FARM WATER QUALITY PLANNING MANAGEMENT PRACTICE

Channel Vegetation
 # 322

University of California Cooperative Extension
Natural Resources Conservation Service

Channel Vegetation is the practice of using vegetation to stabilize and protect the banks of streams and other waterbodies. The purpose is to prevent bank erosion and reduce sediment loads.

Stream Channel Stabilization #584 can be used when the stream channel is deepening also called 'downcutting' or filling with sediment. Streambank Protection #580 can be used when structures are needed to stabilize the channel banks.

Advantages	Disadvantages
• Retention of sediment by vegetation	• Can defliect flow to unprotected banks on opposite side or downstream if not properly designed
• Reduced erosion due to decreased flow at the base of stream banks	
• Habitat enhancement	

Practice Effectiveness for Reducing Water Quality NPS Pollution Potential

Erosion-sheet & rill	Erosion-streambank	Pesticides-leaching	Pesticides-dissolved in runoff	Pesticides-adsorbed to sediment	Nutrients-leaching	Nutrients-surface waters
	significant					negligible

Empty boxes indicate information not yet collected for this practice

Additional sources of information regarding channel vegetation:

UC Sustainable Agriculture Research and Extension Program http://www.sarep.ucdavis.edu/
UC Weed Research and Information Center http://wric.ucdavis.edu/

Photo provided by Monterey County RCD

Some of the information in this management sheet has been taken from the Natural Resource Conservation Service (NRCS) Handbook of Conservation Practices practice #322. Contact your local NRCS office or visit http://www.nrcs.usda.gov for more information.

NATURAL RESOURCES CONSERVATION SERVICE
CONSERVATION PRACTICE SPECIFICATION

322 - CHANNEL VEGETATION

I. SCOPE

The work shall consist of furnishing all materials and placing them on all exposed, disturbed, or barren areas within and adjacent to the channel to the limits as shown on the drawings, or as staked in the field.

II. MATERIALS

Seed

All seed shall be delivered to the site tagged and labeled in accordance with the California Agricultural Code, and shall be acceptable to the County Agricultural Commissioner.

Bag tag figures will be evidence of purity and germination. Time since date of seed test shall not exceed 9 months.

Seed shall be of a quality that weed seed shall not exceed 0.5 percent of the aggregate of pure live seed (PLS) (percent germination x percent purity) and other material.

Fertilizer

Unless otherwise specified on the Practice Requirements sheet, all fertilizer shall be Ammonium Phosphate Sulfate containing a minimum of 16 percent Nitrogen, 20 percent available phosphoric acid and 0 percent water soluble potash and be uniform in composition, dry and free flowing, pelleted or granular.

All fertilizer shall be labeled in accordance with applicable state regulations and bear the warranty of the producer for the grade furnished.

Inoculants

The inoculant for treating legume seeds shall be a pure culture of Nitrogen fixing bacteria prepared specifically for the plant species and shall not be used later than the date indicated on the container. A mixing medium, as recommended by the manufacturer or approved substitute, shall be used to bond the inoculant to the seed. For nonpellet inoculated seed, two times the amount of the inoculant recommended by the manufacturer shall be used and seed shall be sown with 24 hours.

For pellet inoculated seed, at least 30 pounds of inoculant shall be used per 1,000 pounds of raw seed and the seed shall be labeled to show the Lot Number, Expiration Date, and Percent Coat of the finished product. Pellet inoculated seed shall be kept cool and sown within 180 days.

Straw

Straw shall be new straw derived from rice, wheat, oats, or barley, which meets the County Agricultural Commissioner's standards for weed pests. Clearance shall be obtained from the County Agricultural Commissioner, as required by law, before straw obtained outside the county in which it is to be used is delivered to the site.

Jute Matting

Jute matting shall be cloth mesh of uniform plain weave of undyed and unbleached jute yarn with a minimum weight of one pound per 10 square feet, and a maximum opening size of 1 inch by 1 inch.

Plastic Netting

Plastic netting shall be a polypropylene extruded plastic netting with square or rectangular openings not greater than 3/4 inches and weight of not less than 2.6 pounds per 1000 square feet.

Excelsior Matting

Excelsior matting shall consist of a machine-produced mat of wood excelsior fiber with consistent thickness and fiber evenly distributed over the entire area of the blanket. At least 70 percent of the fibers shall be 6 inches or longer in length. The topside of each blanket shall be covered with a biodegradable extruded plastic mesh with a maximum opening size of 2-inch by 2-inch.

Staples

Staples shall be made of 0.09-inch diameter or heavier wire, "U" shaped, with legs at least 8 inches in length.

Anchor pins may also be used to anchor jute matting. Anchor pins shall be made of rigid 0.12-inch diameter or heavier galvanized wire with a minimum length of 10 inches for hook or "J" type pins.

III. SEEDING MIXTURE AND PLANTING DATE

The seed(s) and rate(s) specified on the Practice Requirements sheet shall be used.

The seeding rate(s) shall be the weight exclusive of any coating material. Any legume seed used shall be inoculated. Based on bag tags, seeding rates shall be adjusted to insure the required amounts of pure live seed.

Planting shall be performed after final grading is completed unless otherwise specified on the Practice Requirements sheet.

Woody cuttings and container plants needed for this work shall be used according to the supplemental Specifications for Practice 342 G and 342 H specified on the Practice Requirements sheet.

IV. SEEDBED PREPARATION

The area to be planted shall be weed free and have a firm seedbed which has previously been roughened by scarifying, disking, harrowing, chiseling, or otherwise worked to a depth of 2 to 4 inches. No implement shall be used that will create an excessive amount of downward movement of clods on sloping areas. Seedbed may be prepared at time of completion of earth moving work. The horizontal indentations left by tracked equipment is acceptable on steep slopes.

Rocks larger than 6 inches in diameter, trash, weeds, and other debris that will interfere with seeding or maintenance shall be removed.

Seedbed preparation shall be suspended when soil moisture conditions are not suitable for obtaining a satisfactory seedbed.

V. FERTILIZING, SEEDING, MULCHING

Fertilizing

Fertilizer shall be distributed uniformly over the seedbed at the rate of 500 pounds per acre unless a different amount is specified on the Practice Requirements sheet.

Fertilizer shall be applied in any way that will result in uniform distribution. The fertilizer shall be incorporated into the soil. Incorporation may be as part of the seedbed preparation, or as part of the seeding operation.

Seeding

Seed shall be drilled or broadcast by hand, mechanical hand seeder, or power operated seeder. Seed shall be incorporated into the soil, but not more than 1 inch deep.

Mulching

A straw covering shall be distributed uniformly over the seeded area within 48 hours after seeding. Straw shall be applied at the rate of 2 tons per acre unless a different amount is specified on the Practice Requirements sheet. The straw shall be applied by hand, blower, or other suitable equipment. If straw is applied by blower, it shall not be chopped in lengths less than 6 inches.

Anchoring the Mulch

The mulch shall be anchored in place using one of the following methods as specified on the Practice Requirements sheet.

Method 1

The straw shall be anchored using hand tools, mulching rollers, straight serrated disks, or similar types of suitable equipment and shall be performed in a satisfactory manner. The straw shall be tucked in a minimum of 3 inches on a spacing not to exceed one foot in both directions.

Method 2

The straw shall be anchored in place by the placement of jute matting or excelsior matting. The matting shall be applied up and down the slope and shall continue beyond the edge of the mulched or seeded area at least 1 foot at the sides and at the top and bottom of the

mulched area. If existing vegetation or structures mark the boundaries of the area, the matting shall be continued into the stable vegetated area or to the edge of the structure. The matting shall be cut around objects so it will lay flat on the soil surface.

The upper end of the matting at the top of the area shall be buried in a trench at least 6 inches deep. Sides of rolls shall overlap at least 4 inches, and rolls shall overlap at least 3 feet where an uphill roll joins a downhill roll. The uphill roll shall overlie the downhill roll. The side of an upstream roll shall overlie the downstream roll.

Staples shall be installed perpendicular to the slope and shall be spaced approximately 5 feet apart down the sides in the overlap area and center of the roll. Staples spaced not more than 1 foot apart shall be installed across the upper end of each roll and across the overlap area where an uphill roll joins a downhill roll.

Method 3

The straw mulch shall be anchored in place by covering the mulch with a plastic netting. The netting shall be applied up and down the slope, and shall continue beyond the edge of the mulched area at least 1 foot at the sides and at the top and bottom of the area.

The upper end of the netting at the top of the area shall be buried in a trench at least 6 inches deep. Sides of rolls shall overlap at least 4 inches and rolls shall overlap at least 3 feet where an uphill roll joins a downhill roll. The uphill roll shall overlie the downhill roll. The side of an upstream roll shall overlie the downstream roll.

Staples shall be installed perpendicular to the slope and shall be spaced 5 feet apart in both directions. The staples on the exterior edges of the netting shall be spaced 5 feet apart.

VI. IRRIGATION

When specified, irrigation water shall be applied during the establishment period at the times and rates as listed on the Practice Requirements sheet.

VII. OTHER REQUIREMENTS

Other details for the establishment and maintenance of the plants including, but not limited to, the need for livestock and traffic control shall be applied when specified on the Practice Requirements sheet.

Measures and methods that enhance fish and wildlife values, protect visual resources, and maintain key shade, food, and den trees shall be performed when specified on the Practice Requirements sheet.

Operations shall be done in such a manner that soil erosion and air and water pollution are minimized and held within legal limits.

The owner, operator, contractor, or other persons shall conduct all work and operations in accordance with proper safety codes for the type of work being performed with due regards to the safety of all persons and property.

NATURAL RESOURCES CONSERVATION SERVICE
CONSERVATION PRACTICE STANDARD

CHANNEL VEGETATION

(acre)
CODE 322

DEFINITION

Establishing and maintaining adequate plants on channel banks, berms, spoil, and associated areas.

PURPOSES

To stabilize channel banks and adjacent areas and reduce erosion and sedimentation. To maintain or enhance the quality of the environment, including visual aspects and fish and wildlife habitat.

CONDITIONS WHERE PRACTICE APPLIES

On channel banks, berms, spoil, and associated areas; except grassed waterways, diversions and areas with protective linings, those covered with water for an extended period, or in areas where conditions will not support adequate vegetation.

This standard applies to the revegetation of open channels, streams, or ditches installed as floodwater diversions (400), floodways (404), open channels (582), stream channel stabilization (584), streambank protection (580), and surface drainage, main or lateral (608). It does not apply to diversions (362), grassed waterways (412), or surface drainage, field ditches (607).

CRITERIA

Side slopes shall permit establishing and maintaining desired vegetation and shall not be steeper than 2:1. In urban and recreation areas, flatter side slopes may be required to provide for public safety and enhancement of visual resources.

Plant species shall be selected from the Vegetative Guide in the FOTG. They must provide a lasting cover to protect the channel area and to maintain the channel design capacity.

Apply fertilizers and soil amendments to supply at least 40 pounds per acre of nitrogen at planting.

Mulch materials will be anchored in place.

Apply irrigation if it is needed for establishing vegetation.

CONSIDERATIONS

Evaluate slopes and soil material, time of year for proper establishment of vegetation, necessity for irrigation, visual aspects, fish and wildlife, fire hazards and special needs.

Provide for protection of channel vegetation from sediment deposits resulting from wind and water erosion.

Provisions for safety and protection of human life and property in all aspects of application and maintenance.

Protection for any endangered and threatened plants and nationally recognized natural vegetated areas.

Need for overseeding or planting woody or herbaceous vegetation on the unexcavated sides.

Protection of existing desirable trees and other vegetation.

Special techniques for establishing and maintaining vegetation near inlets, outlets, or other appurtenances.

The application of channel vegetation can be accomplished by the requirements prescribed by the appropriate Specification for conservation practice 342-Critical Area Planting.

When grazing will be performed as part of the operation and maintenance, consult with a Range Conservationist for grazing period and extent. Control access to channels, as needed by fencing or by other means to protect slopes and vegetation from damage.

Endangered Species Considerations

Determine if installation of this practice with any others proposed will have any effect on any federal or state listed Rare, Threatened or Endangered species or their habitat. NRCS's objective is to benefit these

species and others of concern or at least not have any adverse effect on a listed species. If the Environmental Evaluation indicates the action may adversely affect a listed species or result in adverse modification of habitat of listed species which has been determined to be critical habitat, NRCS will advise the land user of the requirements of the Endangered Species Act and recommend alternative conservation treatments that avoid the adverse effects. Further assistance will be provided only if the landowner selects one of the alternative conservation treatments for installation; or at the request of the landowners, NRCS may initiate consultation with the Fish and Wildlife Service, National Marine Fisheries Service and/or California Department of Fish and Game. If the Environmental Evaluation indicates the action will not affect a listed species or result in adverse modification of critical habitat, consultation generally will not apply and usually would not be initiated. Document any special considerations for endangered species in the Practice Requirements Worksheet.

Some species are year-round residents in some streams, such as, freshwater shrimp. Other species, such as steelhead and salmon, utilize streams during various seasons. Be aware that during critical periods, such as spawning, eggs in gravels, and rearing of young may preclude activities in the stream that may directly affect the stream habitat during those periods. For example there should be no disturbance of stream gravel beds that may have eggs in them. That could include any equipment in the stream or even walking in the stream or work upstream that may result in sediment depositing in the gravel beds. Document any special considerations for endangered species in the Practice Requirements Worksheet.

Water Quantity

Channel vegetation may reduce the rate and velocity for the same flow depth. Soil water in the channel banks will be reduced by the amount used by the plants to support their growth.

1. Potential runoff from bare soil during construction.
2. Effects on the water budget components, especially on volumes and rates of runoff.

Water Quality

Channel vegetation may have an effect on surface water quality during the time of establishment. The banks will be exposed during grading, seedbed preparation, seeding/planting until the protective vegetation is established. During the establishment period sediment delivery may be increased. Where fertilizers are applied, they may be washed into the stream or be applied directly to the water.

Streambank erosion will be reduced in the long term. The channel side slope may be stabilized, reducing the potential for bank failure. These sources of sediment and associated sediment-attached substances may be reduced which will improve water quality. If pesticides are used to control undesired vegetation they may drift or wash into surface water. The vegetation will trap some of the sediment moving overland to the channel and some of the sediment carried by the stream. Stream temperatures could be reduced because of shading and lower soil temperatures when woody vegetation is used.

Vegetation in ditches take up nitrate-nitrogen which may be released during vegetation die-back.

1. Effects of nutrients or pesticides in runoff during establishment of vegetation.
2. Effects of streambank erosion before vegetative establishment.

PLANS AND SPECIFICATIONS

Plans and specifications are to be prepared for specific field sites. Plant species and planting rates shall conform to the Vegetative Guide in Section II of the FOTG.

The location of all supporting practices will be shown on the drawings or conservation plan map.

Specifications for each supporting practice will be developed as addendums to this specification. Specifications will be consistent with federal, state and local regulations.

OPERATION AND MAINTENANCE

Maintenance needed for this practice includes:

Periodic inspection and evaluation of the vegetation to determine stand density, soil fertility, weed problems, pest problems, and any overgrazing.

Management of vegetation growth, as applicable, by mowing, controlled grazing, applying approved pesticides and fertilizer, or other means to maintain the desired cover.

Reseeding or replanting, along with the use of fertilizers and/or soil amendments and irrigation, as needed.