LOUISIANA DEPARTMENT OF WILDLIFE & FISHERIES

OFFICE OF FISHERIES
INLAND FISHERIES SECTION

PART VI -B

WATERBODY MANAGEMENT PLAN SERIES

NANTACHIE LAKE

WATERBODY EVALUATION &
RECOMMENDATIONS

CHRONOLOGY

DOCUMENT SCHEDULED TO BE UPDATED ANNUALLY

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WATERBODY EVALUATION

STRATEGY STATEMENT

Recreational

Sportfish species, primarily largemouth bass (LMB) are managed to provide a sustainable population while providing anglers the opportunity to catch or harvest adequate numbers of fish to maintain angler interest and efforts.

Commercial

Nantachie Lake does not support high numbers of commercial fish species. The physical characteristics (i.e., acreage and fertility) of Nantachie Lake are not conducive to the production of commercial fish species; therefore a commercial fisheries management strategy is not used.

Species of Special Concern

No threatened or endangered fish species are known to inhabit this waterbody.

EXISTING HARVEST REGULATIONS

Recreational

Statewide regulations for all fish species, the LDWF recreational fishing regulations may be viewed at the link below:
http://www.wlf.louisiana.gov/fishing/regulations

Commercial

The LDWF commercial fishing regulations may be viewed at the link below:
http://www.wlf.louisiana.gov/fishing/regulations

SPECIES EVALUATION

Recreational

Largemouth bass (LMB) populations are targeted for assessment because they are a species indicative of the overall health of the fish population due to their high position in the food chain. Electrofishing is the most efficient sampling method for collecting largemouth bass to evaluate abundance and size distribution, with the exception of large bass. Gill net sampling is generally the preferred method to determine the status of large bass and other large fish species.

Largemouth Bass

Relative abundance, length distribution and size structure indices-

Electrofishing has been used to collect LMB population data in Nantachie Lake since 1990. Catch per Unit Effort (CPUE) results from electrofishing are normally based on the number of fish captured in one hour of electrofishing. This value provides an estimate of relative

abundance and allows us to monitor changes in abundance over a period of time. In Figure 1, springtime electrofishing results are used as an indicator of LMB relative abundance with total CPUE indicated since 1990. Sampling was conducted in the spring and fall on a bi-annual basis from 2001 through 2010, except during years when the lake was undergoing a fall drawdown. Figure 2 indicates that CPUE for all largemouth bass size groups are slightly variable over time. Sampling from 1991 through 2010 indicated a relatively normal LMB population with good annual recruitment of stock-size bass. The slight decrease in CPUE in 2003 may be a result of decreased sampling efficiency due to excessive submerged vegetation, primarily hydrilla (*Hydrilla verticillata*). Electrofishing sampling is primarily conducted in waters less than 6 feet deep, which were matted to the surface with submergent vegetation in 2003. Nantachie Lake underwent three consecutive years of drawdowns for vegetation control in 2005, 2006, and 2007. This annual shoreline drying improved spawning habitat for nesting fishes as electrofishing results for 2010 indicate that the relative abundance of stock-size LMB was above historical levels (Figure 2).

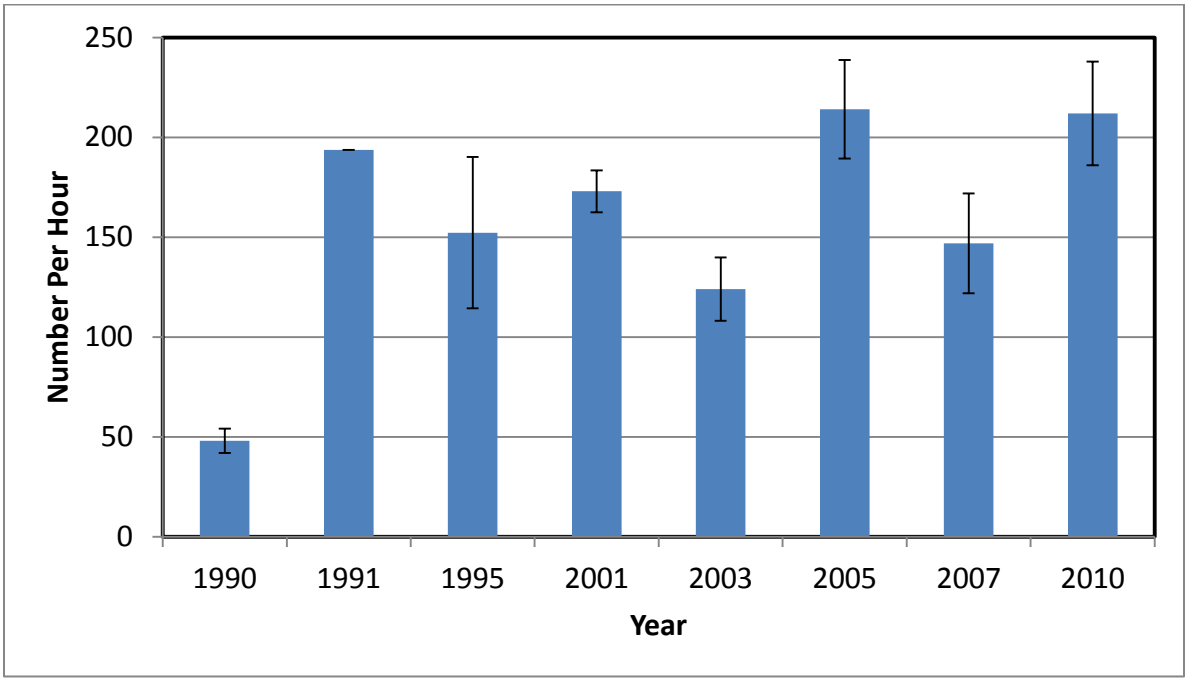

Figure 1. The total CPUE (± SE) for largemouth bass for spring electrofishing results from Nantachie Lake, Louisiana from 1990 – 2010. Error bars represent standard error of total CPUE.

Catch rate is sorted by inch groups to provide a size distribution model of the population at the time of sampling. The spring 2010 length distribution of the bass population ranged from 5 to 19 inches with strong representation from the 10-12 inch size groups (Figure 3). A healthy fish population should contain an abundance of smaller, younger individuals. Larger fish (≥ 13 inches) were found to be less abundant.

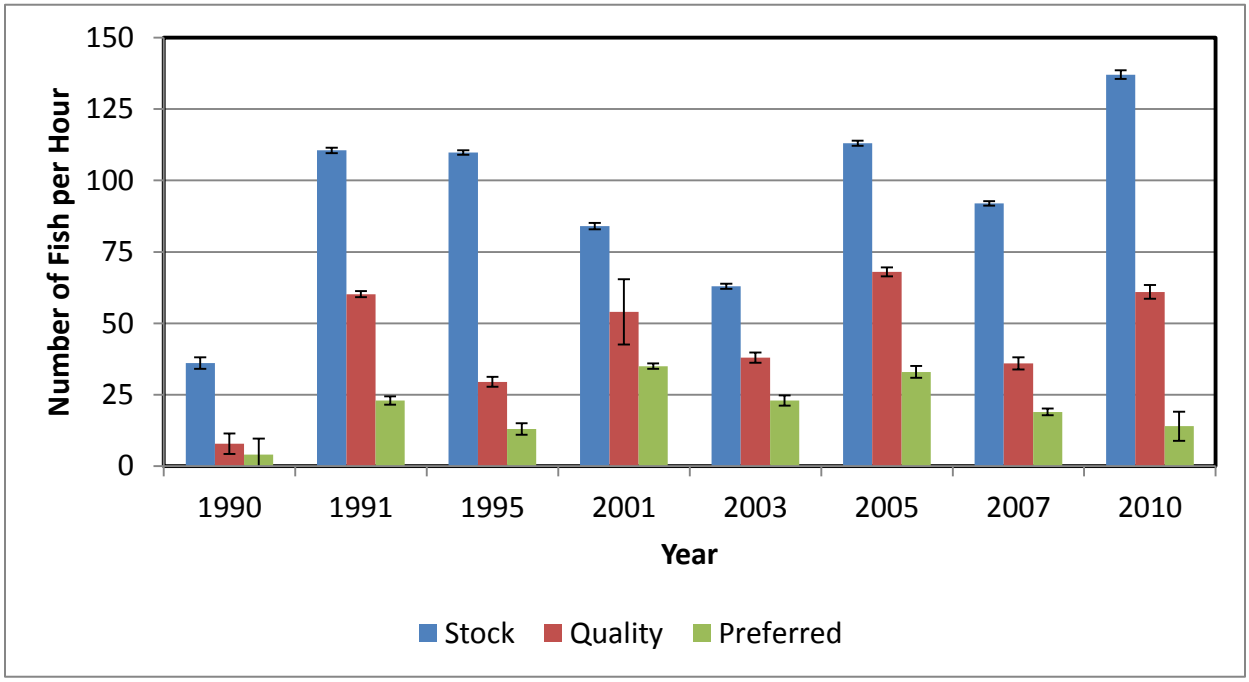

Figure 2. The CPUE (± SE) for stock-, quality-, and preferred-size classes of largemouth bass on Nantachie Lake, Louisiana for spring season from 1990 – 2010.

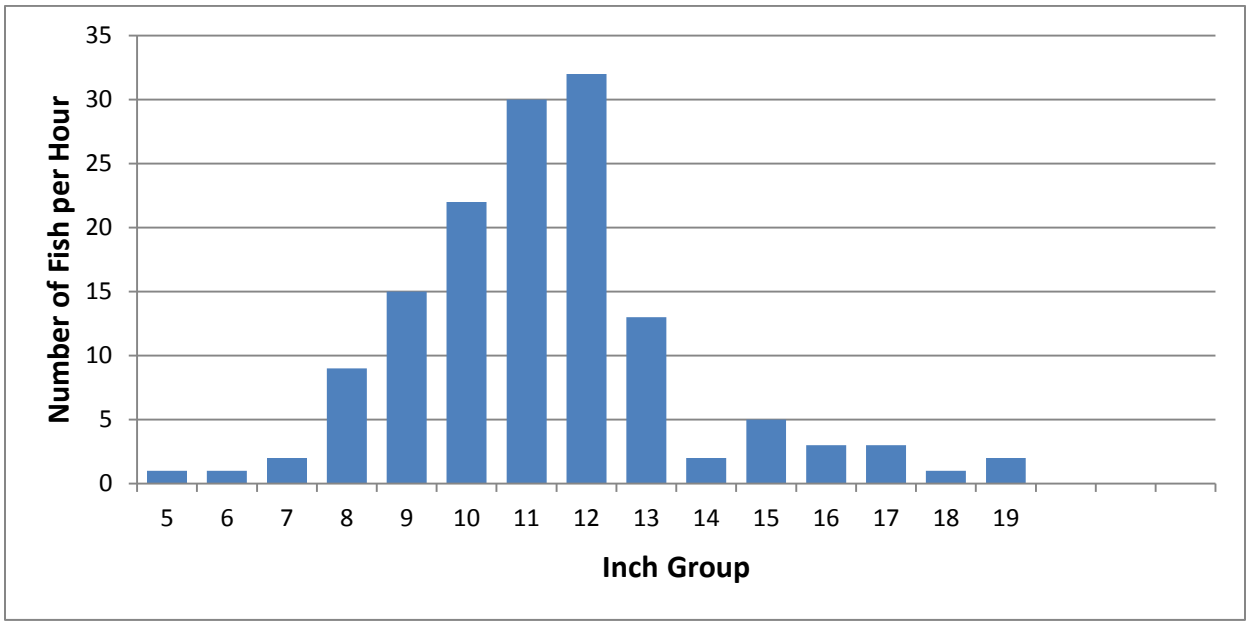

Figure 3. The size distribution (inch groups) of largemouth bass per hour of electrofishing for Nantachie Lake, Louisiana from spring 2010 (n = 141).

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). 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 4, below indicates a PSD of 60 for 2005. The number indicates that 60% of the bass stock (fish over 8 inches) in the sample was at least 12 inches or longer. Generally PSD's between 40 and 60 are considered good for central Louisiana lakes.

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

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

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

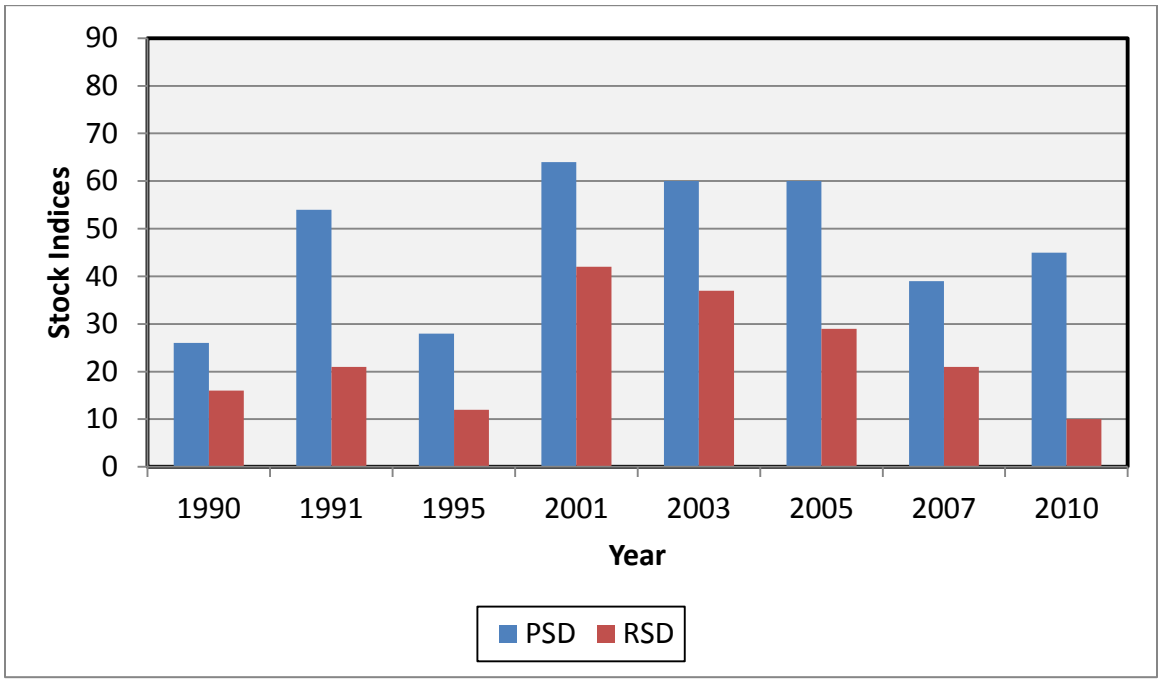

Figure 4. The size structure indices (PSD and RSD-p) for largemouth bass collected from Nantachie Lake, Louisiana during spring electrofishing samples from 1990 – 2010.

Trends in largemouth bass structural indices indicate PSD and RSD-p values have remained relatively stable from 2001 through 2010. The slight decrease in 2007 and 2010 may be due

to the drawdowns in 2005, 2006, and 2007. Overall, stable populations may be expected in upland reservoirs with relatively infertile water and stable habitat.

Largemouth bass genetics

Florida largemouth bass (FLMB) have been stocked into Nantachie Lake primarily to improve public relationships with the local fishermen and lake users following lake drawdowns. The first stocking was initiated in 1984 and included 65,300 fingerlings. An additional 2,800 fingerlings were stocked in 1986. These initial limited stockings did not increase the Florida genetic influence. Florida bass stocking has occurred 8 times between 2002 and 2014. The most recent genetic testing occurred in 2010, and results indicated that 15% of the 74 bass tested contained the Florida genome. See Table 1 for the complete genetic testing results.

Table 1. Largemouth bass genetic testing results in Nantachie Lake, Louisiana.

Year	% Northern	% Florida	% Hybrid	% Florida Influence
1990 (n=28)	82	0	18	18
2001 (n=96)	75	3	22	25
2010 (n= 74)	85	1	14	15

Forage

Forage availability is measured through two methods: summertime shoreline sampling with haul seines and fall forage electrofishing. Shoreline seine haul results for 1999 – 2001 are shown in Figure 5. The two major forage species found in 1995 forage electrofishing results included sunfishes and threadfin shad (Figure 6). Forage availability is also measured 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 relative weights below 80 may indicate a potential problem with forage availability. The relative weights of LMB collected from Nantachie Lake have been relatively stable for all size classes since 1990. Relative weight sampling results indicate Nantachie Lake relative weights for largemouth bass are above acceptable levels (Figure 7).

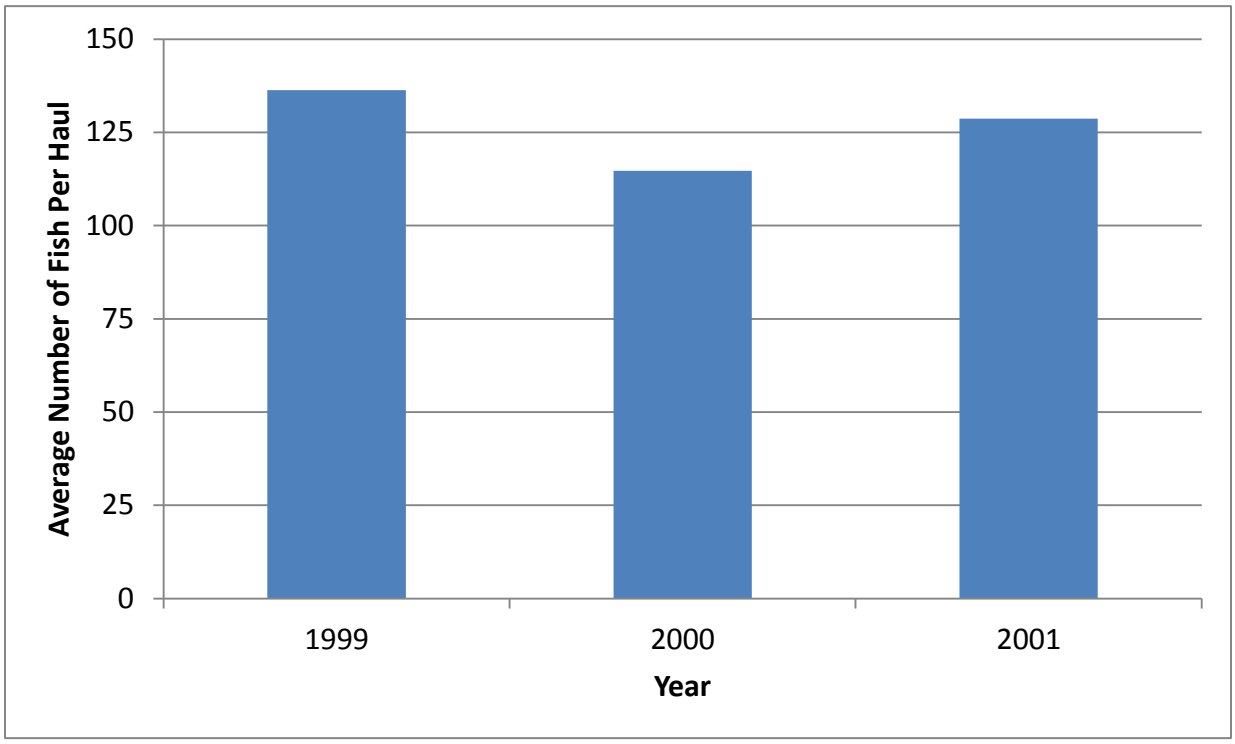

Figure 5. The CPUE (average number per seine haul) of fish from shoreline seining for Nantachie Lake, LA, for 1999, 2000, and 2001.

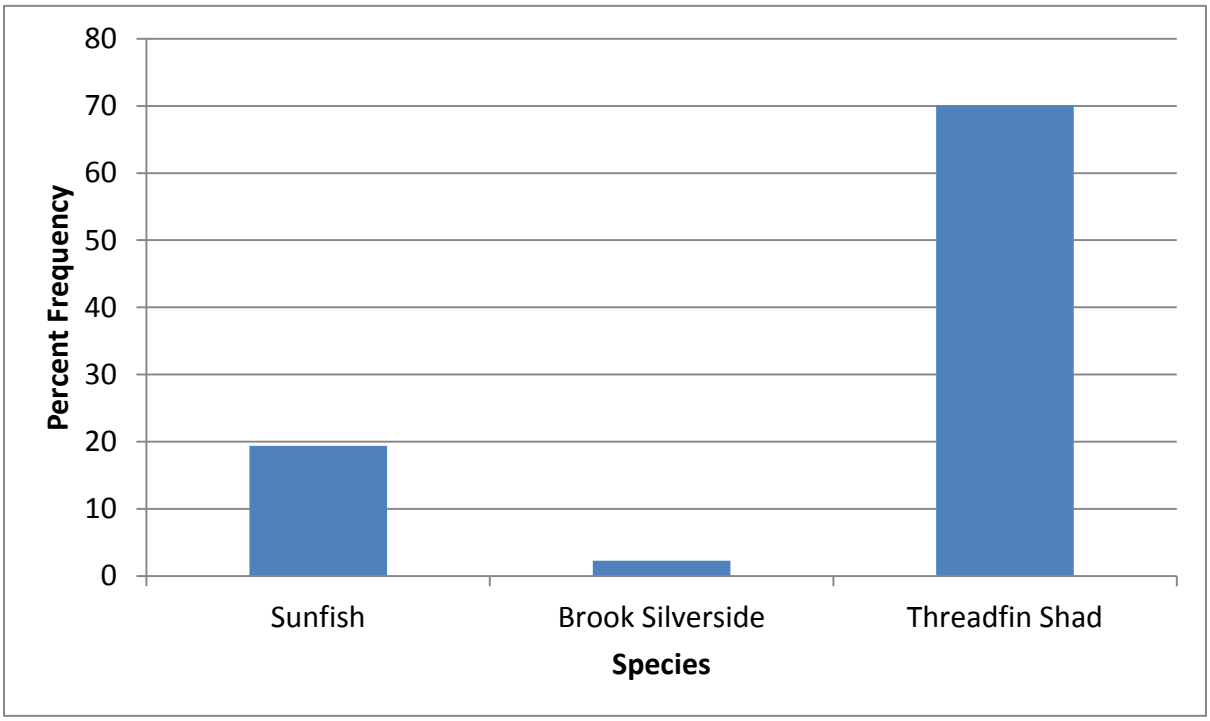

Figure 6. Percent frequency of forage species found in Nantachie Lake, Louisiana from fall 1995 electrofishing results.

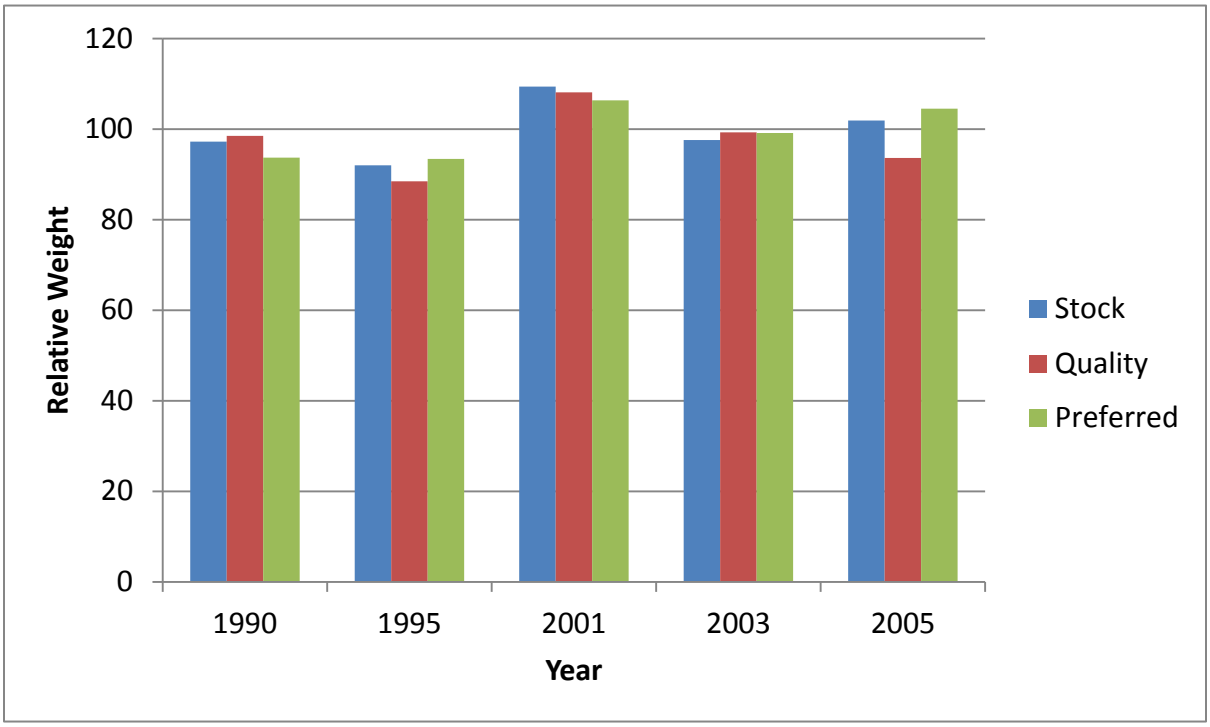

Figure 7. Relative weights for stock-, quality-, and preferred-size classes of largemouth bass collected during fall electrofishing for Nantachie Lake, Louisiana in 1990, 1995, 2001, 2003, and 2005.

Crappie

Biomass (rotenone) sampling occurred in 1980, 1984 and 1994. Very few crappie were collected in these samples. Standing crop sampling averages for each year were less than 0.5 pounds of crappie per acre in Nantachie Lake. Additional sampling for crappie was conducted with lead nets in 2004. Eight experimental lead nets of various mesh sizes were each fished a total of 72 hours soak time. A total of 35 crappies were collected from the lead net efforts. Nantachie Lake crappie sampling results indicate the crappie population in Nantachie may be lower than other central Louisiana lakes. However, a significant number of crappie anglers utilize the lake. Primarily, the fish are caught in the winter and early spring prior to the emergence of aquatic vegetation. Also, fishing yo-yo's from cypress trees is popular during the winter months. Additional crappie population sampling is needed at this time.

Commercial

Large fish species that normally comprise a commercial fishery are not found in this waterbody in sufficient numbers to support a viable commercial fishery. Gill net sampling was conducted by LDWF personnel in 2007 and 2013. A variety of commercial fish species were collected, but abundance was found to be low. Gill net results are found in Figure 8.

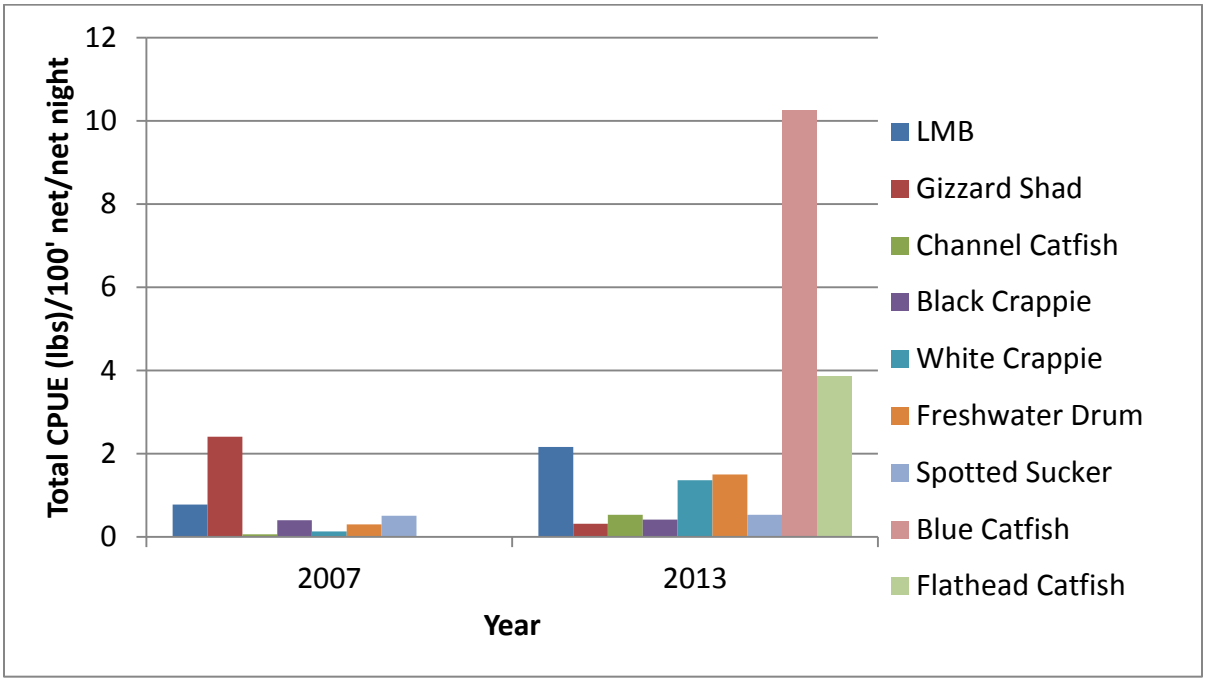

Figure 8. The total CPUE by species by year collected with gill nets (100' net/net night) for Nantachie Lake, Louisiana, for 2007 and 2013.

Species of Special Concern

No threatened or endangered fish species are known to inhabit this waterbody.

HABITAT EVALUATION

Aquatic Vegetation

Nantachie Lake has been plagued with aquatic vegetation for a long period of time. The first drawdown occurred in 1974. A second drawdown occurred in 1979; both were for submersed aquatic vegetation control. In the 1970's, native aquatic vegetation was predominantly found in the shallow water areas of the lake. Submersed vegetation included fanwort (*Cabomba caroliniana*) and bladderwort (*Utricularia spp.*). No emergent vegetation was reported as problematic during this time.

Hydrilla was first recorded in the lake in 1998 near the public boat launch on LA 1240. By 2000, hydrilla was the most abundant submergent vegetation in the lake. The majority of water less than 6 feet deep was matted to the surface by hydrilla. Since that time, hydrilla has been a continuous problem. Drawdowns were conducted for three consecutive years in 2005, 2006, and 2007 to reduce hydrilla. The results were mixed and hydrilla has become established in deep water that cannot be dried during drawdowns.

By fall 2012, hydrilla was again causing serious problems. At this time, approximately 56% of Nantachie Lake was infested with hydrilla. The majority of waters out to the 8' depth contour were matted to the surface with hydrilla. In the fall of 2012, LDWF developed an

aquatic vegetation plan that included a 4' drawdown in 2012/2013. This was followed in the spring of 2013 with the introduction of triploid grass carp (TGC).

When stocked at sufficient rates, TGC have proven to be effective at controlling submergent vegetation, especially hydrilla. Due to the limited success from drawdowns on hydrilla, triploid grass carp were introduced as a control measure. Two thousand (2000) TGC were stocked in Nantachie Lake on April 3, 2013. The 8" to 12" carp were stocked at a rate of 4 fish per vegetated acre. Annual vegetation surveys will be conducted each summer (July - August) to determine the success of the TGC in reducing hydrilla growth. Additional TGC stocking may be considered in 3 to 5 years if necessary.

Giant salvinia (*Salvinia molesta*) was discovered in the lake in 2008. The invasive fern has not caused major problems to date. However, LDWF personnel conduct maintenance spraying 2 to 4 days each month to prevent the spread of giant salvinia. On October 9, 2013, less than 50 acres of giant salvinia were observed scattered throughout the impoundment. No major mats of giant salvinia were present. A fringe of alligator weed (*Alternanthera philoxeroides*) and scattered water hyacinth was present along the shoreline. Combined coverage of these two species was less than 50 acres.

Emergent vegetation, including giant salvinia, may be less of a problem in 2014 due to colder than normal temperatures in January of 2014. During this period a thin layer of ice formed on shallow water areas of central Louisiana lakes.

Substrate

Nantachie Lake has a watershed ratio of 32 to 1. Water level fluctuation is moderate. Turbidity fluctuates depending on rainfall; however due to the extensive coverage of submersed vegetation, water clarity is generally good. The majority of the watershed is forested. There is a minimal amount of agricultural farming in the watershed and little sediment inflow into the lake. The lake bottom substrate consists primarily of coarse and medium grain sands which provide excellent spawning areas for bottom nesting fish such as largemouth bass, crappie and other sunfish species.

Artificial Structure

Nantachie Lake has an overabundance of natural complex cover including aquatic vegetation and cypress and tupelo timber. No artificial structure is necessary.

CONDITION IMBALANCE / PROBLEM

There is currently an overabundance of submergent vegetation in Nantachie Lake. A range of 15-30% coverage of complex cover is considered desirable for sportfish production. Vegetation coverage well above the optimal range for fisheries and angler access has been documented since 2000.

Currently, hydrilla and giant salvinia are causing problems for recreational users of the lake especially home and camp owners.

The completion of the Red River Navigation project in 1993 prevents future use of the Nantachie Lake Dam No. 1 gate to dewater the lake. A control structure in Dam No. 2 was constructed by USCOE to alleviate this problem. This structure allows dewatering to approximately 7 feet below pool stage. Dewatering through Dam No.1 allowed for the lake water level to be lowered 10 feet.

In the fall of 2010, the Grant Parish Police Jury (GPPJ) and the Lake Nantachie Property Owners Association (LNPOA) requested an opening of Dam No. 1 to allow Red River water to backflow into Nantachie Lake. The action was requested in an effort to raise the level of the impoundment to alleviate low water issues. A parallel action to open Dam No. 2 was requested by the GPPJ to provide irrigation water for farmers and ranchers downstream in Bayou Darrow. LDWF requested an opinion from DOTD on operation of Dam No.1 for back flow. In a recommendation against the action, DOTD explained that the structure was not designed for reverse flow and that there is no trash rack on the downstream side for protection. Obstruction of the gate opening is a concern. Operations to close an obstructed gate could cause extensive damage to the gate and structure. LDWF advised that the action carried long term risk for all Nantachie Lake users to attain short term gain for a small number of users and did not forward a request for the gate opening to DOTD.

On November 7, 2011 a joint agreement was signed by GPPJ and LDWF. In the agreement, the Police Jury assumed liability and responsibility for all damages due to the operation of Dams No. 1 and 2. Nantachie Dam No.1 was opened to allow Red River water to back flow into the impoundment. Dam No. 2 was opened to provide water for drought relief to downstream farmers and ranchers in western Grant Parish.

CORRECTIVE ACTION NEEDED

Nantachie Lake would benefit from a reduction in submersed aquatic plants. A LDWF corrective action plan was implemented in 2012. It included a fall/winter drawdown in 2012 to reduce hydrilla biomass, followed by a TGC stocking in the spring of 2013 to help slow the regrowth of hydrilla.

LDWF aquatic vegetation spray crews utilize foliar herbicide applications 2 to 4 days per month to slow the spread of giant salvinia.

RECOMMENDATIONS

1. Continue existing harvest regulations until LDWF sampling results indicate that change is appropriate and necessary from a biological perspective or such time as a change in management strategy is indicated by the collective opinion of Nantachie Lake anglers.

2. Continue LDWF standardized sampling to assess fisheries populations.

3. LDWF spray crews will continue treating emergent and floating vegetation on an as needed basis with either glyphosate (0.75 gal/acre) or diquat (0.75 gal/acre) and an approved surfactant (0.25 gal/acre). A mixture of diquat (0.25 gal/acre) and glyphosate (0.75 gal/acre) with Aqua King Plus (0.25 gal/acre) and Air Cover (12 oz./acre) surfactants may be applied to common salvinia. Alligator weed will be controlled with imazapyr (0.5 gal/acre) in undeveloped areas and with Clearcast (0.5 gal/acre) near houses and developed shorelines. Turbulence surfactant (0.25 gal/acre) will be used in conjunction with both of these herbicides.

4. Continue aquatic vegetation surveys each summer to determine species composition and coverage of aquatic vegetation. This will provide a method to monitor the success of the TGC stocking and determine if additional vegetation control is necessary.