

NATURAL RESOURCES CONSERVATION SERVICE
CONSERVATION PRACTICE STANDARD

CRITICAL AREA PLANTING

(acre)
CODE 342

DEFINITION

Planting vegetation, such as trees, shrubs, vines, grasses, or legumes, on highly erodible or critically eroding areas (does not include tree planting mainly for wood products).

PURPOSES

To stabilize the soil, reduce damage from sediment and runoff to downstream areas, and improve wildlife habitat and visual resources.

CONDITIONS WHERE PRACTICE APPLIES

On highly erodible or critically eroding areas that cannot be stabilized by ordinary conservation treatment and management and if left untreated can cause severe erosion or sediment damage. Examples of applicable areas are *sand dunes*, dams, dikes, mine spoil, levees, cuts, fills, surface-mined areas, and denuded or gullied areas where vegetation is difficult to establish by usual planting methods.

CRITERIA

Selected plants, numbers, seeding mixtures and rates shall be in conformance with the respective Major Land Resource Area (MLRA) Vegetative Guide in Section II of the Field Office Technical Guide.

Based on bag tags, adjust seeding rates at the field site to insure the required amount of pure live seed (PLS)(germination x purity). Do not include any hard seed in the percent germination. When coated seed is used, adjust seeding rate to compensate for the weight of coating.

Use straw mulch on plantings made in summer and when animal or foot traffic is expected to interfere.

CONSIDERATIONS

These sites are generally severely eroded or disturbed and have low fertility and few, if any, resident seeds.

High seeding and fertilizer rates are needed to insure adequate vegetative cover.

Stabilized sites are expected to have locally adapted species invade the site and provide long-term stability.

When sites are reshaped, creating smooth hard surfaces on final grading causes compaction and makes it difficult to prepare a good seedbed.

The horizontal indentations left by tracked equipment provides a suitable seedbed on steep slopes.

Most California soils are low in sulfur. Preference should be given to fertilizers with this element. Ammonium Phosphate Sulfate 16-20-0 contains 15 percent sulfur and is the preferred fertilizer when seeding mixtures of grasses and legumes.

Straw is the preferred mulch but needs to be anchored in place. Rollers and crimpers can be pulled on slopes up to 3 to 1. Where there is access, equipment can be winched up and down steeper slopes. Tackifiers can be used to anchor the straw when equipment cannot be used on the site.

Use of wheat straw will result in less volunteer grain compared to barley straw.

When using straw grown in the same county, use clean straw to minimize spread of noxious weeds. Encourage users to have straw inspected by the County Agricultural Commissioner.

Use 75 feet as the effective range for straw blowing equipment.

Use 125 feet as the effective range for hydroseeders. When a 100-foot hose is available, the range can be extended up to 200 feet.

When seeding grasses, apply nitrogen at the rate of 80 pounds per acre (500#/acre of 16-20-0) except if soils are coarse sandy, gravelly or granitic, fertilizer rates can be reduced 50 percent.

When seeding legumes, fertilize with the equivalent to 44 pounds per acre of phosphorus (500#/acre of 16-20-0).

When water quality is expected to be adversely impacted by leached fertilizer, reduce fertilizer rates by 50 percent.

When planting perennial grasses, the fertilizer rate can be reduced by 50 percent.

When fertilizer rates are reduced, the balance of the fertilizer needs to be applied at the beginning of the next growing season.

Use hydro-mulch planting on steep, inaccessible sites not suitable for straw mulch planting and on other sites when rain is expected within 60 days following planting; except, do not use when high winds or animal or foot traffic are expected to interfere.

The split hydro-mulch planting can be used when small seeds will be planted on sites suitable for hydromulch planting. Seed and fertilizer are hydroseeded on first to provide better seed to soil contact and then the rest of the wood fiber is hydromulched over the site.

Bermudagrass sprigs and plugs should only be planted in areas having adequate soil moisture throughout the summer. On sloping banks, the first row is at the waterline and additional rows are numbered going up the bank. For water impoundment's with fluctuating water levels, use the average waterline expected during the active growing season.

When plantings are to be irrigated, maintain adequate moisture in the upper six (6) inches of soil during the first four (4) weeks and then in the upper 12 inches thereafter until the rainy season.

Limit human and livestock use of the area as needed to protect the plant cover.

Stabilization of interior and coastal sand dunes

The foredune to be created or stabilized must be a sufficient distance upwind to avoid having the base encroach on the area to be protected as the dune forms or increases in height. Proper distance can be best estimated by observing mature dune dimensions adjacent to the area receiving treatment. Ordinarily 300 to 500 feet of base width will be required.

Interior Sand Dunes

Use both woody and herbaceous types of plantings for permanent vegetative stabilization.

Initial stabilization of active dunes or sand blow areas:

Use wind controlling fences or artificial windbreaks as necessary to still sand on the area to be treated. Fence should be of uniform height placed across the prevailing wind direction. Three to five fences at approximately 50-foot intervals may be required.

Use a mulch to help stabilize the sand until vegetation is established.

Install and test the irrigation system to be used prior to planting.

Make plantings of the woody materials selected at the upwind edge of the area or dunes.

Extend plantings down wind over the dune as new dune area forms.

Establish a solid windbreak of plants at the down wind edge of dunes as soon as possible. See practice 380 - Windbreak / Shelterbelt Establishment.

Introduce long-lived, low maintenance plant species as needed to assure permanent stabilization of the treated area.

Coastal Sand Dunes

Initial Stabilization of active dunes:

If sand fences or artificial windbreaks will be required to still sand movement while establishing beachgrass, select locations for one or more fences beyond the high tidewater mark. Fences to create the foredune will be placed perpendicular to the prevailing wind at uniform height and about 30 feet apart. The fences may require lifting to keep from being buried as the foredune takes shape.

During December, January, or February plant culms of European beachgrass, *Ammophila arenaria* or another suitable species to create a foredune or add height to an existing foredune. Where space permits, planting should be extensive enough to provide a dune base width of 400 to 500 feet. The grass culms should be from vigorous young plants harvested to provide at least one underground node

per culm or stem. Tops of the culms should be cut back to 20 inch length for easy handling. The culms will be planted on approximate 18-inch centers, 3 per hill. Planting depth should be about 12 inches with about 8 inches of top protruding above the soil surface. The bundles of plant material must be maintained in live, moist conditions until planted.

Plant from windward to leeward, continuing in annual increments until the total unstable area is under control.

Apply nitrogen fertilizer (preferably 16-20-0) over the planted area at the rate of 20 pounds of nitrogen per acre. Fertilizer applied during gentle rain or irrigated in immediately will prove most effective. Fertilize again at the same rate about three months later. Do not use ammonium sulfate (21-0-0).

Supplemental planting on beachgrass stabilized dunes:

1. During the fall months, introduce adapted and enduring species of trees, shrubs, and other plants into the beachgrass cover using methods that will not damage the cover.
2. Provide protection from rabbits, insects, and disease as necessary during establishment of the supplemental planting.

Careful evaluation is needed to avoid disturbing Ecologically Significant Areas. Dunes often support threatened and/or endangered plants and animals.

Selection of vegetative species should consider local opinion on use of introduced species.

In most areas, irrigation water will be necessary for establishing and maintaining vegetative cover.

Where rainfall is adequate or irrigation water available, barley or sudangrass can be used successfully to grow mulch in place where sand blow areas need such treatment to keep sand from being removed. Also asphalt emulsions and certain other chemicals have been used successfully as spray on materials for temporary sand blow control to permit establishment.

Initial stabilization may require use of board or slat fencing to trap sand while vegetative cover is being established.

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 gravel's, 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

Critical area planting may have a minor effect on the quantity of surface and ground water. If there are large areas involved, as in mined land reclamation, there may be a reduction of surface runoff and increased infiltration and percolation.

1. Effects on the water budget, especially on volumes and rates of runoff, infiltration, evaporation, transpiration, deep percolation, and ground water recharge.

2. Effects of vegetation management on soil moisture.
3. Effects of snowcatch and melt on the water budget.
4. Effects of increased organic matter on water holding capacity of the soil.
5. Potential for a change in plant growth and transpiration because of changed in soil water volume.

Water Quality

This practice may reduce soil erosion and sediment delivery to surface waters. Plants may take up more of the nutrients in the soil, reducing the amount that can be washed into surface waters or leached into ground water. This practice may reduce wind blown soil delivery to surface waters.

Excessive fertilizer applications can increase the amount of nutrients leached into ground water.

During grading, seedbed preparation, seeding, and mulching, large quantities of sediment and associated chemicals may be washed into surface waters prior to plant establishment.

1. Effects on erosion and the movement of sediment and soluble and sediment-attached substances carried by runoff.
2. Filtering effect of vegetation on movement of sediment and dissolved and sediment-attached substance.
3. Short-term and construction-related effects on downstream water courses.
4. Potential for earth moving to uncover or redistribute toxic materials and effect on water or vegetation.
5. Effects on the use and management of nutrients and pesticides and resulting effects on surface and ground water quality.
6. Effects on the visual quality of downstream water resources.

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washed into surface waters or leached into ground water.

7. Excessive fertilizer applications can increase the amount of nutrients leached into ground water.

PLANS AND SPECIFICATIONS

Plans and specifications are to be prepared for each field or treatment area and include species of grasses, legumes, shrubs, and trees; methods and rates of planting; fertilizer and lime requirements; planting site preparation; time of planting; mulching; and irrigation.

Specify wheat straw rather than barley straw where volunteer growth is not desirable.

When straw mulch cannot be anchored by rollers or crimping equipment, use tackified straw planting. Use caution on decomposed granitic soils since some react adversely to mulch being anchored.

The acceptable time period for obtaining woody cuttings from host plants can be listed on the Practice Requirements sheet.

Specify the best window of time for planting at each site. At higher elevations, this might be August 15 to September 15 to obtain enough growth after the first rain before it gets too cold. September 15 to October 15 is used in some lower elevation areas and October 15 to November 15 in other areas. Wheat and barley can be successfully planted in November and December in some areas. Use local knowledge of the rainfall pattern, temperature, wind conditions, and growth characteristics of the species being planted to determine the window of time for planting.

Identify the water source, method of irrigation, and irrigation water management.

Show the type of fence to use, spacing between fences, and direction of fences and windbreaks on the drawings.

Identify the kind of mulch that will be used, plus the amount and method of anchoring.

Identify the fertilizer to use, application rate, method of applying fertilizer, and timing.

Provide for crowd control, including animals and vehicles.

OPERATION AND MAINTENANCE

Maintenance needed for this practice includes replanting areas with less than 60 percent vegetative cover, periodic fertilizer applications, control of noxious weeds, replacing dead trees and shrubs, periodic inspections of the treatment area, and control of pest infestations.

Equipment will be operated in a safe manner and underground utilities marked before work begins.

Plans must include provisions for excluding people, livestock, and vehicular traffic during and following establishment of vegetative plantings. Recreational use of the planted area must be controlled as necessary to avoid damaging the vegetation.

Long-term provision for maintenance will be needed following the initial planting. Blowouts that require replanting commonly occur during initial establishment. Also, more enduring plants will need to be added after initial stabilization. Occasional applications of nitrogen fertilizer will be required to maintain dense vigorous grass cover.