

WETLAND CREATION

(Ac.)

CODE 997



Source: Hey and Associates, Inc.

DEFINITION

The creation of a wetland on a site that was not historically a wetland through the manipulation of the physical, chemical or biological characteristics present.

PURPOSE

To create wetland functions, values, habitat, diversity and capacity on a site where none previously existed.

CONDITIONS WHERE PRACTICE APPLIES

This practice applies to sites where no natural wetland occurred historically and which contain soils that are not hydric. This means creating wetland characteristics on land that was historically upland.

For a constructed wetland intended to treat point and non-point sources of water pollution use the practice standard [BIORETENTION FACILITY 800](#).

Wetland enhancements intended to rehabilitate a degraded wetland where specific functions and/or values are enhanced beyond original conditions shall use the practice standard [998 WETLAND ENHANCEMENT](#).

Where the intention is to rehabilitate or re-establish a wetland where the soils, hydrology, vegetative community and biological habitat are returned to approximate historic wetland conditions practice standard [999 WETLAND RESTORATION](#) shall be used.

CRITERIA

General Criteria

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

The soils, hydrology and vegetative characteristics existing on the site and the contributing watershed shall be

documented before wetland creation at the site begins.

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.

Disturbance to ground nesting wildlife species shall be minimized.

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 Soils

Created wetlands shall be located in landscape positions and soil types capable of supporting wetland functions and values. Soils must have low permeability (less than 0.6 inches per hour), a seasonal high water table or a compacted layer and/or core trench constructed to inhibit subsurface drainage and allow for maintenance of proper water levels.

Loosening or ripping of compacted soils, addition of organic matter or other soil preparation activities shall be accomplished where necessary to establish desired wetland vegetation.

Criteria for Hydrology

The site shall be designed to create hydrologic conditions (including the timing of inflow and outflow, duration, stage and frequency) that provide the desired wetland functions and values. See also practice standard [999 WETLAND RESTORATION](#).

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 optimum use by fish and wildlife.

Where applicable, water rights shall be assured prior to creation. Wetland micro- and macro-topography shall be created if necessary to achieve appropriate hydrologic conditions and diversity.

Designs shall always ensure that the work associated with the wetland creation 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.

A natural water supply shall be used to establish 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.

Engineering structures constructed for wetland creation shall mimic natural hydrologic conditions. Existing drainage systems will be utilized, removed or modified as needed to achieve the intended purpose. A clear management plan with objectives and responsible parties for adjusting water control structures shall be completed if adjustable structures are used.

Criteria for Vegetation

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

Preference shall be given to native wetland plants 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.

Where natural colonization of desired species will realistically dominate the site within 5 years, sites may be left to revegetate naturally. If a site has not become dominated by the targeted species within 5 years, active forms of revegetation shall be required.

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 desired 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.

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 establishment. 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.

Where the dominant vegetation will be forest or woodland community types, vegetation establishment will include a minimum of six woody species appropriate to the hydrologic regime being re-established.

Seed viability will be determined prior to planting. Tree (and shrub) planting will follow the criteria of the 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.

CONSIDERATIONS

Both the present and future land use of the proposed wetland creation site and its surrounding area should be considered. Developments and other land use changes that may be initiated after the wetland creation 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.

Consider micro-topography and hydroperiod when determining which species to plant.

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.

Nearby or adjacent existing wetland functions and/or values may be impacted by the practice. Consider effects on nearby or adjacent existing wetlands and water-related resources, including fish and wildlife habitats, which will be associated with the practice.

Consider the effect wetland creation 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.).

The wetland creation practice may affect volumes and rates of runoff, infiltration, evaporation and transpiration thus changing the water budget for the site. This should be considered in the design and planning. Also consider effects on downstream flows or aquifers that would affect other water uses or users.

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.

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

Consider micro-topography, hydrology and hydroperiod when determining which species of vegetation to plant.

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 creation.

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 creation to compare with project goals and objectives.

Consider also the impact that water surface drawdowns may 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.

PLANS AND SPECIFICATIONS

Plans and specifications for wetland creation shall be in keeping with this standard and shall describe the requirements for applying the practice to achieve its intended purpose for a specific site. 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 create 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 detailed sediment and erosion control plans.
5. Planting lists with installation details for any live herbaceous or woody plants installed.

6. Planting zone boundaries for various plant communities proposed for establishment.
7. Herbivory protection measures.
8. Performance standards that can be used to determine project success.

If subsurface drainage systems are being modified or disabled, see practice standard [999 WETLAND RESTORATION](#).

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 creation 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, 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 berms and structures for damage assessment. Management actions shall maintain desired vegetation and control unwanted vegetation.

REFERENCES

Admiraal, A.N., M.J. Morris, T.C. Brooks, J.W. Olson, and M.V. Miller. 1997. Illinois Wetland Restoration and Creation Guide. Illinois Natural History Survey Special Publication 19. 188 pp.

Eggers, S.D. and D. M. Reed. 1997. Wetland Plants and Plant Communities of Minnesota and Wisconsin. U.S. Army Corps of Engineers, St Paul District, St. Paul, MN 263 pp.

Executive order 13112, Invasive Species, February 3, 1999. Federal Register: Vol.64, No.25. Feb. 8, 1999.

Galatowitsch, S. M. and A. G. van Der Valk. 1998. Restoring Prairie Wetlands an Ecological Approach. Iowa State University Press, Ames IA. 246 pp.

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

Hurt, G.W. and V.W. Carlisle. 2001. Delineating Hydric Soils, in Wetland Soils – Genesis, Hydrology, Landscapes and Classification. Edited by J.L. Richardson and M.J Vepraskas. CRC Press, Boca Raton, FL pp. 183 – 206.

Kingsbury, B. and J. Gibson. 2002. Habitat Management Guidelines for Amphibians and Reptiles of the Midwest. Partners in Amphibian & Reptile Conservation, Ft Wayne IN, 57 pp.

Maschhoff, J. T. and J. H. Dooley. 2001. Functional Requirements and Design Parameters for Restocking Coarse Woody Features in Restored Wetlands, ASAE Meeting Presentation, Paper No: 012059.

Midwest Invasive Plant Network.
www.mipn.org

Mitsch, W.J. and J. G. Gosselink. Wetlands 4th edition. 2007. John Wiley and Sons Inc., Hoboken, NJ. 582 pp.

Northeast Illinois Invasive Plant Partnership. www.niipp.net

River to River Cooperative Weed Management Area.
<http://www.rtrcwma.org/>

Society of Wetland Scientists. 2009. Current Practices in Wetland Management for Mosquito Control.
http://www.sws.org/wetland_concerns/docs/SWS-MosquitoWhitePaperFinal.pdf

U.S. Army Corps of Engineers and U.S. Environmental Protection Agency. 2008. Compensatory Mitigation for Losses of Aquatic Resources; Final Rule. 40 CFR Part 230, 33 CFR Parts 325 and 332. Federal Register Volume 73, Number 70, April 10, 2008.

USDA, Natural Resources Conservation Service –Illinois. 2013. Illinois Field Office Technical Guide (FOTG)
<http://www.nrcs.usda.gov/wps/portal/nrcs/main/il/technical/>

USDA, Natural Resources Conservation Service. 2003. ECS 190-15 Wetland Restoration, Enhancement, Management & Monitoring. 425 pp.

USDA, Natural Resources Conservation Service. 2002. Field Indicators of Hydric Soils in the U.S., Version 5.0. G.W. Hurt, P.M. Whited and R.F. Pringle (eds.).

USDA, Natural Resources Conservation Service 2000. Illinois Biology Technical Note No. 20 “Using Micro and Macrotopography in Wetland Restoration”, 7 pp.

USDA, Natural Resources Conservation Service. Wetland Restoration, Enhancement, or Creation, Engineering Field Handbook Chapter 13, Part 650, pp. 3, 24, 77, 78.

USDA, Natural Resources Conservation Service, US Environmental Protection Agency, US Fish and Wildlife Service, and US Army Corps of Engineers Chicago District. 1997. Native Plant Guide for Streams and Stormwater Facilities in Northeastern Illinois. 174 pp.

Vepraskas, M.J. and S. W. Sprecher editors, 1997. Aquic Conditions and Hydric Soils: The Problem Soils. Soil Science Society of America Special Publication Number 50. SSSA, Inc. Madison, WI.

January 2014
urbst997.doc