

## **FISH POPULATION AND AQUATIC PLANT WATER QUALITY SURVEYS REPORT**

Charles Mesing and Bob Rousseau, our biologists, conducted the surveys on Lake Tallavana April 6, 2004. The following is their report.

### **Objectives**

The objectives for 2004 were to :

- (1) Measure basic water quality parameters and oxygen levels.
- (2) Determine the status of the Fish Population.
- (3) Evaluate drawdown and Bass and Crappie Regulations.

### **Water Quality**

Water quality parameters measured were total hardness (68 ppm), pH (8.5), dissolved oxygen at the surface (8.9 ppm), 5.2 ppm at 5 feet and 2.1 at 10 feet. These dissolved oxygen values are higher than 1999 to 2001 because of an algae bloom. This bloom was lake wide and wind blown to the eastern shore. Water clarity or sechi readings were low (< 12 inches) due to the dense algae bloom on April 6, 2004. Nutrients such as nitrogen, phosphorus, and chlorophyll a samples are collected each month by Lake Watch volunteers.

### **Fish Population Survey**

Lake Tallavana is approximately 170 acres in surface area. On April 6, 2004, eight electrofishing stations were electrofished for 10 minutes (pedal time) each to evaluate the fish population and compare to previous electrofishing samples. The new restored cove was also included for electrofishing. All fish were identified, measured, and recorded. Largemouth bass were weighed individually to determine relative weights (Wr values) for general condition.

Since the drawdown of 2001, the fish population in Lake Tallavana changed dramatically compared to all previous electrofishing results. The fish population continues to be dominated by small bluegill (4-5 inches), age-3 largemouth bass (14-17 inches), age-3 common carp (16-20 inches), gizzard and threadfin shad, and redbreast sunfish. Bluegill (53%) Carp (24%) and Largemouth bass (15%) are the three dominant fish collected although there are more shad than any other species in the lake. Large numbers of age-0 gizzard shad and threadfin shad were observed on 75% of the electrofishing sites throughout the lake and they were too numerous to dip, count, or measure. Threadfin shad (2-5 inches) were collected throughout the lake and they will begin spawning soon as the water temperatures begin to stay warm in May.

### **Drawdown Produced Bass**

The largemouth bass population is dominated by 14-17 inch fish, which have been determined to be age-3 bass from the 2001 drawdown. These bass were produced

shortly after the 2001 winter/spring drawdown and re-flood. In April 2004, age-3 bass from the drawdown represented the modal peak (16 inches) of the bass population, and comprise more than 50% of all bass >8 inches. These bass have grown to 17 inches and weighing approximately 2 to 3 pounds.

Relative health or condition of bass in 2004 was excellent based on the relative weights. Relative weights (Wr) of largemouth bass averaged 104. Wr values greater than 90 indicate that the fish are being well fed and they are considered in good shape. However, many of the smaller 3-7 inch age-1 bass are very small for their age. Wr values lower than 80 indicating food is beginning to become limited for the numerous smaller bass produced after the drawdown. There are plenty of threadfin shad for the spawn in May.

### **Trophy Largemouth Bass**

Fewer trophy-sized bass measuring 20-26 inches (5 to 10 lbs) were observed during our samples in 2004 than 2003. We collected 10 bass (9% of the total) greater than 20 inches in length. These bass weighed from 5 to 10 lbs and many will gain additional weight lost during spawning. One very large 11-12 lb bass was collected in April 17, 2004 during carp removal. Some of the larger sized trophy bass may have already come to shore in March as the water temperatures approach 68 F and some spawning occurred as evident by the presence of 1-inch fry in our April 6, 2004 electrofishing samples.

**Relative Abundance of Bass** is defined as the catch rate for bass during electrofishing. The electrofishing catch rate for age-1 and older bass was 1.6 bass per minute in 2004 compared to 2.0 bass per minute in 2003. The size distribution for largemouth bass on April 6, 2004 was dominated by 14-17-inch bass. This large group of bass was produced after the 2001 drawdown and age analysis of otoliths revealed they are predominately age-3 bass. Our electrofishing samples in April 2004 indicate a substantial high percentage of age-3 bass (53%) contributed to the population compared to 1998, 2001, and 2002. As mentioned previously, some of the larger sized bass had already spawned during a warm March 2004 and many probably left the shoreline for deeper water by April thus reducing our over all catch rate for 2004. We also observed higher numbers and healthier bass in April 2004 based on Wr values. Wr values averaged an extraordinary 104 for 2004. Wr values >90 are considered good and they often indicate a healthy population. The current population should support the recent bag and size limit for largemouth bass, while protecting the drawdown produced bass for at least one more year. The 3-year old drawdown bass will carry the fishery for 2-3 years. We recommend **no change in Largemouth Bass Regulations for 2004-2005.**

**Black crappie population** continues to be low since the die-off, but young black crappie were present in our samples and during the carp removal project. We were only able to collect a few (N=2) adult fish during April 6, 2004 and they appeared to be healthy. Although, we observed hundreds of yoy black crappie throughout the lake in 2001, we did not observe many age-1 black crappies in our 2002 and 2003 electrofishing samples. However, this year we did observe several (30-40) of 3-4 inch and 10-12 inch crappie in

our April 17, 2004 carp removal electrofishing. The larger black crappie appeared to be in good spawning condition. Although April is generally late for black crappie spawning, the cooler weather in spring 2004 has apparently delayed spawning of most species. We examined gills most of the Black crappie during the carp removal and found no evidence of anemia in the fish. We will continue to monitor their recovery in future years. **The 10-inch minimum size limit for Black crappie should stay in effect.**

**Bluegill population** was dominated by 4-5 inch fish in 2004. Electrofishing samples in 2004 indicated an increase in the medium sized bluegill (4-5 inches) produced during the drawdown and collected during 2003. Age analysis (otoliths) revealed that 80% of the 4-5 inch bluegill analyzed were age-2 and 3 and produced after the 2001 drawdown. The numbers of bluegill greater than 6 inches has declined since the fish kill. However, hundreds of the smaller bluegill (< 6 inches) were collected or observed in 2003. Sufficient numbers of 4-5 inch bluegill are still present in the population and they should provide a good fishery in the near future. These fish need another year to grow into harvestable sizes greater than 6 inches. There is no need to stock bluegill at this time.

**Common carp** numbers increased dramatically immediately after the 2001 drawdown. These carp are now three years old and range from 16-20 inches. We collected several age-0 carp in 2001, but we did not collect or observe many age-0 in 2002, 2003, and 2004. In November 2003 and January 2004, we removed 1,200 carp. In April 2004, we removed an additional 950 adult carp on April 17, 2004 before spawning occurred. In 2004, the carp were congregating in the creek and on shore near emergent vegetation as well as coves. The carp selected these vegetated areas compared to un-vegetated sections of the lake. High numbers of age-3 carp were observed during electrofishing (Estimate 250 +) in selected vegetation areas in April 2004. Remember, aquatic vegetation is good for all fish including largemouth bass, shad, bluegill, and of course common carp! As the Smart weed and Panicum disappear in 2003, the cover which allowed the carp and other sportfish eggs to hatch and fry survive and grow will be gone and the numerous 14-17 inch bass will feed on small young carp (1-3 inches) produced in 2004.

**Aquatic Vegetation** Most of the beneficial emergent aquatic vegetation produced during the 2001 drawdown have disappeared by 2004. Water hyacinths and Salvinia have been greatly reduced by the drawdown and increased spraying activities by our company. As a result, less biomass of aquatic vegetation will need to be controlled by maintenance spraying. There was no extensive blue green algae bloom during our samples on April 6, 2004. The cooler air temperatures in the spring 2004 have probably contributed to less phytoplankton production so far this year. Of course, nutrients (phosphorus and nitrogen), and warm weather will probably continue to produce algae blooms in the summer because there are a lack of aquatic plants to uptake the nutrients in the lake. There is no immediate need to spray Salvinia or Water hyacinths at this time. Small areas of Salvinia were observed in the upper end coves on the north end of the lake. The growth and expansion of these plants should be monitored this summer. It is always better to use herbicides to treat small amounts of exotic plants more frequent than a large biomass once or twice a year because the dead vegetation eventually turns into muck and

reduces oxygen levels. There is a need to establish some littoral aquatic vegetation in the lake.

**Restoration of Southern end** The shallow south end of the lake had extensive accumulated sediments removed in 2003. The restoration was successful in reducing Water hyacinths, Salvinia, and improving natural shoreline of aquatic habitats. As of April 2004, these plants have not returned in high densities. Extended benefits of this drawdown and restoration efforts will be obvious in future years as spraying of unwanted exotic aquatic, vegetation will be reduced. Reduced maintenance spraying of problematic plants will reduce muck build up in shallow areas. Boat access has also been greatly improved. High numbers of threadfin shad were observed in this “new restored” area in pre-spawning condition. Good numbers of largemouth bass and bluegill were observed in the restored area.

### **CONCLUSIONS:**

- 1) The drawdown in 2001 was very successful in increasing the fish population. Age-3, Bluegill, Common carp, and Largemouth dominate the fish population.
- 2) Numbers of bluegill have increased after the drawdown. Sufficient numbers of smaller sized bluegill are present in the population to replenish the fishery.
- 3) Beneficial fishery aquatic plants such as Smartweed and Panic grasses have disappeared three years after the drawdown. Water hyacinths and Salvinia are under control, but maintenance spraying is important. Pennywort has expanded in the upper end of the lake and it's continued growth and expansion should be monitored this spring and summer.
- 4) The habitat enhancement or fish attractor program continues to be successful.
- 5) Growth of age-0 sportfish was poor in 2003. The presumable loss of aquatic insects (with the beneficial aquatic plants) may have contributed to this poor growth.
- 6) Common carp numbers are high, while Black crappie adult numbers are low, but appear to be increasing in 2003. The current population does not seem to have an anemia problem at this time based on our observation of several adult fish during our samples and carp removal project.
- 7) Threadfin and Gizzard shad numbers are higher than previous years.
- 8) Relative weights of adult bass were high in April 2004, indicating most bass are healthy and in good condition.
- 9) Bream species are recovering since the fish kill in 2000-01. Stocking is not necessary because sufficient numbers were produced after the 2001-drawdown.

**RECOMMENDATIONS:** The recommendations for 2004-05 are similar to 2003.

- 1) Develop and review the Lake Management Plan with aquatic vegetation and fishery goals and objectives. This plan should include a partial winter drawdown (3-4 months) every 4-6 years to dry out lake bottom sediments and old decaying vegetation and re-establish shoreline vegetation. Identify problematic aquatic vegetation for spraying.
- 2) Conduct frequent aquatic vegetation inspections with maintenance herbicide treatment for water hyacinths, Salvinia, and problem areas of pennywort in front of homes as requested.
- 3) Size and Bag limits for Largemouth bass and Black crappie should stay in place.
- 4) Encourage homeowners to feed bluegill with floating fish food. Anglers should remove all carp caught and use them as organic fertilizers.
- 5) No fish stocking is necessary during 2004.
- 6) Consider a plan for establishing native aquatic plants (Giant bulrush) for fish habitat. These littoral plants were successfully planted and established in Lake Talquin in 1998 and provided cover and spawning areas for bass and bream species. We can provide guidance and recommendations for specific areas and plant densities if the homeowners desire.
- 7) Investigate an aeration system, which could improve oxygen levels and water quality in the deeper sections near the dam and help reduce nutrients as a secondary benefit. We can provide estimates and locations for an aeration system if requested by the homeowners.