

Managing Wetland Vegetation for Marsh Birds and Waterfowl

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Background:

Wildlife populations have benefited greatly from federal and state programs to acquire, protect and manage wetlands. But the high cost of developing wetlands, warrants careful assessment of the management potential of these areas. Successful management requires specific information on the influence of flooding and drainage on the growth and development of wetland vegetation. This study was designed to provide this information for restored wetlands in central Illinois. Our objectives were to: (1) identify plant species present in the seed bank of wetland soils, (2) investigate the growth of these species in relation to the timing of summer drainage, and (3) quantify the abundance of waterfowl and marsh birds using these wetlands during migration and the breeding season.



Study area: 4 restored wetland units separated by levees at Carlyle Lake.

Study Area:

The study was conducted on Carlyle Lake Wildlife Management Area near Vandalia. The area consisted of 4 moist-soil units (MSUs) divided by levees. Each unit could be flooded or drained by water control structures and ditches. Prior to the development of these units, this land had been agriculture fields for over 50 years.

Methods:

We surveyed seed banks by collecting 20 soil cores in each MSU. Core were transferred to the EIU greenhouse. As seedlings germinated, they were identified, and counted. The number of seedlings growing in each core was converted to density per m² for analysis.

To investigate the influence of the timing of drawdowns on the growth of wetland vegetation, we drained 2 of MSUs early May and 2 in late June. The timing of drawdowns was reversed in these units during the second year of the study. We surveyed the vegetation growing in each unit during August each year. Vegetation was sampled in 0.25-m² plots established along the transects where soil cores had been collected. Plants in each plot were identified and categorized into cover classes. MSUs were flooded again in October after the growing season and before the onset of waterfowl migration.



Collecting soil cores



Germinating seeds in EIU greenhouse

We conducted weekly censuses from October-January to determine the species composition and abundance of birds using MSUs during the fall migration & winter. Weekly censuses were conducted from March-July to quantify use during spring migration & the nesting season.

Results:

Viable seeds from 23 species of wetland plants were identified in the seed banks of the 4 MSUs. Seed densities were high in each unit, averaging 15,000 seeds/m² and species composition differed little among units (Table 1).

Table 1. Viable seeds/m² in seed banks of wetland units.

Species	Unit A	Unit C	Unit B	Unit D
False pimpernal	2,955	10,515	4,704	9,407
Ammania	2,931	3,226	3,694	2,561
Rusty flatsedge*	2,438	3,226	1,576	1,921
Blunt spikerush*	1,453	1,822	394	1,872
Smartweeds*	2,561	468	370	345
Red-root sedge*	911	1,108	862	247
Rice-cut grass*	1,773	123	394	197
16 other species				
TOTAL	17,095	21,648	14,140	17,612

* Valuable wildlife food plant

Early drawdowns favored beggar-ticks, rice cut-grass, & smartweeds; whereas, water hemp, water primrose & sedges grew best with late drawdowns (Table 2). Wildlife food plants were more common in early drawdowns.

Table 2. Percent cover of emergent vegetation in MSUs drained in May vs. June.

Species	Early-drawdown	Late-drawdown
Beggar-ticks	41.5%	2.1%
Rice cut-grass	35.6	13.4
Smartweeds	14.5	7.7
Ammania	7.1	0.0
Water hemp	0.0	24.8
Water primrose	0.0	29.1
Sedges	0.0	5.4
Cocklebur	0.4	5.4

Early drawdowns were used heavily by birds during fall migration, particularly dabbling ducks. These MSUs held 75% of all birds in the fall (Table 3). However, late drawdowns were more heavily used during spring migration, perhaps because seeds had been depleted in early drawdowns during the fall & winter. Late drawdowns also provided important nesting habitat for marshbirds during the summer.

Table 3. Avian use of MSUs during fall migration.

Species	Early drawdown	Late drawdown	Total
Mallard	6,912	1,436	8,348
Coot	510	1,219	1,729
Gadwall	486	106	592
Wigeon	347	15	362
Wood duck	189	87	276
Pintail	216	2	218
Shoveler	200	0	200
Gw teal	111	87	198
Black duck	117	2	119
Gr. blue heron	41	52	93
8 other species	65	23	88
Totals	9,194 (75%)	3,034 (25%)	12,228

Management Recommendations:

Restored wetlands should be managed as marsh complexes with both early & late drawdowns to best meet the annual habitat requirements of waterfowl and marsh birds.

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