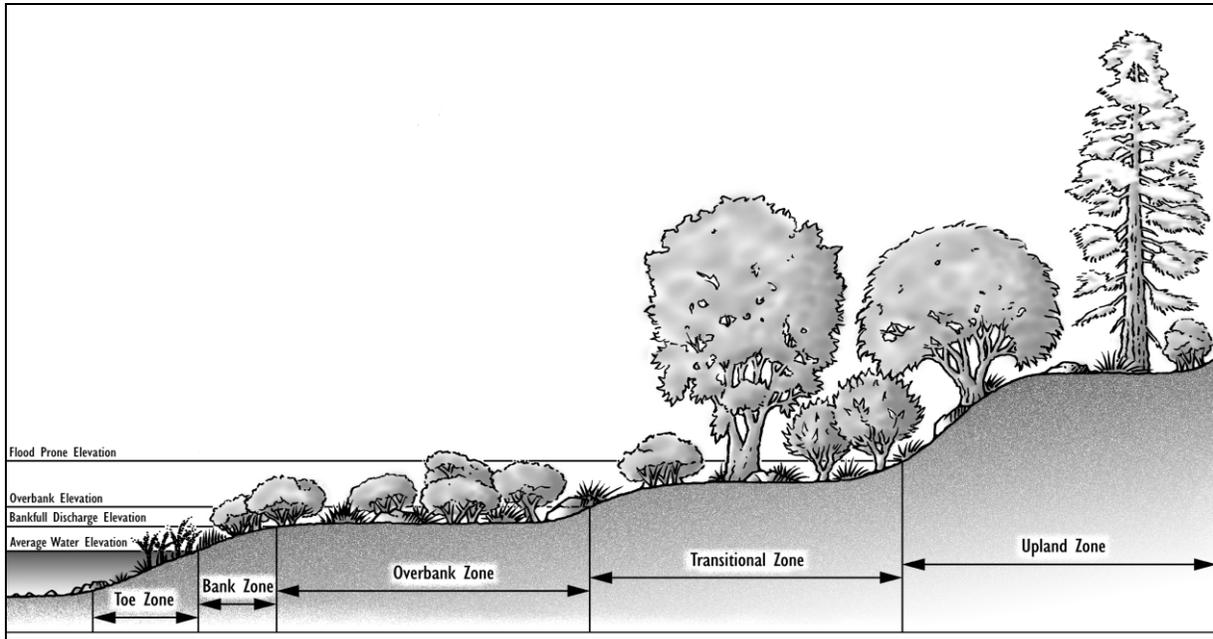


Figure 1. Location of hydrologic zones along a channel or shoreline.

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.

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Additional Criteria to Restore Sand Dunes and Sandy Areas

Plants for sand dunes and other sandy sites must be able to survive being buried by blowing sand, sand blasting, drought, heat, and low nutrient supply.

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

CONSIDERATIONS

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

To benefit pollinators and other wildlife, flowering shrubs and wildflowers with resilient 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 forbs to support pollinator habitat. Including species that flower early, mid, and late season should be considered.

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 Diversion (362), Obstruction Removal (500), Subsurface Drain (606), or Underground Outlet (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.

Additional Considerations for Restoring Channel Bank Vegetation. Stable, overhanging banks that provide shade and cover for fish should not be disturbed.

Streambank and Shoreline Protection (580) should be considered in conjunction with

Critical Area Planting to facilitate establishment of channel bank vegetation.

A riparian functional assessment should be completed on live streams to determine channel condition.

In constructed channels, consider the size of vegetation at maturity so as not to restrict the capacity of the channel or conflict with surrounding uses.

Vegetative practices should be designed to provide effective stability and cover. Stability will allow for indigenous vegetation to volunteer on the site.

Filter Strip (393), Riparian Forest Buffer (391) and Conservation Cover (327) applied in conjunction with channel bank vegetation will improve water quality and enhance wildlife habitat.

Providing plant species diversity will help combat disease and the overuse of a single species.

Supplemental irrigation of new plantings should be considered where economically feasible and practical.

Protect channel bank vegetation from upland sediment deposits resulting from wind and water erosion. Utilize techniques to minimize sedimentation impacts from practice installation, such as sediment barriers, erosion control fabric, and biodegradable mulches.

Provisions for safety and protection of human life and property should be considered in all aspects of design, application, and maintenance.

Consider economic and resource costs of practice failure or re-establishment.

Effects of vegetation on water budget components, especially on volumes and peak flows of runoff, should be considered.

Effects of woody vegetation on stream temperatures and invertebrate populations should also be considered.

PLANS AND SPECIFICATIONS

Prepare plans and specifications for each field or management unit according to the criteria and operation and maintenance sections of

this standard. Specifications shall describe the requirements for applying this practice to meet the intended purpose.

Record practice specifications using NE-CPA-8 Grass Seeding Jobsheet and additional specifications as needed for weed control, site preparation and other details.

The following elements shall be addressed in the plan, as applicable, to meet the intended purpose.

- Site preparation
- Topsoil requirements
- Fertilizer application
- Seedbed/planting area preparation
- Methods of seeding/planting
- Time of seeding/planting
- Selection of species
- Seed/plant source
- Seed analysis
- Seeding rate/plant spacing
- Mulching
- Planting Trees, Shrubs and Vines
- Supplemental water needed for establishment
- Protection of plantings
- Describe successful establishment (e.g. minimum percent ground/canopy cover, percent survival, stand density).

OPERATION AND MAINTENANCE

Use of the area shall be managed as long as necessary to ensure the site remains stable.

Plantings shall be protected from pests (e.g. weeds, insects, diseases, livestock, or wildlife) as necessary to ensure long-term survival.

Observation of establishment progress and success should be performed at regular intervals until the practice has met the criteria for successful establishment and implementation.

The site will be inspected for erosion damage after significant runoff events.

Shaping, reseeding and mulching will be completed as needed.

Where establishment of vegetation creates potential habitat for grass-nesting birds, the impacts of vegetative disturbance upon these birds and their nests should be considered and included in operation and maintenance plans.

Maintenance activities that result in disturbance of vegetation will not be conducted during the primary nesting season for grass-nesting birds where occupied habitat for these species exists.

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

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

REFERENCES

Federal Interagency Stream Restoration Working Group. 1998. Stream corridor restoration: principles, processes, and practices. National Engineering Handbook, Part 653.

NRCS Nebraska Critical Area Planting Design Procedures (342DP)
<http://efotg.sc.egov.usda.gov/references/public/NE/NE342DP.pdf>

NRCS Nebraska Herbaceous Vegetation Design Procedures (550 DP)
<http://efotg.nrcs.usda.gov/references/public/NE/NE550DP.pdf>

NRCS Nebraska Conservation Planning Form, Grass Seeding Jobsheet, NE-CPA-8:
[http://efotg.sc.egov.usda.gov/references/public/NE/NE-CPA-8\(grass_seeding_jobsheet\).xlsm](http://efotg.sc.egov.usda.gov/references/public/NE/NE-CPA-8(grass_seeding_jobsheet).xlsm)

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.