United States Department of Agriculture

Natural Resources Conservation Service

CONSERVATION PRACTICE STANDARD

WETLAND CREATION

CODE 658

(ac)

DEFINITION

The establishment of abiotic site characteristics (e.g., water control features, topographic features, and substrate) that result in reoccurring periods of soil saturation or inundation during the growing season on a site that was historically not a wetland.

PURPOSE

This practice supports one or more of the following purposes:

- Create hydrologic conditions (inundation or soil saturation) conducive to the establishment and growth of hydrophytic plants.
- Create hydrologic conditions to provide habitat for wetland-dependent wildlife.
- Create hydrologic conditions to provide floodwater storage.
- Create hydrologic conditions suitable for the sequestration of nutrients, elements, and compounds.

CONDITIONS WHERE PRACTICE APPLIES

This practice applies to all Natural Resources Conservation Service (NRCS) land uses, where the site was not historically a wetland.

Common supporting NRCS Conservation Practice Standards (CPS) are:

- CPS Dike or Levee (Code 356) or CPS Diversion (Code 362), used to construct a dike, diversion, or berm.
- CPS Structure for Water Control (Code 587), used to install a water control structure.

Associated CPS commonly installed prior to, concurrent with, or following installation of this wetland creation are:

- CPS Seasonal Water Management for Wildlife (Code 646), used to manage the water (inundation or soil saturation) to meet the target hydroperiods (depth, duration, timing, and frequency of inundation or soil saturation).
- CPS Wildlife Habitat Planting (Code 420) or CPS Tree and Shrub Establishment (Code 612), used to plant perennial vegetation.
- CPS Wetland Wildlife Management (Code 644), used to manage wetland wildlife habitat or to plant annual vegetation.
- CPS Stream Habitat Improvement and Management (Code 395), used to improve or manage the ecological conditions of a stream adjacent to the created wetland.
- CPS Brush Management (Code 314) or Herbaceous Weed Treatment (Code 395), used to control undesirable species.

- CPS Forest Stand Improvement (Code 666), used to manage the species composition or density of existing trees.
- CPS Prescribed Burning (Code 338), used to restore or manage the plant community, or for site preparation.
- CPS Prescribed Grazing (Code 528), used to manage the vegetation with livestock.
- CPS Structures for Wildlife (Code 649), used to address abiotic structures for wildlife (e.g., elevated sandy mounds to provide subsurface nesting sites for invertebrates, reptiles, and ground nesting mammals; course woody debris to provide shelter and foraging habitat for invertebrates, reptiles, and mammals; and elevated earthen pads to provide escape cover during periods of elevated water levels).

This practice does not apply to:

- Constructing wetlands for the single purpose of treating wastewater or providing other water quality functions. Use CPS Constructed Wetland (Code 656).
- Restoring the original abiotic conditions to an area that was once an undisturbed and naturally occurring wetland. Use CPS Wetland Restoration (Code 657).
- Rehabilitating a degraded wetland, reestablishment of a former wetland, or modifying an existing wetland, where specific wetland functions are augmented beyond the original natural wetland conditions, possibly at the expense of other functions. Use CPS Wetland Enhancement (Code 659).
- Installing subsurface perforated pipe to distribute drainage system discharge beneath a vegetated buffer. Use CPS Saturated Buffer (Code 604).
- Impounding water for the exclusive purpose of storing permanent water. Use CPS Pond (Code 378).
- Constructing a dam with significant or high hazard potential as defined in the NRCS National Engineering Manual (Title 210), Part 520, Subpart C, “Dams,” Section 520.21.

CRITERIA

General Criteria Applicable to All Purposes

The hydrology (frequency, depth, duration, and timing of inundation or soil saturation) of the created wetland will address the identified resource concern(s).

Identify the project area’s physical constraints (e.g., soils and watershed size) and legal constraints (e.g., property boundaries, flood prevention levees, public drainage systems, utility easements, and water rights) to assure the project objectives can be met.

Anticipate sediment loads and install upgradient sediment mitigation measures if needed to assure the functional life of the practice is obtained.

Additional Criteria to Create Hydrologic Conditions (Inundation or Soil Saturation) Conducive to the Establishment and Growth of Hydrophytic Plants

Use local reference site information, NRCS ecological site description, or other technical sources to assure the target hydroperiods (depth, duration, frequency, and timing of inundation or soil saturation) will align with the wetness tolerance of the target plant community.

Additional Criteria for Creating Hydrologic Conditions to Provide Habitat for Wetland Dependent Wildlife

Conduct a suitable wildlife habitat evaluation to ensure the hydrologic conditions will meet the habitat needs of the target wetland dependent wildlife.

If CPS Structure for Water Control (Code 587) is implemented, CPS Seasonal Water Management for Wildlife (Code 646) will be applied to optimize the management of water for the target wildlife species.

Additional Criteria to Create Hydrologic Condition to Provide Floodwater Storage

If needed, install a water control structure according to CPS Structure for Water Control (Code 587).

- Manage the structure to ensure floodwater storage capacity is available the normal wet portion of the year.
- Utilize WebWIMP (Matsuura et al., 2003)Web WIMP (udel.edu)or another climate-based prediction tool, to determine the normal wet portion of the year.
- Design the water control structure to allow for a maximum 7-day drawdown period.
- Manage the structure to maintain target hydrology following drawdown, or during the anticipated dry portion of the year.

Additional Criteria to Create Hydrologic Conditions Suitable for the Sequestration of Nutrients, Elements, and Compounds

When nitrate sequestration is an objective—

- Within the constraints of the site, other purposes, and water source, maximize the number of anaerobic/aerobic events in the substrate during the growing season to assure soil organic matter production and anerobic conditions, as both are necessary for denitrification.

CONSIDERATIONS

On all created wetlands—

- In some situations, a sediment basin installed upgradient of project area with the use of CPS Sediment Basin (Code 350), will extend the functional life of the created wetland.
- High levels of sulfur (S), iron (Fe), aluminum (Al), or sulfate bearing minerals (examples: jarosite and pyrite) can reduce vegetative production and rates of denitrification.
- Amendment of soil carbon will improve soil tilth and may increase the rate of vegetative establishment and cover.
- Wetland creation can impact down-gradient aquatic resources (e.g., water temperature, flows, and water availability).

On created wetlands with water control capabilities—

- Predation of aquatic organisms may increase under planned water management regimes.
- The impacts to the ingress and egress of aquatic organisms may warrant implementation of CPS Aquatic Organism Passage (Code 396).

PLANS AND SPECIFICATIONS

Prepare plans and specifications in accordance with the criteria of this standard and describe the requirements for applying the practice to achieve its intended purpose. As a minimum, include—

- A description of the target hydroperiod (depth, duration, timing, and frequency) of saturation or inundation. DrainMod, or any other NRCS approved water-budget tool provided in the NRCS National Engineering Handbook (Title 210), Part 650, Chapter 19, “Hydrology Tools for Wetland Identification and Analysis,” have utility to predict hydroperiod for wetland creation with surface runoff hydrologic source.
- A site-specific plan view of the main features of the project.
- Typical berm profiles, excavated side slopes, spillways and other earthen features.
- Detail drawings of structures and appurtenances, as applicable.

- Specifications that include materials, quantities, methods, sequence, and timing of project implementation needed to fully apply the practices.

OPERATION AND MAINTENANCE

The operation and maintenance plan will include the actions necessary to ensure installed CPSs are maintained for the life of the practice. It will include—

- Inspection schedules.
- A list of items requiring inspection.
- Procedures and documentation requirements for inspections.

REFERENCES

Matsuura K., C. Willmott and D. Legates. 2003. “WebWIMP, The Web-Based Water-Budget, Interactive, Modeling Program.” University of Delaware. Accessed July 27, 2023.Web WIMP (udel.edu)

National Research Council. 1995. Wetlands: Characteristics and Boundaries. Washington, D.C.: The National Academies Press. https://doi.org/10.17226/4766

USDA NRCS. 2008. National Engineering Handbook (Title 210), Part 650, Chapter 13, Wetland Restoration, Enhancement, or Creation. Washington, D.C.https://directives.sc.egov.usda.gov/

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https://www.nrcs.usda.gov/Internet/FSE_DOCUMENTS/nrcs143_010838.pdf

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