

NATURAL RESOURCES CONSERVATION SERVICE  
CONSERVATION PRACTICE STANDARD

**WETLAND CREATION**

(Acre)

**CODE 658**



*Wetland creation site along edge of pond*

**DEFINITION**

The creation of a wetland on a site location that was historically non-wetland.

**PURPOSE**

To establish wetland hydrology, vegetation, and wildlife habitat functions on soils capable of supporting those functions.

**CONDITIONS WHERE PRACTICE APPLIES**

This practice applies only to sites where hydric soils do not exist and the objective is to establish specific wetland functions.

This practice does not apply to:

- The treatment of point and non-point sources of water pollution (Constructed Wetland – Code 656).
- The rehabilitation of a degraded wetland or the reestablishment of a former wetland so that soils, hydrology, vegetative community, and habitat are a close

approximation of the original natural condition and boundary that existed prior to the modification. (Wetland Restoration – Code 657).

- The rehabilitation of a degraded wetland, the reestablishment of a former wetland, or the modification of an existing wetland, where specific wetland functions are augmented beyond the original natural conditions; possibly at the expense of other functions. (Wetland Enhancement – Code 659).

**CRITERIA**

**General Criteria Applicable to All Purposes**

The purpose, goals, and objectives of the creation shall be clearly outlined, including the soils, hydrology, vegetation, and any fish and wildlife habitat criteria that are to be met for the site. Document this information in a conservation plan or wetland creation or mitigation plan, and on NRCS Job Sheets as appropriate. Restoration requirements may vary based on the program authority under which the restoration is conducted (e.g., Food Security Act Wetland Conservation, Wetlands Reserve Program, etc.).

Document the soils, hydrology and vegetative conditions existing on the site, the adjacent landscape, and the contributing watershed in the planning process. Onsite condition information may be attained via wetland delineation forms, existing condition UMAM assessments, and/or other technical references if needed. Utilize appropriate maps (e.g., soil survey, National Wetland Inventory, and USGS topographical maps), aerial and onsite photos, remotely sensed data, and other site-specific references.

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

Base the soils, vegetation, and hydrology criteria for creation on the desired community type, which will be defined according to the “26 Ecological Communities of Florida” (or successor document), the Guide to the Natural Communities of Florida, or other recorded classification system such as the hydrogeomorphic wetland classification system. The desired community type may or may not be the same as the existing wetland type but shall be identified with enough specificity to achieve the enhancement objectives, e.g., “cutthroat seep,” “hydric hammock,” etc. It may be useful here to identify features of the soil, vegetation or predominant hydrology source(s) that will drive creation objectives. Data obtained for reference wetlands (those sites containing the targeted soil, vegetation, and/or hydrologic conditions) in the watershed may also be used.

Upon completion of the practice, the site shall meet the appropriate wetland criteria and provide wetland functions as defined in the project’s objectives.

Where known nutrient and pesticide contamination exists, the nutrient and pesticide tolerance of the plant and animal species likely to occur in the created wetland shall be evaluated. Sites suspected of containing hazardous material shall be tested to identify appropriate remedial measures. Do not plan this practice if remedial measures are not possible or practicable.

The establishment and/or use of non-native plant species is discouraged.

Ensure that design, construction and maintenance activities associated with the practice do not result in potentially adverse effects to adjacent properties or other water users unless agreed to by signed written letter, easement, or permit. Detailed surveys may be needed to determine the extent of planned surface and subsurface water levels near property lines.

Avoid or minimize impacts to cultural resources, wetlands, and Federal and State protected species to the extent practicable during planning, design and implementation of this practice in accordance with established

National and Florida NRCS policy in the General Manual Title 420-Part 401, Title 450-Part 401, Title 190-Parts 410.22 and 410.26, the National Planning Procedures Handbook (Florida Supplements to Parts 600.1 and 600.6), the National Cultural Resources Procedures Handbook, and the National Environmental Compliance Handbook.

All necessary local, state, and federal permits shall be obtained by the landowner or designee prior to the creation.

### **Criteria for Hydric Soils**

Created wetlands shall be located in landscape positions and soil types capable of supporting the planned wetland functions.

Changes to soil hydrodynamic and biogeochemical properties such as permeability, porosity, pH, or soil organic carbon levels shall be made as needed to meet the planned objectives.

If soil enhancement is needed, monitor relevant properties at intervals during the enhancement process to determine trends in the desired properties. Refer to NRCS soil quality publications or soil quality assessment information (see References) for further information on assessing soil properties or consult a soil scientist for guidance.

### **Criteria for Hydrology**

The hydroperiod, hydrodynamics, and dominant water source of the creation site shall meet the project objectives. The creation plan shall document the adequacy of available water sources based on groundwater investigation, stream gage data, water budgeting, or other appropriate means. Assumptions regarding the appropriate hydroperiod for the creation site may also be based on aerial photographic signatures on a reference wetland over a minimum of ten years, NRCS-approved hydrologic models, soil survey information, and/or other relevant data.

Document existing roads, ditches, canals, terraces, water control structures, etc., within the contributing watershed. Evaluate these structures for their potential effects on

hydrologic enhancement. Also document and evaluate how adjacent properties drain into and through the creation site. Where offsite hydrologic alterations impact the site, the design shall compensate for these impacts when necessary to achieve project goals.

Use a natural water supply which approximates the needs of the community type to establish the site's hydroperiod. If this is insufficient, artificial water supplies can be utilized to augment the natural supply; however, do not divert these sources from wetlands or sensitive aquatic resources, or pump from wells. Do not use artificial water sources designated by the Florida Department of Environmental Protection (FDEP) as Class IV or Class V waters unless first treated to meet criteria for Class III waters. If the alternate water source requires energy inputs, estimate and document these in the plan.

Other structural practices and installation of macrotopography and/or microtopography features may be used to meet the planned objectives. Soil investigations may be necessary to ensure that any earthwork excavation does not exceed impermeable soil textures that may be necessary to maintain surface and subsurface hydrology.

Wetland creation sites that exhibit soil oxidation and/or subsidence resulting in a lower surface elevation shall take this factor into account when planning the hydrologic regime needed to support the proposed functions.

Water control structures that may impede the movement of target aquatic species or species of concern shall conform to the criteria and measures in the FL NRCS – USFWS Consultation Matrix located in the Florida NRCS Field Office Technical Guide, Section II (D).

### **Criteria for Vegetation**

Hydrophytic vegetation planned to meet the selected wetland functions shall be of species typical for the wetland type(s) being established and the varying hydrologic regimes and soil types within the site. Preference shall be given to native Florida species.

Where natural colonization of pre-identified, selected species will realistically dominate within three years for herbaceous wetlands or five years for forested or shrub wetlands, sites may be left to revegetate naturally. If a site has not become dominated by the targeted species within these time frames, active forms of revegetation may be required.

Include details on adequate substrate material and site preparation necessary for proper establishment of the selected plant species in the plan specifications.

Species diversity in the created wetland will be maximized as appropriate to meet the targeted functions. Vegetation establishment will include species diversity and amounts adequate to establish a wetland that approximates to the extent possible the reference community.

Where the dominant vegetation community is to be herbaceous, the conditions three years after planting will be within 75% (density and species diversity) of the planned target vegetative conditions. Any of a variety of methods, including mechanical or aerial seeding, organic mat placement, wetland sod, vegetative sprigs or transplants, etc., may be used to establish herbaceous vegetation over the entire site or a portion of the site and at densities and depths as appropriate. Herbaceous species planting will follow the Florida NRCS conservation practice standard Range Planting, Code 550.

Where the dominant vegetation community is to be forest or shrub, the conditions five years after planting will be within 75% (density and species diversity) of the planned target vegetative conditions. Tree/shrub planting and site preparation will follow Florida NRCS conservation practice standard Tree/Shrub Establishment, Code 612. *[Note: Survival requirements in Code 612 may be superseded by the wetland enhancement criteria.]*

Note that planting density and stocking rates may be lower and the selection of species different than for agricultural or silvicultural production purposes, since the objective of wetland creation is to establish wetland function(s) appropriate for the site.

Address all Category 1 invasive species designated by the Florida Exotic Pest Plant Council (see the FOTG Section I (E)) on the site where their presence or overpopulation jeopardizes the success of the restoration. This may require recurrent use of practices such as Florida NRCS conservation practice standards Prescribed Burning, Code 338; Herbaceous Weed Control, Code 315; Brush Management, Code 314, and/or manipulation of water levels. Avoid or minimize adverse effects of pesticide application on desirable wetland vegetation.

### **Creation Success Criteria**

Pursuant to program-specific requirements, monitor creation success at appropriate intervals. At a minimum, this includes prior to and at the conclusion of the targeted time frame for achievement of the desired soil, vegetation, and hydrologic conditions on the site. The UMAM assessment (or approved successor methodology) will be used to measure the increase in wetland functions from the baseline conditions to the final successful and self-sustaining wetland community.

Determine targeted site functioning levels, represented by UMAM scores from a suitable reference wetland(s). It is strongly recommended to assess the creation site at intermediate points along the project trajectory. Selection of additional reference wetlands may be necessary to provide target UMAM scores when intermediate developmental reference points are needed.

Monitoring of creation success shall occur at least annually during the first five years after establishment of the practice and shall include assessment of the vegetation, hydrologic, and soil characteristics. More frequent monitoring is recommended during the first 2-3 years, or if events occur that may compromise the restoration success trajectory. UMAM assessments are recommended as part of regular monitoring events.

Adaptive modification of management shall be made if necessary to achieve the stated goals of the restoration. More stringent program-specific requirements may apply.

### **CONSIDERATIONS**

Consider the effect of construction equipment on soil density, infiltration, and structure.

Consider increasing soil organic carbon by incorporating compost.

Consider establishing and maintaining vegetative buffers on adjacent uplands to protect and enhance wetland functions such as water quality enhancement, floodwater storage and wildlife habitat.

Consider creating sites adjacent or in close proximity to existing wetlands as they may offer increased wetland system complexity and diversity, lessen habitat fragmentation, and help ensure colonization of the site by desirable wetland flora and fauna.

Consider linking the site to other wetlands by corridors if appropriate to enhance use and colonization of the created wetland by the native flora and fauna. This may not be appropriate if concerns exist regarding the potential for increased predation on desirable species.

On sites where woody vegetation will dominate, consider adding several snags, tree stumps, or logs if appropriate to provide structure and cover for wildlife and a carbon source for food chain support.

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

Consider the effect creation will have on disease vectors such as mosquitoes.

Consider whether the use of biological control of undesirable plant species and pests (e.g. using predator or parasitic species) is feasible and appropriate, and the approved methods.

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

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

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

Consider the effects of soil disturbance and the probability of invasion by unwanted species.

Consider controlling water levels to prevent oxidation of inundated organic matter and materials.

Consider long term groundwater source availability in areas where numerous or large capacity consumptive use wells may lower regional groundwater tables.

*Note: This [NRCS Wetlands](http://www.nrcs.gov/wetlands) webpage contains useful information on wetland science and links to resources to assist the planner in creation plan development, operation, maintenance and monitoring. Florida-specific information on wetland restoration that may contain information useful to the planner may be found at <http://www.dep.state.fl.us/water/wetlands/fwric/library.htm> and <http://www.dep.state.fl.us/water/wetlands/docs/mitigation/mitman.pdf>.*

## PLANS AND SPECIFICATIONS

Prepare specifications for this practice for each site and provide the required detail to implement the practice in accordance with this standard. Record specifications using applicable job sheets, narrative statements in the conservation plan, and any other relevant documentation. Items that shall be included in the plan and engineering design include but are not limited to:

- Location map of site
- Plan view of the site showing all planned practices
- Creation site acreage
- Historic and current aerial photos of site
- Description of targeted wetland type(s) and planned functions
- Method used to vegetate treatment area if applicable, and species to be planted
- hydrologic creation method and practices

- Material type, size, location, and dimensions of all structural practices
- Borrow location and compaction requirements for earthfill, if applicable
- Location of all known utilities
- Information for any required permits.

Plans and specifications must be written or approved by NRCS staff with appropriate conservation planning authority in wetland restoration planning, and in engineering design where applicable.

## OPERATION AND MAINTENANCE

Prepare a separate Operation and Maintenance Plan for sites that have structural features. The plan will include specific actions for the normal and repetitive operation of installed structural items, especially water control structures, if included in the project. The plan will also include the maintenance actions necessary to assure that constructed items are maintained for the life of the project. It will include the inspection schedule, a list of items to inspect, a checklist of potential damages to look for, recommended repairs, and procedures for documentation.

Management and monitoring activities needed to ensure the continued success of the wetland functions may be included in the above plan, or in a separate Management and Monitoring Plan. In addition to the monitoring schedule, this plan may include the following:

- The timing and methods for the use of pesticides, prescribed burning, mechanical treatments, and other management practices.
- Actions which specifically address any expected problems from invasive or noxious species.
- The circumstances which require the removal of accumulated sediment.
- Conditions which indicate the need to use haying or grazing as a management tool, including timing, methods, and measures to minimize disturbance to ground nesting species;

- Conditions where manipulation of water depth and duration may be used to control unwanted vegetation if it does not jeopardize project success.

## REFERENCES

Florida NRCS conservation practice standards:  
Constructed Wetland, Code 656  
Wetland Restoration, Code 657  
Wetland Enhancement, Code 659

USDA NRCS, 2008. Uniform Mitigation Assessment Method (UMAM, FDEP 2007) as modified for use by Florida NRCS, Field Office Technical Guide (FOTG), Section I (E)(1)(b)  
<http://www.nrcs.usda.gov/technical/eFOTG/>

USDA SCS, 1989. 26 Ecological Communities of Florida. Field Office Technical Guide, Section II  
<http://www.nrcs.usda.gov/technical/eFOTG/>

Florida Natural Areas Inventory, 2010. Guide to the Natural Communities of Florida,  
<http://www.fnai.org/naturalcommguide.cfm>

NRCS General Manual:  
Title 420-Part 401,  
Title 450-Part 401,  
Title 190-Parts 410.22 and 410.26,

National Planning Procedures Handbook  
(Florida Supplements to Parts 600.1 and 600.6),

National Cultural Resources Procedures Handbook

National Environmental Compliance Handbook

National Engineering Field Handbook, Chapter 13, Florida Supplement

USDA NRCS Soil Quality Assessment website:  
<http://soils.usda.gov/sqi/assessment/assessment.html>

USDA NRCS Soil Quality Publications:  
<http://soils.usda.gov/sqi/publications/publications.html>