**NATURAL RESOURCES CONSERVATION SERVICE**

# CONSERVATION PRACTICE STANDARD

# CHANNEL BANK VEGETATION

**(acre)**
**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

Streambank and Shoreline Protection (code 580) shall be used when stabilization of the Toe and/or Bank Hydrologic Zones is 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 that 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.

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

- Typically occur in the hydrologic zone into which they will be planted. See Figure 1 for hydrologic zone locations and descriptions.
- Be adapted, tested and proven cultivars in the regions in which they will be used.
- Produce plant communities that are compatible with those in the area when mature.
- Be resistant to diseases or insects common to the site or location.
- Protect the channel banks and help maintain channel capacity.

Certified seed shall be used, if available, for all seeded species.

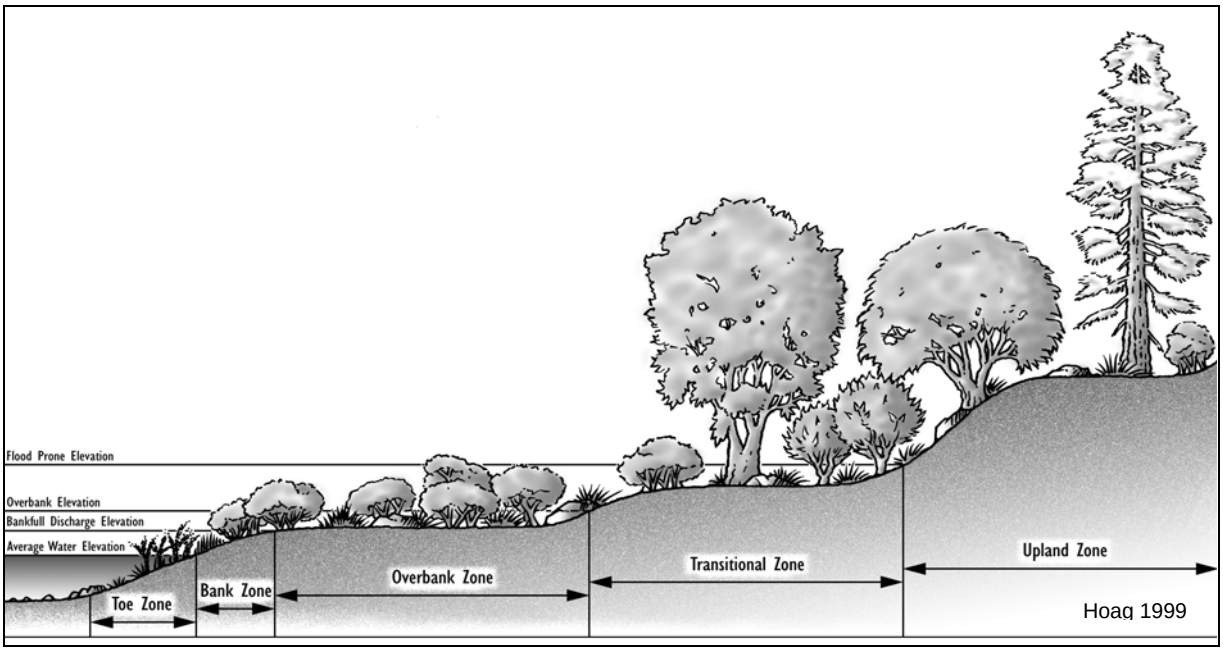


Figure 1. Location of Hydrologic Zones Along a Channel

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

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

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 practice standard 484, Mulching.

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

**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 practice standard 528, Prescribed Grazing.

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.

## 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.

Where economically feasible and practical, irrigation of new plantings should be considered.

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.

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.

## 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.