

Fish Population and Aquatic Plant Water Quality Surveys Lake Tallavana

April 30, 2009



Lake Tallavana Homeowners

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Objectives

The objectives for 2009 were: (1) Measure basic water quality parameters and oxygen levels.
(2) Determine the status of the fish population.
(3) Investigate declining numbers of Age-1 Largemouth bass.

Water Quality

Water quality parameters measured were total hardness (68 ppm), pH (8.0), conductivity (95 micromhos/cm) and dissolved oxygen ranged from 10.0 ppm at the surface (78 F) to 1.0 ppm at a depth of 7 feet (Table 1). These dissolved oxygen values were lower than previous years possibly to the partial lake drawdown and recent high water flooding conditions. Dissolved oxygen values were stable (10.0 ppm) to 5-6 feet. However, DO continued to decline below 1.0 ppm from 7- 15 feet (Table 1). Oxygen levels are lower (1.0 ppm) at 7 feet than in the past years as the lake was already stratified. Water depths and oxygen levels below 10 feet have not been suited for sportfish for many years. As previously recommended, dissolved oxygen profiles from surface to bottom should be conducted in late June or July to determine the extent of the oxygen stratification. Water clarity or seechi readings were low due to green algae blooms and low rainfall. Hopefully, Lake Watch volunteers will continue to collect monthly nutrient samples for nitrogen, phosphorus, and chlorophyll a. Seechi or water visibility was 27 inches and clearer than previous years. Nutrient monitoring should continue with Lake Watch volunteers. Installing an aerations system in the deepest section of the lake would help recycle nutrients tied up in the lake bottom sediments below 7 feet, which contribute to a high Basic Oxygen Demand, lower oxygen levels, and dissolved oxygen stratification.

Fish Population Survey

On April 30, 2009, six stations were electrofished for 10 minutes (pedal time) each to evaluate the fish population and compare to previous electrofishing samples. Because of slightly lower water levels (1 ft), we adjusted our shallow shoreline sites to deeper water locations to collect fish. All fish collected were identified, measured, and recorded. Largemouth bass were weighed individually to determine relative weights (Wr values) for their general health and condition.

The results in 2009 are similar to 2007 except for lower numbers of adult and age-1 largemouth bass collected (Figure 1 and Figure 2). Since the 2001 lake drawdown, the size distribution of largemouth bass population continues to improve towards larger fish because of the high number of bass produced in 2001 and 2003. Age-1 bass comprised 22% of the total

bass sampled in 2002 (Figure 3). This strong 2001 year-class of largemouth bass continues to dominate the bass population as evidenced by the large number of trophy-sized fish greater than 21 inches in our April electrofishing samples (Figure 2).

The fish population is dominated by intermediate sized bluegill (3-4 inches), drawdown produced trophy largemouth bass (21-25 inches), common carp (16-36 inches), gizzard & threadfin shad, and redbreast sunfish (Figure 4). Bluegill (71%), Largemouth bass (16%) and Redbreast sunfish (5%) were the three dominant fish species collected in 2009 (Table 2). The numbers and percent occurrence of redbreast declined in 2009, although the numbers were improving since 2005. We did not collect any redear sunfish or "shellcrackers" in April 2009, which is consistent since 2005. Redear sunfish numbers have declined dramatically since 1999 (Figure 5).

Common carp numbers continue to appear to be declining based recent observations during our electrofishing samples. However, not all common carp are pick-up during fish population surveys because of their large size and handling problems with other sportfish in our holding tank. A trailing carp pick-up boat netted several (N = 10-15) inter-mediated sized common carp during fish population surveys. Low numbers of carp were also observed in February 2009 during an attempt to remove additional fish. Operations were discontinued after a halve day of electrofishing due to low numbers collected. Recent floods discharged hundreds of carp out of the lake based on homeowner's observations. Although largemouth bass are in excellent condition limited numbers of threadfin and gizzard shad were observed in the lake. These important forage fish are directly responsible for the size and growth of trophy largemouth bass in Lake Tallavana.

Largemouth Bass

Largemouth bass produced during 2001 continue to dominate the bass population. Reproduction and survival of bass was excellent after the 2001 drawdown based on age analysis and size distributions. The electrofishing catch rate for all bass was 1.16 bass per minute in April 2009 a decline since 2006 and 2007 (1.6/minute). Fish population surveys were not conducted in 2008 so comparisons were made to 2007. Catch rates for all bass in 2002 and 2003 exceeded 2.0 fish per electrofishing minute.

The largemouth bass population is dominated with larger and older fish produced in 2001 and 2003. These age-6 and age-8 represent bass from 19-25 inches in length and weigh

approximately 6-10 lbs (Figure 1 and Figure 2). Low numbers of young bass survived in 2007, 2008, and potentially the 2009 year-class due to limited aquatic habitat available for spawning and nursery habitats.

The numbers of largemouth bass surviving to age-1 have declined since 2004 due to the loss in shoreline aquatic vegetation, drought conditions, and low water during spawning and nursery periods in April-May (Figure 3 and Figure 6). The low numbers of age-1 bass collected by electrofishing in 2009 was similar to 2005 and 2006 (Figure 3). Higher number of age-1 bass in 2004 may be linked to high water levels from spring/summer flooding in 2003. A relatively strong year-class was produced in 2003, as 32 % of all largemouth bass sampled in April 2004 were age-1 compared to 8% in April 2009 (Figure 3). The 2001 drawdown-produced bass are now age-8 and probably range from 23 to 25 inches in length and weigh from 7-10 lbs, while age-6 bass from the 2003 year-class range from 18-22 inches (Figure 1). These two strong year classes (2001 & 2003) may contribute more than 35% of the total adult bass population due to weak year classes produced in 2002, 2004, 2005, 2007 and 2008. Numbers of age-1 bass collected in 2009 (N = 7 (8%)) were lower than 2002, 2004, and 2007. Low numbers of age-1 bass were expected in 2008 if low water levels persisted in spring 2008. Our assessment of the 2007 year-class suggest another poor cohort because of the low numbers (N = 4) of age-2 bass (10-14 inches) collected in April 2009 (Figure 1). Observations during our electrofishing samples in April 2007 revealed low water levels during the spawning season (April-May 2007) resulting in poor survival of young fish (Figure 7). However in 2009, if shoreline plants such as *Juncus* spp. *Panicum* are flooded in early May 2009 then higher numbers of young fish such as bream may be expected in 2010 (Figure 7). This late flooding may not benefit black crappie and largemouth bass since their spawning periods are all most completed. Re-flooding and maintaining higher water levels during spawning in early spring will result in increased habitat, cover, food, and a nursery areas for young juvenile fish including largemouth bass, black crappie, bluegill, redbreast, threadfin shad, and gizzard shad.

Largemouth Bass (Wrs)

All adult largemouth bass are in excellent condition for their size as we have reported previously. **Relative weights** (Wrs) of largemouth bass collected in Lake Tallavana on April 30, 2009 averaged 96 compare to 106 in 2007 (Table 3). This slight decline may not be significant because Wr values greater than 90 indicate that largemouth bass are in excellent condition for

