United States Department of Agriculture

Natural Resources Conservation Service

CONSERVATION PRACTICE STANDARD

SHALLOW WATER DEVELOPMENT AND MANAGEMENT

CODE 646

(Ac.)

DEFINITION

The inundation of lands to provide habitat for fish and/or wildlife.

PURPOSE

To provide habitat for wildlife such as shorebirds, waterfowl, wading birds, mammals, fish, reptiles, amphibians, and other species that require shallow water for at least a part of their life cycle.

CONDITIONS WHERE PRACTICE APPLIES

The practice may be applied on:

- Lands where water can be impounded or regulated by diking, excavating, ditching, and/or flooding.
- Floodplain areas that provide refuge habitats for native fish during high flow periods.

This practice does not apply to:

- The rehabilitation of a degraded wetland or the reestablishment of a former wetland, where the soils, hydrology, plant community, and biological habitat are returned to a close approximation of the original conditions. Refer to the Maryland conservation practice standard for Wetland Restoration (657).
- The augmentation of wetland functions beyond the original natural conditions on a degraded or naturally functioning wetland site, possibly at the expense of other functions. Refer to the Maryland conservation practice standard for Wetland Enhancement (659).
- Development specifically for the treatment of point and non-point sources of water pollution. Refer to the Maryland conservation practice standard for Constructed Wetland (656).
- The creation of a wetland on a site that was historically not a wetland. Refer to the Maryland conservation practice standard for Wetland Creation (658).
- A site that is developed and managed primarily for permanent fish habitat. Refer to the Maryland conservation practice standards for Pond (378) and Fishpond Management (399).

CRITERIA

General Criteria Applicable to All Purposes

In addition to the criteria included in this standard, follow the criteria and specifications provided in the *Maryland Wildlife Habitat Planning Guide* for habitat design and management requirements, as applicable. For additional requirements concerning plant species selection, planting dates, rates, methods, and care in

handling and planting of seed or planting stock, refer to the applicable sections of the *Maryland Conservation Planting Guide*.

Where water will be impounded, a soils investigation shall be performed to determine conditions for minimizing seepage losses. Soils shall have low permeability or a seasonal high water table to impede subsurface drainage and allow for maintenance of proper water levels.

Where known nutrient and pesticide contamination exists, the nutrient and pesticide tolerance of the plant and animal species likely to occur shall be evaluated. If hazardous wastes are suspected on the site, test for the presence of hazardous waste in accordance with local, state, and federal requirements to identify appropriate remedial measures. If remedial measures are not possible or practicable, the practice shall not be planned.

The site must be capable of retaining shallow surface water during part or all of the year to provide habitat for the desired wildlife species. At normal pool elevation, at least 70 percent of the pool area shall be 18 inches deep or less. An exception to this criterion is made for floodplain habitats connected to stream channels, where water depths of up to 6 feet provide habitat for native fish species that use these habitats during periods of inundation associated with high stream flows.

Within these constraints, the specific depths, duration, and frequency of surface water on the site shall be based on site conditions, the desires of the client, the needs of the targeted wildlife species, and program requirements, as applicable. Refer to the Maryland fact sheet “Shallow Water Areas” for specific requirements of selected wildlife species.

Where active habitat management is planned (such as disking or water level management) a point of access will be planned and developed to facilitate management activity.

Shallow water areas in which hydrology will be manipulated by a managed drawdown shall be designed with a suitable outlet for de-watering the site, or shall include provisions for pumping to remove water within the desired time limits. When moist-soil management is planned, outlet structures shall be designed to accommodate slow release rates.

If applicable, the size and character of the watershed above the site shall be assessed under present and future conditions in order to determine available water. If pumping is to be used as a water source, the ability to supply sufficient water shall be assessed.

Water management shall not adversely affect (i.e., impede drainage, result in flooding, etc.) adjacent properties unless agreed to by a signed written agreement or easement.

Existing drainage systems shall be utilized, removed, or modified as needed to achieve the intended purpose. A variety of structural measures, including but not limited to embankments, surface drain plugs, subsurface drain plugs, and shallow excavation below the natural ground surface, shall be used as needed to provide shallow surface water.

Structural measures such as embankments, ditch plugs, and water control structures, shall meet the requirements as specified in the *Maryland Wetland Design Guide*. If the feature exceeds the limits or is not specified in the *Maryland Wetland Design Guide*, the feature 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 (e.g., Dike (356)).

In the pool area, establishment of a diverse stand of plant species that are native, or are naturalized and are non-invasive, is not required, but shall be encouraged where feasible in order to provide wildlife food and cover.

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. No plant listed by the state of Maryland as an invasive species shall be planted on the shallow water site. Noxious weeds shall be controlled as required by state law.

Additional Criteria for Waterfowl Habitat

Areas planned to provide waterfowl feeding and resting habitat shall be designed to facilitate gradual flooding of areas containing food plants to an average depth of 6 to 10 inches during seasonal periods of waterfowl use.

Additional Criteria for Shorebird Habitat

Areas planned to provide shorebird habitat shall have exposed mudflats and areas with 1 to 4 inches of water during seasonal periods of shorebird use.

Additional Criteria for Amphibian Habitat

Inundation shall be planned to last throughout the local breeding period of one or more native amphibian species.

Surrounding upland habitat shall be of sufficient quality and quantity to support the complete life-cycle requirements of one or more native amphibian species.

Structures shall be designed to prevent fish access to areas planned for amphibian breeding habitat.

Additional Criteria for Off-Stream Fish Habitat

Water control structures shall be designed to prevent native fish from being trapped as water recedes.

Note: Specific programs may dictate criteria in addition to, or more restrictive than, those specified in this standard.

CONSIDERATIONS

Consider the long-term land use objectives of the client. Consider the wildlife species or groups of species to be supported and the habitat needs which can be met on the managed property.

Assess site conditions including surrounding land uses, soils, residual herbicides (to the extent known), water availability, and existing vegetation on the site and in adjacent areas, including any noxious weeds which may be present or are likely to be introduced.

Consider the potential for adverse impacts and management needs of invasive plants on the site.

Consider designing the site to maintain permanent or semi-permanent habitat pools (3 to 4 feet deep) on 20% or less of the shallow water area. This will benefit resident wildlife such as waterfowl, wading birds, frogs, toads, salamanders, and turtles that need a long-term water supply. Also consider the effects of these deeper pools on depth and duration of inundation over other portions of the site. The effects of deeper pools may be addressed by leaving natural shallow barriers that limit surface water loss from shallow areas into the deeper pools.

Consider the natural availability of plant species in the soil seed bank vs. the need for planting in the pool area to provide wildlife food and cover. Vegetation in the pool area may include annual grain crops, crop residue, and/or naturally occurring native or naturalized plant species. Consider the need for water level management to promote seedling survival when vegetation is planted in the pool area.

Consider the effects of management actions on compliance with federal and state hunting regulations (e.g., baiting).

When the shallow water area will be planted to agricultural crops, consider the potential for crop damage by non-target wildlife. If the landowner/operator plans to implement measures to deter non-target wildlife, consider the design requirements necessary to facilitate the deterrent measures.

Consider the adverse impacts of nearby populations of nuisance wildlife such as muskrats, beavers, or resident geese, on the establishment and maintenance of the site. Also consider the potential for attracting nuisance wildlife into an area.

Consider the potential conflict with attracting large flocks of geese within 5 miles of regional and international airports.

Consider the potential for adverse impacts on nearby waters and wetlands. Consider the effects of water level management on water quality downstream of the site.

Consider the need for additional conservation practices, such as Riparian Herbaceous Cover (390) and/or Riparian Forest Buffer (391), to establish a vegetative buffer around the shallow water area. Buffers can help to reduce movement of sediment and other pollutants into the site and can also provide wildlife habitat.

Take note of other constraints such as economic feasibility, access, regulatory or program requirements, social effects, and visual aspects, such as compatibility with the natural landscape.

Consider long-term maintenance requirements of the site, including water control structures, embankments, and vegetation.

PLANS AND SPECIFICATIONS

Plans and specifications for this practice shall be prepared in accordance with the previously listed criteria. Plans and specifications shall contain sufficient detail to ensure successful implementation of this practice, and may be recorded in narrative form, on Implementation Requirements (IR) sheets, on fact sheets, or other approved forms.

At a minimum, develop plans and specifications based on the habitat requirements for individual wildlife species or groups of species. The completed 646 IR sheet can serve as the plan and specifications for this practice.

The following items shall be addressed, as appropriate:

- Wildlife species, or groups of species, for which habitat will be developed and managed.
- Required depth(s) and duration of surface water and soil saturation during the different seasons. If water control structures and/or pumps will be used, describe the timing and water level control settings to meet the objectives of the project.
- Desired vegetation types, and the methods of establishing and managing vegetation.

When this practice is implemented with one or more associated engineering practices (e.g., dike, structure for water control, etc.), plans and specifications shall meet the requirements of this standard and the other applicable standard(s) to achieve the intended purpose of the project. The completed work shall be checked and documented to verify that the project was completed according to the drawings and specifications of all applicable standards.

Supporting Data and Documentation

The following is a list of the minimum data and documentation to be recorded in the case file:

- Location of the practice on the conservation plan map.
- Assistance notes. The notes shall include dates of site visits, name or initials of the person who made the visit, specifics as to alternatives discussed, decisions made, and by whom.
- Completed IR sheet, and copy of the appropriate fact sheet(s) or other specifications and management plans.

OPERATION AND MAINTENANCE

An Operation and Management (O&M) plan shall be prepared and is the responsibility of the client to implement. The O&M Plan shall provide specific instructions for proper operation and maintenance of each component of this practice, and shall detail the level of repairs needed to maintain the effectiveness and useful life of the practice. This plan shall be reviewed with and provided to the client.

The completed 646 IR sheet may serve as the management plan, as well as supporting documentation, and shall be reviewed with and provided to the client.

At a minimum, the following components shall be addressed in the O&M plan, as applicable:

- Inspect the management area at least annually to determine whether the desired vegetation is present in suitable quantity, quality, and distribution to meet the objectives of the project.
- Inspect all embankments and structures at least once per year and after every major storm. Promptly remove trash and obstructions, fix leaks, and make other repairs as needed.
- On embankments to be maintained in herbaceous cover, spot mow or burn infrequently (not more than once every 2 to 3 years) if needed to reduce encroachment of trees and shrubs. Flash grazing by livestock may also be used. To protect ground-nesting wildlife, do not mow or burn between April 15 and August 15.
- Control noxious weeds and other invasive plants by spot treatment, using mechanical methods, or approved herbicides. Control of noxious weeds is required by state law. Noxious weed control can be conducted during the primary nesting season (April 15 to August 15), but may require prior approval if the site is enrolled in a financial assistance program. Contact your local weed control specialist concerning recommendations for spot-treating the weed problem.
- Deter colonization of undesirable plants (e.g., cocklebur, phragmites, cattails, red maple, sweetgum) by conducting regular site inspections and spot treatment using mechanical methods or approved herbicides. If undesirable plants become established, disk 2 or 3 times by mid-summer, then immediately flood, if possible, until the following spring.
- Nuisance animals such as beavers and muskrats may be removed in accordance with state game regulations. Geese can be discouraged by minimizing areas of open water and promoting the growth of tall vegetation in the shallow water area and adjacent buffers.
- Avoid noisy activities, such as mowing or use of recreational vehicles, in or near the shallow water area when waterfowl are present. To the extent possible, do not allow livestock and other domestic animals to have uncontrolled access to the site.
- Limit use of motorized vehicles to designated trails and access roads to protect vegetation and minimize disturbance to wildlife. Avoid use of motorized vehicles on ponded or inundated areas at any

time during the year to prevent damage to soil, vegetation, and aquatic wildlife (e.g. frogs, salamanders).

- Avoid the use of pesticides on the site to prevent harm to wildlife that use the shallow water area.

- Describe the acceptable uses (e.g., flash grazing, cropping, timber production, hunting, nature preserve, etc.) and time of year or frequency of use restrictions, if any. *Pay particular attention to program requirements as they relate to acceptable vs. restricted uses and other management restrictions.*

REFERENCES

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