ILLINOIS URBAN MANUAL
PRACTICE STANDARD

WETLAND ENHANCEMENT
(Ac.)

CODE 998

Source: Hey and Associates, Inc.

DEFINITION

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

PURPOSE

To provide conditions to favor or improve specific wetland functions and targeted species. This could be accomplished by:

1. Hydrologic enhancement (depth, duration and season of inundation and/or duration and season of soil saturation)
2. 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 existing wetland where the objective is to enhance selected wetland functions.

For a constructed wetland intended to treat point and non-point sources of water pollution use practice standard **800 BIORETENTION FACILITY**.

To rehabilitate a degraded or drained wetland where the soils, hydrology, vegetative community and biological habitat are returned to original conditions use practice standard **999 WETLAND RESTORATION**.

To create a wetland on a site which historically was *not* a wetland use practice standard **997 WETLAND CREATION**.

CRITERIA

General Criteria

The purpose, goals and objectives of the wetland enhancement shall be clearly described, 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 wetland functions shall be evaluated. The practice will minimize any adverse impacts to wetland functions not targeted for enhancement.

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

Disturbance to ground nesting wildlife species shall be minimized

Sites suspected of containing hazardous waste shall be tested to identify appropriate remedial measures. Sites containing hazardous material shall be cleaned up to appropriate environmental standards that protect ecological resources prior to the installation of this practice. The nutrient and pesticide tolerance of the species planned shall be considered where known nutrient or pesticide contamination exists.

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. This will include mowing, cutting, pulling, herbicide application or the manipulation of water levels to control unwanted vegetation. Attention shall also be given to adjacent or nearby propagule sources that may compromise the success of the practice.

Any invasive species control measures used must minimize “collateral damage” to desired or non-target species and wildlife.

Criteria for Hydrologic Enhancement

The hydrology of the site (defined as the rate and timing of water 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 hydrologic design parameters.

If water control structures are required, the water level and timing of operation must be specified to obtain desired hydrologic conditions for vegetation establishment, management and optimal use by fish and wildlife.

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

Designs shall always ensure that the work associated with the wetland enhancement shall not adversely affect adjacent properties or other water users unless agreed to by signed written letter, easement or permit. Designs may need to include provisions for the by-pass flow of offsite drainage to avoid impacts to up-gradient landowners. All surface flows to be passed through the system shall first be conveyed through a vegetated buffer or other appropriate means of cleansing.

Wetlands shall not be enhanced by impounding perennial or intermittent streams, except where the functions that the existing stream provides are considered and the planned wetland enhancement must not have an overall negative impact on the functions of the existing stream ecosystem.

A natural water supply shall be used to enhance the site's hydrology that will support the desired wetland type, however, this water source shall not be diverted from other wetland resources (*e.g*. prairie pothole wetland complexes or springs) and provisions must be made for its ongoing operation and maintenance.

Criteria for Vegetative Enhancement
Hydrophytic vegetation establishment shall be of native species typical for the wetland type(s) being created.

Preference shall be given to native wetland plant species of localized genetic stock. Plant materials collected or grown from material collected within a 100-mile radius from the site are considered local ecotypes unless otherwise specified by the project purpose or a land management or regulatory agency. If the desired species cannot be found within the 100 mile radius, then this can be expanded as needed to meet project goals. More conservative species may be more difficult to locate.

Adequate substrate material and site preparation necessary for proper establishment of the selected plant species shall be included in the design. Adequate substrate shall mean a soil suitable as a growth medium for the desire wetland vegetation in terms of organic content, permeability and soil texture.

Where planting and/or seeding is necessary, the minimum number of native species to be established shall be based upon the types of vegetative communities present and the vegetation type planned. To achieve floristic and habitat diversity and minimize the adverse effects of climate, disease and other limiting factors, many species adapted to the site shall be established in each vegetative community. Natural wetlands in the vicinity can be used as a reference for developing planting/seeding lists.

Herbaceous vegetation may be established by a variety of methods including: mechanical or aerial seeding, top-soiling, organic mats, hand seeding, live plugs, etc., over the entire site, or a portion of the site and at densities and depths appropriate to the desired native species.

Seeding rates shall be based upon percentage of pure live seed tested within 12 months of planting. Live plugs shall be used for species difficult to establish from seed, or if needed to meet desired vegetation growth goals. Rhizomes, root stock, and bulbs may also be used for some species. Most often a combination of methods is used for herbaceous/emergent wetland enhancements. The spacing of plugs and seeding rates are determined in part by the aggressiveness of the species being established, the time frame desired for full vegetative performance and depredation pressure. Planting or seeding too sparsely often leads to undesirable weedy growth. Seeding rates should consider the seed

size and be based on seed counts per unit area.

Tree (and shrub) planting will follow the criteria of practice standard **985 TREE AND SHRUB PLANTING**.

Trees will be planted on the contour to facilitate placing the appropriate species at the contour which will have the optimum depth and duration of inundation. Tree stocking rate or stem density shall be determined based on the type of community desired, size of stock, and expected mortality rate. Follow practice standard **985 TREE AND SHRUB PLANTING** for specification regarding the use of root pruned stock.

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

Where natural colonization of selected native species will dominate within 5 years, natural regeneration can be left to occur. Reforestation through natural regeneration may be used under the following conditions:

1. Areas that are within 200 feet of existing mature woodlands which contain adequate and desirable seed sources.
2. Areas that experience flooding of a frequency and duration that make plantings unlikely to succeed.
3. Depressional areas too wet to machine or hand plant.

CONSIDERATIONS

Both the present and future land use of the proposed wetland enhancement site and its surrounding area should be considered. Developments and other land use changes that may be initiated after the wetland enhancement is completed could adversely affect the practice by altering the hydrology or the water quality.

A permanent conservation easement (including measures for maintenance and monitoring) should be considered.

The inclusion of micro-topography can achieve changes in depth and duration of flooding without changing extent of surface area. When determining which species to plant, consider micro-topography and the different hydrology levels.

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 also the impact that water surface drawdowns will have on concentrating aquatic species such as turtles and fish into diminished pool areas resulting in increased mortality.

Where visual quality would be impacted by structures (*e.g.* outlet structures, dikes, etc.), consider using low profile structures, natural screening and or colors that minimize the aesthetic impact.

Link wetlands by corridors of native vegetation wherever appropriate to enhance the wetland's use and colonization by native flora and fauna. Consideration should be given to any regional green infrastructure plans or watershed plans.

Establish vegetative buffers on surrounding uplands, where appropriate, to reduce sediment and soluble and sediment-attached pollutants carried by runoff and/or wind. Buffers also provide refuge and nesting habitat for wildlife.

Adding artificial nesting structures that are appropriate for the region can increase utilization of these areas. 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.

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

Consider the effect wetland enhancement may have on disease vectors (e*.g.* mosquitoes) and methods to limit disease vectors (*e.g.* making the wetland accessible to vector predators, summer drawdowns, etc.).

Considerations for Water Control Structures

Manipulation of water levels may be used to control unwanted vegetation depending on the wetland type being enhanced. When determining which species to plant, consider microtopography and the different hydrology levels.

The ability of fish and other aquatic species to move in and out of the wetland may be affected by water control structures, which may be desirable or undesirable. Consideration should be given to whether the natural wetland type desired is typically a fishless system, or if there are aquatic invasive species that should be precluded from entering the wetland enhancement.

The use of water control structures to manage water depth and timing of inundation to mimic the hydrologic regime of a natural wetland in the area may further enhance the habitat for aquatic species.

Devices such as staff gauges and monitoring wells should be installed to enable measurement of the hydrology in the wetland enhancement to compare with project goals and objectives.

PLANS AND SPECIFICATIONS

Plans and specifications for wetland enhancement shall be in keeping with this standard and shall describe the requirements for applying the practice to achieve its intended purpose. All plans shall include installation, inspection and maintenance schedules with the responsible party identified.

At a minimum include the following items:

1. Species planting lists with appropriate seeding rates in ounces or pounds per acre of pure live seed based on specific seed sizes and the desired species density. Species shall be limited to those known to be available for a minimum of 3 years as local ecotype seed.
2. Appropriate engineering plans for measures to enhance the hydrology including any necessary grading plans or water

control structures (*e.g.* riser board control structures).
3. Utility plans disclosing locations of water control structures, inlets, outlets and any other subsurface utility lines.
4. Construction sequencing plan to keep steps of practice in the optimum order including a detailed sediment and erosion control plan.
5. Planting lists with installation details for any live herbaceous or woody plants installed to enhance vegetation.
6. Planting zone boundaries for various plant communities proposed for enhancement.
7. Herbivory protection measures.
8. Performance standards that can be used to determine project success.

If subsurface drainage systems are being modified or disabled, follow the Wetland Restoration (999) standard.

OPERATION AND MAINTENANCE

Any use of fertilizers, mechanical treatments, prescribed burning, pesticides and other chemicals shall assure that the intended purpose of the wetland creation will not be compromised. Any use of fertilizers, pesticides and other chemicals shall be applied only when necessary. Mechanical treatments and prescribed burning should be an integral component of any wetland enhancement project.

The depth of any accumulated sediment should be measured and the accumulations removed when the planned project objectives are jeopardized.

Management actions shall maintain native vegetation and control undesirable or invasive species. Biological control of undesirable plant species and pests (*e.g.* using predator or parasitic species) shall be implemented where available and feasible. Herbicide applications will be as specifically targeted to the control species as possible to minimize collateral damage. All herbicide applications shall be consistent with labeling.

The control of water depth and duration may be utilized to control unwanted vegetation. A clear process for determination of water level adjustments must be established as part of the plan and consistent with the project objectives. Responsibility for water level adjustments must be defined and understood by the parties involved.

For wildlife habitat purposes, haying and grazing, if justified as a necessary wildlife/wetland management tool for wetland enhancement, can be used for management of vegetation. If grazing is used, a Grazing Plan shall be developed. Disturbance to ground nesting species shall be minimized by controlling the timing of grazing activities. If grazing is contemplated, surveys may be necessary to determine what ground-nesting species are present.

An annual inspection schedule shall be established for embankments and structures for damage assessment.

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