



SHALLOW WATER MANAGEMENT FOR DABBLING WATERFOWL

Fish and Wildlife Habitat Management Guidesheet

Natural Resources Conservation Service (NRCS) - Minnesota

WHAT IS SHALLOW WATER MANAGEMENT?

Managing shallow water on agricultural fields and moist soil areas can provide open water areas for waterfowl resting and feeding. Proper management can increase and maintain desirable foods for waterfowl and other wetland wildlife species, see Table 1.

Shallow water areas in Minnesota are typically flooded in the fall prior to freeze up. Sites are then drained or dried during the spring or summer to promote the growth of desirable native food plants, or to plant crops that will benefit wildlife. After the seed producing plants have matured, and during bird migration, the area is allowed to flood to a depth of 1 to 18 inches of water. The flooded food plants provide excellent resting and feeding areas for shorebirds and "puddle ducks" that "tip" to feed like mallard, shoveler, pintail, and teal. Canada geese will also feed in shallow water areas.

In the spring during a slow draw down, shallow water areas are especially beneficial for shorebirds, like plovers and sandpipers, on their northward migration.

VEGETATION MANAGEMENT

There are three basic ways to provide quality waterfowl foods through vegetation management. They are 1) natural moist soil plants, 2) planting a crop for wildlife and 3) management of crop residue. Advantages of moist soil management over planting crops are:

- Management costs are less.
- Attracts greater diversity of wildlife.
- Provides foods with greater nutrient value.
- Possible on marginal row crops sites.
- Production less influenced by weather.



Advantages of planting crops are:

- Total energy production can be higher.
- Does not require as precise of water control.
- Easier to control undesirable plant species.

Each shallow water area may be managed using different methods in different years. In some cases, altering the type of management can facilitate maintenance and increase productivity and diversity of the site.

Natural moist-soil plants:

Wild millet, rice cutgrass, nutgrasses, smartweeds, beggarticks, etc., can be encouraged, through water level manipulations, to germinate from existing seed sources in the soil and produce an abundant source of high quality food for waterfowl.

Periodic drawdown (dewatering) of the area is necessary for moist soil plant production. Slow drawdowns (2-3 weeks) usually are more desirable for plant establishment and wildlife use. Early drawdowns (first 45 days of growing season) and midseason drawdowns (at least 90 days **before the end** of the growing season) result in the greatest quantity of seeds produced.

Consider the species of seed that is likely to exist in the soil when determining the species of food plants for which you are going to manage.

Table 1. Habitat conditions that attract vertebrates to moist-soil impoundments.

Vertebrate Group	FOODS				Water Depth (cm)	OPENING	
	Vertebrates	Invertebrates	Seeds	Browse		Water	Mudflat
Amphibians		x			0-20	x	x
Reptiles	x	x			0-50	x	
Grebes	x				25+	x	
Geese			x	x	0-10	x	x
Dabbling Ducks		x	x		5-25	x	x
Diving Ducks		x	x		25+	x	
Galliformes		x	x		Dry-Moist		
Hérons	x	x			7-12	x	
Rails		x	x		5-30	x	
Coots			x	x	28-33	x	
Shorebirds		x			0-7	x	x
Raccoons	x	x	x		0-10	x	x

Fredrickson, L.H. 1988

SHALLOW WATER MANAGEMENT FOR WATERFOWL

By understanding how waterfowl use resources, managers are able to attract and hold waterfowl on managed habitat. Where man-made or modified wetlands area managed, manipulations that emulate natural wetland complexes and water regimes provide diverse habitats for a variety of waterfowl.

The species of seeds in the soil, the timing of the drawdown, as well as the type of drawdown, will determine plant species composition. See Table 2 for the response of common moist-soil plants to time of drawdown. The timing and extent of the drawdown should be varied from year to year to maintain productivity and a diverse plant community. See Figure 1 for suggested annual flooding strategies.

Spring Habitat Management - During most years, early and midseason drawdowns result in the greatest quantity of seeds produced. In general, early season slow drawdowns favor smartweeds and sedges, benefiting early migrants such as mallards and pintails. Mid-spring drawdowns favor millets and beggarticks, providing resources for late migrants such as shovelers, teals, rails, and bitterns. Mid- and late season drawdowns provide food for breeding waders and waterfowl broods.

Fall Flooding - After the moist soil plants have produced seed in late summer or fall, reflood the site slowly to coincide with the arrival of migrant waterfowl. Flooding the site slowly (2-3 weeks) to a depth of 4 inches, allows new areas of food to become available each day as the water is rising.

85% of the surface area of a management area should be flooded to an optimum foraging depth at the peak of fall waterfowl migration.

Undesirable species that should be controlled include cocklebur, reeds canarygrass, phragmites (common reed), woody vegetation, and all noxious weeds including purple loosestrife. Mowing and/or burning or disking during the growing season, then flooding until the following spring can usually control undesirable species, including tree seedlings. Most other plants that volunteer will be readily utilized by waterfowl.

Planting waterfowl food plants:

Moist-soil - Draw down in late spring and plant species such as browntop millet, buckwheat, Japanese millet, grain sorghum, or corn. Fertilize for good production. Use of herbicides is generally not required since annual weeds produce useable wildlife food. After the crop has matured in late summer or fall, reflood the site slowly to coincide with the arrival of fall migrant waterfowl.

Dry land - During fall, winter and early spring, agricultural foods are preferred forage. Waste grain is a locally abundant, high energy food that can be consumed by waterfowl. Energy values, while indicative of fresh seeds, are not representative of grains underwater or exposed outdoors for an extended period. Under these conditions, energy value may decline rapidly. See Table 3 for recommended treatments to enhance food availability for waterfowl.

Crop residue:

Abundant grain crops are worthless if they are not presented in a manner that makes them available to birds. Utilize minimum tillage or no-till operations to maximize crop residue and waste grain after crops are harvested. Even though modern implements harvest about 95% of ripened grain, most fields still

contain 50-310 lb./ac. of residual grain. Generally, waterfowl feeding on land will reduce densities to 13 lb./ac. before switching to alternate food sites, whereas waterfowl using foods underwater may abandon fields after densities decline to 45 lb./ac.

Table 2. Response of common moist-soil plants to drawdown date.

<u>SPECIES</u>			<u>DRAWDOWN DATE</u>		
Family	Common name	Scientific name	Early ^a	Midseason ^b	Late ^c
Grass	Swamp timothy	<i>Heleochloa schoenoides</i>	+ ^d	+++	+
	Rice cutgrass	<i>Leersia oryzoides</i>	+++	+	
	Sprangletop	<i>Leptochloa sp.</i>		+	+++
	Crabgrass	<i>Digitaria sp.</i>		+++	+++
	Panic grass	<i>Panicum sp.</i>		+++	++
	Wild millet	<i>Echinochloa crusgalli var. frumentacea</i>	+++	+	+
	Sedge	Red-rooted sedge	<i>Cyperus erythrorhizos</i>		++
Chufa		<i>Cyperus esculentus</i>	+++	+	
Spikerush		<i>Eleocharis spp</i>	+++	+	+
Buckwheat	Pennsylvania smartweed	<i>Polygonum pennsylvanicum</i>	+++		
	Curltop ladysthumb	<i>Polygonum lapathifolium</i>	+++		
	Dock	<i>Rumex spp.</i>		+++	+
Pea	Sweetclover	<i>Melilotus sp.</i>	+++		
	Sesbania	<i>Sesbania exalta</i>	+	++	
Composite	Cocklebur	<i>Xanthium strumarium</i>	++	+++	++
	Beggarticks	<i>Bidens spp.</i>	+	+++	+++
	Aster	<i>Aster spp.</i>	+++	++	+
Morning glory	Morning glory	<i>Ipomoea spp.</i>	++	++	

U.S. Fish and Wildlife Service, Fish and Wildlife Leaflet 13.4.6. • 1991

- a) Drawdown completed within the first 45 days of the growing season.
- b) Drawdown after first 45 days of growing season and before 1 July.
- c) Drawdown after 1 July
- d) + = fair response; ++ = moderate response; +++ = excellent response.

Table 3. Recommended treatments to enhance food availability for waterfowl.

CROP	TREATMENT
Barley, wheat	• Leave low-growing varieties standing, their seed heads are easily fed upon by ducks and geese.
Corn, milo	• Harvest when grain moisture is <21%. Utilize conservation tillage - do not flood. Graze cattle if snow cover is persistent.
Soybeans	• Do not flood fields. Beware of potential impaction problems if dry beans are consumed by birds.
Millet	• Best if unharvested. Flood gradually to a depth of 8 inches.
Rice	• Disk harvested fields to loosen and mix soil with grain and straw, or roll with a water-filled drum to create openings in stubble. Flood to a depth of 8 inches.

SHALLOW WATER MANAGEMENT FOR WATERFOWL DESIGN WORKSHEET

Structural Components Required

Source of water: (Check if required and see engineering design for site)

- Water control structure on tile line, ditch, or dike.
- Diversion.
- Pond/reservoir
- Well with pump.
- Pump.
- Surface water (Seasonal flood events and/or surface runoff is usually sufficient).

Dikes required: (see engineering design for site)

Average height _____ Total length _____. Total cubic yards _____.

Seeding Required:

- Acres of seeding on dikes.
- Acres of seeding for buffer strips.

Management Recommendations (Schedule one of the following management methods each year)

Crops Planted For Waterfowl

Year	Planting Date	Crop	Rate	Fertilizer
_____	_____	_____	_____	_____
_____	_____	_____	_____	_____
_____	_____	_____	_____	_____

- Gradually flood to 1 - 18 inches as waterfowl and shorebirds migrate through the area in the fall.
- Leave flooded through the winter.

Crop Residue Managed For Waterfowl

In the following years conventional crops will be grown and harvested with the crop residue left for wildlife. After harvest flood 1 to 18 inches deep, to coincide with the arrival of fall migrant waterfowl.

Year(s) _____ Crop(s) _____

NOTES: _____

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