

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:

- Watering Facility (614) 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;

- Constructed Wetland (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 or seasonal high water table to inhibit subsurface drainage and allow for maintenance of proper water levels. The use of fabricated liners to limit water loss to the soil is generally not compatible with this purpose and should not be used on more than half of the site. Fabricated liners will often prevent suitable plant growth from occurring and will restrict amphibians from completing their life cycle, especially during winter hibernation.

Site must be free of hazardous materials.

The shallow water habitat area must be buffered by a minimum of 20 feet of herbaceous vegetation or 35 feet of woody vegetation. Exceptions can be made for sites which are planted to annual crops where planting is deferred to provide important waterfowl migration habitat. Refer to Filter Strip (393), Riparian Herbaceous Cover (390) or Riparian Forest Buffer (391) for additional information on the requirements of those buffer areas.

Water supply for flooding the area during periods of planned inundation must be adequate. Artificial water sources, including pumping well water or diverting irrigation tail-water, is acceptable provided that the source is sustainable, reliable, and is acceptable within

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

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the requirements of other state and local laws.

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.

Variation in water depths using macrotopography (6"-18") and microtopography (<6") features must occur across the sites to increase diversity of hydroperiod and associated plant communities.

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.

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

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. Most species of diving ducks (i.e. canvasback) prefer water depths of 10 to 20 inches or more.

Areas containing food plants shall be flooded during seasonal periods of waterfowl use. Manage the site to encourage the growth of beneficial annual plants such as barnyard grass, smartweeds, and other similar species during mid-summer with subsequent inundation during the fall and spring seasons to provide feeding areas for migrating waterfowl.

Habitat must be provided for migrating waterfowl which is the most critical need for Nebraska. Peak waterfowl migration periods are Spring – (mid-February to mid-April) and Fall – (mid-September to mid-November).

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. Larger shorebirds (i.e. American avocet) will use shallow water areas up to 10 inches deep if available.

Several species of shorebirds migrate through Nebraska in the spring during March through June. At a minimum, shallow water and mudflat habitat will be provided during the peak of spring migration (late April to the end of May).

Criteria for Amphibian Habitat

Inundation shall be planned to last throughout the local breeding period of at least one endemic amphibian species. Potential target species for Nebraska include Northern leopard frog as well as at-risk species such as American toad, Great Plains narrowmouth toad, and the smallmouth salamander.

The period of inundation must begin during the month of March and must last a minimum of 4 months in order to accommodate the life cycle of these species. Earlier or longer inundation periods are acceptable and encouraged.

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

Submerged or floating woody material must be present within the shallow water habitat area to provide structure for reproduction of amphibians.

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

Criteria for Off-stream Stream Fish Habitat

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

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These habitats may also provide habitat for important mollusk species if hydrologic connections to the stream or river provide suitable habitat conditions.

CONSIDERATIONS

Water volume, rates of runoff, infiltration, evaporation and transpiration will affect performance of the practice.

Nearly level sites will allow for larger units while keeping planned water depths within the optimum range over most of the unit.

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.

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

For example, rapid drawdown (<2 weeks) may result in the establishment of undesirable species such as cocklebur; or a drawdown event that exposes mudflats during cottonwood seeding will allow for that species to invade the site.

Consider tolerance of plants to flooding and salinity, as well as the composition of seed in the soil.

Food provided by seed-producing plants may be increased by: planting crops such as millet following drawdown; flooding crop stubble after harvest; or periodically disking a portion of the site each year in rotation to encourage annual plant growth.

Nutrient and pesticide residues may affect plant species composition and the site's capability to grow desirable plants.

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

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 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.

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

Installation of vegetated buffers on surrounding uplands may improve water quality in the shallow water area.

The practice may raise downstream water temperature, causing detrimental impacts to associated aquatic and terrestrial communities.

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.

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. Refer to Structure for Water Control (587) for additional information.

Specifications shall be recorded using approved specifications sheets, job sheets, narrative documentation in the conservation plan or other acceptable documentation. Target species or wildlife guild (i.e. shorebirds, amphibians, etc.) must be identified in the wildlife habitat plan and inundation, including depths, timing, and duration, should be planned to meet those habitat needs. Refer to NE-CPA-14 Wildlife Habitat Development and Management Plan for a suitable format and content.

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Specifications shall be reviewed and approved by an NRCS biologist or an NRCS conservation planner with adequate Job Approval Authority (JAA) to design the applicable job class for the site being planned. Concurrence from a state wildlife agency or other partner biologist may suffice when the conservation planner lacks adequate JAA for the site.

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).

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

Biebighauser, T.R. A Guide to Creating Vernal Pools. USDA Forest Service.

<http://herpcenter.ipfw.edu/outreach/VernalPonds/index.htm>

Fredrickson, L.H., and T.S. Taylor. Management of Seasonally Flooded Impoundments for Wildlife. Resource Publication 148. U.S. Fish and Wildlife Service, 1982.

Helmets, Doug. 1992. Shorebird Management Manual. Western Hemisphere Shorebird Reserve Network, Manomet, MA 58 pp.

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.

Smith, Loren M. and Roger L. Pederson. 1989. Habitat management for migrating and wintering waterfowl in North America. Texas Tech University Press, 574 pp.