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 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 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. Conduct a site investigation to identify any physical, chemical, or biological conditions that could negatively affect the establishment of vegetation.

Clear unwanted materials from the areas to be planted, and smooth or shape if necessary.

Prepare a seedbed for seeded species. Mechanically break any compaction prior to planting.

If grading is required, stockpile topsoil so it can be returned to the area once the grade is achieved.

Species Selection. Use species that are suited to local site conditions and intended uses, and would be common to the site or location.

Use species that have the capacity to achieve adequate density and vigor to stabilize the site within an appropriate period.

Establishment of Vegetation. Plant using the method or methods best suited to the site and soil conditions.

Use sod only in areas that can naturally supply needed moisture or sites that can be irrigated during establishment.

Anchor sod so that it remains in place until established.

Before application, specify species, cultivars, 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. Use only viable, high quality seed or planting stock. Any legume seed must be inoculated with the appropriate species of Rhizobium.

Plant only during the time of year appropriate for the species being used.

Apply amendments (e.g. lime, fertilizer, compost) as determined by a soil analysis report and any Field Office Technical Guide requirements.

Use mulch as necessary to ensure establishment or prevent erosion.

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

Bank and Channel Slopes. Shape channel side slopes so they are stable and allow establishment and maintenance of vegetation.

To ensure stability, a combination of vegetative and structural measures may be necessary on slopes steeper than 2:1.

Species Selection. Use plant material that is:

- adapted to the hydrologic zone (see Fig. 1) (next page),
- adapted and proven in the regions in which it will be used,
- compatible with existing vegetation in the area, and
- protects the channel banks but does not restrict channel capacity.

Establishment of Vegetation. Use species, planting rates, spacing, and methods and dates of planting that are based on local planting guides or technical notes.

Identify and protect desirable existing vegetation during practice installation.

Use a combination of vegetative and structural practices using living and inert material when flow velocities, soils, or bank stability preclude stabilization by vegetation alone.

Control any existing vegetation on the site that may compete with the desired, vegetatively (e.g. bare-root, containerized, ball-and-burlap, potted) established plants.

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).

Site Protection and Access Control. Restrict access to planted areas until fully established.

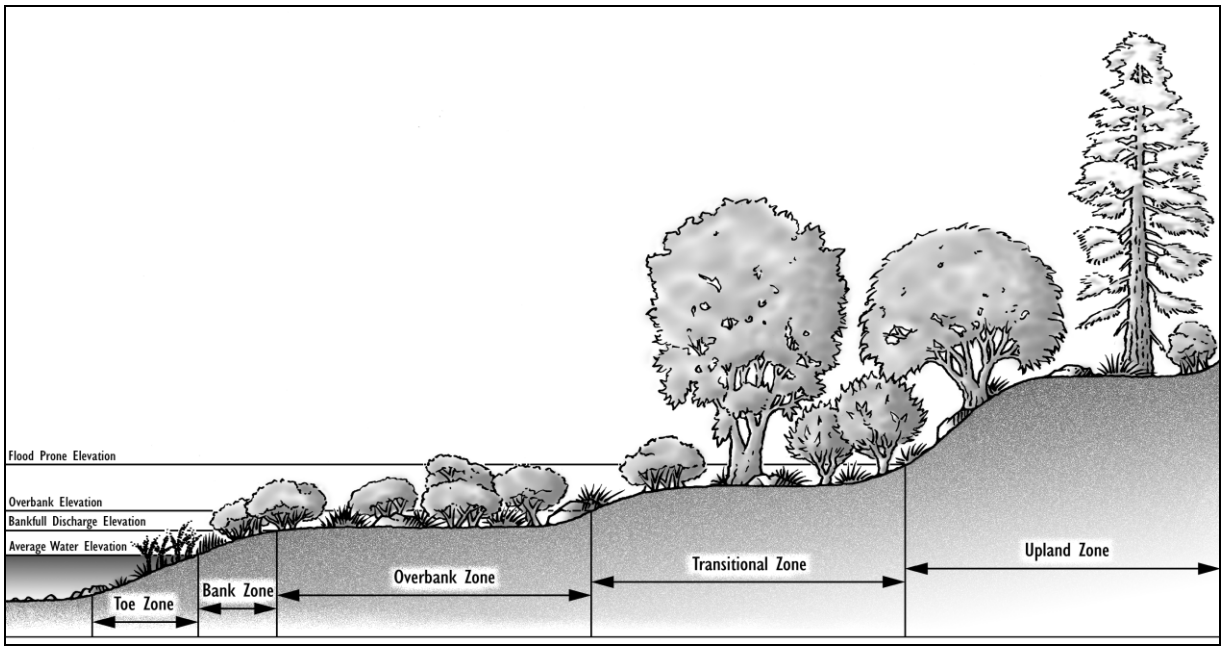

Figure 1. Location of hydrologic zones along a channel or shoreline.

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 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.

Where applicable, use sand trapping devices such as sand fences or brush matting.

CONSIDERATIONS

Species or mixes that are adapted to the site and have multiple benefits should be considered. Native species may 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.

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 (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

Prepare and record specifications for establishment and operation of this practice for each field according to the Criteria, Considerations, and Operation and Maintenance described in this standard.

Address the following elements, 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
- 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

Continue management as long as necessary to ensure the site remains stable.

Protect the plantings from pests and grazing animals.

Inspections, reseeding or replanting, and fertilization may be needed to ensure that this practice functions as intended throughout its expected life. Observation of establishment progress and success should be performed at regular intervals until the practice has met the criteria for successful establishment and implementation.

Any grazing of the area after establishment needs to be in accordance with an NRCS prescribed grazing plan (Code 528).

Do not graze areas such as cut banks, areas of seepage, or other unstable areas.

REFERENCES

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