

# **LOUISIANA DEPARTMENT OF WILDLIFE & FISHERIES**



**OFFICE OF FISHERIES  
INLAND FISHERIES SECTION**

**PART VI -B**

**WATERBODY MANAGEMENT PLAN SERIES**

**BAYOU PLAQUEMINE**

**WATERBODY EVALUATION &  
RECOMMENDATIONS**

## **CHRONOLOGY**

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# WATERBODY EVALUATION

## STRATEGY STATEMENT

### Recreational

Recreational species are managed to provide a sustainable population while providing anglers the opportunity to catch or harvest numbers of fish.

### Commercial

Commercial species of fish are managed to provide a sustainable population.

### Species of Special Concern

Species of special concern are managed to ensure sustaining populations.

## EXISTING HARVEST REGULATIONS

### Recreational

Statewide regulations are in effect for all species except black bass. The current regulations may be viewed at the link: <http://www.wlf.louisiana.gov/fishing/regulations>

Black Bass (*Micropterus spp.*) – 7 daily, no size limit.

### Commercial

Statewide regulations are in effect for all species. The current regulations may be viewed at the link: <http://www.wlf.louisiana.gov/fishing/regulations>

### Species of Special Concern

Paddlefish (*Polyodon spathula*)

Pallid sturgeon (*Scaphirhynchus albus*) and shovelnose sturgeon (*Scaphirhynchus platyrhynchus*) two federally threatened and endangered species inhabit the reach of the Mississippi River where Bayou Plaquemine connected.

Gulf pipefish (*Syngnathus scovelli*) is listed as a species of concern in the Louisiana Comprehensive Wildlife Action Plan.

## SPECIES EVALUATION

### Recreational

*Largemouth Bass*

#### Relative abundance, relative weight and structural indices-

Spring electrofishing results indicate that the catch-per-unit-of-effort (CPUE = bass per hour) of largemouth bass (*Micropterus salmoides*) fluctuates between 42 and 100 fish per hour (Figure 1). The greatest increase in CPUE is noticed in 2010 catch results, whereas, the lowest catch was the previous year in 2009.

Relative weight (Wr) is the ratio of a fish's weight to the weight of a "standard" fish of the same length. The index is calculated by dividing the weight of a fish by the standard weight for its length, and multiplying the quotient by 100. Largemouth bass Wr below 80 indicate a potential problem with forage availability. Relative weights for largemouth bass are determined from fall electrofishing results. Figure 2 indicates that the body condition of largemouth bass is healthy with a relative weight of over 90 for stock-, quality- and preferred-size fish.

Proportional stock density (PSD) and relative stock density (RSD) are indices used to numerically describe length-frequency data. Proportional stock density compares the number of fish of quality-size (greater than 12 inches for largemouth bass) to the number of bass of stock-size (8 inches in length). The PSD is expressed as a percent. A fish population with a high PSD consists mainly of larger individuals, whereas a population with a low PSD consists mainly of smaller fish. For example, Figure 3 below indicates a PSD of 53 for 2008. The number indicates that 53% of the bass stock (fish over 8 inches) in the sample was at least 12 inches or longer.

$$\text{PSD} = \frac{\text{Number of bass} > 12 \text{ inches}}{\text{Number of bass} > 8 \text{ inches}} \times 100$$

Relative stock density (RSD) is the proportion of largemouth bass in a stock (fish over 8 inches) that are 15 inches (preferred-size) or longer.

$$\text{RSD} = \frac{\text{Number of bass} > 15 \text{ inches}}{\text{Number of bass} > 8 \text{ inches}} \times 100$$

Although there were increases in the overall CPUE's in 2010 electrofishing results, size-structure indices slightly decreased in both the proportion of quality-size and preferred-size fish (Figure 3).

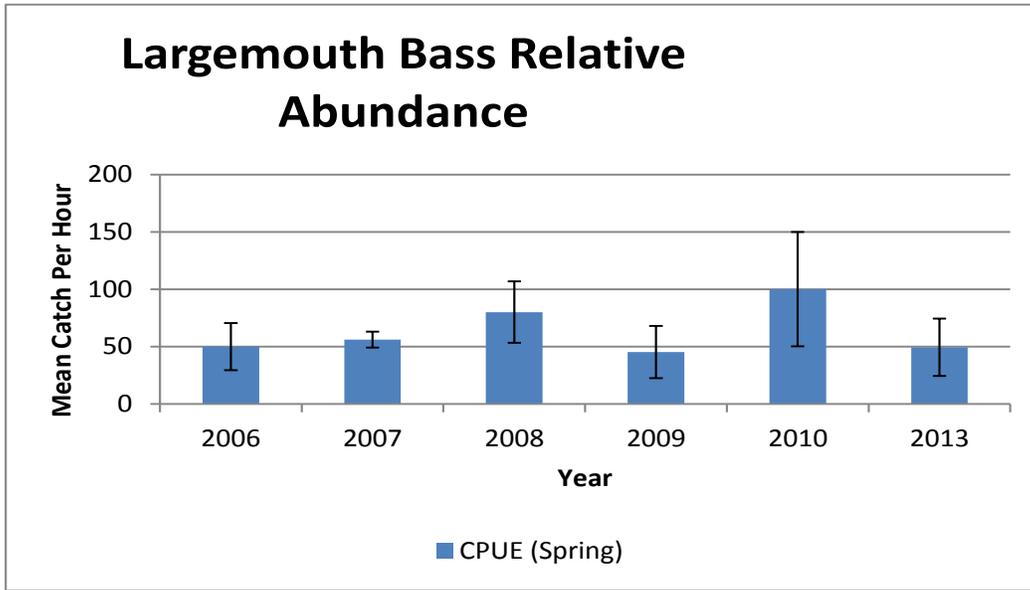


Figure 1. The mean CPUE (number per hour) for largemouth bass from spring electrofishing in Bayou Plaquemine, LA, from 2006 to 2013. Error bars represent 95% confidence limits of the mean CPUE.

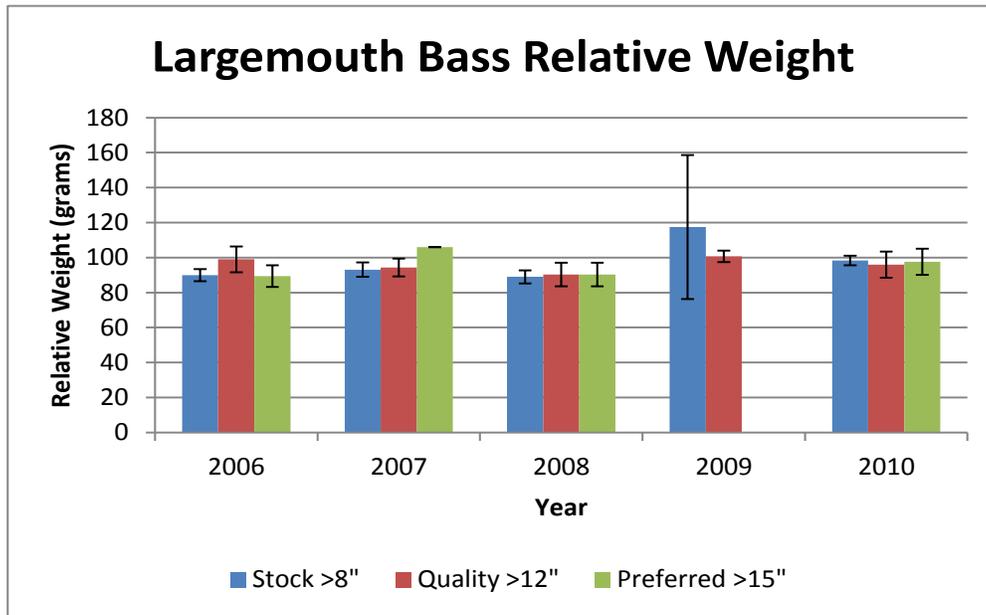


Figure 2. The mean  $W_r$  ( $\pm$  95% CI) for largemouth bass collected in fall electrofishing samples from Bayou Plaquemine, LA, from 2006 to 2010. Error bars represent 95% confidence limits of the mean  $W_r$ 's.

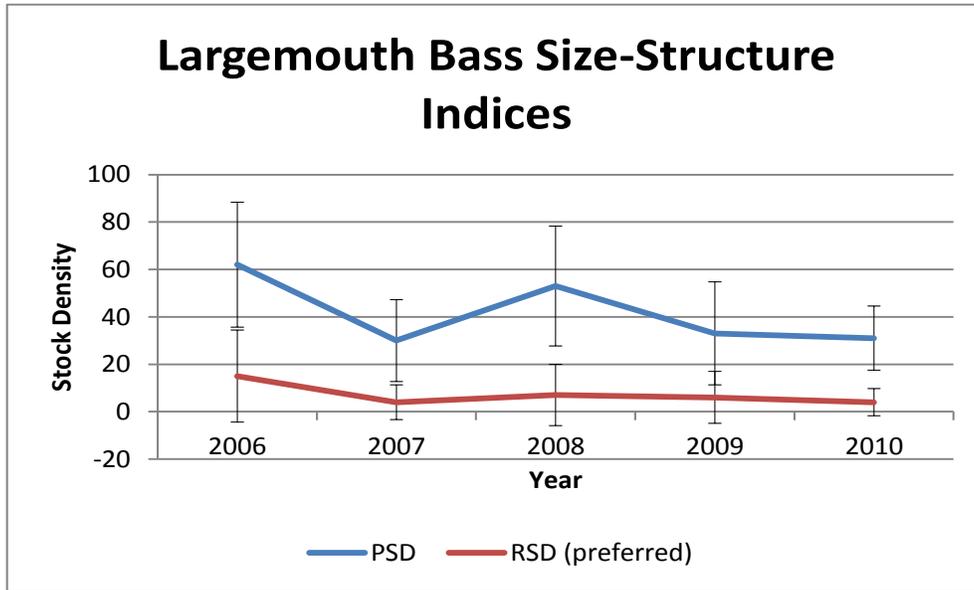


Figure 3. The mean size-structure indices (PSD and RSDp) for largemouth bass from fall electrofishing results in Bayou Plaquemine, LA, from 2006 to 2010. Error bars represent 95% confidence limits of the mean size-structure indices.

*Genetics*

Largemouth bass have not been tested in Bayou Plaquemine for the Florida allele.

*Stockings*

As shown in Table 1, Bayou Plaquemine has been stocked with 16,041 Florida strain largemouth bass since 2006.

Table 1. Stocking history by species by year for Bayou Plaquemine, LA from 2006 – 2009.

<b>YEAR</b>	<b>FLORIDA LARGEMOUTH BASS (fingerlings)</b>	<b>FLORIDA LARGEMOUTH BASS (phase II)</b>
2006	13,593	1,352
2007	-	1,006
2009	-	90

### *Forage*

Forage availability is typically measured directly through electrofishing and shoreline seine sampling and indirectly through measurement of largemouth bass body condition or relative weight.

Forage in Bayou Plaquemine is comprised mainly of threadfin shad (*Dorosoma petenense*), and longear, bluegill, warmouth and green sunfishes. Forage composition in catch-per-unit-effort by species collected in fall electrofishing samples in 2009 are presented in Figure 4.

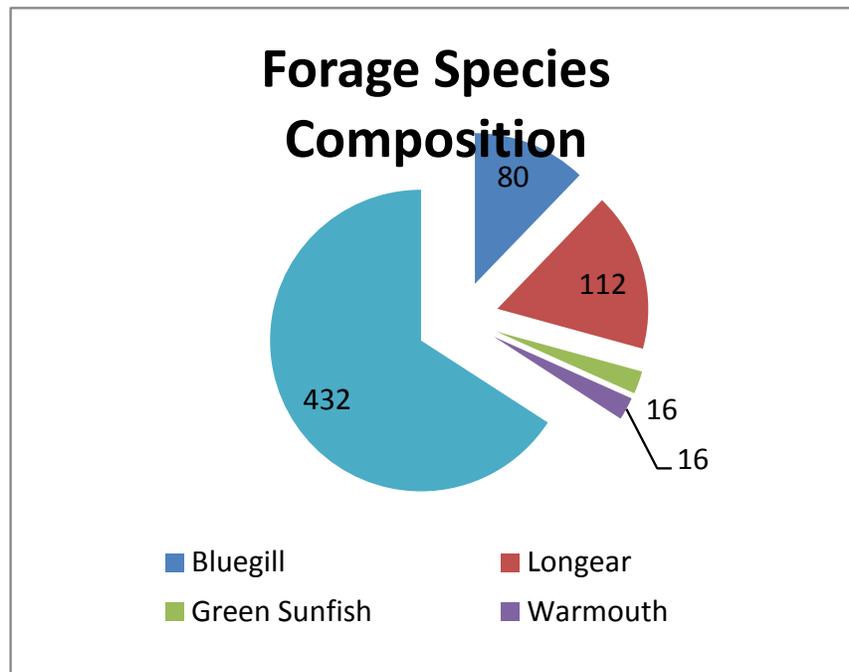


Figure 4. Forage composition CPUE (number per 900 seconds) by species collected in fall electrofishing samples in 2009 from Bayou Plaquemine, LA.

### Commercial

Hoop net catch results in 2010 and 2013 combined suggest that the most abundant commercially important fish are channel catfish, followed by smallmouth buffalo, common carp, spotted gar, freshwater drum, blue catfish and gizzard shad (Figure 5).

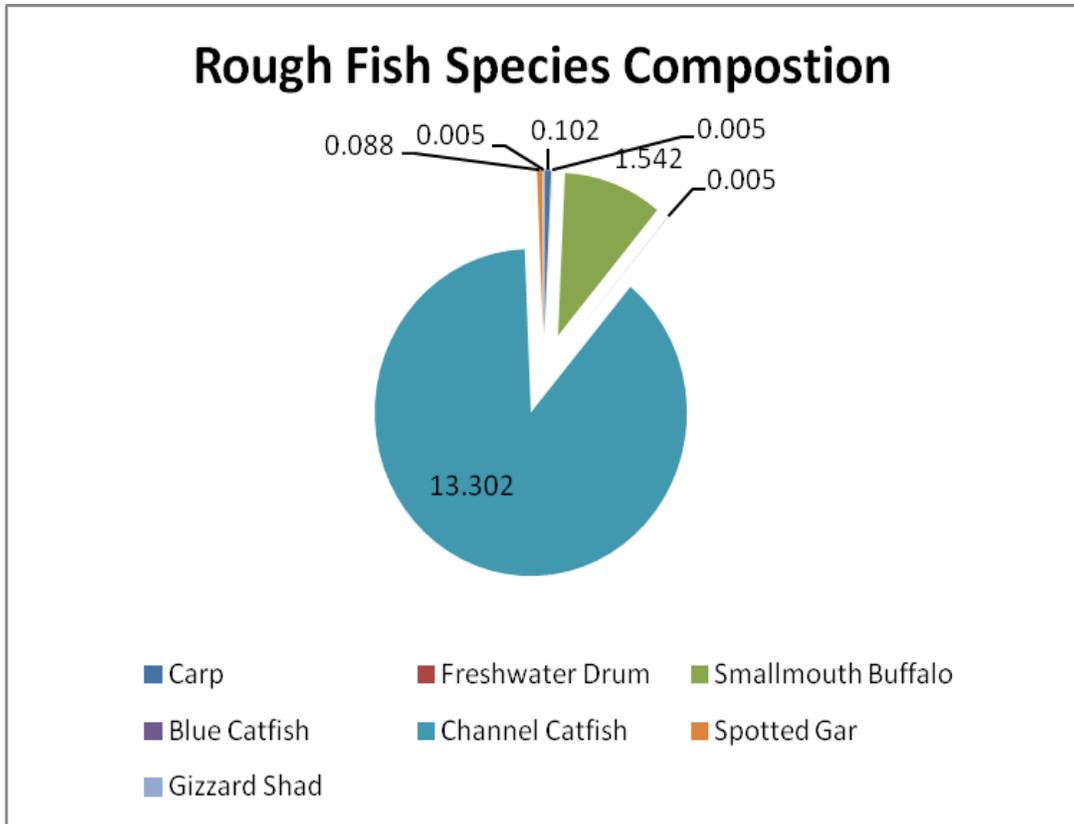


Figure 5. The hoop net CPUE (catch per hour) results for selected commercial fish species in 2010 and 2013 (combined data) from Bayou Plaquemine, LA.

Aquatic Invasive Species

Though their populations have not been monitored, common carp (*Cyprinus carpio*), and Asian carp species are present in the bayou.

**HABITAT EVALUATION**

Aquatic Vegetation

There are no records of treatment or complaint of vegetation.

Water Quality

Bayou Plaquemine was listed on DEQ's list of impaired waterways in 2008 because it did not meet the standard for dissolved oxygen. Bayou Plaquemine was removed from the list in 2010. Water quality data collected during spring of 2013 while collecting electrofishing samples had a mean dissolved oxygen level of 8.18 milligrams per liter.

Substrate

Substrate is composed of natural levee deposits of stiff clays, silt and silty sands along with downed timber and accumulation of organics.

## **CONDITION IMBALANCE / PROBLEM**

1. The bayou is subject to infestations of nuisance aquatic organisms that are present in the Mississippi River. Especially Asian carp and common carp. Because of the operation of the Port Allen Lock upstream, it is not feasible to exclude such infestations.
2. Garbage and nutrient laden runoff that can result in low levels of dissolved oxygen.
3. Possibility of stagnant water conditions if pump is underutilized.
4. Lack of fish cover near public fishing piers.

## **CORRECTIVE ACTION NEEDED**

1. Control Asian carp and common carp populations.
2. Work with Iberville Parish and the City of Plaquemine to reduce the amount of garbage and nutrient laden runoff.
3. Work with Iberville Parish, City of Plaquemine and U.S. Army Corps of Engineers to maintain proper pump function and water flow in the bayou.
4. Addition of fish structure near public fishing piers to improve angler success.

## **RECOMMENDATIONS**

1. Continue standardized sampling of fish populations to evaluate the condition of the stocks.
2. Continue to evaluate the presence and influence of invasive aquatic organisms.
3. Work with Iberville Parish and the City of Plaquemine to implement public outreach plan to reduce the amount of garbage and nutrient laden runoff that enters the bayou.
4. Continue to monitor the dissolved oxygen levels in the lake to ensure that it is suitable for aquatic life.
5. Work with Iberville Parish and the City of Plaquemine to add fish cover near the park site.