CHRONOLOGY

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WATERBODY EVALUATION

STRATEGY STATEMENT

Recreational
Sportfish species are managed on Caney Creek Reservoir to provide a sustainable population while providing anglers with the opportunity to catch or harvest numbers of fish adequate to maintain angler interest and efforts. Bass anglers are afforded the opportunity to catch trophy fish through the introduction of Florida largemouth bass.

Commercial
The physical characteristics of Caney Creek Reservoir do not support the large rough fish species that normally comprise a commercial fishery; therefore, a commercial fishery strategy is not used. The existing prohibition on commercial fishing gear follows the recreational strategy chosen for largemouth bass by providing the greatest opportunity of catching trophy sized fish.

Species of Special Concern
No threatened or endangered fish species are found in this waterbody.

EXISTING HARVEST REGULATIONS

Recreational
Crappie - 50 daily per person, no size restrictions

Sunfish (Bluegill, Redear, etc.) - no daily limit or size restrictions

Largemouth Bass – Effective February 20, 2018-statewide regulations of 10 fish daily per person, no size restrictions. Following a comprehensive population assessment, it was determined that the protective slot limit regulations that had been in place on Caney Creek Reservoir since 1991 failed to shift the population towards a larger average size bass. Immediately following impoundment, black bass were managed using a no length limit regulation. Beginning in April of 1991, a 14-17” protective slot limit with an 8 fish daily creel (only 4 fish over the slot) was implemented on the lake. The initial protective slot limit was put in place as a corrective measure to direct harvest towards over-abundant small bass. The regulation was altered in July of 1994, by adjusting the protective slot to 15-19” (only 2 fish over the slot), as an enhancement strategy to improve upon the trophy bass that were being caught on the reservoir.

Yellow Bass - 50 daily per person, no size restrictions.

Trot lines, yo-yos, and set hooks legal

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

Commercial
The use of gill nets, trammel nets, fish seines and hoop nets are prohibited.
The commercial fishing regulations may be viewed at the link below:  
http://www.wlf.louisiana.gov/regulations

SPECIES EVALUATION

Recreational

*Largemouth Bass*

Relative abundance, size distribution and relative weight-
Standardized sampling was initiated on Caney Creek Reservoir in 1989 with electrofishing. As with any fish sampling technique, electrofishing is influenced by environmental factors that can create significant variance in results. Accordingly, LDWF sampling is standardized to the greatest extent possible and analyzed over long periods of time to establish population trends. Largemouth bass are targeted as a species indicative of the overall fish population due to their high position in the food chain. Electrofishing is the best indicator of largemouth bass abundance and size distribution, with the exception of large bass. Gill net sampling is used to determine the status of large bass. In Figure 1 below, springtime electrofishing is used as an indicator of largemouth bass abundance (catch per unit effort – CPUE) by size group since 1990.

The most recent length distribution of largemouth bass collected during spring 2016 is presented in Figure 2. Bass ranged from 3 inches total length (TL) to 22 inches TL, and most fish were 7-14 inches TL. Based on previous growth rates, those bass < 7 inches are typically young-of-the-year (YOY) recruits. These fish were spawned the previous year and the numbers indicate that ample reproduction occurred the previous spring. About 16% of the largemouth bass sampled were protected by the 15 – 19 inch slot limit regulation that was in place at the time. Overall, about 80% of the bass sampled were under that protected slot limit (i.e., 14.9” or less in TL).
Figure 1. The CPUE for stock-, quality-, preferred- and memorable-size groups of largemouth bass collected during spring electrofishing on Caney Creek Reservoir, LA from 1990 – 2016.

Figure 2. The length distribution (inch groups) of largemouth bass collected per hour of electrofishing effort on Caney Creek Reservoir, LA in the spring of 2016 (n = 527).

Extensive changes have occurred over time in the bass population. Trends in the largemouth bass population of Caney Creek Reservoir have been the direct result of distinct environmental influences and are characterized in stages as listed below.

Stage 1. 1986-1989 Expanding population dominated by small young fish in the early years after impoundment.
Stage 2.  1989-1992 Bass population dominated by undersized individuals that exhibited slow growth due to inadequate forage. Some bass were able to grow through the competition and achieved trophy size. However, the overall condition of the bass population was poor. A slot limit of 14”-17” was implemented as corrective measure to direct harvest to the overabundant small bass. Threadfin shad were also stocked to increase bass forage base.

Stage 3.  1992-1996 With success of corrective management, including the stocking of additional forage base (threadfin shad) and the pending increase of aquatic vegetation into the desirable 15%-30% range, the bass population was healthy and displaying rapid growth rates. The 14”-17” slot limit for bass was increased to enhance the existing bass population and take advantage of the excellent potential for production of trophy bass.

Stage 4.  1996-2005 The reduction in submerged aquatic vegetation to a level below 15% coverage was responsible for reduced bass abundance. The reduction in vegetation resulted in changes in the Caney Creek Reservoir fish population that were similar to those documented in Lake Conroe, Texas. Young sunfish and largemouth bass were subjected to reduced invertebrate forage and to increased predation. Their abundance and subsequently that of adult largemouth bass was reduced after the reduction in vegetation.

Stage 5.  2005-2016 Increased bass abundance is now occurring as a product of the slowly increasing coverage of aquatic vegetation. The beneficial changes are expected to continue as aquatic vegetation increases toward the desirable 15%-30% range of coverage. A decrease in relative abundance of largemouth bass was noted in the 2012 spring electrofishing sample. This may be due to the reduction in submersed aquatic vegetation that occurred because of low water levels resulting from the two previous years of drought.

Proportional stock density (PSD) and relative stock density (RSD) are indices used to numerically describe size distribution (length) data. Proportional stock density compares the number of fish of quality-size (> 12 inches TL for largemouth bass) to the number of bass of stock-size (> 8 inches TL). The PSD is expressed as a percentage. A fish population with a high PSD consists mainly of larger individuals, whereas a population with a low PSD consists mainly of smaller fish. Relative stock density compares the number of fish of a given size range to the number of bass of stock size. A common calculation used in fisheries management is for RSD-Preferred or RSD-P. This value compares the number of largemouth bass > 15 inches TL to the number of stock-size largemouth bass in the population. This is also commonly called RSD-15 values. Values for PSD and RSD – Preferred (> 15 inches in TL) from the spring electrofishing samples are shown in Figure 4 below. Ideal PSD and RSD-P values for a largemouth bass population range from 40-70 and 10-40, respectively. The size structure indices from spring electrofishing samples are shown in Figure 3. The RSD-P values are lower on average following the disappearance of submersed aquatic vegetation in the reservoir.

Since 1992, the PSD and RSD-P from spring samples consistently fell within or just above the desired ranges for both statistics. The one exception year was 2012, where many young fish were collected in the samples. The year 2010 was a drought year and water levels on Caney Creek Reservoir dropped considerably. Data would indicate the bass population responded to those low water conditions with increased spawning activity soon after. Spring samples
typically under-represent immature fish that are not in shallow areas preparing to spawn. For that reason, fisheries managers typically rely more on fall data to evaluate PSD and RSD\(_P\).

![Figure 3](image-url) Figure 3. Size-structure indices for largemouth bass collected on Caney Creek Reservoir, LA during spring electrofishing from 1990 to 2016.

Figure 4 displays the PSD and RSD\(_P\) values from fall electrofishing sampling. There has been very little change over time on both indices. Overall, both statistics fall at or below the minimum of the desired ranges for the entire 26 year period.

![Figure 4](image-url) Figure 4. Size-structure indices for largemouth bass collected during fall electrofishing on Caney Creek Reservoir, LA from 1990-2016.
Standardized gill net sampling conducted on Caney Creek Reservoir may provide insight into the population of trophy size largemouth bass (*Micropterus salmoides*) that is not revealed with electrofishing sampling. Largemouth bass captured in gill nets during sampling from 1994 - 2016 are depicted in Figure 5. The results indicate that the number of memorable size (20” – 25”) largemouth bass (*Micropterus salmoides*) remained fairly constant despite the changes in coverage of submersed aquatic vegetation.

**Figure 5.** The mean CPUE (number) per net night (100’ net) by inch group of largemouth bass collected during standardized gill net sampling on Caney Creek Reservoir, LA from 1994 - 2016. Stages 3 – 5 represent submerged vegetation present, absent following grass carp introductions and returning submersed vegetation respectively. See page 7 for further discussion.

**Available Forage**

Forage availability is measured indirectly through measurement of bass body condition (relative weight, Wr). In Caney Creek Reservoir, complex cover = aquatic vegetation. With adequate complex cover, sunfish had been very abundant and were the primary forage base for largemouth bass. With the reduction in complex cover, open water fish species became more abundant. Threadfin shad and inland silversides became the primary bass forage species. Stable largemouth bass Wr’s as shown in Figure 6 are an indication that the observed reduction in littoral forage (young sunfish) was offset with a corresponding increase in available pelagic forage (shad). However, from 2005 to 2011, there was a slight decrease in bass Wr’s. Perhaps littoral forage was becoming a limiting factor during this time period. Since 2011 and the establishment of eelgrass in new areas, relative weights have increased indicating that the vegetation is likely providing suitable cover once again for littoral forage.
The habitat change affected bass feeding behavior and growth. Ambush-type feeding on sunfish in cover required a small expenditure of energy and allowed for more growth. The shift to smaller pelagic forage limited bass growth (especially after age 3) due to the expenditure of considerable energy, as indicated in the bass age and growth comparison in Figure 7 below. Age and growth data from 2014-2016 is difficult to compare to the older information presented in Figure 7, as a change in sampling techniques was implemented. However, it appears that growth rates have increased with the expansion of submersed vegetation.

The downward trends in both relative weights and PSD values for largemouth bass in Caney Creek Reservoir may indicate a population that is beginning to crowd, especially in the stock-size range. Studies performed on Caney Creek Reservoir and other area lakes with protective slot limits have shown a strong reluctance of bass anglers to harvest bass from these lakes. The data supports this trend with an abundance of small bass present in the lake. PSD and RSD-P values have fallen below or within the lower portion of the desired ranges in recent years, further indicating a rise in the relative numbers of small bass within the population. Additionally, stock density indexes calculated from fall samples frequently fall well below the desired ranges.

Every fish population is the product of a unique set of influences, both natural and man-induced. A thorough understanding of those influences and the corresponding population response is essential to good fisheries management. As part of a statewide effort, the Louisiana Department of Wildlife and Fisheries completed a study to describe the Caney Creek Reservoir largemouth bass (LMB) population in 2016. The project included data collection of the Caney Creek Reservoir LMB population over a three year period from 2014 – 2016. Population characteristics measured included relative abundance, spawning success, growth, body condition, mortality, and longevity. Caney Creek Reservoir anglers were also interviewed.
during a 2015 LDWF creel survey to determine their collective influence on the LMB population.

Electrofishing gear was used by LDWF fisheries biologists to collect LMB from Caney Creek Reservoir each spring during this study. Length and weight measurements were recorded for each fish, and ear bones (called otoliths) were removed from approximately 22% of the sampled fish for age and growth analyses. Annual growth rings on the otoliths provide an accurate measurement of fish age. Size and age for all of the sampled fish were combined to generate estimates of average growth rate and longevity.

Figure 8 illustrates that Caney Creek Reservoir supports a healthy bass population with some LMB reaching 24 inches. Good representation of fish in the 8 to 20 inch range was observed in electrofishing samples during all three years of the project. The recurring presence of small 4 to 8 inch (age-1) bass indicates successful reproduction. Recruitment of age-1 LMB in Caney Creek Reservoir is the most stable of all LMB populations included in this project. Contributing factors include quality spawning substrate and adequate cover for fingerlings.

![Figure 7. Growth rates of largemouth bass from Caney Creek Reservoir, LA for 1996, 2000, 2006 and 2008.](image)

**Population Assessment-Age, Growth and Mortality**

![Histograms showing frequency of size groups for 2014, 2015, and 2016](image)
Figure 8. Annual length frequency distributions of largemouth bass collected from Caney Creek Reservoir during 2014-2016 spring electrofishing surveys. Sample sizes (n) are presented in each graphic.

Table 1 illustrates that body condition or relative weight (Wr) of Caney Creek Reservoir LMB improves with size. The body condition of LMB in the 8-12 inch range is below the recommended range of a healthy population (95-105) and ranks last among the other waterbodies included in the statewide project. This may indicate a problem with feeding conditions where overabundant 8-12 inch LMB compete for forage. However, the body condition of LMB ≥ 12 inches can be described as robust. Good physical condition of bass is generally the product of an adequate food supply that is readily available to predation.

Table 1. Average relative weights (W_r) of stock (8-12 inches), quality (12-15 inches) and preferred (15-20 inches) size LMB of waterbodies included in this project. Relative weights are sorted from highest to lowest with Caney Creek Reservoir results highlighted.

<table>
<thead>
<tr>
<th>LMB 8-12 Inches</th>
<th>LMB 12-15 Inches</th>
<th>LMB 15-20 Inches</th>
</tr>
</thead>
<tbody>
<tr>
<td>Waterbody</td>
<td>Wr</td>
<td>Waterbody</td>
</tr>
<tr>
<td>Cross</td>
<td>107.9</td>
<td>Poverty</td>
</tr>
<tr>
<td>Concordia</td>
<td>107.6</td>
<td>Atchafalaya</td>
</tr>
<tr>
<td>Bruin</td>
<td>106.7</td>
<td>Cross</td>
</tr>
<tr>
<td>Atchafalaya</td>
<td>106.6</td>
<td>Caddo</td>
</tr>
<tr>
<td>Black/Clear</td>
<td>105.7</td>
<td>Concordia</td>
</tr>
<tr>
<td>Caddo</td>
<td>103.7</td>
<td>Red River</td>
</tr>
<tr>
<td>Toledo</td>
<td>103.4</td>
<td>Chicot</td>
</tr>
<tr>
<td>Red River</td>
<td>103.3</td>
<td>Caney</td>
</tr>
<tr>
<td>Iatt</td>
<td>103.0</td>
<td>Black/Clear</td>
</tr>
<tr>
<td>Poverty</td>
<td>100.6</td>
<td>Toledo</td>
</tr>
<tr>
<td>FalseR</td>
<td>100.0</td>
<td>D’Arbonne</td>
</tr>
<tr>
<td>Cataouatche</td>
<td>99.0</td>
<td>Iatt</td>
</tr>
<tr>
<td>D’Arbonne</td>
<td>97.9</td>
<td>Brun</td>
</tr>
<tr>
<td>Vernon</td>
<td>97.5</td>
<td>Cataouatche</td>
</tr>
<tr>
<td>CalcasieuR</td>
<td>97.4</td>
<td>Vernon</td>
</tr>
<tr>
<td>Chicot</td>
<td>97.2</td>
<td>CalcasieuR</td>
</tr>
<tr>
<td>Caney</td>
<td>93.1</td>
<td>FalseR</td>
</tr>
</tbody>
</table>

Figure 9 illustrates the growth rate of male and female Caney Creek Reservoir LMB. Female LMB are protected from harvest for approximately 2 years (grow to 15 inches in 2.8 years and 19 inches in 4.8 years). Male LMB grow into the 15 inch protected slot in 3.1 years and remain in the slot for the remainder of their lives (do not grow beyond 19 inches on average).
Figure 9. Average total length at age of Caney Creek Reservoir largemouth bass (2014-2016) relative to the current 15-19 inch protected slot limit regulation.

Figure 10 illustrates the age structure of Caney Creek Reservoir LMB collected from the 2014-2016 spring electrofishing surveys. The rate at which fish die each year is referred to as mortality. Mortality consists of two parts: natural mortality (predation, disease) and fishing mortality (angler harvest and discard mortality). Results of this study indicate that the Caney Creek Reservoir LMB population’s total mortality rate is 46% per year. At that rate, if you start with 100 age-1 Caney Creek Reservoir bass, only 1 will remain alive by age 9.

Figure 10. Age distribution of largemouth bass from Caney Creek Reservoir for spring electrofishing surveys (2014-2016) catch per unit effort. Sample size (n) is presented in graphic.
Fishery Characteristics:
A creel survey was conducted in 2015 to document Caney Creek Reservoir LMB fishery characteristics. Results of this study suggest that total mortality of the Caney Creek Reservoir LMB population is more influenced by natural mortality than by fishing mortality (26% and 20% per year, respectively). The fishing mortality rate comes from two sources: 1) harvest mortality, and 2) post release mortality. Creel survey results indicate that Caney Creek Reservoir LMB anglers voluntarily released a much larger percentage of LMB than they harvested (82% of legal size fish are released).

Figure 11 illustrates the size distribution of Caney Creek Reservoir LMB harvest. Harvest of LMB in the 12 to 14 inch range comprised 63% of the total LMB harvest and very few LMB below 12 inches were harvested.

![Figure 11](image)

Figure 11. Length frequency distribution of largemouth bass harvest from Caney Creek Reservoir during the 2015 angler creel survey. Sample size (n) is presented in the graphic.

Figure 12 (left graphic) illustrates the effect of four different length limit regulations (15”-19” protective slot limit (PSL), no length limit, and a 12 and 14 inch minimum length limit) on LMB catch rates (total and ≥ 15 inches). Total LMB catch differs by 0.5 LMB or less per angler trip for each regulation scenario; LMB catches ≥ 15 inches differs by 0.2 fish or less per angler trip. Figure 12 (right graphic) illustrates the proportion of LMB catch available to harvest for each regulation scenario.
Figure 12. Simulation results of four size regulation scenarios on Caney Creek Reservoir LMB: a 15-19 inch PSL, no length limit, and a 12 and 14 inch minimum length limit. Left graphic illustrates LMB catches per angler trip (total and ≥15 inches); right graphic illustrates % of the LMB catch that is available to harvest.

The Caney Creek Reservoir LMB population has a high maximum age, fast growth rate, and a moderate to low mortality rate, with low recruitment variability when compared with the other LMB populations in Louisiana. The Caney Creek Reservoir LMB population is more influenced by natural than by fishing related factors. The prevalence of voluntary catch and release in the Caney Creek Reservoir fishery is high. The Caney Creek Reservoir LMB fishery was managed with a 15-19 inch protected slot limit and an eight fish daily harvest limit, including no more than two fish over 19 inches, for 23 years. Protected slot limit restrictions are intended to increase growth rates of LMB in the slot and increase abundance of LMB above the slot by utilizing angler harvest of LMB below the slot as a management tool. Because Caney Creek Reservoir LMB anglers harvest only 18% of legal size LMB that are caught, the effectiveness of any size-limit regulation as a management tool will be limited.

Based upon the study results, a Notice of Intent (NOI) was passed by the Louisiana Wildlife and Fisheries Commission on September 7, 2017 to remove the 15” - 19” protective slot limit on Caney Creek Reservoir and replace it with the statewide regulations of no size limit and a creel limit of 10 fish per day for black bass. The regulation change became effective February 20, 2018.

Largemouth bass genetics-
Genetics surveys indicate the presence of Florida strain genetics in over 60% of the largemouth bass population. Florida genetics provide a critical component for trophy bass production. Biannual stocking allows increased identification of particular lines of Florida bass that prove to be most successful in Caney Creek Reservoir. A compilation of bass genetics results are listed in Table 2.

Table 2. Genetic analysis for largemouth bass from Caney Creek Reservoir, LA for the time period 1987 – 2016.
Fisheries Dependent Data
Recreational angler creel surveys have been a key component of fisheries management on Caney Creek Reservoir over the years. In the early years, roving on-the-water creels were conducted (1986-1989) to assess angler information and harvest in the new reservoir. In later years, LDWF sampling shifted to access-point angler interview creels with trailer counts to estimate total effort. Such surveys were conducted in 1993, 1994, 1996, 1998, 2007, and 2015. From these surveys over time, some trends in angler behavior and success rates can be observed and even statistically described. Unfortunately, due to sampling design, anglers were not asked about fish they released during the roving on-the-water creels. Therefore, much of that data is not comparable to later surveys.

From 1993-2015, many angler success statistics remained fairly constant and show no significant difference over time. There is no estimated difference in average trip length, bass caught per trip, bass harvested per trip, percentage of anglers harvesting a limit of bass, or the relative percentages of bass caught within the protective slot limit. However, there is a statistical difference in the number of anglers interviewed per day, percentage of bass anglers harvesting fish, and the percentage of bass anglers voluntarily releasing fish that could be legally harvested. Based upon these creel surveys, it appears that bass anglers on Caney Creek Reservoir have become more reluctant to harvest bass over time despite having similar rates of success during each trip. Until this behavior changes, it is unlikely that any size-limit regulation would successfully alter the bass population of Caney Creek Reservoir. Some of the statistics from historical creel surveys are displayed in Table 3 below.

<table>
<thead>
<tr>
<th>Year</th>
<th>Creels</th>
<th>70%</th>
<th>16%</th>
<th>14%</th>
<th>30%</th>
</tr>
</thead>
<tbody>
<tr>
<td>1987</td>
<td>346</td>
<td>70%</td>
<td>16%</td>
<td>14%</td>
<td>30%</td>
</tr>
<tr>
<td>1988</td>
<td>287</td>
<td>73%</td>
<td>16%</td>
<td>11%</td>
<td>27%</td>
</tr>
<tr>
<td>1989</td>
<td>300</td>
<td>82%</td>
<td>5%</td>
<td>13%</td>
<td>18%</td>
</tr>
<tr>
<td>1990</td>
<td>300</td>
<td>64%</td>
<td>11%</td>
<td>25%</td>
<td>36%</td>
</tr>
<tr>
<td>1991</td>
<td>35</td>
<td>63%</td>
<td>11%</td>
<td>26%</td>
<td>37%</td>
</tr>
<tr>
<td>1994</td>
<td>39</td>
<td>49%</td>
<td>23%</td>
<td>28%</td>
<td>51%</td>
</tr>
<tr>
<td>2000</td>
<td>66</td>
<td>35%</td>
<td>21%</td>
<td>44%</td>
<td>65%</td>
</tr>
<tr>
<td>2004</td>
<td>100</td>
<td>39%</td>
<td>28%</td>
<td>33%</td>
<td>61%</td>
</tr>
<tr>
<td>2006</td>
<td>70</td>
<td>16%</td>
<td>37%</td>
<td>47%</td>
<td>84%</td>
</tr>
<tr>
<td>2008</td>
<td>160</td>
<td>48%</td>
<td>19%</td>
<td>33%</td>
<td>52%</td>
</tr>
<tr>
<td>2014</td>
<td>189</td>
<td>16%</td>
<td>22%</td>
<td>62%</td>
<td>84%</td>
</tr>
<tr>
<td>2015</td>
<td>172</td>
<td>29%</td>
<td>15%</td>
<td>56%</td>
<td>71%</td>
</tr>
<tr>
<td>2016</td>
<td>186</td>
<td>36%</td>
<td>26%</td>
<td>38%</td>
<td>64%</td>
</tr>
</tbody>
</table>
Table 3. Historical statistics on the LMB fishery derived from access point, recreational angler creel surveys on Caney Creek Reservoir, 1993-2015.

<table>
<thead>
<tr>
<th>Year</th>
<th># Bass Caught per Trip</th>
<th>% Bass Anglers Harvesting fish</th>
<th>% of Bass Anglers that Release all fish</th>
<th>Voluntary Release Rate of Legal-size Bass</th>
<th>% Bass Anglers Harvesting a limit</th>
<th>Angling Hours/Acre</th>
</tr>
</thead>
<tbody>
<tr>
<td>1993</td>
<td>2.07</td>
<td>34</td>
<td>66</td>
<td>52</td>
<td>0.99</td>
<td>33</td>
</tr>
<tr>
<td>1994</td>
<td>1.83</td>
<td>29</td>
<td>71</td>
<td>57</td>
<td>0.6</td>
<td>44</td>
</tr>
<tr>
<td>1996</td>
<td>3.76</td>
<td>31</td>
<td>69</td>
<td>58</td>
<td>0.8</td>
<td>35</td>
</tr>
<tr>
<td>1998</td>
<td>1.58</td>
<td>18</td>
<td>82</td>
<td>62</td>
<td>0.7</td>
<td>19</td>
</tr>
<tr>
<td>2007</td>
<td>1.53</td>
<td>9</td>
<td>91</td>
<td>87</td>
<td>0.53</td>
<td>17</td>
</tr>
<tr>
<td>2015</td>
<td>2.21</td>
<td>15</td>
<td>85</td>
<td>82</td>
<td>1.34</td>
<td>17</td>
</tr>
</tbody>
</table>

Following the black bass regulation change in 2018, an angler creel survey is being conducted from January 1, 2018 until February 28, 2019 on Caney Creek Reservoir to evaluate any changes in angler behavior or success under the new regulation.

Forage

Forage sampling is performed in conjunction with fall electrofishing sampling and targets the fishes available as forage for larger predators such as largemouth bass. Only fishes ≤ 5 inches TL are considered ‘forage’ for the purpose of evaluating the available forage in the reservoir. Sunfish (*Lepomis* spp.) comprised the majority of the species available as forage for all years sampled. The CPUE by number of black bass, sunfish and forage species from the 2016 samples are illustrated in Figure 13. The average pounds per hour per station collected during this sample were 24.58 pounds.
Figure 13. The CPUE (number per hour) for forage fishes ≤ 5 inches TL captured in Caney Creek Reservoir, LA from forage samples taken in 2016.

*Sunfish (Bluegill & Redear) and Black Crappie*

Sunfish and crappie abundance has also been influenced by habitat changes in Caney Creek Reservoir. Until recently, a reliable sampling technique has not been available to sample sunfish and crappie. Low catch rates in 2000 and 2001 followed by higher catch rates in 2004 and 2006 are more an indication of development of the new sampling gear than a measure of fish population status. A new technique of standardized sampling was initiated in 2006, by utilizing 1.0 inch square mesh lead nets set with 2 offshore anchors. Comparisons are made by catch per unit effort (CPUE) of sampling time. The CPUE of bluegill is depicted in the chart in Figure 14 below. The catch rate shows a steady decline from 2006 – 2012; this is likely due to the absence of any significant amounts of submerged aquatic vegetation. However, the bluegill catch rates for stock- and quality-sizes increased in 2014 -2016, which corresponds with a noticeable increase in submerged aquatic vegetation on the lake.
Figure 14. The catch per unit effort (number per hour) of stock-, quality- and preferred-size bluegill collected during lead net sampling on Caney Creek Reservoir, LA from 2000 – 2016.

The CPUE of redear sunfish collected in lead nets is shown in Figure 15. The trend of the catch rate follows closely that of the bluegill CPUE.

Figure 15. The CPUE (number per hour) of stock-, quality-, preferred- and memorable-size redear collected during lead net sampling on Caney Creek Reservoir, LA from 2000 – 2016.
Black crappie is the only species of crappie found in Caney Creek Reservoir. The chart in Figure 16 shows the CPUE (number per hour) of black crappie in lead net samples from 2000 – 2016. The population of black crappie in the reservoir appeared to remain more stable than the bluegill and redbear populations from 2006 – 2012. However, black crappie are typically found in open water and are not negatively impacted by the lack of submerged aquatic vegetation. The population may be increasing based upon the 2014-2016 leadnet results.

![Graph showing CPUE of black crappie](image)

Figure 16. The CPUE (number per hour) of stock-, quality-, preferred-, memorable- and trophy-size black crappie collected during lead net sampling on Caney Creek Reservoir, LA from 2000 – 2016.

**Population Assessment Study**

Black crappie in Caney Creek Reservoir can be characterized as fast-growing, with many individuals reaching sizes of > 14 inches total length. Figure 17 illustrates the growth rates of the Caney Creek Reservoir crappie population (2014-2016) compared to the Louisiana statewide average crappie growth rate (2009-2017). Caney Creek Reservoir crappie reach preferred-size range (TL=10-inches) in just two growing seasons, the third fastest population in Louisiana. Relative weights of crappie are high for all size groups (>100%). Recruitment of crappie on the lake is somewhat variable compared to other lakes in Louisiana.

As part of the assessment, mortality rates (total, natural and fishing) were estimated for the population. The Caney Creek Reservoir crappie population had an estimated total annual mortality rate of 71%. Caney Creek Reservoir crappie anglers had one of the highest success
rates for numbers of fish caught per hour in Louisiana, ranking third behind only Lake Louis and Toledo Bend. Nonetheless, natural mortality (41%) was more influential on the population than fishing mortality (30%).

During the study, 1,681 crappie were collected, with only two of those fish reaching Age 6. Based upon information from the study, the crappie population was modeled to show theoretical responses to both a 10-inch minimum length limit (MLL) and a 12-inch MLL regulation. The models indicate that although catches might increase under either MLL scenario, yield of crappie to anglers would be reduced compared to a no length limit regulation. Anglers would be required to release and estimated 62% of the crappie they caught under multiple scenarios if a MLL was used. With the current fishing pressure on the lake, a MLL strategy would not likely alter the population to any significance, due to the high mortality rates and other factors.

![Figure 17. Growth rates of black crappie collected from lead nets in Caney Creek Reservoir (2014-2016) compared to the Louisiana statewide average growth rate (2009-2017).](image)

**Commercial**

With the exception of flathead catfish, large rough fish species that normally comprise a commercial fishery are not found in this water body.

**HABITAT EVALUATION**

**Aquatic Vegetation**

The role of aquatic plants in Caney Creek Reservoir is recognized as significant. Native aquatic plants provide valuable fish and wildlife habitat, improve water quality, reduce rates of shoreline erosion and usually help prevent the spread of nuisance exotic plants. A 15-30% areal coverage of submersed vegetation with a diverse composition of native species is
recognized as the most beneficial to a productive sport fishery (Described in Caney Creek Reservoir Aquatic Plant Management Plan, 1993).

The management of aquatic vegetation to the confines of a desirable coverage range is an elusive goal dependent on the combined influence of factors that may not be controllable or even defined. In Caney Creek Reservoir, the challenge of aquatic vegetation management is particularly difficult for reasons including the following:

1. Physical characteristics of the reservoir provide ideal growing conditions for aquatic vegetation with limited options available for control.
2. Due to the small watershed of Caney, water level manipulation is not a viable tool to manage aquatic habitat.
3. The potential for introduction of non-native or exotic plants is ever-present and natural controlling influences for exotic species are typically present only in their native range.
4. Caney Creek Reservoir is a multi-use impoundment, including fishing, boating, skiing, sailing, swimming, and aesthetic enjoyment. Participants in each endeavor have distinct levels of tolerance for aquatic vegetation. Conflict between the various user groups is inevitable at all levels of coverage.

The most recent aquatic vegetation type map survey was conducted on July 17, 2018. Aquatic vegetation coverage was determined to be approximately 7% (340 acres). Submersed vegetation has continued to expand slowly, and may indicate that the grass carp impacts are now minimal. The predominant submersed species were hydrilla, eelgrass, fanwort and bladderwort. Eelgrass was observed in areas less than three feet deep and with limited wave action. Although not as dense, eelgrass was also found in most coves on the south shore in areas with limited wave action. Hydrilla was identified in five locations around the lake and was estimated to cover 95 acres of the lake. Hydrilla was found just east of the Hwy. 4 bridge, in a small pocket east of the Ebeneezer launch, in a small cove in Smith Branch just off the main lake, and scattered down the banks in both Clear and Boggy arms. Hydrilla was thickest in Clear Branch, but did not top out by the end of the growing season. Plant density was considered ideal for fish habitat without significantly hampering boating access. These areas were treated with granular Aquathol herbicide in 2015 and 2016, but plants returned the next growing season. Unfortunately, herbicide applications have not been able to eradicate hydrilla on Caney Creek Reservoir, and past experience indicates that herbicide treatments alone will not be able to control the plant once it is widely established around the lake. For those reasons, it was decided not to treat the hydrilla with herbicides in 2017, but to monitor the areas and gauge the rate of expansion or lack thereof. The expansion rate has been far slower than observed with hydrilla when the lake was newly impounded (1989-1992) and available nutrients for hydrilla growth were more abundant. The hydrilla infestation will be closely monitored in future years before making a long-term management decision. A future control plan including stocking additional grass carp may be needed and will require advocacy from the multiple user groups to be successfully implemented.

Giant salvinia was the primary floating species present on the lake in 2018, but was drastically reduced for most of the year from two harsh freeze events in January. Historically, LDWF has been able to contain most of the salvinia on the lake to the extreme upper reaches of the coves and the area west of the Hwy. 4 bridge. Following the consecutive mild winters of 2015 and 2016, salvinia was expanding on the lake. Larger mats were formed and pushed from the backs
of the coves by current or wind action into more visible areas of the lake. Public outcry from shoreline property owners and other user groups was greater than in previous years. The LDWF implored additional crews from other districts to support the District 1 crew for a week to treat the majority of the salvinia present. Follow-up applications by the District 1 crew were able to drastically reduce the amount of salvinia present by the end of the growing season. The area experienced two hard freezes in January of 2018, and most of the giant salvinia on the lake was frozen for multiple days. The LDWF crews only treated 147 acres of aquatic vegetation in 2018, compared to 523 acres in 2017. Giant salvinia, pennywort, watershield and torpedo grass were the most commonly treated plants in 2018.

Substrate
The majority of the reservoir’s substrate is sandy loam with little organic content. Such substrate is suitable for nesting fish. In the upper ends of each arm of the reservoir, organic content is higher. Overall, suitable spawning substrate is not a limiting factor for nesting fish species.

Artificial Structure
Artificial reefs have been constructed using the polyethylene reef structures in several Louisiana water bodies, including Lake D’Arbonne, Lake Claiborne, and Toledo Bend. Construction of 100 pallet structures was planned by JPWD in March of 2002. However, in October of 2004, JPWD rescinded its resolution for the construction of polyethylene pallet reef structures, expressing intent to collect Christmas trees and sink them instead. Cooperative efforts to construct artificial reefs in Caney Creek Reservoir will remain a standing offer to JPWD under guidelines established by LDWF including the following:

1. The role of LDWF will be that of Administrator/Consultant. As such, the department will make final decisions relative to project design, material selection and placement for all projects sanctioned by the department.

2. All inquiries and correspondence relative to habitat enhancement projects will be routed to the Biologist Manager responsible for the water body involved. LDWF assumes no responsibility for projects done independently by groups working outside LDWF guidelines.

3. Habitat enhancement structures must be placed so that they present no danger to boaters, swimmers or any other user groups. To prevent personal injury, care should be exercised during construction and deployment of habitat structures. Project participants should use appropriate safety guidelines for the use of all tools and materials.

4. Prohibited materials include tires, appliances, metallic objects, engines and vehicles.

5. Structures must be well anchored to prevent movement.

6. Materials should be long lived in underwater conditions.

7. Design should be durable to avoid damage during deployment as well as post deployment failure.
8. Structures may be marked with buoys and/or signs. If so, marker buoys will be bright yellow. Buoys may be marked to credit project sponsors.

9. Project sponsors should provide marker buoys and future maintenance of those buoys.

10. As Project Administrator/Consultant, LDWF will advise sponsors regarding the type and location of structures used in this program. LDWF staff will have final approval of locations for artificial structures. LDWF will participate in deployment as manpower and scheduled duties allow.

11. Structures should be easily accessible by anglers. In deciding structure locations, consideration should be given to natural factors such as wind, water currents and wave action, anticipated water level fluctuations as well as boat traffic and other recreational activities.

**CONDITION IMBALANCE / PROBLEM**

Complex cover is currently below 15%-30% areal coverage. In Caney Creek Reservoir, with minor exceptions, complex cover = aquatic vegetation. For maximum fisheries productivity, coverage of aquatic vegetation should be in the range of 15%-30% areal coverage.

Manage invasive, aquatic vegetation such as hydrilla and giant salvinia.

The dewatering bulkhead guides for the drawdown gates on the control structure are in poor condition and could prevent the gates from being operated properly based upon an inspection in 2016 by the Louisiana Department of Transportation and Development (LDOTD).

**CORRECTIVE ACTION NEEDED**

Re-establish and control native aquatic vegetation to provide increased productivity.

Use an Integrated Pest Management program to control giant salvinia and hydrilla. For giant salvinia, foliar herbicide applications will be the primary tool supplemented with the stocking of salvinia weevils if needed. Hydrilla will be monitored, and a control plan developed if it should expand greatly. Triploid grass carp will likely be needed to control hydrilla should it become established lakewide and expand.

The sluice gates for dewatering Caney Creek Reservoir have not been operated since impoundment. The dewatering bulkhead guides have deteriorated and would likely prevent the gates from being closed properly should the need arise to operate the structure. The Louisiana Department of Transportation and Development is responsible for the operation and maintenance of the structure and is currently exploring repair options.
RECOMMENDATIONS

1. Aquatic vegetation control plans should consider the efforts to reestablish beneficial native vegetation and the low coverage of aquatic vegetation currently found in the lake. Utilize all available tools to maintain the range of 15-30% areal coverage of aquatic vegetation with a diverse composition of native species.

2. Caney Creek Reservoir should be monitored for any noxious exotic aquatic vegetation. If nuisance aquatic weeds are found, control efforts should be in accordance with the approved LDWF Aquatic Herbicide Application Procedures. Water hyacinth should be controlled with foliar applications of 2,4-D (0.5 gal/acre) with a non-ionic surfactant (1pt/acre). Salvinia should be controlled with foliar applications of diquat (0.75 gal/acre) and a non-ionic surfactant from November 1 through March 31. Outside of that time frame, it should be treated with a mixture of glyphosate (0.75 gal/acre) and diquat (0.25 gal/acre) with Turbulence (or approved equivalent, 0.25 gal/acre) surfactant.

3. Monitor areas where hydrilla was found in 2018 for the reoccurrence or expansion of the plant. Assess the expansion rates of hydrilla over the entire lake and begin to formulate an integrated pest management strategy to control hydrilla, including potential stocking of triploid grass carp. Given the history of the controversial use of grass carp on Caney Creek Reservoir, communication with all user groups of the lake will be critical for the success of any such program. Prior to any future stockings, public meetings will be held along with a public comment period on the proposed action.

4. Continue bi-annual Florida largemouth bass stockings. Stockings may include over the water transport to areas throughout the lake that offer protection for the young fish.

5. Continue scheduled standardized sampling of fish populations and aquatic vegetation to determine status over time.

6. Conduct annual hearings to allow for public input regarding management goals.
APPENDIX I

PLAN TO REESTABLISH NATIVE AQUATIC VEGETATION IN CANEY CREEK RESERVOIR

The introduction and evaluation of native aquatic vegetation is to be implemented as per techniques as described in *Update to the Propagation and Establishment of Aquatic Plants Handbook, Smart, Dick, and Snow, 2005*. The approach utilizes founder colonies as propagule sources: these are small colonies of aquatic plants established in strategic locations within the reservoir. Once established, founder colonies spread in two manners, including expansion (vegetative spread from the founder colony itself) and colonization (formation of new colonies from fragments, seeds, etc.).

In-lake cultivation has been selected for this project. A large but movable container for holding and stabilizing the pots and a protective fence to prevent grazing (and other disturbances) will be used. Pots will be filled with lake sediments and planted with propagules, and plants allowed to grow within the protection of the fencing. When plants are mature, they are moved to designated sites and transplanted. Empty pots are refilled with sediment substrate, and a subsequent crop is started to ensure a continued supply of mature transplants (or other propagules) throughout the growing season.

Commercial suppliers sell aquatic plant propagules. These propagules may be used as starter materials for plant propagule production, but not for establishing plant colonies. Stem fragments, daughter plants, root crowns, tubers or winter buds, even seeds (usually dependent upon species) may be used as starter materials for aquatic plant cultures. After a culture of a particular species is established, it will be used as a source for the next generation of cultivation.

Shallow coves well protected from winds and wave action will be selected establishment of aquatic plants. High-use areas will be avoided. In addition, wooded shorelines will be avoided due to excessive shading, which greatly reduces the light available to submersed aquatic plants.

Only native plant species are to be used. Diverse communities of native plants will provide the greatest water quality and habitat benefits over the long term. Plant species will be selected based on lake habitats or anticipated environmental conditions.

Timing can be as critical as species selection. Planting will occur before or during periods of active growth to ensure establishment. Plants will be planted as early as practical. Late planting reduces the length of growing season remaining and may decrease the likelihood of success.

Establishment of new colonies of aquatic plants will require protection from herbivores. Herbivores in Caney Creek Reservoir are certainly not limited to grass carp. Nutria, waterfowl and especially turtles are significant grazing pests. Exclosures will be constructed of wire-mesh fencing or orange plastic construction fencing to protect multiple plants.

Once suitable sites are selected and exclosures constructed, the project will proceed in three phases. Phase 1 involves planting and monitoring over a full growing season of test plants of a variety of species within small protective exclosures. Assuming suitable sediments, water quality, and water levels, these plants will establish and hopefully expand beyond their protective cages, depending on the level of herbivory. During Phase 1, the level of herbivory and, if...
possible, the sizes and types of herbivores, will be noted. The response of the plants will dictate the best course of action for subsequent growing seasons.

During the second growing season, those species performing best during Phase 1 will receive additional plantings. Phase 2 should result in the successful establishment of founder colonies of several species.

During Phase 3, colonies should expand to fill the niche within the fenced cove, and begin to spread into unprotected areas by vegetative and/or sexual modes of reproduction. Monitoring will continue at this stage, as large-scale disturbances can have serious consequences on newly established plant communities. Additional species may also be desirable to ensure maximum diversity, stability, and resilience of the aquatic plant community.
Re-vegetation efforts included the January, 2006 placement of 10 exclosures in sites throughout the impoundment. The exclosures were simple 10ft. x 10ft. pens with a layer of 2”x4” fence wire and an outside layer of 1” poultry wire. Tubers of eelgrass (*Vallisneria americana*), sago pondweed (*Potamogeton pectinatus*) were placed in the exclosures on May 1, 2006. Some tubers were also planted in unprotected areas.

Large quantities of coontail (*Ceratophyllum demersum*) vegetation was collected in Black Bayou and transported to Caney Creek Reservoir. Approximately one trip per week was made through the months of May, June, and July. Trips were discontinued when the coontail in Black Bayou became brownish and brittle, evidently due to the hot weather.
An evaluation of the plantings was made June 22, 2006 with the use of an underwater camera (Aqua-view). With the exception of two exclosures, all tuber plantings were observed to be successful. One of the unsuccessful exclosures had become covered with watershield, shading the submerged plants. Very little of the vegetation planted outside of the exclosures was observed.

Coontail was observed during evaluation trips, but in much smaller increments than when placed at the planting sites. Small amounts of coontail were found in adjacent water and mixed with emerged vegetation.

During the Caney Creek Reservoir typemap survey, another evaluation of plantings in the exclosures was made. Four of the exclosures had become covered with watershield, with no submerged vegetation observed underneath. The remainder of the exclosures had only remnants of the eelgrass and sago pondweed that had been observed earlier. The outside layer of poultry wire had been completely corroded on all pens. The 2”x4” fence wire was intact, but also corroded.