NATURAL RESOURCES CONSERVATION SERVICE

CONSERVATION PRACTICE STANDARD

SHALLOW WATER DEVELOPMENT AND MANAGEMENT FOR WILDLIFE

(acre)

Code 646

DEFINITION

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

PURPOSE

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, ditching, excavating, 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 and improvement 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 pollution;
- Wetland Creation (658) for creating a wetland on a site that was not previously a wetland; or
- Fish Pond Management (399)

CRITERIA

General Criteria Applicable to all Purposes

Soils must have low permeability or seasonal high water table, to inhibit subsurface drainage and allow for maintenance of proper water levels.

Site must be free of hazardous materials.

Shallow water impoundments require an adequate water supply for reflooding the impoundment during periods of planned inundation. This water supply can be as a result of flooding, overland run-off, or a pumped source. An adequate method for dewatering the impoundment is required during planned drawdowns.

Water levels must be maintained between 1 to 18 inches in depth with an average depth of 6 inches over 50% or more 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.

Landowner shall obtain all local, state, and federal permits as necessary. Water control structures and drainage modifications shall comply with all local, state, and federal regulations (e.g. state drainage law). If pumping is required, water rights must be obtained.

The Oklahoma NRCS standards for Pumping Plant (533) and/or Structure for Water Control (587) will be used as appropriate. Refer to Chapter 6 of the Engineering Field Handbook, “Structures,” for additional design information. Water control structures will be designed on an individual job basis, or applicable NRCS standard drawings shall be adapted to meet site conditions and functional requirements. The drawings shall be part of an approved overall engineering plan for the site.

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

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.

The Oklahoma NRCS Structure for Water Control (587) standard will be used if dikes are needed as part of the water control plan.

Management measures shall be provided to control invasive species and noxious weeds on the site.

Existing wetlands will be preserved and protected from being manipulated or will not be used in a manner which would reduce the functions (type or capacity) of the wetlands.

A water management plan, when needed, will be developed to insure proper use of water level manipulation. Consult with NRCS Biologist, Resource Conservationist or ODWC Wetland Biologist for specific recommendations. See the Oklahoma NRCS Job Sheet JS 646 01, Shallow Water Management for Wildlife.

All disturbed areas outside of inundated area will be seeded to wildlife friendly vegetation according to a re-vegetation plan. Vegetation used will be adapted for use on the local soil/site conditions. Use the Oklahoma NRCS Conservation Cover (327) standard unless the area is subject to frequent overflows or spillway protection is needed, then the Oklahoma NRCS Critical Areas Planting (342) standard will be used. Native plant materials will be used whenever possible to provide the intended protection.

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 inches.

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

The Oklahoma NRCS standards for Nutrient Management (590), Pest Management (595), and Residue Management Practices (329, 344,345, 346) 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.

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.

Criteria for Off-stream 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**.

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

Consider gradually flooding the area to a depth of 3 to 8 inches over a majority of the impoundment to insure that foods are available to wide variety of wildlife.

Consider the effects of the timing of the flooding and drawdown, as well as the type of drawdown, on target plant species and plant species composition (moist soil areas) as well as the chronology of targeted migratory birds.

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

Consider disking 25-40% of the area on a rotational basis to prevent woody encroachment and provide a variety of seed bearing herbaceous vegetation. Soil disturbance may increase the probability of invasion by unwanted plant species.

Consider the plant species flooding tolerances and the composition of seed in the soil at the site (moist soil areas).

Consider effects on wetlands or wildlife habitats that would be associated with the practice.

Consider the need for buffer practices beneficial to wildlife around the perimeter of the site. Plan practices such as Filter Strip (393), Field Border (386) and/or Conservation Cover (327) to create a vegetative buffer between the management unit and adjacent land uses. This buffer should be at least 30 feet wide, or wider, depending on its purpose.

Consider the effects of residual herbicides and insecticides, excessive nutrients, and mineral accumulation potential (moist soil areas).

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

Consider effects on downstream flows that would affect other water uses or users.

Consider disease vectors such as mosquitoes.

Consider flood impacts or water seepage problems on adjacent areas.

PLANS AND SPECIFICATIONS

Plans and specifications for this practice shall be prepared for each site. Plans and specifications shall be recorded using approved specification sheets, job sheets, technical notes, narrative documentation in the conservation plan, or other acceptable documentation.

NRCS staff is encouraged to work closely with the NRCS Biologist, ODWC Wetland 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, and 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 purpose of operation and maintenance is to insure that the practice functions as intended.

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, 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. An annual inspection should be made of all structural and vegetative practices.

Actions will be carried out to ensure the practice functions as intended throughout its expected life. These actions include normal repetitive activities in the application and use of the practice (operation) such as water level manipulation, moist soil management, planting waterfowl food crops, managing crop residue, prescribed fire, and disking. Repair and upkeep of the practice (maintenance) shall be carried out as needed, such as repair or replacement of vegetative or structural components.

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

REFERENCES

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.

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.

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. 6pp.

Kelley, J.R. Jr., M.K. Laubhan, F.A. Reid, J.S. Wortham, and L.H. Fredrickson. 1990. *Options for Water-level Control in Developed Wetlands, 13.4.8 Fish and Wildlife Leaflet 13, Waterfowl*

Management Handbook. U.S. Fish and Wildlife Service. Washington D.C. 8 pp.

Ringelman, James K. 1990. *Managing Agricultural Foods for Waterfowl, 13.4.3 Fish and Wildlife Leaflet 13, Waterfowl Management Handbook.* U.S. Fish and Wildlife Service. Washington D.C. 4 pp.

USDA Natural Resources Conservation Service. 1992. *Engineering Field Handbook, Chapter 13*, *Wetland Restoration, Enhancement, or Creation*. Washington D.C. 74 pp

USDA Natural Resources Conservation Service. 1975. *Engineering Field Handbook, Chapter 6*, *Structures*. Washington D.C. 91 pp.

Table 1. Important considerations in evaluating shallow water management potential.

Factors	Optimum Condition
Water supply	• Independent supply into each unit. • Water supply enters at highest elevation.
Water discharge	• Independent discharge from each unit. • Discharge at lowest elevation for complete drainage. • Floor of control structure set at correct elevation for complete drainage.
Water control	• Stoplog structure allowing 2-inch changes in water levels. • Adequate capacity to handle storm events.
Optimum unit size	• 5 to 100 acres.
Optimum number of units	• At least 5 within a 10-mile radius of units.

NRCS, OK
July, 2007