

**NATURAL RESOURCES CONSERVATION SERVICE  
CONSERVATION PRACTICE STANDARD**

**CHANNEL BANK VEGETATION**

(Ac.)

**CODE 322**

**DEFINITION**

Establishing and maintaining vegetative cover on channel banks, berms, spoil, and associated areas.

**PURPOSE**

- Stabilize channel banks and adjacent areas and reduce erosion and sedimentation.
- Maintain or enhance the quality of the environment, including visual aspects and fish and wildlife habitat.

**CONDITIONS WHERE PRACTICE APPLIES**

This practice applies to establishing vegetation on channel banks, berms, spoil, and associated areas. This practice does not apply to grassed waterways, diversions, areas with protective linings, areas covered with water for an extended period of time, or areas where conditions will not support adequate vegetation.

**CRITERIA**

**General Criteria Applicable to All Purposes**

The Oklahoma NRCS Streambank and Shoreline Protection (580) standard shall be used when stabilization of the Toe and/or Bank Hydrologic Zones are required before channel vegetation establishment.

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

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

When slopes are modified for seeding, topsoil will be stockpiled and spread over areas to be planted as needed to meet planting and landscaping needs.

Streambanks 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).

**Bank Stabilization Techniques.** A combination of vegetative and structural measures will be used on slopes steeper than 3:1 to insure that they are stable.

The cause for bank instability must be determined before treatment measures are selected.

**Species Selection.** Plant materials used for this practice shall:

- Be adapted to and typically occur in the hydrologic zone into which they will be planted. See **Figure 1** for hydrologic zone locations and descriptions.
- Produce plant communities that are compatible with those in the area when mature.

Additional guidance and technical details for planting specifications are provided in **Appendix 1**.

**Establishment of Vegetation.** The species used, planting rates, spacing, methods, and dates of planting shall be based on the selected plant materials program trials or other

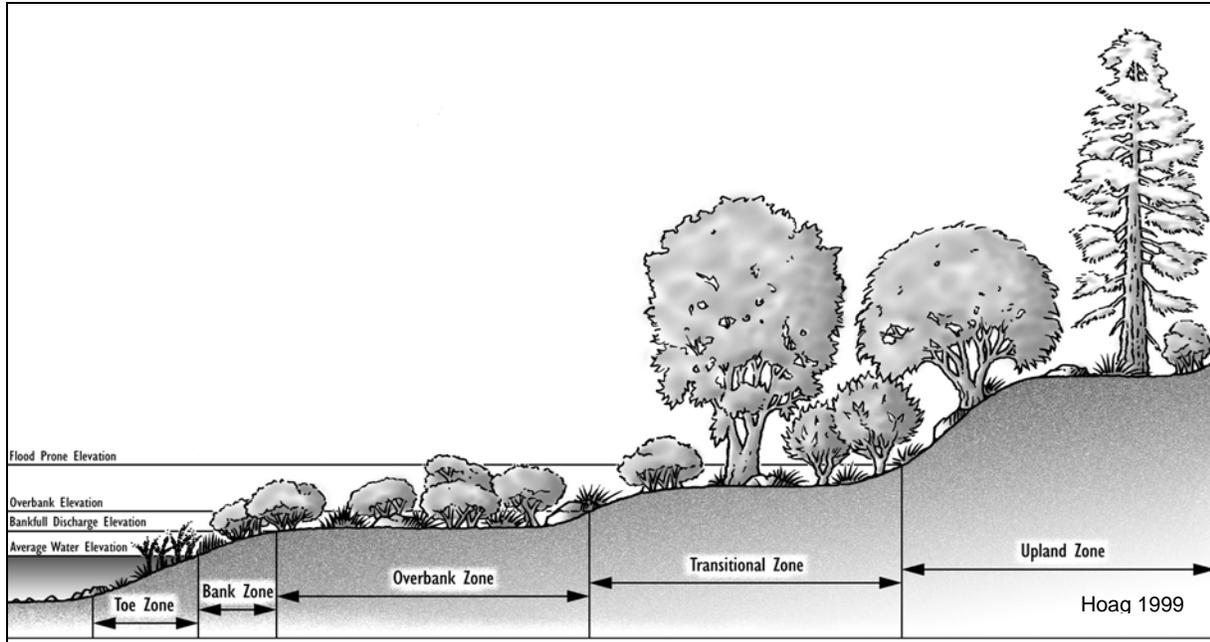


Figure 1. Location of Hydrologic Zones Along a Channel

#### Definitions and descriptions of hydrologic zones used for Channel Bank Vegetation:

**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 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 have fewer than four hydrologic zones because of differences in soils, topography, entrenchment and/or moisture regime.*

technical guidance, such as local planting guides or technical notes.

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

Biotechnical slope stabilization practices (a combination of vegetative and structural measures using living and inert materials) are to be used when flow velocities, soils, and bank stability preclude stabilization by

vegetative establishment alone. The determination to use either vegetation and a structural component or vegetation alone will be based on criteria found in the Oklahoma NRCS Streambank and Shoreline Protection (580) standard.

The existing vegetation will be cleared in a three-foot diameter around each site where

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container, balled, potted, plug, paper sleeve and bare root stock plantings are planted.

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

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 year.

Sod will be placed and anchored using techniques to insure that it remains in place during the establishment period.

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

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

**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 Oklahoma NRCS Prescribed Grazing (528) standard.

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 tree and shrub plantings as needed to protect against animal damage.

**CONSIDERATIONS**

Stable, overhanging banks that provide shade and cover for fish should not be disturbed.

Channel stabilization and streambank protection practices should be considered to

facilitate establishment of channel 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 strips, riparian forest buffers and conservation cover applied in conjunction with channel vegetation will improve water quality and enhance wildlife habitat.

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

Consider irrigating new plantings when economically feasible and practical.

Protection of channel vegetation from upland sediment deposits resulting from wind and water erosion should be considered.

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.

Techniques to minimize sedimentation impacts from practice installation, such as sediment barriers, erosion control fabric, and biodegradable mulches, should be considered.

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

**PLANS AND SPECIFICATIONS**

Plans and designs are to be prepared for specific field sites. The plan will identify site

conditions, required permits, and include design drawings showing location of planned measures, cut and fill cross sections, requirements for site preparation, location of planned species, planting dates, planting methods, plant spacing, planting depth, mulching, fertilizer and irrigation requirements. Forms OK-CPA-4 and/or OK-CPA-4a will be used for planning and certification.

A management strategy protecting the site will be in place prior to the installation of Channel Bank Vegetation improvements.

Specifications will be completed for each hydrologic zone located within the channel.

#### **OPERATION AND MAINTENANCE**

Maintenance for this practice includes the following:

- Management of vegetative growth, as applicable, by mowing, prescribed grazing, applying approved pesticides and fertilizer, or other means to maintain the desired cover. Vegetative removal will be restricted to periods having the least impacts on nesting wildlife. All species shall be allowed adequate time for re-growth in order to provide winter cover.
- Repair of appurtenances and fences will be completed as needed.
- Replanting will be completed as necessary to ensure site stability.

#### **REFERENCES**

Bentrup, G., and J.C. Hoag. 1998. The Practical Streambank Bioengineering Guide - User's Guide for Natural Streambank Stabilization Techniques in the Arid and Semi-arid Great Basin and Intermountain West. Interagency Riparian/Wetland Plant Development Project. USDA-NRCS, Aberdeen, ID.

FISRWG. 1998. Stream Corridor Restoration: Principles, Processes, and Practices. Federal Interagency Stream Restoration Working Group (FISRWG).

Hoag, J.C. 1999. Riparian Planting Zones. View from a Wetland, No. 5. (1998-1999) Interagency Riparian/Wetland Project, Plant Materials Center, USDA-NRCS, Aberdeen, ID.

National Engineering Field Handbook, Chapter 16, Streambank and Shoreline Protection.

Technical Note 14-H: Flow Changing Techniques, NRCS Stream Restoration Design Handbook, DRAFT (9/7/05)

## APPENDIX 1

### PLANTING SPECIFICATIONS

#### Grass Plantings

The following species of grasses shall be used for channel vegetation in areas that will not be inundated except for very short-term flooding.

- Bermudagrass
  - Mulch sod
  - Solid sod
  - Sprigs
  - Seed
- Native mixture
- Switchgrass - 'Blackwell'
- Tall Fescue

The Oklahoma NRCS Critical Area Planting (342) standard will be used for the establishment, maintenance, cultivar selection and planting rates and dates for the above grasses.

The following grasses shall be used in areas where inundation is expected. The use of 'Kanlow' switchgrass and common reedgrass can be in combinations or used individually. Common reedgrass is adapted to areas of permanent water, such as the waters edge (transition between toe zone and bank zone). 'Kanlow' switchgrass can tolerate fluctuations in water levels, such as that found in the bank zone, or above the shoreline.

#### Common Reedgrass

**Harvest** - Top growth greater than 2 inches shall be removed before rhizomes are harvested. Rhizomes can be dug with a lister, moldboard plow, or other suitable implement. Rhizomes shall be dormant, healthy and 8-12 inches long. Rhizomes shall be kept moist until planted.

**Site Preparation** - The area to be planted should have no more than 5 percent ground cover of living plants present. If plant competition exceeds 5 percent, the area shall be prepared by any method which will result in a fresh, clean, friable, firm seedbed without excessive weedy competition or plow plans.

**Planting Dates** - Rhizomes shall be planted from January 15 to May 1. An exception would be rhizomes kept in cold storage (dormant) may be planted between May 1 and September 15.

**Planting Methods** - Rhizomes can be planted by the following methods:

**1. Posthole** - Postholes shall have a minimum diameter of 8 inches and approximately 6 inches deep. Postholes will be spaced no more than 2 feet apart down the row with 2 rhizomes placed vertically on opposite sides of the hole. If more than one row is planted, rows will be 40 to 48 inches apart. Postholes in adjoining rows shall be spaced to have a staggered type layout. Loose soil shall be pushed over the rhizomes within 15 minutes of planting. The soil shall be firmed and water added immediately.

**2. Open Furrow** - A furrow shall be opened for each row to a depth of 6 inches. Rhizomes shall be dropped by hand parallel in the open furrow with 6 inches between rhizomes. Loose, moist soil shall be placed over the rhizomes within 15 minutes after planting to prevent drying. The soil shall be firmed around the rhizomes and smoothed to ground level. Rows shall be spaced 40 to 48 inches apart.

**3. Stream Channels** - Where the soil is muddy, the rhizomes can be buried 3-5 inches deep by any method such as treebar, square nosed shovel, tire tool, or other methods which accomplished the same result. Spacing will be as described for the posthole method

#### 'Kanlow' Switchgrass

**Planting Dates** - Dec. 1 to May 31

**Rate** - 6 PLS lbs/ac.

**Site Preparation** - The seedbed shall be firm, free of clods that restrict seeding equipment, have no restrictive compacted layers, and be free of competitive vegetation.

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**Seeding** - Seed shall be uniformly spread and firmed into the soil surface. Do not cover seed more than 1/2 inch.

**Management**

Common reedgrass and 'Kanlow' switchgrass shall not be grazed until well established. Limit grazing only during dormant season. Graze no closer than 12 inches in height.

**Tree and Shrub Plantings**

Tree and shrub plantings may be done alone or in combination with grass planting.

The Oklahoma NRCS Tree/Shrub Establishment (612) standard will be used for the establishment, maintenance, species and cultivar selection, and planting rates and dates.

**Soil Bioengineering** - When the use of soil bioengineering practices are needed to protect

and stabilize streambanks and shorelines, Chapter 18 of the Engineering Field Handbook will be used for guidance and design of vegetative components. These will include but are not limited to live stakes, live fascines, brushlayers, branchpacking, live cribwalls, live gully repair, vegetated rock gabions, vegetated rock walls, and joint plantings.

Erosion control blanket material shall be used as needed to control erosion during vegetation establishment.

**Wildlife Food and Cover**

The Oklahoma NRCS Wildlife Upland Habitat Management (645) standard and the Oklahoma NRCS Wildlife Habitat Appraisal Guides can be used to evaluate habitat requirements for targeted species. OK Biology-32 technical note can be used for guidance for plant species selection to enhance wildlife habitat.