

**NATURAL RESOURCES CONSERVATION SERVICE
CONSERVATION PRACTICE STANDARD**

**SHALLOW WATER DEVELOPMENT AND MANAGEMENT
(Ac.)**

CODE 646

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

On lands where water can be impounded or regulated by diking, excavating, ditching, and/or flooding.

On floodplain areas that provide refuge habitats for native fish during high flow periods.

This practice does not apply to:

- Wildlife Watering Facility (648), intended to provide watering places for wildlife;
- Wetland Restoration (657), intended to rehabilitate a degraded wetland where the soils, hydrology, vegetation community, and biological habitat are returned to a close approximation of the original conditions;
- Wetland Enhancement (659), intended for modification of an existing wetland where specific attributes are targeted by management objectives, possibly at the expense of other attributes, or the rehabilitation of a degraded wetland where the result is a wetland that is different than what previously existed on the site;
- Wetland Construction (656), intended to treat point and non-point sources of water pollution;

- Wetland Creation (658), for creating a wetland on a site which historically was not a wetland; or
- Fish Pond Management (399).

CRITERIA

Soils must have low permeability (less than 0.6 inches per hour) or seasonal high water table to inhibit subsurface drainage and allow for maintenance of proper water levels.

Site must be free of hazardous materials.

Water supply for flooding the area during periods of planned inundation must be adequate.

An adequate method for dewatering is required when water levels must be artificially lowered in order to produce desired habitat condition.

Water levels must be able to be maintained between 1 to 18 inches in depth over the majority of the area during periods of planned inundation. 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.

Existing wetlands will be preserved and protected from being manipulated or used in a manner which would reduce the functions (type or capacity) provided by the wetlands.

Existing drainage systems shall be utilized, removed or modified as needed to achieve the intended purpose.

Sites for shallow water impoundments shall have overall slopes less than 2 percent.

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.

Invasive plant species and federally/state listed noxious and nuisance species shall be controlled on the site.

Landowners shall obtain all necessary local, state and federal permits.

Water control structures and drainage modifications shall comply with all local, state, and federal regulations (e.g. state drainage law).

The Standards and Specifications for Wetland Restoration (657), Dike (356), Pumping Plant for Water Control (533), Structure for Water Control (587) and Drainage Water Management (554) will be used as appropriate.

On structure sites, if soil and climatic conditions permit, a protective cover of vegetation shall be established on all disturbed earth surfaces except for the area that will be inundated for long durations. If soil or climatic conditions preclude the use of vegetation and protection is needed, non-vegetative means, such as mulches or gravel, may be used. In some places, temporary vegetation may be used until permanent vegetation can be established. Seeding specifications shall comply with Conservation Cover (327) or Critical Area Planting (342) Standards.

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. ⁽¹⁾⁽²⁾

Areas containing food plants shall be flooded during seasonal periods of waterfowl use.

The conservation practices Nutrient Management (590), Pest Management (595) and Residue Management (329) shall be planned and applied to all flooded cropland in order to minimize environmental risks and increase invertebrate foods for waterfowl.

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. ⁽³⁾⁽⁴⁾

Criteria For Amphibian Habitat

Inundation shall be planned to last throughout the local breeding period of at least one endemic amphibian species.

Surrounding upland habitat shall be of sufficient quality and quantity to support the complete life-cycle requirements of at least one endemic amphibian species.

Structures shall be designed to prevent fish access to areas planned for amphibian breeding habitat. ⁽⁵⁾

Criteria For-Off Stream Fish Habitat

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

CONSIDERATIONS

For optimum site conditions and management considerations for shallow water impoundments see [Table 1](#). Consider effect of volumes and rates of runoff, infiltration, evaporation and transpiration on the water budget and the effect on the performance of the practice.

Consider nearly level sites which will allow for larger units while keeping planned water depths within the optimum range over most of the unit. Sites with steeper grades will have higher construction, operation and maintenance cost.

Where impoundments are developed, shorelines with irregular shapes and varying side slopes from 10:1 to 20:1 or flatter along water surface margins may increase habitat diversity.

Consider how the timing of flooding and drawdown, as well as the type of drawdown, will affect moist-soil plant species composition. ⁽²⁾

Consider affect of nutrient and pesticide residues and how they may affect plant species composition and the site's capability to grow desirable plants.

Consider affect on nearby wetlands, or water-related fish and wildlife habitats.

Table 1. Important considerations in evaluating wetland management potential.

Factors	Optimum Condition
Water supply	<ul style="list-style-type: none"> • Independent supply into each unit. • Water supply enters at highest elevation.
Water discharge	<ul style="list-style-type: none"> • Independent discharge from each unit • Discharge at lowest elevation for complete drainage.
Water control	<ul style="list-style-type: none"> • Floor of control structure set at correct elevation for complete drainage • Stoplog structure allowing 2-inch changes in water levels. • Adequate spillway capacity to handle storm events • Water control structure capable of draining at least 1 inch per day from the unit.
Optimum unit size	<ul style="list-style-type: none"> • 5 to 100 acres
Optimum number of units	<ul style="list-style-type: none"> • At least 5 within a 10-mile radius of units
Optimum topography	<ul style="list-style-type: none"> • Nearly level up to 1% slope is optimum, up to 2% slope is allowed.

Adapted from: *Fredrickson, 1991.*⁽²⁾

Consider movement of dissolved and suspended substances to downstream surface waters and groundwater.

The practice may affect downstream flows, or aquifers that would affect other water uses or users.

Consider the need for buffer practices that may improve water quality and be beneficial to wildlife on surrounding uplands. To create a vegetative buffer between the management unit and adjacent land uses plan practices such as Filter Strip (393) to limit sedimentation from entering or leaving the management unit, and/or Field Border (386) and/or Conservation Cover (327) to provide escape and nesting cover for wildlife. Buffers should be at least 30 feet wide or wider depending on their purpose.

Consider the use of upstream impoundments as a source of water when additional water is needed.

Consider disease vectors such as mosquitoes.

The practice may function as a link in a habitat corridor that aids the site's use and colonization by wetland flora and fauna.⁽⁶⁾

The composition and extent of surrounding upland vegetation may influence this practice's habitat functions.⁽⁶⁾

Soil disturbance may increase the probability of invasion by unwanted plant species.

Added water depth and duration may be used as a method to control unwanted vegetation.

Biological control of undesirable plant species and pests (e.g., using predator or parasitic species) may be the least damaging alternative for pest control.

Human and livestock activities in and surrounding the practice may disturb wildlife, thereby decreasing habitat suitability and function. Vegetative screens, fences, or gates are means of reducing unwanted disturbance.⁽⁷⁾

On larger units, consider building islands for waterfowl loafing and nesting, as well as constructing microtopographic relief over the area.

PLANS AND SPECIFICATIONS

Plans and Specifications for installing structures for water control shall be in keeping with this standard and shall prescribe the requirements for applying the practice to achieve its intended purpose. Site specific management objectives should be specified for each application.

Specifications shall be recorded using approved specifications sheets, job sheets (Illinois Shallow Water Management Job Sheet-646)⁽⁸⁾, narrative documentation in the conservation plan or other acceptable documentation. Specifications shall be reviewed and approved by a person with appropriate training in the design and implementation of shallow water areas to benefit fish and wildlife.

The planner is encouraged to work closely with the NRCS Biologist, IDNR Biologist, or other

wetland specialist in developing site specific plans and specifications.

Plans and specifications for installing structures for water control shall be in keeping with this standard and shall prescribe the requirements for applying the practice to achieve its intended purpose. The plan shall specify the location, grades, dimensions, materials, hydraulic and structural requirements for the individual structure, and the timing or sequence of installation activities. Provisions must be made for necessary maintenance.

OPERATION AND MAINTENANCE

The following actions shall be carried out to ensure that this practice functions as intended throughout its expected life. These actions include normal repetitive activities in the application and use of the practice (operation), and repair and upkeep of the practice (maintenance).

A plan for the operation, maintenance, and management of the shallow water or moist-soil area shall be developed and recorded using approved job sheets (Illinois Shallow Water Management For Wildlife Job Sheet-646) ⁽⁸⁾, technical notes, or other forms of acceptable documentation. The plan shall include monitoring and management of the overall site, as well as structural and vegetative measures.

Biological control of undesirable plant species and pests (e.g., using predator or parasitic species) shall be implemented where available and feasible.

Waterfowl and shorebird feeding and resting areas that can be hydrologically controlled or have natural dry periods should be burned, disked or surface disturbed every 3-5 years to set back succession and control the growth of undesirable plants. Such burning, disking, or surface disturbance shall be scheduled to encourage desirable habitat plants.

Any use of fertilizers, mechanical treatments, prescribed burning, pesticides and other chemicals shall not compromise the capability of the practice to provide habitat for the target species.

Operation and maintenance shall include monitoring and management of structural components and habitat quality provided.

REFERENCES

- (1) Smith, Loren M. and Roger L. Pederson. 1989. Habitat management for migrating and wintering waterfowl in North America. Texas Tech University Press, 574 pp.
- (2) Fredrickson, Leigh H. 1991. Strategies for Water Level Manipulations in Moist-soil Systems, 13.4.6 Fish and Wildlife Leaflet 13, Waterfowl Management Handbook. U.S. Fish and Wildlife Service. Washington D.C. 8 pp http://www.nwrc.usgs.gov/wdb/pub/wmh/13_4_6.pdf
- (3) Helmers, Doug. 1992. Shorebird Management Manual. Western Hemisphere Shorebird Reserve Network, Manomet, MA 58 pp.
- (4) Eldridge, Jan. 1990. Management of Habitat for Breeding and Migrating Shorebirds in the Midwest, 13.2.14 Fish and Wildlife Leaflet 13, Waterfowl Management Handbook. U.S. Fish and Wildlife Service. Washington D.C. 6 pp. http://www.nwrc.usgs.gov/wdb/pub/wmh/13_2_14.pdf
- (5) Kingsbury, Bruce & Joanne Gibson, 2002. *Habitat Management Guidelines for Amphibians and Reptiles of the Midwest*. Partners in Amphibian & Reptile Conservation, Ft Wayne IN, 57 pp.
- (6) Fredrickson, Leigh H. and Frederic A. Reid. 1988. Waterfowl Use of Wetland Complexes, 13.2.1 Fish and Wildlife Leaflet 13, Waterfowl Management Handbook. U.S. Fish and Wildlife Service. Washington D.C. 6 pp http://www.nwrc.usgs.gov/wdb/pub/wmh/13_2_1.pdf
- (7) Korschgen, C.E. and R.B. Dahlgren. 1992. Human disturbances of waterfowl: causes, effects, and management, 13.2.15 Fish and Wildlife Leaflet 13, Waterfowl Management Handbook. U.S. Fish and Wildlife Service. Washington D.C. 8 pp. http://www.nwrc.usgs.gov/wdb/pub/wmh/13_2_15.pdf
- (8) USDA Natural Resources Conservation Service. 2005. Illinois Shallow Water Management for Wildlife Job Sheet (646). Champaign, IL. 4 pp. <http://efotg.nrcs.usda.gov/references/public/IL/A CF953.pdf>