NATURAL RESOURCES CONSERVATION SERVICE

CONSERVATION PRACTICE STANDARD

WETLAND RESTORATION

(acre)

CODE 657

DEFINITION

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

PURPOSE

To restore hydric soil conditions, hydrologic conditions, hydrophytic plant communities, topographic features and wetland functions that occurred on the disturbed wetland site prior to modification to the extent practicable.

CONDITIONS WHERE PRACTICE APPLIES

This practice applies only to natural wetland sites that contain hydric soil and where the hydrology, vegetation, topography have been previously degraded.

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

This practice is applicable only if natural hydrologic conditions can be approximated by modifying drainage and/or artificial flooding of a duration and frequency similar to natural conditions.

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 using this standard.

This practice does not apply to Oklahoma Conservation Practice Standards Constructed Wetland (656) intended to treat point and non-point sources of water pollution; Wetland Enhancement (659) where specific functions and/or values are enhanced beyond original conditions; or Wetland Creation (658) for creating a wetland on a site location which historically was not a wetland.

CRITERIA

General Criteria

The landuser shall obtain necessary local, state, and federal permits that apply before restoration.

Any requirements for water rights will be assured prior to restoration.

The design and installation will insure that offsite impacts do not occur on neighboring lands without first obtaining easements or permits.

Establish vegetative buffers on surrounding lands to reduce the movement of sediment and soluble and sediment-attached substances carried by runoff.

Document the soil, hydrology and vegetative characteristics existing on the site before restoration efforts begin.

After restoration is completed, the site will meet the soil, hydrology, and vegetation criteria for wetland as defined in the National Food Security Act Manual.

NRCS, OK
April 2004

Criteria for Hydric Soil Conditions

Restoration sites will be located on hydric soils or on soils that met hydric soil criteria before being modified.

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.

Criteria for Hydrology Restoration

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

The restored hydrologic conditions of the site will approximate the conditions that existed before the wetland was modified.

An adequate water supply in the form of rainfall, runoff, or ground water should be available to meet the hydrologic condition of the wetland before modification.

Existing drainage systems, diversions, or other structures affecting hydrology of the site will be utilized, removed, or modified as needed to achieve the intended purpose.

The Oklahoma Conservation Practice Standards Structure for Water Control (587), Diversion (362), and Grade Stabilization Structure (410) will be used as appropriate. Refer to the Engineering Field Handbook, Chapter 6, "Structures; "Chapter 13, "Wetland Restoration, Enhancement and Creation," and, "Oklahoma Engineering Forms and Standard Drawings Handbook" (Also available on the Oklahoma NRCS website) for additional design information.

Criteria for Vegetation Restoration

The vegetation shall be restored as close to the original natural 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 suitable technical reference.

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

Preference shall be given to native wetland plants with localized genetic material.

In soils where seed banks realistically exist, or where natural colonization of selected native species will dominate within 5 years, natural regeneration can be allowed.

Required soil conditions and site preparations will be addressed in the specifications to insure proper establishment of selected plant species.

Herbaceous vegetation may be established by a variety of methods including: mechanical or aerial seeding, topsoiling, organic mat placement, wetland sod, vegetative sprigs, wetland hay, or etc., over the entire site or a portion of the site and at densities and depths appropriate.

Plantings made to restore herbaceous wetland vegetation will include a minimum of two plant species on each ecological site (i.e., wet meadow, shallow marsh).

Plantings made to restore forested wetlands will consist of bare-rooted or containerized seedlings and include a minimum of three tree or shrub species on each ecological site (i.e., low flat, ridges, etc.) Tree plantings will be made in accordance with the Oklahoma Conservation Practice Standard Tree/Shrub Establishment (612).

Restoration of vegetation on adjacent wetland buffers will be accomplished with native vegetation adapted to the site. Herbaceous plantings will consist of native grasses, forbs, and legumes planted in accordance with the Oklahoma Conservation Practice Standard Range Planting (550). Tree plantings on buffers will be established in accordance with the Oklahoma Conservation Practice Standard Tree/Shrub Establishment (612).

Criteria for Restoration of Topographic Features

Topographic features (micro and macro) that have been modified by activities such as land clearing, land leveling, and farming practices, should be restored to the extent practical.

The number, size, and location of islands, swales, and other topographic features should be based on a study of the individual site conditions.

Use excavated swales and depressions to provide variations in water depth and duration that will improve habitat for wetland plants and animals.

Macro features such as islands, swells, and depressions, should be installed in accordance with designs contained in "Oklahoma Engineering Forms and Standard Drawings Handbook" (also available on the NRCS website).

Construct a "Deep Water Habitat Island "as a beaver management tool where these animals are expected to cause damage. See standard drawings in "Oklahoma Engineering Forms and Standard Drawings" (which is also available on the Oklahoma NRCS website).

Micro features should be installed by disking, plowing, or scraping to create ridges, furrows, and other uneven surface conditions.

Criteria for Wetland Functions

A functional assessment of existing site conditions shall be performed on the site prior to restoration.

Restoration goals and objectives shall include targeted natural wetland functions for the wetland type and the site location as determined by the functional assessment and reference site data.

A post-project assessment will be performed after an adequate period to assess the success of the restoration. Periodic monitoring will be conducted for the life of the project.

CONSIDERATIONS

Consider the use of buffer zones around the perimeter of restored wetlands to provide water quality benefits and improved habitat diversity.

Consider effect of volumes and rates of runoff, infiltration, evaporation, and transpiration on the water budget.

Evaluate the potential for a change in rates of plant growth and transpiration because of changes in the volume of available soil water.

Consider effects on offsite water flows, flooding, and aquifers that would affect other water uses or users.

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

Consider sites adjacent to existing wetlands as the highest priorities for restoration in an effort to increase the size, complexity, and diversity of wetland systems.

Consider linking wetlands by corridors wherever appropriate in order to enhance wetland use and colonization by the flora and fauna.

Consider the effects of varying water levels in response to potential climatic events such as wet or dry periods.

Consider changes in salt movement / concentrations in the soil resulting from hydrologic alterations.

The nutrient and pesticide tolerance of the plant species planned should be considered where known nutrient and pesticide contamination exists.

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

For discharge wetlands, consider upslope water/groundwater source availability.

PLANS AND SPECIFICATIONS

Specifications for restoration of soils, hydrology, vegetation, topographic features and wetland functions shall be prepared for each site. Specifications shall be recorded using approved specifications sheets, job sheets, narrative statements in the conservation plan, contracts, or other documentation.

Requirements for the operation and maintenance of the practice shall be incorporated into site specifications.

Plans and specifications will be reviewed by the appropriate NRCS Engineering and Ecological Sciences Staff to insure that the design specifications, management goals, and wetland functions and values are achieved.

OPERATION AND MAINTENANCE

The following actions shall be carried out to insure that this practice functions as intended throughout its expected life. These actions include normal repetitive activities in the application and use of the practice (operation), and repair and upkeep of the practice (maintenance):

Any use of fertilizers, mechanical treatments, prescribed burning, pesticides and other chemicals to assure the wetland restoration function, shall not compromise the intended purpose;

Biological control of undesirable plant species and pests (e.g., using predator or parasitic species) shall be implemented where available and feasible;

Timing and level setting of water control structures required for the establishment of desired hydrologic conditions or for management of vegetation;

Inspection schedule for embankments and structures for damage assessment;

Depth of sediment accumulation to be allowed before removal is required;

Management needed to maintain vegetation, including control of unwanted vegetation;

Haying and livestock grazing plans will be developed so as to allow the establishment, development, and management of wetland and associated upland vegetation.