



Natural Resources Conservation Service

CONSERVATION PRACTICE STANDARD

WETLAND CREATION

CODE 658

(ac)

DEFINITION

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

PURPOSE

This practice is used to accomplish the following 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.

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; Virginia Conservation Practice Standard *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; Virginia Conservation Practice Standard *Wetland Enhancement*(Code 659).

The management of fish and wildlife habitat created under this standard.

CRITERIA

General Criteria Applicable to All Purposes

Permits are not required where there is no impact to existing wetlands and streams. Nationwide Permit 27 (Section 404 of the Clean Water Act) authorizes certain activities impacting wetlands where there is limited incidental loss and creation results in a net gain of wetlands. Contact the U.S. Army Corps of Engineers and/or the Virginia Department of Environmental Quality (DEQ) if there are any wetland questions or stream impacts.

The purpose, goals, and objectives of the creation shall be clearly defined in the creation plan, including soils, hydrology, vegetation and fish and wildlife habitat criteria that are to be met and are appropriate for the site and the project objectives. The creation plan is part of the Job Sheet for this practice.

NRCS reviews and periodically updates conservation practice standards. To obtain the current version of this standard, contact your Natural Resources Conservation Service State office or visit the Field Office Technical Guide online by going to the NRCS website at <https://www.nrcs.usda.gov/> and type FOTG in the search field.

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The soils, hydrology and vegetative conditions existing on the site, the adjacent landscape, and the contributing watershed shall be documented in the planning process.

The nutrient and pesticide tolerance of the plant and animal species likely to occur shall be considered where known nutrient and pesticide contamination exists. Sites suspected of containing hazardous material shall be tested to identify appropriate remedial measures. If remedial measures are not possible or practicable, the practice shall not be planned.

Water rights, if applicable, shall be assured prior to creation.

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

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.

Do not create wetlands on sites with T&E species unless it is demonstrated that the impact will benefit the species at risk. Consultation with the appropriate regulatory agency or agencies is required.

If the wetland is adjacent to a cold-water stream, obtain input from Virginia Department of Game and Inland Fisheries Biologist to ensure that there is no effect on water temperature.

Additional Criteria for Soils

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

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

Additional Criteria for Hydrology

The Virginia Conservation Practice Standards *Dike (Code 356)*, *Pumping Plant (Code 533)*, and *Structure for Water Control (Code 587)* will be used as appropriate. Refer to the National Engineering Handbook, Part 650, Engineering Field Handbook, Chapter 6, "Structures," for additional design information.

Dikes used to impound water must use the Virginia Conservation Practice Standard *Dike (Code 356)*. If there is 18 inches or less of water impounded against the dike, the minimum freeboard requirement is 6 inches.

The hydroperiod, hydrodynamics, and dominant water source 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.

The work associated with the wetland shall not adversely affect adjacent properties or other water users unless agreed to by signed written letter, easement or permit. Detailed surveys shall be conducted at the wetland site to determine the extent of planned water levels near property lines. The full pool water level shall be a minimum of 6-12 inches below the adjacent property boundary elevation to prevent saturation of the soils on the adjacent property unless a detailed hydrologic evaluation shows there will be no negative impacts at higher water levels.

A signed written letter, easement, or permit by the adjacent landowner must be obtained if temporary water storage will occur on adjacent properties due to the wetland work.

Timing and level setting of water control structures required for the establishment and maintenance of vegetation, soil, and wildlife and fish habitat functions shall be determined.

Other structural practices, macrotopography and/or microtopography may be used to meet the planned objectives.

Macrotopographic features, including ditch plugs installed in lieu of re-filling surface drainage ditches, shall meet the requirements of other practice standards to which they may apply due to purpose, size, water storage capacity, hazard class, or other parameters. If no other practice standard applies, they shall meet the requirements for Virginia Conservation Practice *Dike (Code 356)* unless there is no potential for damage to the feature or other areas on or off site due to erosion, breaching, or overtopping.

Water control structures that may impede the movement of target aquatic species or species of concern shall meet the criteria in Virginia Conservation Practice *Fish Passage (Code 396)*.

Additional Criteria for Vegetation

Hydrophytic vegetation planned to meet the selected wetland functions shall be compatible with the planned soil and hydrologic conditions. Preference shall be given to native wetland plants with localized genetic material (200-mile radius).

Where natural colonization of acceptable species can realistically be expected to occur within five years, sites may be left to revegetate naturally. If not, the appropriate species will be established by seeding or planting.

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

To achieve habitat diversity and minimize the adverse effects of climate, disease, and other limiting factors, several species adapted to the site will be established:

On sites that are predominantly herbaceous vegetation, establish a minimum of 4 species on projects restored to one ecological site (i.e., wet meadow, shallow marsh, or slough eco-sites, etc.). For projects where there are two or more ecological sites, establish at least three native species on each site.

On sites that are predominantly forest or woodland community types, vegetation establishment will include a minimum of 6 species.

Use the Virginia Plant Establishment Guide to determine vegetative species, seeding rates and dates.

CONSIDERATIONS

Hydrology Considerations

Consider the general hydrologic effects of the restoration, including the impacts on downstream hydrographs, volumes of surface runoff, and groundwater resources due to changes of water use and movement created by the restoration.

Consider the impacts of water level management, including:

- Increased predation due to concentrating aquatic organisms, including herptivores, in small pool areas during drawdowns.
- Increased predation of amphibians due to high water levels that can sustain predators.
- Decreased ability of aquatic organisms to move within the wetland and from the wetland area to adjacent habitats, including anadromous fish and herptivores, as water levels are decreased.
- Increases in water temperature on-site, and in off-site receiving waters.
- Changes in the quantity and direction of movement of subsurface flows due to increases or decreases in water depth.
- The effect changes in hydrologic regime have on soil bio-geochemical properties; including oxidation/reduction, maintenance of organic soils, and salinity increase or decrease on adjacent

areas.

- The potential for water control structures, dikes, and macrotopographic to negatively impact aquatic organism passage.
- The potential for using manipulation of water levels to control unwanted vegetation.

Vegetation Considerations

Consider:

- The relative effects of planting density on wildlife habitat versus production rates in woody plantings.
- The potential for vegetative buffers to increase function by trapping sediment, cycling nutrients, and removing pesticides.
- The selection of vegetation for the protection of structural measures that is appropriate for wetland function.
- The selection of vegetation for the protection of structural measures that is appropriate for wetland function.
- The potential for invasive or noxious plant species to establish on bare soils after construction and before the planned plant community is established.

Consider microtopography, hydrology and hydroperiod when determining which species of vegetation to plant.

Soil Considerations

Plan borrow areas for dikes or embankments as permanent pools or deepwater habitats. Use excess materials to create islands in water features or upland areas in flatlands.

Where possible, excavate fill for dikes and embankments away from the dike. This prevents permanent water against the structure and reduces likelihood of rodents burrowing in the dike.

Consider changes of physical soil properties, including:

- Increasing or decreasing saturated hydraulic conductivity by mechanical compaction or tillage, as appropriate.

Incorporating soil amendments.

The effect of construction equipment on soil density, infiltration, and structure. Consider changes in soil bio-geochemical properties, including:

- Increasing soil organic carbon by incorporating compost.
- Increasing or decreasing soil pH with lime, gypsum, or other compounds.

Wildlife Habitat Considerations

Consider:

- The addition of coarse woody debris on sites to be restored to woody plant communities for an initial carbon source.
- The potential to restore habitat capable of supporting wildlife with the ability to control disease vectors such as mosquitoes.
- The potential to establish fish and wildlife corridors linking the site to adjacent landscapes, streams and waterbodies and to increase the sites colonization by native flora.
- The need to provide barriers to passage for unwanted or predatory wildlife species.

Consider installing complexes of vernal pools (5 acres is ideal) to provide habitat for amphibian species, that includes hardwood buffer areas.

Where impoundments are developed, shorelines with irregular shapes and varying side slopes from 9:1 to 20:1 along water surface margins may increase habitat diversity.

PLANS AND SPECIFICATIONS

Specifications for this practice shall be prepared for each site. Record all required information in Wetland Creation Job Sheet and in an engineering field book, on a plan sheet or design computation sheet, or other appropriate location. Plans and specifications shall be reviewed by staff with appropriate training in design and implementation of wetland creation.

DESIGN DATA

- Completed Environmental Evaluation and subsequent requirements.
- Wetland Creation Job Sheet. (The Operation and Maintenance Plan is part of the Job Sheet.)
- Survey and plot data: profile, cross-sections, topography, as needed.
- Design computations, including purpose of practice and references used.
- Plan view of site with existing and planned features, including dimensions, distances, etc.
- Standard Cover Sheet (VA-SO-100A).
- Materials and quantities needed. Identify borrow material and/or spoil area, as needed.
- Vegetation and/or ground cover requirements.
- Identification of needed Erosion & Sediment Control measures.
- Supplemental practices required.
- Virginia Conservation Practice Specifications (700 Series).
- Operation and Maintenance Plan

CHECK DATA

- As-built survey.
- As-built plans including dimensions, types and quantities of materials installed, and variations from design. Include justification for variations.
- Locations of appurtenant practices.
- Adequacy of vegetation and/or ground cover.
- Completed as-built section of Cover Sheet.

Use the practice job sheet (IR) to plan and certify this practice.

OPERATION AND MAINTENANCE

The Wetland Creation Job Sheet (IR) includes the Operation and Maintenance Plan for the wetland creation. The O&M Plan contains a list of the management and monitoring activities needed to ensure the continued success of the wetland functions. A Maintenance and Monitoring schedule will be prepared as part of the O&M Plan. All appurtenant practices associated with the wetland creation will meet the requirements of the appropriate Conservation Practice Standard. The Operation and Maintenance Plan for each of these practices will be appended to the Job Sheet.

In addition to the monitoring schedule, this plan may include the following:

The timing and methods for the use of fertilizers, pesticides, prescribed burning, or mechanical treatments.

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

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 and methods. Minimize disturbance to ground nesting species, especially during the primary nesting season.

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

Management actions shall maintain vegetation, and control undesirable vegetation. Biological control of undesirable plant species and pests (e.g., using predator or parasitic species) shall be implemented

available and feasible. Management of water depth and duration may be utilized to control unwanted vegetation.

Inspect the embankments and structures on the site at least annually and after major storm events. Immediately repair any damage.

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.

REFERENCES

USDA, NRCS. 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, NRCS in cooperation with the National Technical Committee for Hydric Soils, Fort Worth, TX.

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