

**NATURAL RESOURCES CONSERVATION SERVICE
CONSERVATION PRACTICE STANDARD**

WETLAND ENHANCEMENT

(Ac.)

CODE 659

DEFINITION

The rehabilitation or re-establishment of a degraded wetland, and/or the modification of an existing wetland, which augments specific site conditions for specific species or purposes; possibly at the expense of other functions and other species

PURPOSE

To provide specific wetland conditions to favor specific wetland functions and targeted species by:

- hydrologic enhancement (depth duration and season of inundation, and/or duration and season of soil saturation).
- vegetative enhancement (including the removal of undesired species, and/or seeding or planting of desired species).

CONDITIONS WHERE PRACTICE APPLIES

This practice applies on any degraded or non-degraded existing wetland where the objective is specifically to enhance selected wetland functions.

This practice does not apply to the following where the intention is to:

- treat point and non-point sources of water pollution (Constructed Wetland 656);
- rehabilitate a degraded wetland where the soils, hydrology, vegetative community, and biological habitat are returned to original conditions (Wetland Restoration 657);
- create a wetland on a site that historically

was not a wetland (Wetland Creation 658).

CRITERIA

General Criteria Applicable to All Purposes

The purpose, goals and objectives of the enhancement shall be clearly outlined, including the soils, hydrology and vegetation criteria that are to be met and are appropriate for the site and the project purposes.

The impact of this practice on existing non-degraded wetland functions and/or values will be evaluated.

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

Where known nutrient and pesticide contamination exists, species selected will be tolerant of these conditions.

Sites containing hazardous material shall be cleaned prior to the establishment of this practice. Appropriate actions to clean sites suspected of containing hazardous wastes shall be based on soil tests.

Invasive species, federal/state listed noxious plant species, and nuisance species (e.g., those whose presence or overpopulation jeopardize the practice) shall be controlled on the site. The establishment and/or use of non-native plant species shall be discouraged.

Any use of fertilizers, mechanical treatments, prescribed burning, pesticides and other chemicals shall assure that the intended purpose of the wetland enhancement shall not be compromised.

Conservation practice standards are reviewed periodically and updated if needed. To obtain the current version of this standard, contact your Natural Resources Conservation Service [State Office](#) or visit the [electronic Field Office Technical Guide](#).

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Criteria for Hydrologic Enhancement

The hydrology of the site (defined as the rate and timing of inflow and outflow, source, duration, frequency, and depth of flooding, ponding or saturation) shall meet the project objectives. An adequate source of water must be available to meet hydrology designs.

Timing and level setting of water control structures is required for the establishment of desired hydrologic conditions for management of vegetation and for optimum wildlife and fish use.

Existing drainage systems will be utilized, removed or modified as needed to achieve the intended purpose.

Criteria for Vegetative Enhancement

Establish native hydrophytic vegetation typical for the wetland type(s) being established. Each state will develop specific guidelines that consider soil, seed sources and species.

Where natural colonization of selected species will dominate within 5 years, natural regeneration can be left to occur.

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

If the targeted hydrophytic vegetation is predominantly herbaceous, several species adapted to the site shall be established. Herbaceous vegetation may be established by a variety of methods including: mechanical or aerial seeding, topsoiling, organic mats, etc., over the entire site, or a portion of the site and at densities and depths appropriate.

For forested wetland establishment, where six or more native species are adapted to the site, reforestation shall include at least six species.

Seeding rates shall be based upon percentage of pure live seed within 6 months of planting.

CONSIDERATIONS

Dike (356), Wetland Restoration (657) and Structure for Water Control (587) may be used to enhance the performance of this practice.

Consider manipulation of water levels to control unwanted vegetation.

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Consider existing wetland functions and/or values that may be adversely impacted.

Consider effect enhancement will have on disease vectors such as mosquitoes.

The inclusion of microtopography can achieve changes in depth and duration of flooding without changing extent of surface area.

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

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

Consider effects on fish and wildlife habitats that would be associated with the practice.

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

Establishing vegetative buffers on surrounding uplands can reduce sediment and soluble and sediment-attached contaminant delivery by runoff and/or wind.

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

Soil disturbance associated with the installation of this practice may increase the potential for invasion by unwanted species.

On sites where woody vegetation will dominate, consider adding 1 to 2 dead snags, tree trunks or logs per acre to provide structure and cover for wildlife and a carbon source for food chain support.

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

When determining which species to plant, consider microtopography and the different hydrology levels.

Consider the effects that location, installation and management may have on subsurface cultural resources.

Consider the effect of water control structures on the ability of fish to move in and out of the wetland.

Consider the effects that water level draw downs will have on the mortality of aquatic species such as turtles.

Consider timing of water control to mimic the natural hydrological regime of the area, further enhancing the habitat for aquatic species.

Consider design modifications that will limit potential negative impacts of wetland plants and animals on the project.

PLANS AND SPECIFICATIONS

Specifications for this practice shall be prepared for each site. Specifications shall be recorded using approved specifications sheets, job sheets, narrative statements in the conservation plan, or other documentation. Requirements for the operation and maintenance of the practice shall be incorporated into site specifications. Plans and specifications should be reviewed by staff with appropriate training in design and implementation of wetland enhancement.

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).

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

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 or grazing shall be used as appropriate to manage vegetation. Minimize disturbance to ground nesting species, especially during the primary nesting season.

REFERENCES

- Executive Order 13112, Invasive Species, February 3, 1999. Federal Register: vol.64, no.25. Feb. 8, 1999.
- Hall, C.D. and F.J. Cuthbert. 2000. Impact of a controlled wetland drawdown on Blanding's Turtles in Minnesota. *Chelonian Conservation Biology*. Vol. 3, No. 4, pp. 643-649.
- Kingsbury, Bruce and Joanne Gibson. 2002. *Habitat Management Guidelines for Reptiles and Amphibians of the Midwest*. Partners for Amphibian and Reptile Conservation. Ft. Wayne, IN. 57 pp.
- Maschhoff, Justin T. and James H. Dooley. 2001. Functional requirements and design parameters for restocking coarse woody features in restored wetlands. ASAE Meeting Presentation. Paper No. 012059.
- USDA, NRCS, 2003. ECS 190-15: Wetland Restoration, Enhancement, Management & Monitoring. 425 pp.
- USDA, NRCS. Wetland Restoration, Enhancement, or Creation, Engineering Field Handbook Chapter 13, Part 650, pp. 3, 24, 77, 78.