**NATURAL RESOURCES CONSERVATION SERVICE**
**CONSERVATION PRACTICE SPECIFICATIONS**

# SHALLOW WATER MANAGEMENT FOR WILDLIFE
# (acre)
# CODE 646

## INTRODUCTION

Shallow water wetlands are among the most productive ecosystems in terms of total biomass. But few wetland dependent animal species, especially bird species, obtain substantial amounts of food directly from plant consumption other than seeds.

Much of the energy from plants is transferred to a diverse group of invertebrate species. Therefore, invertebrates provide a very important part of much bird's total dietary needs. Managing water levels directly affect invertebrate's populations and indirectly other wetland species through modifications of aquatic plant communities. Varying water levels influences germination, seed or tuber production and maturation and plant structure.

## SITE SELECTION

Select fields subject to frequent, shallow flooding during winter. Do not develop sites prone to deep flooding or flooding for extensive periods because of usually excessive maintenance costs and these fields do not provide optimum winter waterfowl habitat.

Fields may vary from relatively flat to precision leveled. They must have good water retention capability and can be irrigated with surface water.

Fields must be accessible by farm equipment so landowners can repair damaged levees, maintain water control structures, and produce food for wildlife, where the landowner desires.

## FIELD MANAGEMENT

On fields that are in commercial production of an agricultural crop, allow no fall tillage or burning of crop residue.

On fields used for rice production re-butt existing interior rice levees after harvest to maintain winter water and roll or chop stubble to allow birds access to water.

## WATER MANAGEMENT

The major considerations in shallow water management for wildlife are: depth, duration, and timing of the area flooded.

Flood fields an average of 6 – 10 inches for optimum waterfowl use. Fields which are not land leveled may average deeper water levels overall but still provide valuable winter waterfowl habitat for both diving ducks and dabbling ducks. Usually these fields can provide shallow and deep-water areas which are beneficial to a broad range of wetland wildlife species.

On fields that are in commercial production of an agricultural crop, close water control structures as soon as the agricultural harvest has been completed or November 15, (whichever occurs first); maintain water until at least March 1 of the following year. Where crops are still in the field after November 15, allow time to harvest the crop.

The landowner has the option to pump water onto the field to increase benefits to early arriving waterfowl and other wetland species of wildlife.

On fields that are not in commercial production of an agricultural crop (idle lands), structures will be closed and/or levees repaired on or before October 1 and maintained until at least March 1 of the following year. The field must be capable of catching and holding rainfall. Pumping is not required but an option for the landowner.

Waterfowl and other water birds benefit most when water levels are increased gradually rather than immediately inundating the entire area. By increasing water levels in 6-inch increments, new areas are flooded and additional food sources gradually become available. This procedure conserves food for later in winter and provides a range of water depths, which benefits a wider array of wildlife.

**WATER CONTROL STRUCTURES**

In fields where suitable existing pipes are in place, the addition of a water control structure (riser) will provide the management capability to manage the seasonally-flooded cropland to meet the objectives of the practice.

If water control structures are not part of the agricultural operation in the field, design and install structures to meet and fulfill the purpose of the practice.

Us water control structures such as flashboard risers made from steel or corrugated metal pipe to vary the water levels on fields by installing or removing boards (See AR-RNG-135 Flashboard Riser). Note that for Seasonally-Flooded Wetlands on Harvested Croplands and Idle Fields, the requirement to have a minimum of 2 feet of additional levee above the top of the flashboard riser does not apply.

Concrete water control structures may also be used in place of steel or corrugated metal structures.

Design water control structures so that they do not interfere with agricultural operations but complement them. Design the water control structure large enough to carry the runoff from the impounded watershed.

**Levees**

On lands not already used for rice production, construction of low exterior levees are often necessary to provide suitable habitat in the winter for waterfowl.

Remove woody vegetation from the levee site because it interferes with construction activities and may cause leakage.

Dig a core trench prior to levee construction.

Levees should be constructed with clay soils, if possible, and the initial height of the levee should be a minimum 10% higher than the finished height to account for levee shrinkage. Non-clay soils shrink more and will require up to 25% or more additional fill to have the desired finished levee height.

Borrow areas created during impoundment construction should be located outside the impoundment and situated at least 10 feet away from the toe of the levee to prevent caving.

Prior to and during levee construction, compact the fill material as the levee is being constructed. Thoroughly compact levee top and sides to assure that a tight seal is formed between the ground and deposited fill material. The minimum levee specification used should be for Class III Dikes as provided in the Arkansas Supplement to the FOTG Standard for Dikes – 356.

For new levees, a minimum 1 ½:1 slope is recommended as provided in the Arkansas Supplement to the FOTG Standard for Dikes – 356. For existing levees which are stable and operational, the existing slope will be suitable, if determined technically sound by the Technician.

Make the top width on new levees at least 8 feet, and a 10-foot top width is desirable.

When required, construct new levees with an adequate emergency spillway constructed at the lowest end of all levees to reduce damage from overtopping.

Use a minimum of 2 feet of fill over the top of newly installed pipes. Consider settling to achieve this minimum.

Shape and compact levee for the last time after the fill material has dried.

The levee top and sides should be planted to control erosion (refer to FOTG Standard for Upland Wildlife Habitat Management – 645). Plantings from the list should be selected according to their known benefit to upland wildlife such as cottontail rabbits and bobwhite quail.

Species recommended from the FOTG Standard for Upland Wildlife Habitat Management include: bahiagrass, any of the bluestems, switchgrass, orchardgrass, and any of the clovers as appropriate for each geographic area of the state. Wildlife benefits will be greater if planted in a mix.

Drain standing water on the top or crown of levee to keep levees operational.

**Permits**

The landowner must obtain permits required by federal, state, and local laws before the practice is initiated.

**Agricultural Fields**

Small grain fields such as rice can provide important habitat for waterfowl and other wildlife. It is estimated that per acre: 150+ pounds of rice, 50+ pounds of soybeans, 180+ pounds of corn, and 130+ pounds of grain sorghum are lost during harvest. These fields can provide substantial food resources if they are not plowed under after harvest and shallowly flooded.

Rice fields are among the most economical areas to manage for waterfowl, shore birds, and wading birds, because the existing levees and structures can be used and the stubble can be lightly disked or rolled prior to flooding. The procedure of manipulating rice stubble prior to flooding aids in decomposition, which increases invertebrate populations. Not only does this enhance the area for wildlife, but also results in fields that are cleaner when the water is draining in the spring for seedbed preparation.
Waterfowl feeding in rice fields also reduce the occurrence of red rice (Oryza sativa) and other weeds for the following production cycle.

Small grains decompose at varying rates when flooded. Rice, grain sorghum, and corn persist for extended periods but soybeans deteriorate rapidly. At least 10% of the area should be flooded in August to mid September to a depth of 2 – 6 inches to provide habitats for early migrants such as teal.

**Moist Soil Areas**

A moist soil system is a semi-cultivated area where native vegetation is controlled by some means of water level manipulation and/or disturbance of the vegetation.

Moist soil areas are important because of the great diversity of foods. In addition, seasonally-flooded moist soil areas tend to support greater density of invertebrates than do habitats that are permanently flooded. Important factors when managing moist soil areas are the timing of the annual drawdown and the frequency of soil disturbance to alter plant succession.
Mid to late season drawdowns generally favor millets and other grasses preferred by waterfowl. However, total seed production is generally greater when impoundments are drained early to

mid-season. Early drawdowns occur within the first 45 days of the growing season, and late season drawdowns occur within the remainder of the growing season.

While slow drawdowns (2 – 4 weeks) typically produce diverse vegetative cover, fast (3 – 12 days) drawdowns are more likely to result in a stand of similar vegetation. To maximize benefits, areas should be drained at varying times and rates.

For maximum seed production, native plant communities must be maintained in an early successional stage. The percentage of non-food producing plant species generally tends to increase in each consecutive year if the area is not disturbed. Soil disturbance greatly affects the response of native plants to different management techniques. Impoundments should be disked at 2 - 3 year intervals to set back succession and control the invasion of undesirable plants. Vegetative succession manipulations should not be done more frequently than every two years unless undesirable plants cause a problem.

Disturbances every year have the potential to reduce beneficial plant communities. Plants such as cocklebur and coffee weed can quickly develop a closed canopy and out compete desirable plants. If undesirable plants invade 50% or more of the managed areas, control by water approved herbicides, disking, shredding, flooding, and/or prescribed burning.

For details on procedures, equipment and plant responses to drawdown dates refer to "Job Sheet – Management of Moist Soil Systems," NRCS, Arkansas

**Plantings for Wildlife Food**

Fields can be planted with small grains such as Japanese millet, browntop millet, corn, and rice. These plants typically produce high yields of seed and are eaten by many birds and waterfowl. Soybeans are not recommended for use in shallow water because they deteriorate quickly once flooded. Japanese millet should not be planted near fields used for commercial rice production because it can infest the commercial fields.

Consult applicable NRCS conservation practice standards, technical notes, and job sheets for seeding rates, planting dates, and management practices.

**References**

1. Ecological Sciences Reference Guide – Volume 1 Pond Management, Wildlife Habitat Management Streambank Restoration, NRCS, Arkansas, including the following job sheets and technical notes:
   a. Creation of Micro-topography on Altered Cropland
   b. Management of Moist Soil Systems
   c. Shallow Water Habitat Management
   d. Specifications Guide for Idling and Flooding of Harvested Rice Fields for Rails and other Wading Birds
   e. Specifications Guide for Seasonally-Flooded Wetlands on Harvested Cropland and Idle Fields for Waterfowl
   f. Specifications Guide for Summer and Fall Flooded Crop, Idle Fields, and Idle Ponds for Shorebirds
2. "Shallow Water Management for Wildlife," Conservation Practice Standard 646, NRCS, Mississippi, January 2000.