LOUISIANA DEPARTMENT OF WILDLIFE & FISHERIES

OFFICE OF FISHERIES
INLAND FISHERIES SECTION

PART VI - B

WATERBODY MANAGEMENT PLAN SERIES

TICKFAW RIVER, LOUISIANA

WATERBODY EVALUATION &
RECOMMENDATIONS

CHRONOLOGY

DOCUMENT SCHEDULED TO BE UPDATED ANNUALLY

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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 Special Concern

Species of special concern and threatened and endangered species are managed to rebuild to self-sustaining and fishable populations.

EXISTING HARVEST REGULATIONS

Recreational

All statewide regulations apply to game fish species, see link below:
http://www.wlf.louisiana.gov/fishing/regulations

Commercial

All statewide regulations apply to commercial fish species, see link below:
http://www.wlf.louisiana.gov/fishing/regulations

Species of Special Concern

Paddlefish (*Polyodon spathula*) 30" max lower jaw fork length, 2 fish daily limit, fish cannot be retained alive; fish cannot be harvested by snagging methods. Gulf sturgeon (*Acipenser oxyrinchus desotoi*) has no legal harvest or possession.
http://www.wlf.louisiana.gov/fishing/regulations

SPECIES EVALUATION

Recreational

Black bass 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, relative weight and structural indices-

Electrofishing has been used to collect LMB population data in the Tickfaw River regularly since 2006. Catch per unit effort (CPUE) results from electrofishing are normally based on the number of fish captured in one hour. This value provides an estimate of relative

abundance and allows us to monitor changes in fish abundance over a period of time. Fall electrofishing results indicate lower catch-per-unit-effort (CPUE) of largemouth bass in the years following Hurricanes Gustav, Isaac and presumably Katrina in 2008, 2012 and 2005 respectively (Figure 1). The storms created water quality conditions, such as low dissolved oxygen, that resulted in major fish kills. The two years following Hurricanes Katrina and Gustav, the mean total CPUE for largemouth bass rebounded steadily. Sub-stock and stock-size fish were highest in the fall of 2007 and 2010 (Figure 2). Total CPUE for 2010 greatly exceeded the long term averages for both stock- and substock-size classes of largemouth bass as depicted in Figures 1 and 2, respectively.

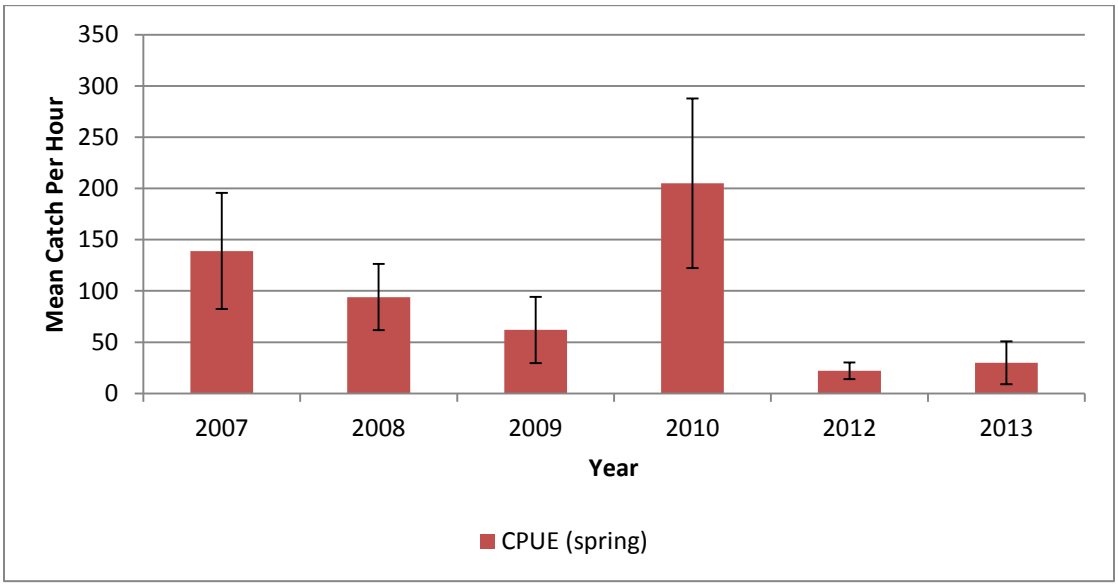

Figure 1. The mean CPUE (± 95% CI) number per hour for largemouth bass from Tickfaw River, LA, in spring electrofishing results from 2007 to 2013. CI = confidence limits of the mean CPUE. Values for n by year: n=139 (2007), n=94 (2008), n=62 (2009), n=205 (2010), n=22 (2012), n=30 (2013).

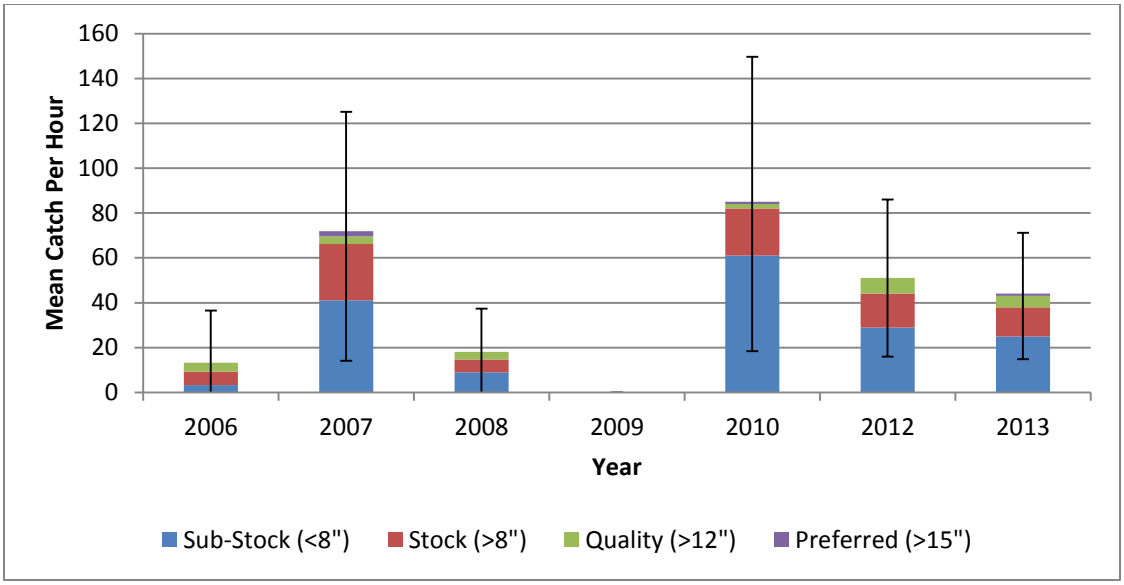

Figure 2. The mean CPUE (±95% CI) for sub-stock- (<8”), stock- (>8”), quality- (>12”) and preferred- (>15”) sized largemouth bass from Tickfaw River, LA, in fall electrofishing results from 2006 to 2013. CI = confidence limits of the total mean CPUE. Values for n by year: n=36 (2006), n=69 (2007), n=0 (2008), n=27 (2009), n=91 (2010), n=47 (2012), n=38 (2013).

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 40 for 2007. The number indicates that 40% 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 (RSD) is the proportion of largemouth bass in a stock (fish over 8 inches) that are 15 inches (preferred-size) or longer.

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

Although there was an increase in the overall mean CPUE in 2010, the size-structure indices for largemouth bass decreased in both, the proportion of quality-size and preferred-size fish (Figure 3). The size distribution comparison (length frequencies) from 2010, 2012 and 2013 for spring electrofishing results show that there were more stock-sized fish inch groups present than in 2009 (Figure 4).

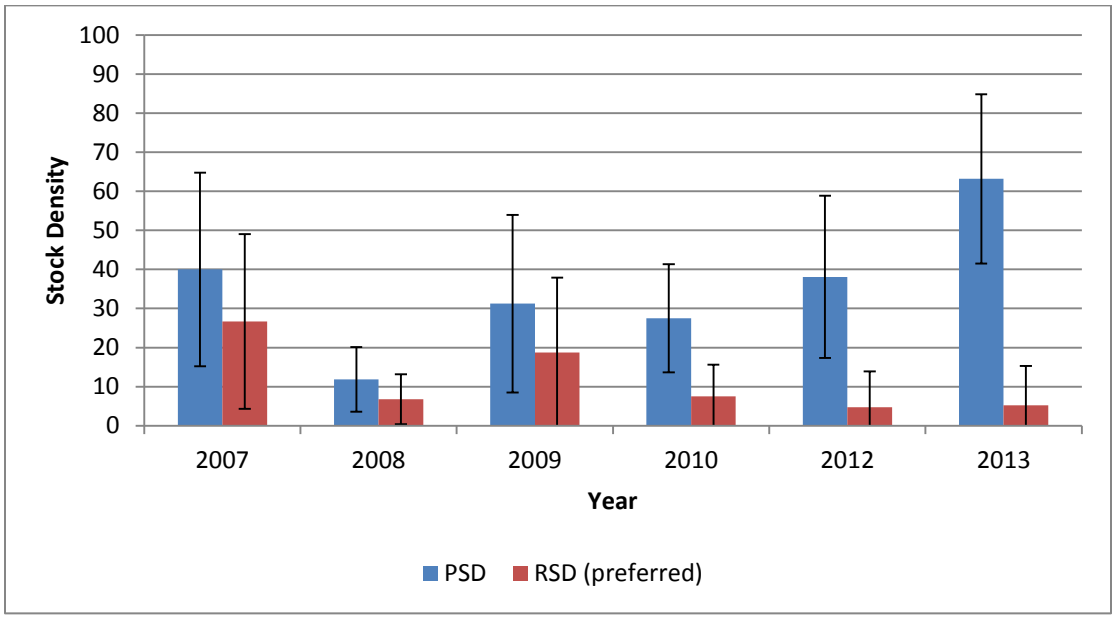

Figure 3. The mean size-structure indices (PSD and RSDp) for largemouth bass from Tickfaw River, LA, for spring electrofishing results from 2007 to 2013. Error bars represent 95% confidence limits of the mean size-structure indices.

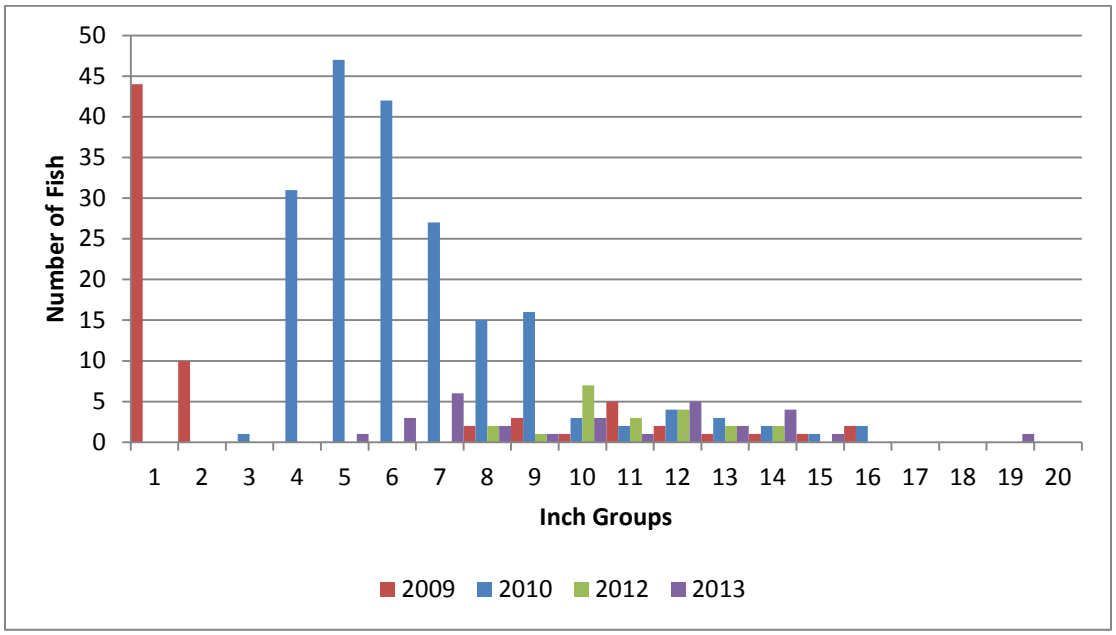

Figure 4. The size distribution (length frequencies) for largemouth bass from Tickfaw River, LA, from spring electrofishing results for 2009 to 2013. Values for n by year: n=72 (2009), n=196 (2010), n=21 (2012), n=30 (2013).

Stocking and Genetics

Over 365,000 Florida bass (*M. floridanus*) have been stocked regularly into Tickfaw River since 1996 (Table 1). A majority of these fish were stocked post Hurricanes Katrina and Gustav in response to public outcry over the massive fish kills that occurred following these storms. In the post storm absence of predation and competition, the Florida largemouth bass should have become dominant in this coastal river, when in fact this species did not even become established. Genetic testing conducted in 2010 indicated that less than 10% of the Florida genome was present in the sample results (Table 2). Additionally, higher CPUE's in 2010 (Figures 1 and 2), along with the genetic results, indicate that the remaining native largemouth bass population, although greatly reduced from pre-storm levels, recovered robustly and that any stocking efforts were unnecessary. The stocking of Florida largemouth bass in the adjacent Blind and Amite Rivers showed a similar fate; the ineffectiveness to establish this genotype during post hurricane recovery. This tenacity for recovery of native largemouth bass populations has also been noted in other coastal river systems including the Calcasieu, Mermentau and Sabine rivers in southwest Louisiana following Hurricanes Rita (2005) and Ike (2008). These systems received little to no stockings of largemouth bass before and after the hurricane related fish kills, yet yielded record CPUE's two years into recovery. These observations suggest that coastal fish populations have adapted to these periodic storm events and are resilient to these events in the long term.

Table 1. Florida largemouth stocking into Tickfaw River, LA from 1996 – 2011.

FLORIDA LMB STOCKING	
Year	Number of Fish
1996	46,264
1997	14,000
1999	33,899
2000	14,244
2001	10,000
2002	19,585
2003	10,036
2004	10,013
2005	10,046
2006	50,260
2007	49,784
2008	49,450
2009	47,183
2011	3,450
TOTAL	**368,214**

Table 2. Results of 2010 genetic testing for the Florida genome in largemouth bass from Tickfaw River, LA.

Number of fish	% Northern	% Hybrid	% Florida
120	93	7	0

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* and *L. gulosus, L. megalotis*, respectively). Currently, there are no plans to sample with lead nets in the river.

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 of largemouth bass caught in the Tickfaw River ranged from 80 to 102 from 2006, 2007, 2009, 2010 and 2012 for all stock length-size and larger fish, indicating an adequate forage base

(Figure 5). The mean Wr of largemouth bass from 2006, 2007, 2009, 2010 and 2012 is approximately 97 (Figure 6). This Wr suggests that there is ample forage available for bass production.

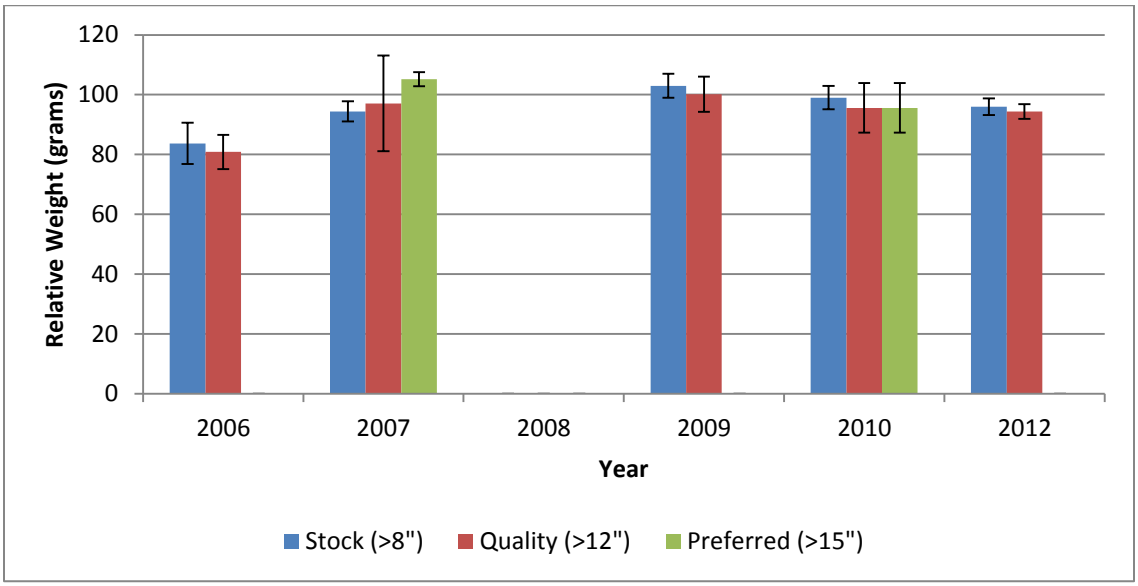

Figure 5. The mean relative weights (± 95% CI) for stock-, quality-, and preferred size largemouth bass collected from Tickfaw River, LA, in fall electrofishing samples from 2006 to 2012. Error bars represent 95% confidence limits of the mean relative weights. Values for n by year: n=8 (2006), n=29 (2007), n=0 (2008), n=26 (2009), n=27 (2010), n=29 (2012).

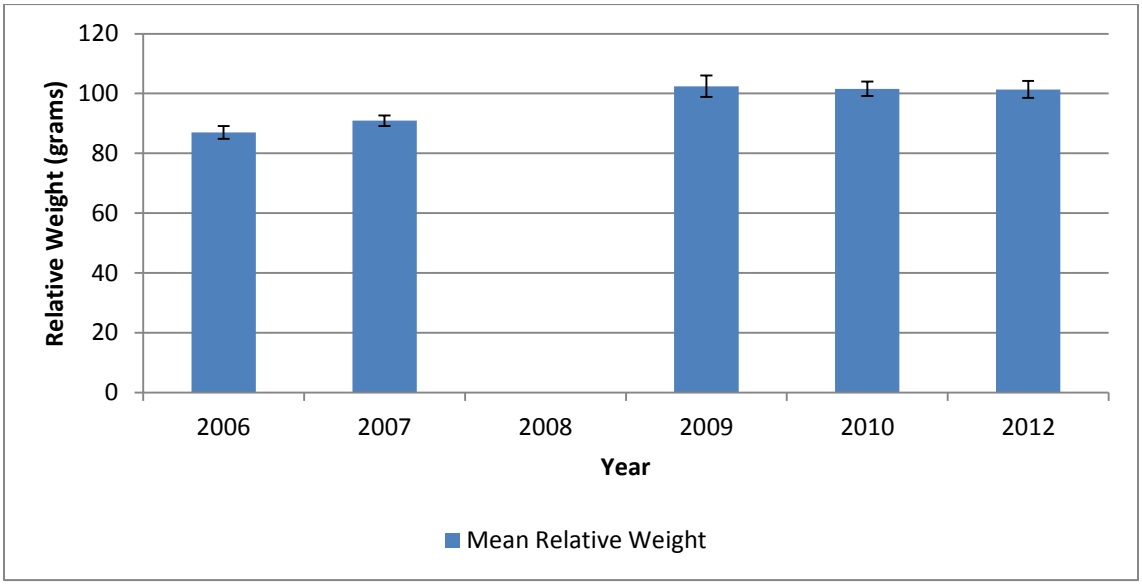

Figure 6. The mean relative weights (± 95% CI) for largemouth bass collected from the Tickfaw River, LA in fall electrofishing samples from 2006 to 2012. Error bars represent 95% confidence limits of the mean relative weights. Values for n by year: n=36 (2006), n=69 (2007), n=0 (2008), n=27 (2009), n=91 (2010), n=47 (2012).

Electrofishing samples from fall 2012 and 2013 showed that the available forage consisted of bluegill, redear, redspotted and warmouth sunfishes, golden shiners (*Notemigonus crysoleucas*), blackstripe topminnows (*Fundulus notatus*) and inland silversides (*Menidia beryllina*) (Figure 7).

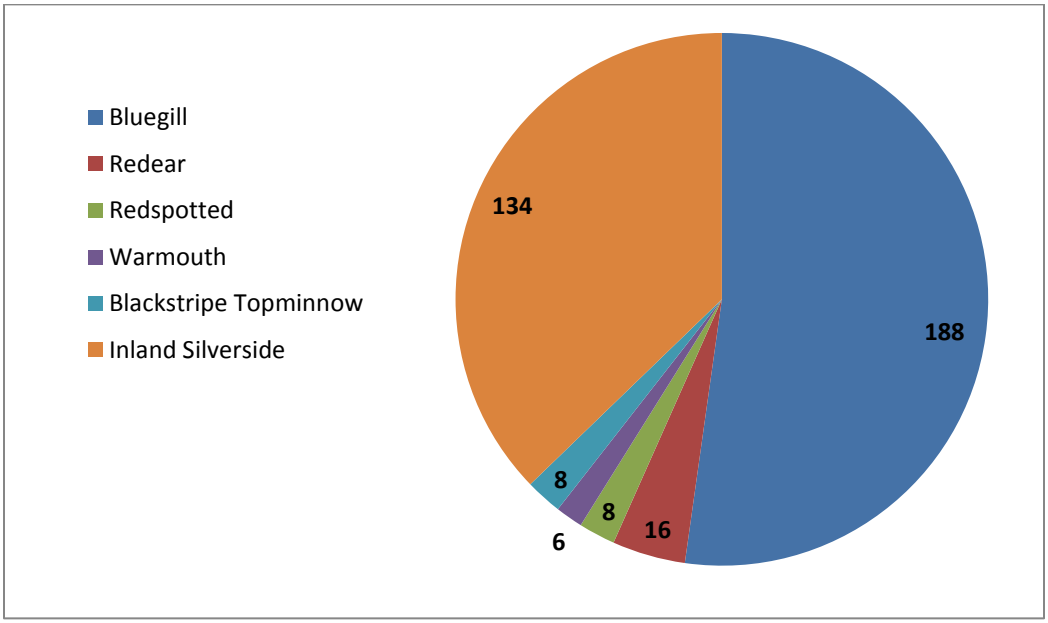

Figure 7. The mean CPUE for forage fish by species for Tickfaw River, LA, from fall electrofishing results 2012 - 2013.

Aquatic Invasive Species

Though their population has not been monitored, common carp (*Cyprinus carpio*) are commonly observed in the river.

In 2012 and 2013, three adult silver carp (*Hypophthalmichthys molitrix*) were identified in the adjacent Amite River. These fish may have been introduced via the Bonne Carre Spillway operation by the US Army Corps of Engineers during the 2011 flood event. To date, no juveniles have been observed.

HABITAT EVALUATION

Aquatic Vegetation

Nuisance species

Common salvinia and water hyacinth have been the main cause of complaints over the past few years. Common salvinia is scattered throughout the basin and is constantly being restocked by adjacent swamps and bayous. Within the river system, the desire to own waterfront property has led to the construction of numerous man-made canals over the past 4 decades. These canals are typically 50 to 200 feet wide, dead-end offshoots of the main river

channel. The canals are lined with houses, camps, boat slips, docks, and an occasional boat ramp. The canal systems are rarely designed so that river water can flow through unimpeded (i.e. horseshoe in shape, etc.). Consequently, these dead-end canals have no inherent "flushing" mechanism to discharge of floating vegetation. Invariably, some form of aquatic vegetation makes its way into these canals each year, remains there due to the stagnant water conditions, and thrives. When the suspect vegetation in these canals has reached critical mass, the home/camp owners complain.

Coverage
Estimates of vegetation coverage (as of September 30, 2013) are provided below:
Problematic Species
Common Salvinia (*Salvinia minima)* – 50 acres
Water Hyacinth (*Eichhornia crassipes)* – 20 acres
Duckweed (*Lemna spp.)* – 15 acres

Beneficial Species
Yellow Water Lily (*Nymphaea mexicana)* – 80 acres
Coontail (*Ceratophyllum demersum)* – 80 acres

Biological Control
NONE

Chemical Control

In summer of 2013 a contract was awarded to treat 259 acres of alligator weed in an area recently acquired by LDWF. Another 139 acres of nuisance vegetation was treated by department personnel (Table 3).

Table 3. Herbicide treatments in the Tickfaw River, Louisiana 2013.

TICFAW RIVER ACRES OF AQUATIC VEGETATION TREATED IN 2013			
SPECIES	**ACRES**	**HERBICIDES***	**APPLICATION RATES**
Water hyacinth	66	2,4-D	0.5 gal/acre
Alligator weed	19	2, 4-D	0.5 gal/acre
	16	Glyphosate	0.75 gal/acre
	259**	Imazapyr	0.5 gal/acre
Pennywort	17	2, 4-D	0.5 gal/acre
	6	Glyphosate	0.75 gal/acre
Common salvinia	2	Diquat/Flumioxazin	0.5 gal/ 4oz /acre
	10	Glyphosate	0.75 gal/acre
	3	Diquat	0.75 gal/acre
TOTAL	398		

* All herbicide applications included a non-ionic surfactant at a rate of 0.25 gal/acre.
** Contract spraying on recently acquired LDWF property.

Limitations
During high water periods within this river complex, common salvinia floods into the surrounding swamps where it flourishes. LDWF spray crews are unable to access these areas due to the stands of dense timber and shallow water. Consequently, common salvinia continues to drain out of the swamp, into the river, when water levels drop.

Water Quality
In 2006, the EPA listed Tickfaw River as an impaired river. Details are available at the attached link.
http://www.epa.gov/surfgulf/louisiana/imp-tickfaw.html

Substrate
Sandy river bottoms, high in inorganic material.

CONDITION IMBALANCE / PROBLEM

1. Agricultural and urban development in the watershed has contributed to water quality impairment.

2. The lower reach of the river is susceptible to salt water intrusion from Lake Maurepas, this is especially evident during periods of low river flow due to drought conditions and storm water surges during tropical weather events.

3. Tickfaw River is very susceptible to major fish kills, especially in the event of a tropical storm or hurricane.

4. Nuisance aquatic vegetation that impede navigation and degrade habitat.

CORRECTIVE ACTION NEEDED

1. Practice of BMPs to reduce contaminants entering the river.

2. Identify, protect and restore critical fisheries habitat in the watershed.

3. Control nuisance aquatic vegetation in the system and upstream at its source.

RECOMMENDATIONS

1. Work with landowners and appropriate agencies to encourage adherence to BMPs.

2. Continue standardized sampling of fish populations to evaluate the condition of the stocks. Design a standard sampling protocol to identify critical fisheries habitat and aquatic life in the watershed.

3. This area will be assessed monthly during the growing season for nuisance aquatic plant infestations. Public complaints will receive a timely response. Problem areas will be treated as they arise in accordance with the approved LDWF Aquatic Herbicide Recommendations. Water hyacinth (*Eichhornia crassipes*) will be treated with 2,4-D at a rate of 0.5 gallons per acre. Common salvinia will be treated with a mixture of glyphosate (0.75 gallons per acre) and diquat (0.25 gallons per acre) with Aqua King Plus (0.25 gallons per acre) and Thoroughbred (8 oz. per acre) surfactants from April 1 – October 31. Outside of that time frame, salvinia will be treated with diquat (0.75 gallons per acre) and a non-ionic surfactant (0.25 gallons per acre). Alligator weed will be treated with imazapyr (0.5 gallons per acre) with Turbulence surfactant (0.25 gallons per acre). Alligator weed growth in developed areas will be treated with Clearcast (0.5 gallons per acre) and Turbulence surfactant (0.25 gallons per acre). Combinations of different submerged/emergent plants will be treated with Sonar AS in areas of little to no flow if conditions warrant such action. Sonar AS will be applied at a rate of between 40 and 90 parts per billion. In-water treatments will be considered on a case by case basis with cost-benefit being a primary consideration.