

# PBRP Research Highlight

November 2006 | No. 4



## Use of Lake Maurepas Wetlands by Migrating Birds P.C. Stouffer and Jason A. Zoller

### Project Overview

Louisiana is an integral part of one of the nation's largest migratory routes for Neotropical migratory birds, many of which use the Maurepas wetlands during spring and fall migrations. Large portions of swamp in the Maurepas wetlands have converted to marsh in the last 50 years, a trend that is likely to continue. We were interested in the effect of landscape change upon these Neotropical migratory birds, so we compared the distribution and abundance of birds in the Maurepas wetlands during migrations to the Pearl River basin, a more intact system. In particular, we wanted to determine the type of habitat birds select as stopover points in migratory routes. It was important to determine if birds either avoid certain wetland types, such as anthropogenic marsh, or concentrate in other wetland types such as swamp.

**Birds were found in higher densities over swamp compared to marsh, leading to the fundamental conclusion that degradation of swamp removes the habitat most heavily used by migrating birds in the Lake Maurepas system.** The Maurepas system was not as heavily utilized as the bottomland hardwood forests of the Pearl River basin in the spring. The Pearl River basin has a much greater percentage of forested wetland area than the Maurepas system, indicating the importance of this habitat type to migratory birds.

### Background

Over the last 50 years, the wetland system around Lake Maurepas has experienced rapid and severe degradation. A system once dominated by expansive areas of swamp, the Lake Maurepas wetlands have rapidly converted to unhealthy and unstable habitat types such as anthropogenic (resulting from the activities of humans) marsh and even open water. The decline is primarily due to stressors such as logging, saltwater intrusion, nutria, and levees along the Mississippi River that prevent fresh water and nutrients from reaching the wetlands. Vast areas of the former swamps in the Lake Maurepas system have undergone this conversion, a trend that is likely to continue without restoration projects such as a Mississippi River re-introduction at Hope Canal.

Our research was designed to study the distribution and abundance of Neotropical migratory birds stopping over in the Maurepas wetlands during both fall and spring migrations. In particular, **we wanted to determine if Neotropical birds avoid certain wetland types such as anthropogenic marsh or concentrate in swamp areas.** This research has important implications given the historical decline and projected future of habitat sustainability in the area. Millions of birds that

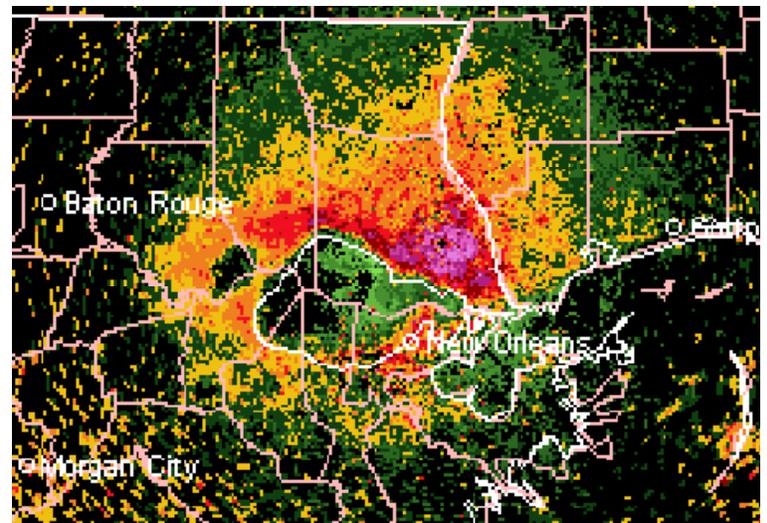


Figure 1. Sample radar reflectivity image from spring 2004 on a night of heavy bird migration. Hot pink represents the highest bird density (dBZ scores equivalent to precipitation falling at 16+ inches/hour).

breed throughout eastern and central North America pass through south Louisiana on their annual trips between breeding and wintering grounds. Finding stopover habitat where they can rest and refuel is critical to successful migrations, especially before and after flying over the Gulf of Mexico. Bird migration illustrates an important

(continued on page 2)

(continued from page 1)

link between the local processes in south Louisiana and a continent-wide phenomenon.

We relied on the development of a habitat classification map of the Maurepas wetlands generated by a group of PBRP researchers using satellite imagery. The map classified the Maurepas wetlands into the following habitat types: potentially sustainable swamp, non-sustainable swamp (swamp likely to convert to anthropogenic marsh in the near future), (swamp that has already converted to) anthropogenic marsh, natural marsh, and bottomland hardwood forest.

A relatively new application for bird research, weather radar, was used to sample bird abundance and distribution during fall and spring migrations: at dusk, birds resume migration from where they spent the preceding day resting and feeding. As they take flight, they enter the radar beam, are detected, and their density is reflected by the amplitude of the signal returning to the radar (just like rain on the familiar radar images used to describe weather). The use of radar, a “snapshot” taken 30 minutes after sunset, allowed us to pinpoint where birds started their nocturnal migration. Looking at the land cover under the migrating birds allowed us to identify critical stopover habitats.

## Results

In the spring, birds were more common along the south and west sides of the lake, possibly because they stopped to rest before crossing the lake. Similarly, in the fall, birds were clearly concentrated along the northeast corner of the lake. As expected, more birds were detected in the fall, presumably due to the inclusion of young birds born that year.

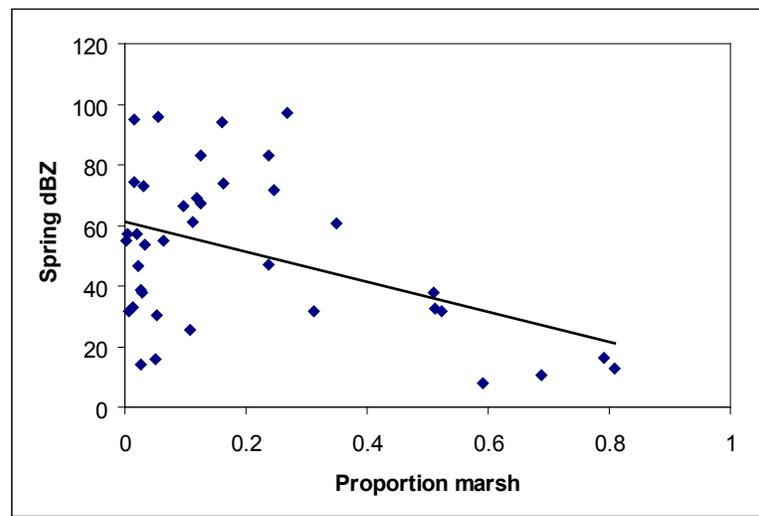


Figure 2. Land areas with greater proportion of marsh had lower numbers of birds (dBZ scores) in the spring.

Birds were found in higher densities over swamp compared to marsh, leading to the fundamental conclusion that **degradation of swamp removes the habitat most heavily used by migrating birds in the Lake Maurepas system**. In the spring, birds had a strong avoidance to marsh, and land areas with greater proportion of swamp had higher numbers of birds. In the fall, bird density increased with increasing proportion of swamp.

At a slightly larger scale, the Maurepas system does not appear to be used as heavily as the more pristine Pearl River basin in the spring. In both spring and fall, the Pearl River basin had higher bird densities than Lake Maurepas. The Pearl River basin has a much greater percentage of forested wetland area than the Maurepas system, indicating the importance of this habitat type to migratory birds.



### Director

Nick Norton, Ph.D.  
SLU Box 10736.  
Southeastern Louisiana  
University  
Hammond LA 70402  
Phone: 985.549.2923  
Email: nnorton@selu.edu

### Assistant Director

Thais Perkins, M.S.  
Phone: 985.549.2268  
Email: teperkins@selu.edu

### Principal Investigators:

Philip Stouffer, Ph.D.  
Associate Professor  
329 RNR Building  
Renewable Natural Resource Bldg.  
Louisiana State University  
Baton Rouge, LA 70803  
225.578.4221

*Study Title: Use of Lake Maurepas  
Wetlands by Migrating Birds*

*Published November 2006*



PBRP is a program of Southeastern Louisiana University and the U.S. Environmental Protection Agency