

NATURAL RESOURCES CONSERVATION SERVICE
CONSERVATION PRACTICE STANDARD

SOIL SALINITY MANAGEMENT – NONIRRIGATED

(Acre)
Code 571

DEFINITION

Management of land, water and plants to control subsurface soil water movement and to minimize accumulations of salts on the soil surface and in the root zone of nonirrigated saline seep areas.

PURPOSE

To promote desired plant growth in nonirrigated saline seep areas.

CONDITIONS WHERE PRACTICE APPLIES

This practice applies to nonirrigated land where a combination of factors such as topography, soils, geology, precipitation, vegetation, land use and cultural/structural practices can increase the extent and soluble salt concentrations of saline seep areas.

CRITERIA

Use of fertilizers, pesticides and/or other chemicals and soil amendments shall not compromise the intended purpose.

A Nonirrigated Soil Salinity Management Plan will be developed to document the extent and planned management of recharge and saline seep areas. Required Plan components are listed in the Plans and Specifications section of this Standard.

Components addressed in NRCS standards, shall meet design and construction criteria for that particular component. Criteria for design of engineering components not addressed in NRCS practice standards shall be consistent with sound engineering practices.

Additional Criteria Specific To Recharge Area Management

Recharge areas will be delineated in the Management Plan.

Plant and/or maintain adapted high water use vegetation in recharge areas to utilize soil water, minimize infiltration and decrease subsurface soil water movement to saline seep areas.

Where practicable, divert run-on and/or install surface and/or subsurface drainage to minimize infiltration and decrease soil water in recharge areas.

Additional Criteria Specific To Saline Seep Management

Saline seep areas will be delineated in the Management Plan.

Establish adapted vegetation in reclaimed saline seep areas after water tables have been lowered sufficiently to prevent capillary movement of water and salts into the root zone and to the soil surface.

CONSIDERATIONS

Eliminate fallow periods in recharge areas to increase utilization of soil water and to decrease infiltration.

Locate snow fences, windbreaks, vegetative filter strips and other structures that may accumulate rain and snow away from recharge areas.

Seal the bottoms of constructed ponds or dugouts to minimize subsurface soil water movement to saline seep areas.

Install underground outlets or surface waterways to drain storage terraces and minimize infiltration.

Plug leaky artesian wells if they contribute to subsurface water flows.

Roadways that cross natural drainageways can impede surface water flows and increase infiltration. Install or improve culverts to minimize blockage of surface water flows.

Plant cover or green manure crops in recharge areas to utilize excess soil water if the planned crop fails due to conditions such as poor stand establishment, hailstorms, winterkill, disease or insect damage.

Plant deep-rooted trees or shrubs in the recharge area to utilize excess soil water.

Apply practices in the reclaimed saline seep area that will help increase infiltration and leaching.

Cultural Resources Considerations

NRCS's objective is to avoid any effect to cultural resources and protect them in their original location. Determine if installation of this practice will have any effect on any cultural resources.

Document any specific considerations for cultural resources in the design docket and the Practice Requirements worksheet.

GM 420, Part 401, the California Environmental Handbook and the California Environmental Assessment Worksheet provide guidance on how the NRCS must account for cultural resources. The Field Office Technical Guide, Section II contains general information, with Web sites for additional information.

Endangered Species Considerations

Determine if installation of this practice, along with any others proposed, will have an 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 that 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 U.S. 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.

PLANS AND SPECIFICATIONS

Plans and specifications for the implementation and operation of this practice shall be prepared for each field or treatment unit according to the Criteria, and Operation and Maintenance sections included in this Standard.

Plans and Specifications shall be recorded using approved specification sheets, job sheets, narrative statements in the conservation plan and/or other acceptable forms of documentation.

Nonirrigated Soil Salinity Management Plan

Plans for Nonirrigated Soil Salinity Management shall include the following components:

1. An Onsite Investigation Report;
2. Conservation practices and specifications to be implemented in recharge areas to increase soil water utilization and decrease subsurface soil water movement to the saline seep areas;
3. Conservation practices and specifications to be implemented to reclaim saline seep areas after water table elevations have been lowered sufficiently to prevent capillary movement of water and salts into the root zone and to the soil surface; and,
4. Monitoring activities that may be needed to evaluate practice implementation and effectiveness.

Onsite Investigation Report – An onsite investigation will be conducted to identify existing field conditions, delineate recharge and saline seep areas, and to gather supporting data for development of the Nonirrigated Soil Salinity Management Plan.

The Onsite Investigation Report will include the following information for recharge and saline seep areas: location maps, including field numbers and measured acres; groundwater elevations; soil tests to evaluate fertility, pH, electrical conductivity (EC), free lime (calcium carbonate), and sodium adsorption ratio (SAR); topographic, soils and geologic maps; and historic photographs and/or cropping and yield histories that document saline seep development and extent.

Reclamation of saline seep areas with SAR values of 13 and greater (saline/sodic soils) may require amendment applications, as determined by soil testing, to replace adsorbed sodium with soluble calcium.

Water Quantity

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

Water Quality

1. Potential for transfer of salinity conditions to another location where surface or subsurface drains are used.
2. Effects of erosion and the movement of sediment, pathogens, and soluble and sediment-attached substances, including salts which could be carried by runoff.

OPERATION AND MAINTENANCE

The following actions shall be identified in the plan and carried out to ensure that this practice functions as intended throughout its expected life.

Identify any required items needed to assist in stand establishment such as mowing, flash grazing and/or herbicides to control weeds. Address insect and disease control needs where they are likely to create establishment problems.

Any necessary replanting due to drought, insects or other uncontrollable events that prevented adequate stand establishment should be addressed as soon as possible. Replanting activities may vary from complete re-establishment to overseeding or spot replanting.

REFERENCES

Halvorson, Ardell D. 1990. Management of dryland saline seeps. p. 372-392. *In* Kenneth K Tanji (ed.) Agricultural salinity assessment and management. ASCE, New York, N.Y.