

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 fish species are managed to maintain sustainable populations while providing anglers the opportunity to catch or harvest numbers of fish.

Commercial

Commercial fish species are managed to provide sustainable populations.

Species of Greatest Conservation Need

Species of special concern are managed toward viable, self-sustaining populations.

EXISTING HARVEST REGULATIONS

Recreational

All statewide regulations apply to game fish species, see link below:

<https://www.wlf.louisiana.gov/page/seasons-and-regulations>

Commercial

All statewide regulations apply to commercial fish species, see link below:

<https://www.wlf.louisiana.gov/page/seasons-and-regulations>

Species of Greatest Conservation Need

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 is connected; no legal harvest or possession.

<https://www.wlf.louisiana.gov/page/seasons-and-regulations>

Gulf Pipefish (*Syngnathus scovelli*), American Eel (*Anguilla rostrata*), and Paddlefish (*Polyodon spathula*) are listed as Species of Greatest Conservation Need (SGCN) in the Louisiana Comprehensive Wildlife Action Plan (2019 Revisions). Paddlefish have a 30" max lower jaw fork length, 2 fish daily limit, fish cannot be retained alive; fish cannot be harvested by snagging methods.

<https://www.wlf.louisiana.gov/page/seasons-and-regulations>

SPECIES EVALUATION

Recreational

Largemouth Bass (*Micropterus nigricans*) are targeted for evaluation since they are a species indicative of the overall fish population due to their high position in the food chain and because they are highly sought after by anglers. Electrofishing is the best indicator of Largemouth Bass abundance and size distribution, with the exception of large fish.

Largemouth Bass Catch Per Unit Effort and Structural Indices

Spring electrofishing results indicate that the catch-per-unit-of-effort (CPUE = bass per hour) of Largemouth Bass 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. From 2016 to 2021, the range of values for CPUE for Largemouth Bass in Bayou Plaquemine have been less variable, ranging from 64 to 78. Catches of stock- and quality-sized fish have been more consistent over the entire range of years, while catches of sub-stock- and preferred-size fish have been more variable (Figure 2).

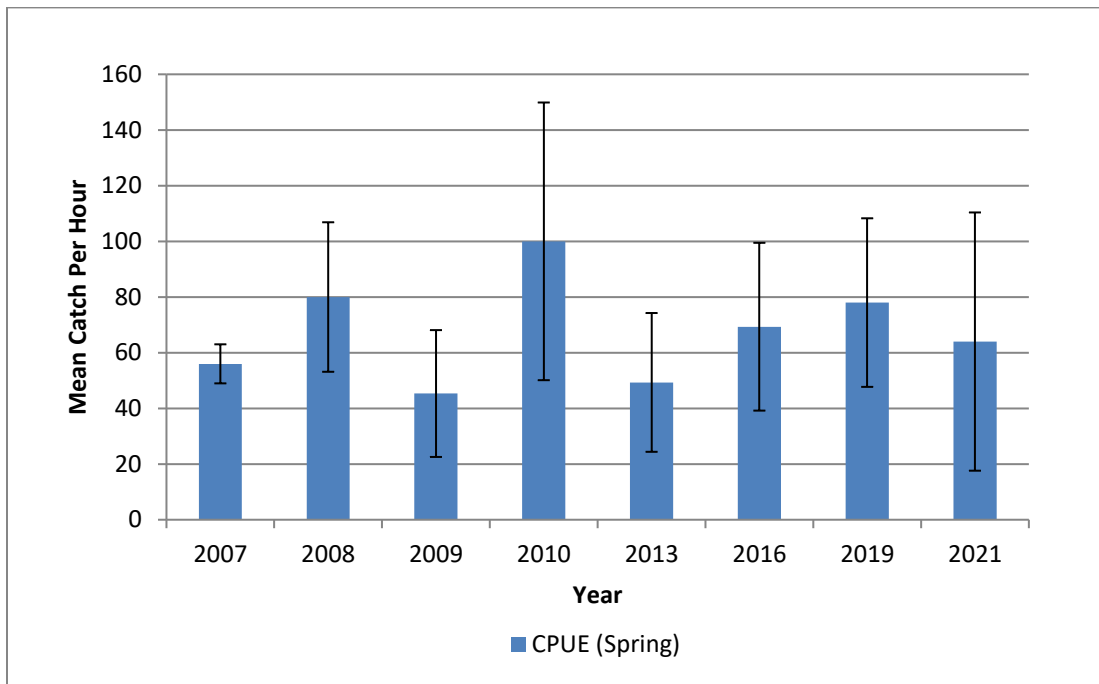


Figure 1. The mean CPUE (number per hour) for Largemouth Bass from spring electrofishing in Bayou Plaquemine, LA, from 2007 to 2021. Error bars represent 95% confidence limits of the mean CPUE.

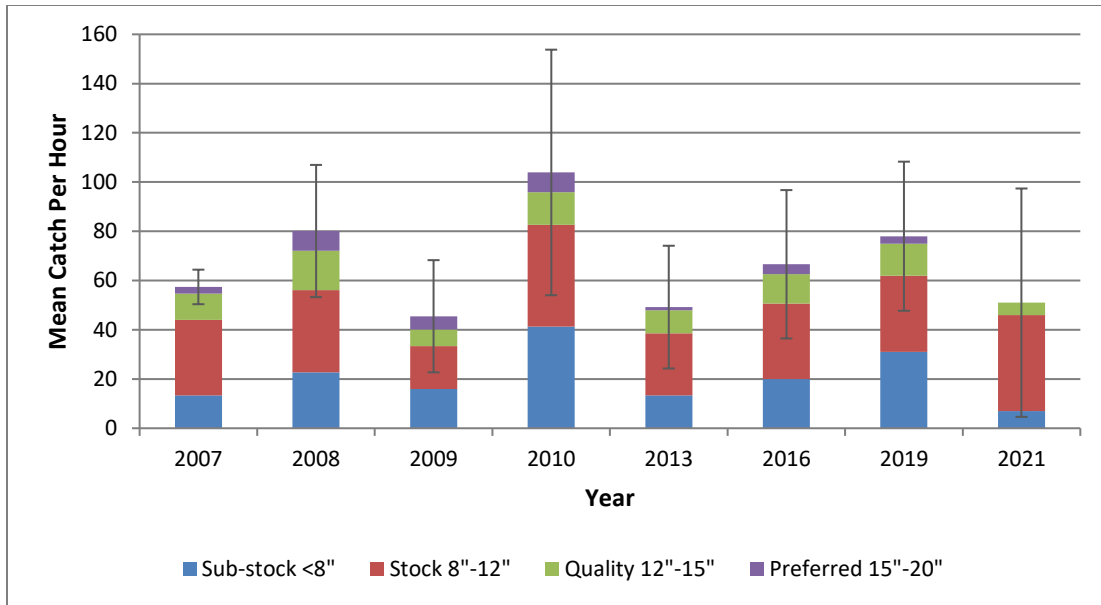


Figure 2. The mean CPUE for sub-stock- (<8”), stock- (8”-12”), quality- (12”-15”) and preferred-size (15”-20”) Largemouth Bass from Bayou Plaquemine for spring electrofishing results from 2007 to 2021. Error bars represent 95% confidence limits of the mean total CPUE.

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 42 for 2008. The number indicates that 42% of the bass stock (fish over 8 inches) in the sample was at least 12 inches or longer.

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

Relative stock density – 15 (RSD₁₅) is the proportion of Largemouth Bass in a stock (fish over 8 inches) that are 15 inches (preferred-size) or longer.

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

Although the overall CPUE has been variable from 2007 to 2021, size-structure indices have been more consistent in both the proportion of quality-size and preferred-size fish over the

same period (Figure 3). PSD values have varied between 30% and 42%, while RSD_{15} values range between 4% and 18%. The size distribution comparison (length frequencies) from 2007 through 2021 for spring electrofishing results show that all years are dominated by sub-stock- and stock-sized fish (Figure 4).

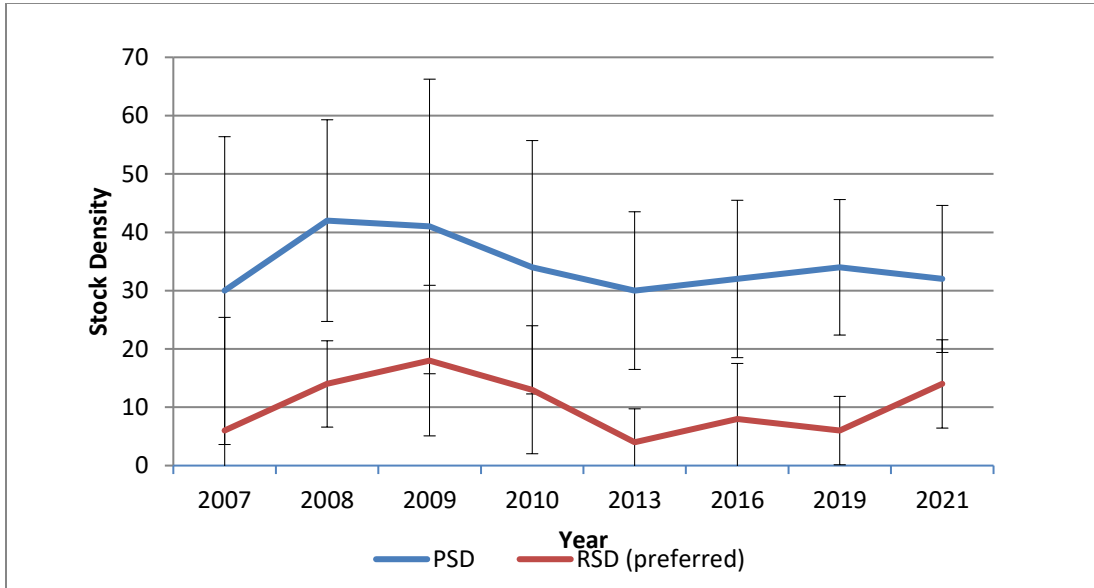


Figure 3. The mean size-structure indices (PSD and RSDp) for Largemouth Bass from spring electrofishing results in Bayou Plaquemine, LA, from 2007 to 2021. Error bars represent 95% confidence limits of the mean size-structure indices.

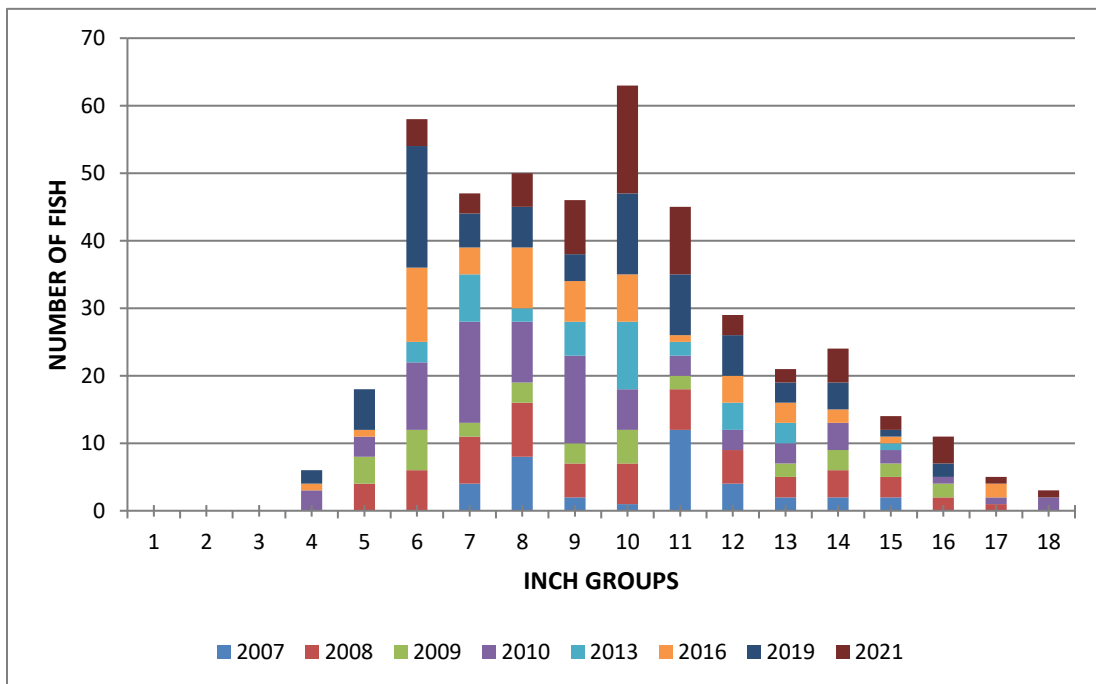


Figure 4. The size distribution (length frequencies) for Largemouth Bass from spring electrofishing results in Bayou Plaquemine from 2007 to 2021.

Genetics

Largemouth Bass have not been tested in Bayou Plaquemine for Florida Bass (*Micropterus salmoides*) genetics.

Stockings

Bayou Plaquemine has been stocked with 16,041 Florida strain Largemouth Bass since 2006 (Table 1).

Table 1. Stocking history by species by year for Bayou Plaquemine, LA from 2006 – 2010.

YEAR	FLORIDA LARGEMOUTH BASS (fingerlings)	FLORIDA LARGEMOUTH BASS (phase II)
2006	13,593	1,352
2007	-	1,006
2010	-	90

Recreational / Other Species

Crappie and Sunfish

Black and White Crappies (*Pomoxis nigromaculatus* and *P. annularis*) have both been observed but not monitored in the river, as well as Bluegill, Redear, Redspotted, Warmouth and Longear sunfishes (*Lepomis macrochirus*, *L. microlophus*, *L. miniatus*, *L. gulosus*, and *L. megalotis*, respectively).

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. 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 5 indicates that the body condition of largemouth bass is healthy with a relative weight of over 90 for stock-, quality- and preferred-size fish.

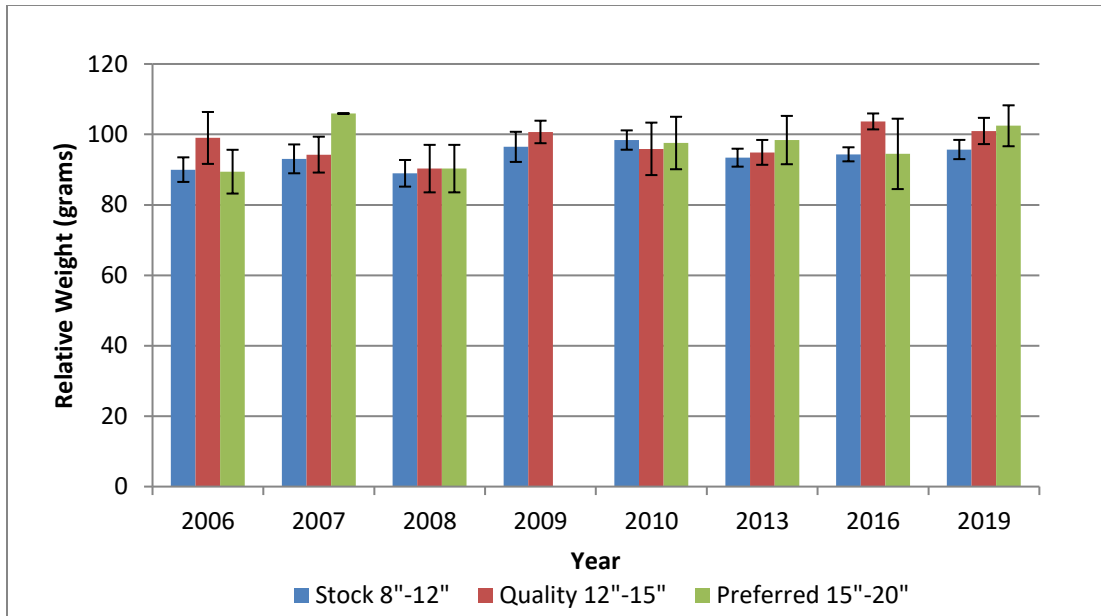


Figure 5. The mean relative weights for stock-, quality-, and preferred- size Largemouth Bass collected from Bayou Plaquemine, LA, in fall electrofishing samples from 2006 to 2016. Error bars represent 95% confidence limits of the mean relative weights.

Electrofishing samples from 2013-2019 showed that the bulk of available forage in Bayou Plaquemine is comprised mainly of Threadfin Shad (*Dorosoma petenense*), sunfishes (*Lepomis* spp.), Gizzard Shad (*Dorosoma cepedianum*) and Striped Mullet (*Mugil cephalus*). Forage composition in catch-per-unit-effort by species collected in fall electrofishing samples from 2013 to 2019 is presented in Figure 6.

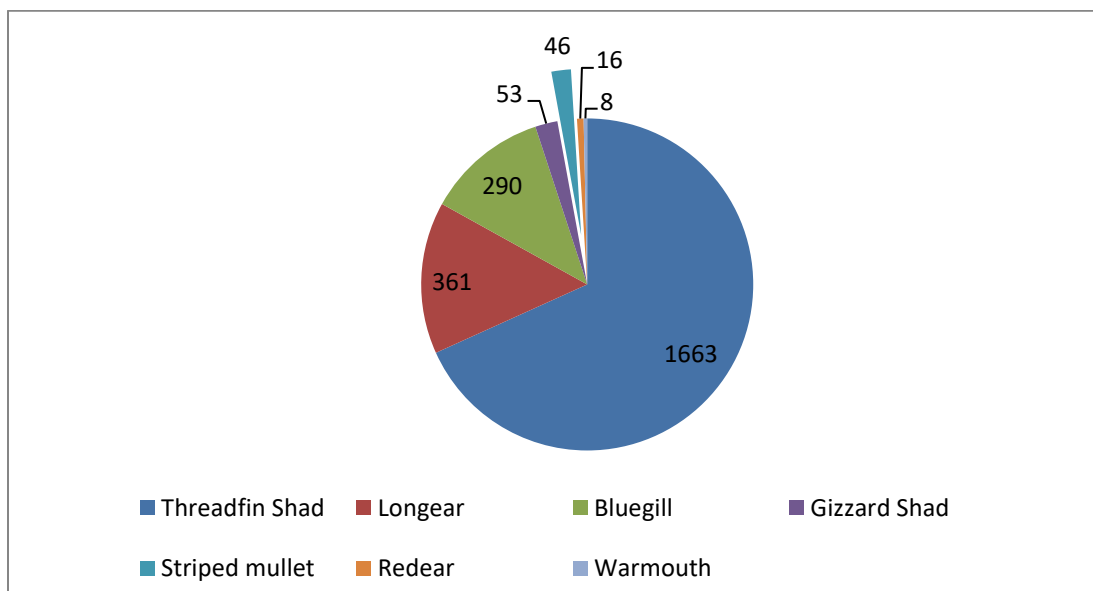


Figure 6. The mean CPUE for forage fish by species for Bayou Plaquemine from fall electrofishing results from 2013 to 2019.

Commercial

Hoop net catch results in 2010 and 2013 combined suggest that the most abundant commercially important fish are Channel Catfish (*Ictalurus punctatus*), followed by Smallmouth Buffalo (*Ictiobus bubalus*), Common Carp (*Cyprinus carpio*), Spotted Gar (*Lepisosteus punctatus*), Freshwater Drum (*Aplodinotus grunniens*), Blue Catfish (*Ictalurus furcatus*), and Gizzard Shad (Figure 7).

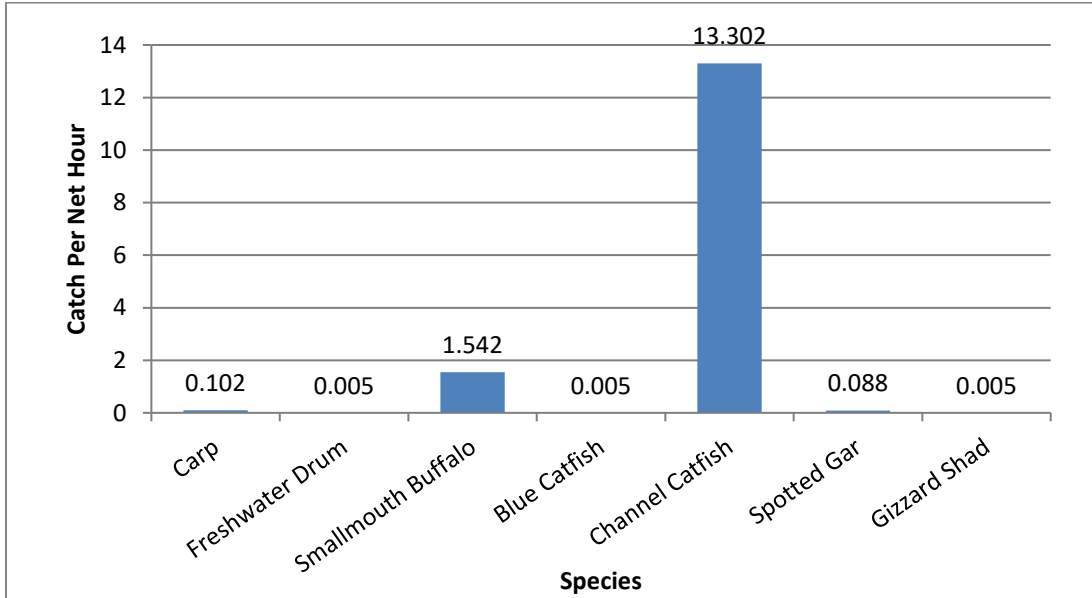


Figure 7. The hoop net CPUE (catch per hour) results for selected commercial fish species in 2010 and 2013 (combined data) from Bayou Plaquemine, LA.

Aquatic Invasive Species

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

The invasive Apple Snail (*Pomacea maculata*) has been documented in Bayou Plaquemine. Infestations of the snail have been reported throughout the Intracoastal Waterway, Grand River, and other connecting waterways.

HABITAT EVALUATION

Aquatic Vegetation

There are no records of treatment or vegetation complaints.

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. According to the most recent (2020) LDEQ Louisiana Water Quality Inventory: Integrated Report; Bayou Plaquemine is listed as fully supporting primary and secondary contact recreation, as well as fish & wildlife propagation.

<https://www.deq.louisiana.gov/page/louisiana-water-quality-integrated-report>

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 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 structures 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 bayou 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.