

NATURAL RESOURCES CONSERVATION SERVICE  
CONSERVATION PRACTICE STANDARD

**WETLAND RESTORATION**

(Acre)  
**CODE 657**

**DEFINITION**

The rehabilitation of a drained, converted or degraded wetland where the soils, hydrology, vegetative community, and biological habitat are returned to the natural condition to the extent practicable.

**Scope**

This practice applies to structural and nonstructural facilities needed to restore wetlands to their original state. Wetland restoration practices may include those measures necessary to mimic natural landscape features that may not have otherwise been present.

**PURPOSES**

To reestablish wetlands for the benefit of wildlife, flood protection, sediment abatement, groundwater recharge, aesthetics and the improvement of water quality.

**CONDITIONS WHERE PRACTICE APPLIES**

This practice applies to sites that were natural wetlands that were drained, converted, degraded or manipulated to the extent that wetland functions and values have been removed or lessened. Site selection will include areas having hydric soils with a good probability of recreating natural hydrology from flooding, ponding or saturation of the soil surface. Sites requiring pumped, piped or artificially diverted water in order to meet the hydrology criteria are not eligible.

If the presence of hazardous waste materials in the sediment or fill is suspected, soil samples will be collected and analyzed for the presence of hazardous waste as defined by local, state, or federal authorities. Sites containing hazardous waste will not be restored under this standard.

This practice does not apply to: a constructed wetland (656) intended to treat point and non-point sources of water pollution; wetland enhancement (659) intended to rehabilitate or improve the functions of an existing wetland beyond original conditions; or wetland creation (658) for creating a wetland on a site which historically was not a wetland or was formally a

wetland but will be replaced with a wetland type which did not occur naturally on the site.

**CRITERIA**

**General Criteria**

Upon completion of the restoration, the site will meet the current NRCS wetland criteria for soil, hydrology and vegetation.

The landowner shall obtain all necessary local, state and federal permits that apply before restoration begins.

Restoration of hydrology will not create an adverse impact on adjacent properties, structures or public utilities.

Water rights associated with increased flows to or storage of water on the restored area are assured prior to restoration.

Perennial herbaceous buffers should be established on associated uplands to further reduce the transportation of sediments and sediment-attached substances carried by runoff.

The soil, hydrology and vegetative characteristics existing on the site and the contributing watershed shall be documented before restoration of the site begins.

**Criteria for Hydric Soil Conditions**

Restoration sites will be located on hydric soils.

If the hydric soil is covered by fill, sediment, spoil, or other depositional material, the material covering the hydric soil shall be removed only to the surface of the buried (or original) hydric soil.

Design considerations will include the reestablishment of the original soil microtopography through shaping and grading of the land surface. It may be necessary to reference USGS topographic maps and older aerial photographs to determine extent, type and location of historical wetland areas.

### **Criteria for Hydrology Restoration**

The hydrology of the site is defined as the rate, path, and timing of inflow and outflow; duration, frequency and depth of flooding, ponding and saturation.

The maximum hydrology and the overall hydraulic variability of the restored site will approximate the conditions that existed prior to alteration.

The standards and specifications for Dike (356) and Structure for Water Control (587), Land Grading (744) will be used as appropriate. Refer to the Engineering Field Handbook, Chapter 13, "Wetland Restoration, Enhancement, and Creation," and Chapter 6, "Structures" for additional design information. Existing drainage systems will be utilized, removed, or modified as needed to achieve the intended purpose.

### **Criteria for Vegetation Restoration**

The vegetation shall be restored as close to the original natural (native) plant community as the restored site conditions will allow. Determination of the original plant community's species and percent composition shall be based upon reference wetlands of the type being restored or other suitable technical reference.

Plantings, seeding, or other types of vegetative establishment will be comprised of native species that occur on the wetland type being restored.

Preference will be given to native wetland plants containing localized genetic material. Plant materials collected or grown from material collected within a 200-mile radius of the site is considered local.

In soils where seed banks for selected species exist, or where natural colonization of selected native species (identified from reference wetlands) will dominate within 5 years, then natural regeneration can be allowed. Refer to the Vegetative Guide for approved species lists, planting rates, Vegetative Soil Groups and MLRA information for detailed planting recommendations.

Adequate substrate material and site preparation necessary for proper establishment of the selected plant species shall be included in the seeding/planting recommendation.

On sites which were predominately herbaceous vegetation prior to modification and where planting is necessary, the minimum number of native species to be established shall be based upon the number of  
NRCS, CA  
July, 2000

ecological sites present. Sites restored to only one ecological site shall be planted to a minimum of 2 species adapted to the site. Sites with 2 or more ecological sites (i.e., seasonal wetland, semi-permanent marsh, woody riparian, tidal wetlands, etc.), shall be established to a minimum of 1 species per ecological site.

## **CONSIDERATIONS**

### **Threatened & Endangered Species**

Where the potential exists, efforts should be made to emphasize the restoration of habitat for listed and proposed listed species as well as species of concern. Flexibility for this standard allows for modifications in the extent and type of wetland components, i.e. shallow water areas, mudflats, upland nesting habitat, semi-permanent wetlands and the establishment of tree and shrub plant communities, in order to emphasize habitat for targeted species. Reference the California Natural Diversity Database, State and Federal wildlife agencies and local resource inventory information for species lists and habitat needs.

### **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.

### **Habitat Diversity**

Effort will be made to maximize habitat diversity by creating various water depths and associated uplands within the restored area. In areas where woody vegetation was present in the climax plant community, restoration will include, to the extent practicable, reestablishment of native woody species similar to the types and composition that previously existed.

### **Water Management**

Water management capabilities, including the ability to drain water from the wetland area, should be provided for long-term maintenance considerations when control of emergent wetland vegetation is a concern.

### **Water Quantity**

1. Consider effect of volumes and rates of runoff, infiltration, evaporation, and transpiration on the water budget.
2. Evaluate the potential for a change in rates of plant growth and transpiration because of changes in the volume of available soil water.
3. Consider effects on downstream flows or aquifers that would affect other water uses or users.
4. Consider effects on the rate of volume of downstream flow to minimize or prohibit environmental, social or economic effects.

### **Water Quality**

1. Consider effects on movement of sediment and soluble and sediment attached substances carried by runoff.

2. Consider effects on movement of dissolved substances to ground water to downstream surface waters.

Consider effects on short-term changes, construction, and maintenance related activities on the quality of water resources.

Consider effects on temperature of water resources to prevent undesired effects on aquatic and wildlife communities.

Consider effects on wetlands or water-related resources, wildlife habitats that would be associated with the practice.

Consider effects on the visual quality of water resources.

### **PLANS AND SPECIFICATIONS**

Plans and specifications for installing measures for wetland restoration shall be in keeping with this standard and shall describe the requirements for applying the practice to achieve its intended purposes.

A NRCS Biologist, prior to the application of this practice shall review plans, drawings and site specifications.

### **OPERATION AND MAINTENANCE**

An operation and maintenance plan must be prepared for use by the owner or other responsible person for operating this practice, prior to the application of this practice. The plan should provide specific instructions for operating and maintaining the system to insure that it functions properly. It should also provide for periodic inspections and prompt repair or replacement of damaged components.