

# Green-tree Reservoir Management Changes – Malmaison Wildlife Management Area

## 1 INTRODUCTION

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Many waterfowl enthusiasts share the excitement of watching waterfowl descend through the canopy of flooded timber. Public land green-tree reservoirs (GTRs) like the one at Malmaison WMA (MAWMA) attempt to provide such opportunity. GTRs across the southeast attempt to provide reliably flooded bottomland forest habitat, much of which was lost to deforestation and hydrological alterations, for wintering waterfowl and sustain a unique type of waterfowl hunting experience. However, due to frequent and prolonged flooding, forests within GTRs have gradually shifted to less desirable conditions from a waterfowl habitat and hunting standpoint. Research-based findings strongly encourage changes to current GTR management or risk degrading this unique wetland habitat and hunting opportunity.

After evaluation of the MAWMA GTR forest, it was concluded forest health and waterfowl habitat quality were deteriorating. Changes to existing management practices, particularly flooding regime, was imperative to stop deterioration of forest habitat conditions for wintering waterfowl. In 2014, proposed changes to management of the MAWMA GTR were presented to and adopted by the Commission on Mississippi Wildlife, Fisheries, and Parks. The adopted changes were presented at a public meeting in Grenada, MS that same year. Approved changes to MAWMA GTR management began prior to the 2014-15 waterfowl season.

The following sections describe how MAWMA GTR management practices prior to 2014 impacted waterfowl habitat, timber quality, and hunting opportunity and outline newly implemented MAWMA GTR management strategies.

## 2 HISTORICAL MANAGEMENT PRACTICES – MAWMA GTR

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Historically, GTRs across the southeast have been managed similarly. GTR forests were flooded annually, beginning in early-mid fall, and de-watering began late winter. The MAWMA GTR was no different. Prior to 2014, the MAWMA GTR was extensively and deeply flooded annually. Each October, all boards were installed in GTR water-control structures and flooding occurred using groundwater pumps and rain-runoff to achieve full capacity prior to the opening day of the November waterfowl season. Trees were flooded prior to complete winter dormancy and often remained flooded through late February after hardwoods begin emerging from dormancy. De-watering within the MAMWA GTR is often delayed by rises in the adjacent Yalobusha River in late winter through early spring. Frequent, extensive, and deep flooding within the MAWMA GTR benefitted boating access for waterfowl hunting but stressed trees and deteriorated forest habitat for wintering waterfowl.



*Figure 1: Water level at Malmaison WMA during full capacity. (Note the water levels on trees)*

### 3 CURRENT WATERFOWL HABITAT CONDITIONS – MAWMA GTR

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Due to size and energy content, cherry-bark, nuttall, water, and willow oak acorns are an important food for waterfowl and numerous other species of wildlife. These and other less water-tolerant bottomland hardwood tree species within the MAWMA GTR currently exhibit signs of stress from years of prolonged, deep flooding before full tree dormancy in early winter and continuing after trees began to emerge from dormancy in late February. Prolonged flood stress is evident by thin and dying tree crowns, dead trees, numerous dead limbs on forest floor, decay along tree trunks, and epicormic branching along tree trunks. A shift in tree species composition is occurring within the MAWMA GTR, from desirable food-producing but less water-tolerant oak species previously mentioned to more water-tolerant tree species such as overcup oak, maple, willow, and bitter pecan which produce less waterfowl food. GTR flooding practices prior to 2014 may have decreased acorn production in desirable oak species due to loss of desirable oaks and interruption of carbohydrate and nitrogen uptake important for acorn production. Little to no regeneration of desirable oak species is occurring throughout the GTR due to lack of forest thinnings and poor tree seedling survival from frequent and prolonged flooding.



*Figure 2: Previous GTR water management has resulted in a shift towards more water tolerant species such as swamp maple.*

Ideal foraging depth for dabbling ducks ranges from 4 to 18 inches. MAWMA flooding practices prior to 2014 significantly decreased waterfowl foraging habitat. By the time regional duck abundances peaked each winter, water depths across much of the MAWMA GTR were too deep for dabbling ducks to reach submerged foods resting on the forest floor such as acorns, insects, and grass seeds.



*Figure 3. Moist-soil area within the Malmaison WMA GTR during spring drawdown. Previous water depths were generally 1 to 2 feet higher for boating access during most of the waterfowl hunting season. Conditions pictured here are ideal for waterfowl foraging.*

## 4 MANAGEMENT MOVING FORWARD – MAWMA GTR

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Implementation of new water management practices for the MAWMA GTR began in 2014. Additional management practices will be implemented as needed in an attempt to improve forest habitat conditions for waterfowl and other wildlife within the GTR. These habitat management practices include:

- Initiate GTR flooding when trees are fully dormant (late November – mid December, depending on the year). Maximum acreage flooded will peak January 1. Water drawdown will generally begin around January 1 with de-watering complete prior to leaf bud swell in early February.
- Implement rotational flooding (i.e., actively flood every 3<sup>rd</sup> year and allow for natural flooding to occur for two years) or pump to a lower level annually and allow rainfall and Yalobusha River levels to fluctuate water levels. During high water events, this natural flooding will “pulse” water levels into the higher elevations of the GTR for short durations, providing new food

resources for waterfowl. When river flood waters recede, water levels will draw back down to managed levels, mimicking a natural system.

- Maintain shallower water depths across the GTR to increase food availability for wintering waterfowl.
- Reduce area flooded to reduce individual tree stress and promote natural regeneration of desirable tree species at highest elevations.
- Incorporate drawdowns during late winter to decrease stagnant water conditions and concentrate aquatic invertebrates for waterfowl foraging.
- Promote regeneration and growth of quality, mixed bottomland tree species, particularly red oak species, within the GTR by selectively thinning existing timber. Subsequent years of lower water levels will be required to allow acorns to germinate and seedlings to grow.

## 5 IMPACTS OF NEW MANAGEMENT PRACTICES ON WATERFOWL HUNTING OPPORTUNITY – MAWMA GTR

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Changes in MAWMA GTR management will hopefully have a minimal impact to waterfowl hunting opportunity. Flooding may be intentionally reduced in some years, thereby reducing huntable area. Hunting access, primarily boating access, may be affected by new water management practices. Water levels will generally be lower moving forward to reduce tree stress and improve waterfowl foraging habitat. This may decrease boating access to some areas within the GTR. Most of the GTR will remain accessible by foot. Popular waterfowl hunting and boat accessible locations within the GTR like oxbow lakes, sloughs, and other low elevation areas will remain flooded, but even these areas may be shallower in some years. New GTR management practices will be monitored to determine impacts to waterfowl habitat and hunting and modified as needed to attempt to optimize both.