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, 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 sites with hydric soil which were natural wetlands that have been previously degraded hydrologically and/or vegetatively.

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 under this standard.

This practice does not apply to Conservation Practice Standards 656, Constructed Wetland, intended to treat point and non-point sources of water pollution; 659, Wetland Enhancement, intended to rehabilitate a degraded wetland where specific functions and/or values are enhanced beyond original conditions; or Conservation Practice Standard 658, Wetland Creation, for creating a wetland on a site location which historically was not a wetland or was formerly a wetland but will be replaced with a wetland type not naturally occurring on the site.

CRITERIA

General Criteria

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

Water rights are assured prior to restoration if required.

Establishing vegetative buffers on adjacent cropland to reduce the movement of sediment substances carried by runoff.

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

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.

Reestablish an approximation of the original soil microtopography.

Criteria for Hydrology Restoration

A permanent water supply should approximate the original conditions of the wetlands. The

maximum hydrology and the overall hydraulic variability of the restored site will approximate the conditions that existed before alteration, e.g., dynamic and static water levels, soil saturation. This will be documented by the use of the Engineering Field Handbook, Chapter 19, "Hydrology Tools."

Conservation Practice Standards and Construction Specifications 356, Dike, and 587, Structure for Water Control, 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.

On soil regimes (Osage, as an example) where dams and/or dike are cost prohibitive or not feasible, depressional areas may be used to provide storage to meet the criteria in the Engineering Field Manual. Depressions can be constructed 3 to 12 inches deep on 15 to 25 percent of the total area. Excavation material can be used as fill or spread evenly outside the excavated area.

Criteria for Vegetation Restoration

The vegetation shall be restored to approximate the original natural plant community as conditions 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, seeding, 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. Adequate substrate material and site preparation necessary for proper establishment of the selected plant species shall be included in the design.

On sites which were predominantly herbaceous vegetation prior to modification and planting and/or seeding is necessary, the minimum number of native species to be established shall be based upon the number of ecological sites present. Sites restored to only one ecological site shall be established with at least two species adapted to the site. Sites with two or more ecological sites (i.e., wet meadow, shallow marsh, or slough eco-sites, etc.) shall be established with at least one native species on each ecological site.

Herbaceous vegetation may be established by a variety of methods including: seeding, planting, placement of wetland topsoil containing propagules and seed, organic mats, etc., distributed over the entire site, or a portion of the site. Where desired plant species are present on site or adjacent areas in sufficient quantity, natural or adjacent areas in sufficient quantity, natural colonization can be considered as an establishment option. Specific guidelines that consider soil, seed source, and species will be developed by the states.

Forested wetland plantings and/or seeding will include a minimum of three tree or shrub species on each ecological site (i.e., low flat, bottom ridge eco-sites, etc.), where appropriate. Tree (and shrub) planting will follow the criteria of Conservation Practice Standard 612, Tree Planting.

Seed planting rates and site preparation will meet the criteria of Conservation Practice Standard 652, Woodland Direct Seeding.

Criteria for Wetland Functions

A functional assessment (Hydrogeomorphic Approach or similar method) 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 if the restoration.

CONSIDERATIONS

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 downstream flows or aquifers that would affect other water uses or users.

Consider effects on wetlands and water-related resources and wildlife habitats that would be associated with the practice. Nesting habitat is an example.

Consider as a high priority those sites adjacent to existing wetlands as they increase wetland system complexity and diversity, decrease habitat fragmentation, and ensure colonization of the site by wetland flora and fauna.

Consider linking wetlands by corridors wherever appropriate to enhance the wetland's 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.

Consider the effects on existing drainage above and below the target site and the effects of adjacent levees.

Consider the invasive or nuisance potential of selected plant species on the aquatic systems.

Consider the effect of the constructed wetland on possible pest problems, i.e. mosquitoes.

PLANS AND SPECIFICATIONS

Specifications for this practice shall be prepared for each site. Specifications shall be recorded using approved specification sheets, job sheets, narrative statements in the conservation plan, or other documentation and include design documentation for minimum requirements. Requirements for the operation and maintenance of the practice shall be incorporated into site specifications.

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. The plans will restrict grazing or haying during the nesting season.