



## **SHALLOW WATER MANAGEMENT FOR SHOREBIRDS**

### *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 waterbird resting and feeding. Proper management can increase and maintain desirable foods for shorebirds 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. In the spring during a slow draw down, shallow water areas are especially beneficial for shorebirds, like plovers and sandpipers, on their northward migration.

After the seed producing plants have matured, and during bird fall migration, the area is allowed to reflood. The flooded food plants provide excellent resting and feeding areas for shorebirds, ducks and Canada geese.

#### **Natural moist-soil plants:**

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.

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 shorebirds (Table 2).

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. 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.

### **SHALLOW WATER MANAGEMENT FOR SHOREBIRDS**

Shorebirds (Charadriiformes) are a diverse group of birds that migrate, breed and winter throughout the world. Shorebirds range in size from 20 grams to more than 500 grams and exhibit a wide diversity of bill lengths, bill structures, and leg lengths. During the year almost 40 species of shorebirds occur in this region during migration, and 10 species breed in Minnesota. Peak migration in Minnesota occurs from mid April through September.

Shorebirds feed predominantly on invertebrate chironomid larvae (blood worms) found on mud flats and very shallow water during the time of an early to midseason drawdown. Therefore, managed shallow water areas can be a very important source of food for shorebirds during their spring migration, and easily incorporated into waterfowl management strategies. Minor changes in the timing, depth, and duration of drawdowns or reflooding within a wetland complex can provide for shorebirds without affecting the potential to provide habitat for other avian groups.

**Table 1. Habitat conditions that attract vertebrates to shallow water areas.**

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

**Management of Breeding Shorebirds:**

For many breeding shorebirds, landscape context of varying wetland complexes and habitats is important. Ephemeral and temporary wetlands are important feeding sites early in reproduction, whereas seasonal, semi-permanent, and saline wetlands provide foraging throughout nesting and brood rearing.

Breeding shorebirds nest in a wide range of habitat, from unvegetated wetland beaches to moderately tall, dense grass in the uplands. Nesting shorebirds avoid tilled fields and prefer native grasslands to tame grasses. Management of grasslands can create essential upland habitat for breeding shorebirds through practices such as prescribed grazing, mowing or prescribed burning.

**Management of Migrating Shorebirds:**

In the spring, migrating shorebirds stop opportunistically to feed. During migration, many species look for a specific combination of habitat elements that include:

- A wetland in partial drawdown,
- Invertebrate abundance of at least 100 individuals per square meter,
- A combination of mudflat and shallow water (3-5 cm), and
- Very little vegetation.

Managing a wetland complex to create different habitat types by drawdowns and flooding increases the diversity of foods available to migrating and resident waterbirds.

When this food diversity occurs within a wetland, several waterbird guilds will use the area simultaneously. Because many waterfowl hens and broods also consume midge larvae, management of habitat for shorebirds is also beneficial to waterfowl.

A key to managing habitat for migrating shorebirds is to encourage invertebrate production and then make invertebrates available to the birds throughout the spring and summer/fall migratory periods. See Figure 1 for annual flooding strategies.

**Spring** – Management areas require fall flooding approximately 1 month before the first heavy freeze and the continued maintenance of flood conditions to assure survival of larvae over winter.

Units should be drawn down slowly (2 to 4 cm per week) to make invertebrates continuously available to shorebirds foraging in open, shallow water and mud flats. Each individual shorebird may stay only a few days, but over several weeks, many individuals of a variety of species may benefit.

Management units in Minnesota should begin drawdowns in late April to early May and continue until early June. Spring drawdowns are particularly important in northern climates since wetlands in drawdown are usually rare at this time of the year.

**Summer/Fall** – Areas suitable for summer/fall management require two different strategies. First, to make invertebrates available, areas that remained flooded through spring and early summer, should be drawn down slowly or natural evaporation should be

allowed to occur. Summer and fall drawdowns can occur from July to October. Second, areas that remained dry should be shallowly flooded 2-3 weeks before summer/fall migration begins. Flood so the basin contains an interspersion of mudflat, shallow water, and deeper water to provide habitat as the wetland dries. Additionally, the vegetation often

needs to be manipulated by shallow disking to assure shorebird response.

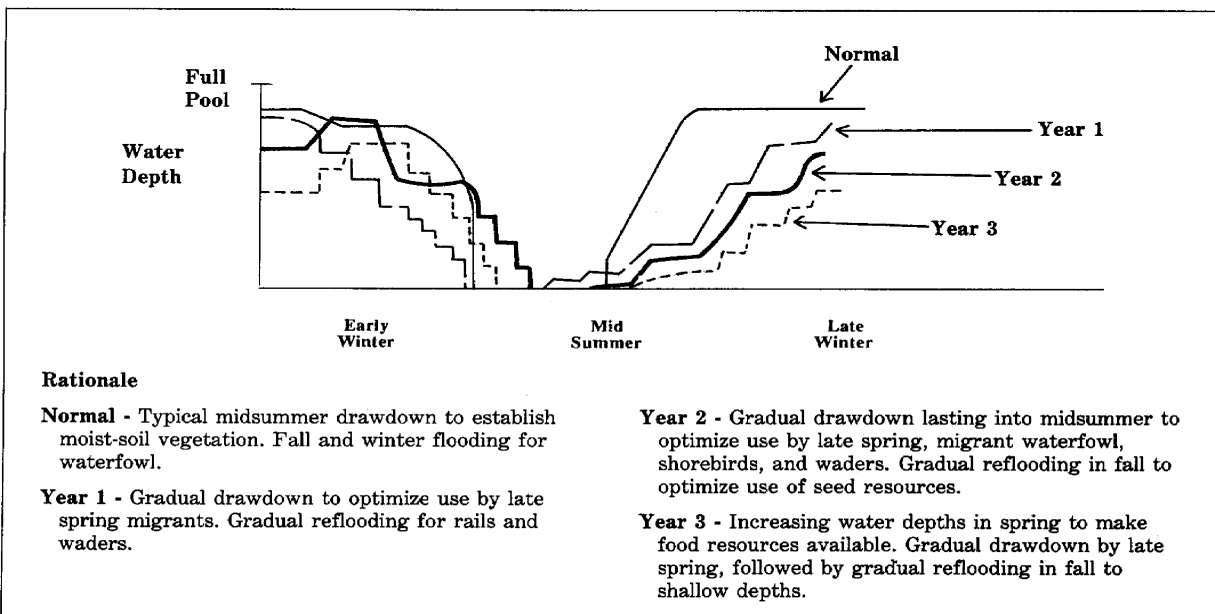
On areas with more than one managed wetland, water regimes should be manipulated asynchronously so that in any given year, some habitat is available for all waterbird species during both spring and fall.

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

Family	SPECIES Common name	Scientific name	DRAWDOWN DATE		
			Early <sup>a</sup>	Midseason <sup>b</sup>	Late <sup>c</sup>
Grass	Swamp timothy	<i>Heleochloa schoenoides</i>	+ <sup>d</sup>	+++	+
	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	<i>Ipomoea spp.</i>	++	++		

- 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.

**Figure 1. Suggested flooding regimes for seasonally flooded wetlands of the midwest.**



# SHALLOW WATER MANAGEMENT FOR SHOREBIRD 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

### Moist Soil Management

- Slow drawdown starting on or about:  
1<sup>st</sup> year \_\_\_\_\_; 2<sup>nd</sup> year \_\_\_\_\_; 3<sup>rd</sup> year \_\_\_\_\_
- Leave drained over summer for moist soil plants to grow.
- Allow shallow water area to gradually refill as waterfowl migrate through the area, start refilling on:  
1<sup>st</sup> year \_\_\_\_\_; 2<sup>nd</sup> year \_\_\_\_\_; 3<sup>rd</sup> year \_\_\_\_\_
- Vary water depth from year to year.
- Every three years disk at the start of the growing season. If undesirable plants become established, disk 2 or 3 times by mid summer then immediately flood (if possible) until the following spring.

**NOTES:** \_\_\_\_\_  
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