

LOUISIANA DEPARTMENT OF WILDLIFE & FISHERIES



**OFFICE OF FISHERIES
INLAND FISHERIES SECTION**

PART VI -B

WATERBODY MANAGEMENT PLAN SERIES

TURKEY CREEK LAKE

**WATERBODY EVALUATION &
RECOMMENDATIONS**

CHRONOLOGY

DOCUMENT SCHEDULED TO BE UPDATED ANNUALLY

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WATERBODY EVALUATION

STRATEGY STATEMENT

Recreational

Sportfish species are managed to provide a sustainable population while providing anglers the opportunity to catch or harvest numbers of fish adequate to maintain angler interest and efforts.

Commercial

An abundant and under-utilized commercial fishery exists in Turkey Creek Lake. Commercial harvest is encouraged

Species of Special Concern

No threatened or endangered fish species are found in this waterbody.

EXISTING HARVEST REGULATIONS

Recreational

Statewide regulations are in effect for all fish species. Recreational fishing regulations may be viewed at this link: <http://www.wlf.louisiana.gov/fishing/regulations>

Commercial

Statewide commercial regulations are in effect. There is no closed season. Commercial fishing regulations may be viewed at this link: <http://www.wlf.louisiana.gov/fishing/regulations>

SPECIES EVALUATION

Recreational

Largemouth 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. Electrofishing is the most efficient sampling indicator of largemouth bass abundance and size distribution, with the exception of large fish. Sampling with gill nets is normally conducted to determine the status of large bass and other large fish species. Gill net sampling is not conducted in Turkey Creek Lake due to the high density of submerged stumps and woody debris. Shoreline seining has been used to collect information related to fish reproduction and forage availability.

Largemouth Bass

Relative abundance and length frequency-

Electrofishing sampling is used to determine largemouth bass relative abundance and obtain length frequency information. One measurement of abundance is the catch per unit of effort (CPUE) for a given species during sampling. This unit of measurement is defined as the number of bass captured per hour of sampling. Since the early 1990's, electrofishing has been the primary tool for estimating bass abundance in Turkey Creek Lake.

Turkey Creek Lake has inherent physical characteristics that do reduce the efficiency of electrofishing sampling. Those characteristics include an extensive cypress forest, countless stumps, and clear shallow water. As a result, target fish are more randomly distributed throughout the lake and not as susceptible to collection. Electrofishing CPUE for bass is typically lower than for some other waterbodies. Standard error for Turkey Creek sampling is typically higher than other waterbodies. For these reasons, data from Turkey Creek Lake are only used for temporal comparisons with other data from Turkey Creek Lake. Such comparisons make it possible to determine abundance trends over a period of time and make general observations about the current population.

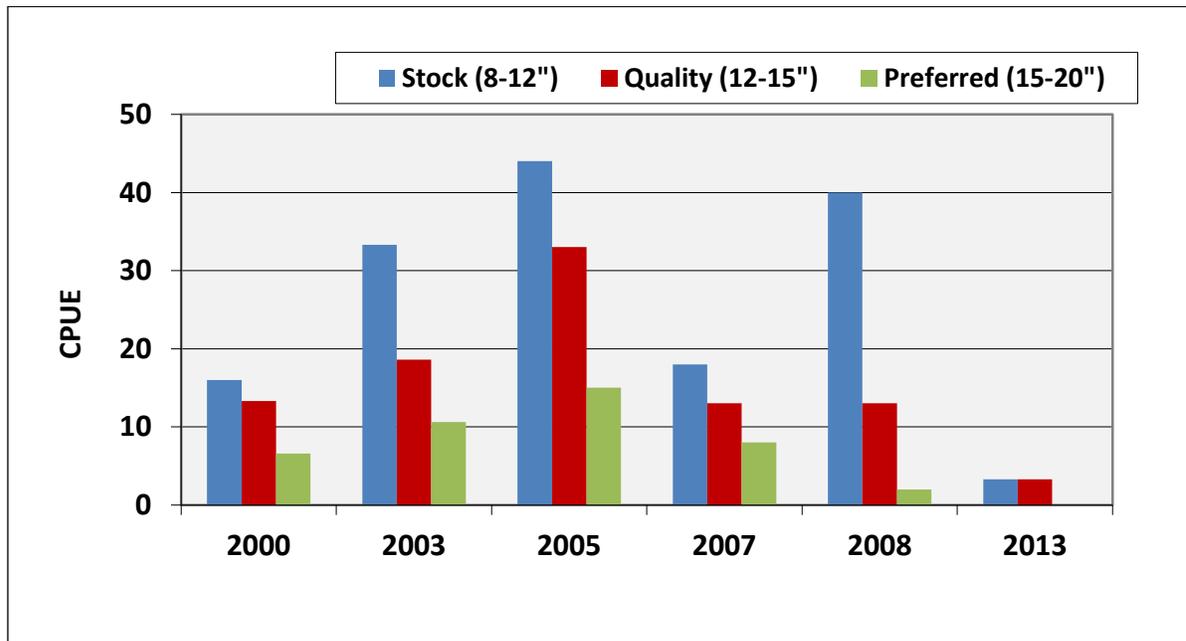


Figure 1. The CPUE (bass per hour) for stock-, quality-, and preferred-size largemouth bass collected from spring electrofishing samples on Turkey Creek Lake, 2000 – 2013.

Seine sampling which is used to estimate forage availability and sportfish reproduction are normally taken at boat ramps after dark during the summer months. Figure 2 shows the catch per seine sample for the last four samples conducted on Turkey Creek Lake.

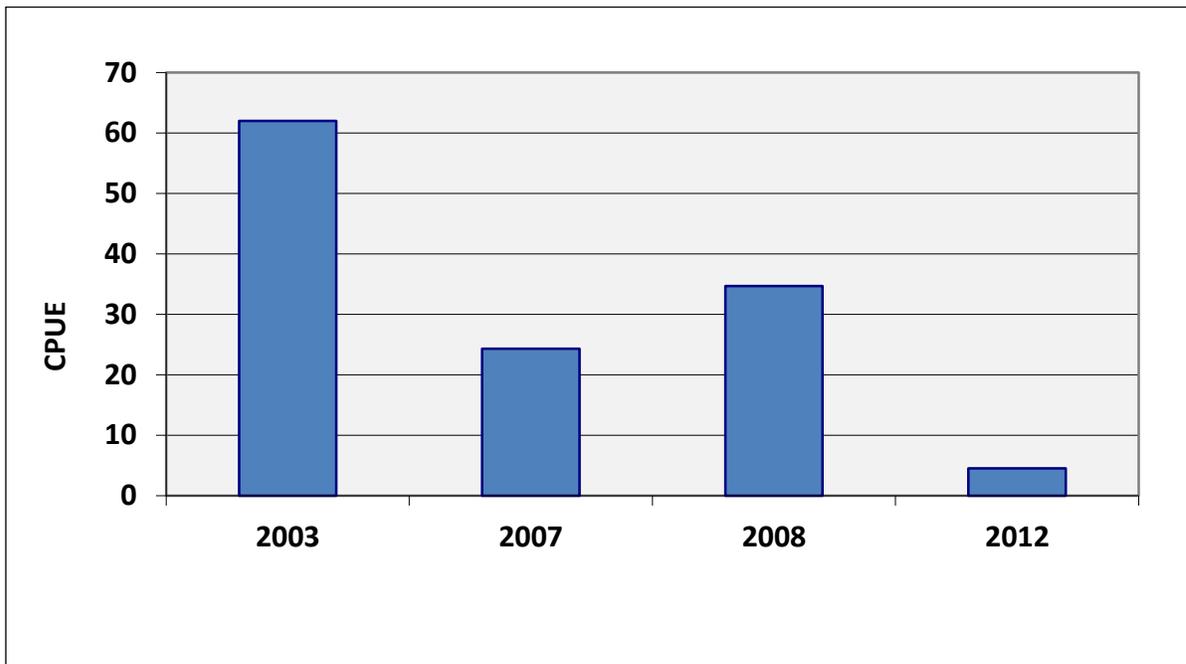


Figure 2. Catch per seining haul of young-of-the-year largemouth bass on Turkey Creek Lake for years 2003, 2007, 2008, and 2012.

Largemouth bass genetics-

Florida largemouth bass (*M. floridanus*) are typically stocked into waterbodies which are believed to have the potential to grow and produce quality size bass. Waterbodies are evaluated on habitat, fertility, forage, and requests from anglers. Florida bass stocking was initiated in 1993. Subsequent stockings were conducted in 1995, 1998, and 2006 – 2013. No genetic analysis was conducted before Florida bass stocking. An evaluation of genetic composition conducted in 2005 indicated 12.5% of the sample ($n = 24$) contained the Florida genome. These fish were all hybrids between Florida x northern largemouth bass. Low sample size of bass from electrofishing samples in 2013 did not allow for a significant genetic sample. Stocking of Florida bass fingerlings at a rate of 10 to 20 /acre is scheduled to continue in an effort to thoroughly evaluate the potential of Turkey Creek Lake habitat to assimilate the Florida largemouth bass genome into the bass population.

Crappie

Crappies (*Pomoxis spp.*) have never been specifically targeted for sampling during previous sampling efforts in Turkey Creek Lake. Both species, white crappie *P. annularis*, and black crappie (*P. nigromaculatus*), have been recorded from various sampling gears, including gill netting, electrofishing, and biomass (rotenone) sampling. Catch rates in these samples have not been sufficient for statistically significant analyses.

Sunfish

Sunfish (*Lepomis spp.*) comprise an important component of the fisheries in Turkey Creek Lake. Bluegill (*L. macrochirus*), and redear sunfish (*L. microlophus*) are the most abundant sunfish species in Turkey Creek Lake. Other species documented from forage and seine

samples include longear sunfish (*L. megalotis*), warmouth (*L. gulosus*), and orange-spotted sunfish (*L. humilis*). Sunfish are utilized as forage for predatory species such as largemouth bass, catfish (*Ictalurus spp.*), and gar (*Lepisosteus spp.*). Biomass (in pounds per acre) of sunfish species has been determined from prior sampling. Figure 3 shows the results of the last four samples taken on Turkey Creek Lake. An electrofishing forage sample was conducted in fall 2013, with only bluegill and no redear sunfish collected. Catch rates for bluegill is shown in Figure 4.

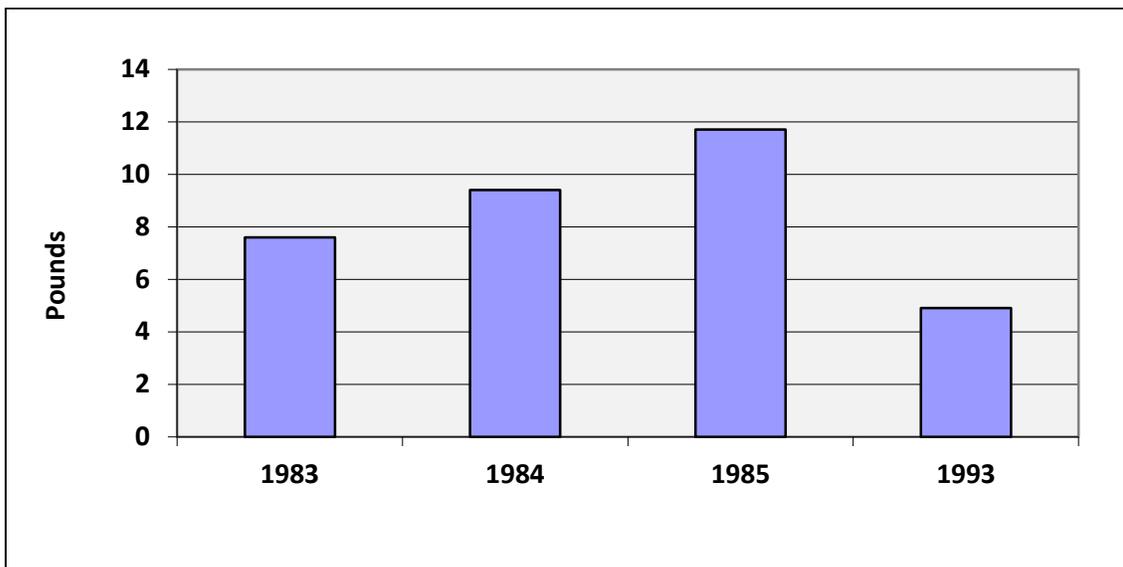


Figure 3. Biomass estimates of sunfish for Turkey Creek Lake, Louisiana from biomass samples taken in 1983, 1984, 1985, and 1993.

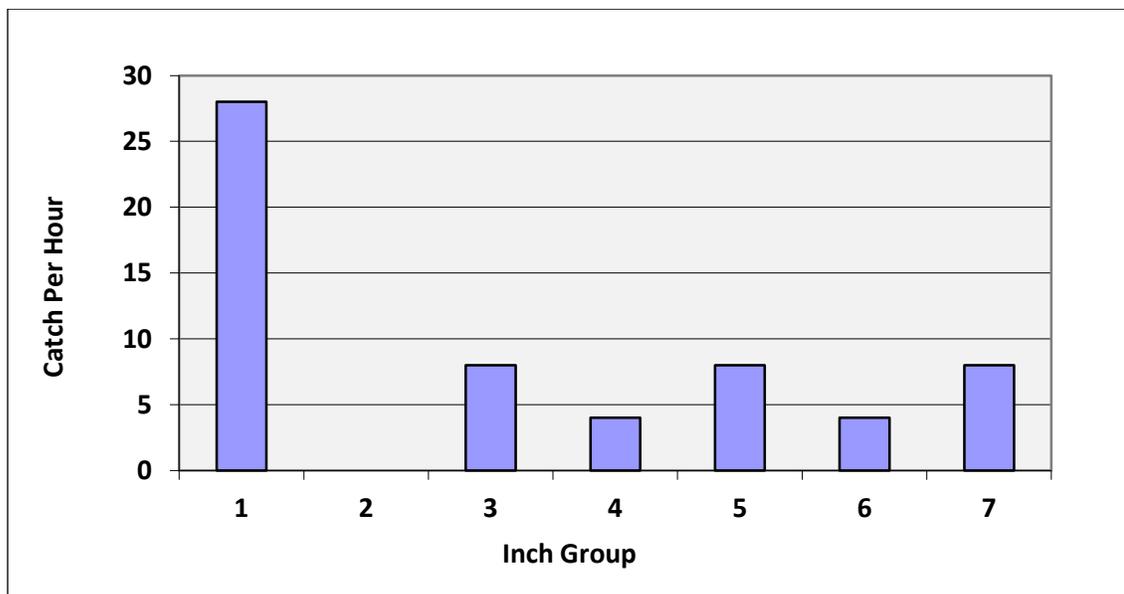


Figure 4. The CPUE (catch per hour) for bluegill on Turkey Creek Lake from fall electrofishing forage sample conducted in 2013.

Other Forage

Silversides (*Labidesthes spp.*), gizzard shad (*Dorosoma cepedianum*), threadfin shad (*D. petenense*), and minnows (*Cyprinidae*) have been identified as other significant forage species in Turkey Creek Lake. Estimates of forage abundance have been made from past biomass samples. The data in Figure 8 represents forage biomass in pounds per acre from samples taken in 1983, 1984, 1985, and 1993.

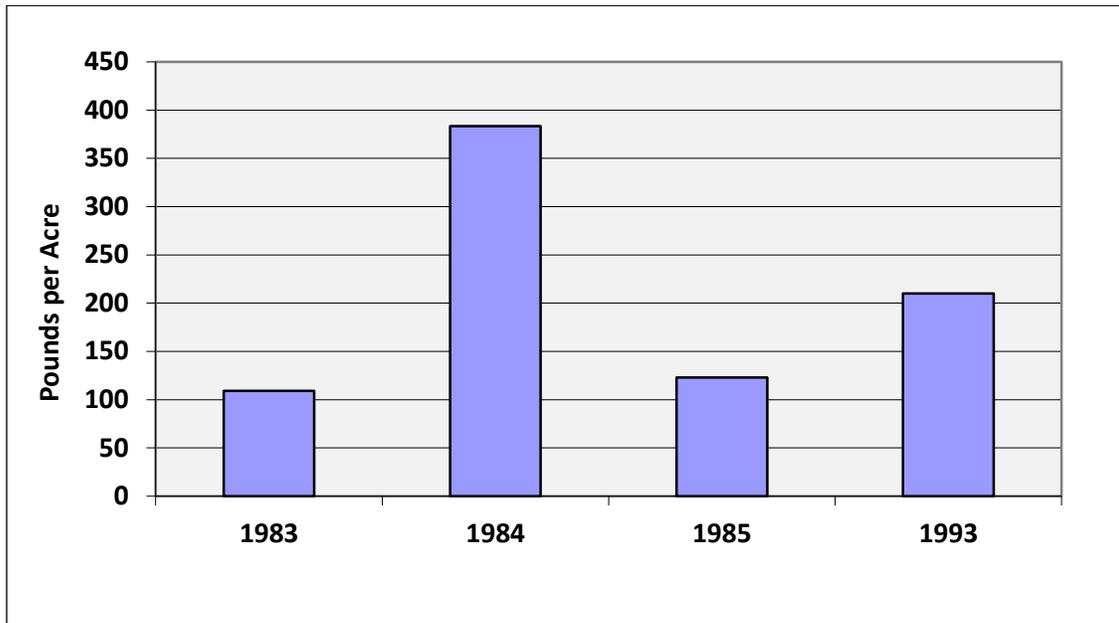


Figure 5. Biomass of forage species in Turkey Creek Lake, Louisiana estimated from sampling in 1983, 1984, 1985, and 1993.

Recreational Creel Survey

No creel surveys have been conducted on Turkey Creek Lake.

Commercial

Biomass sampling with the use of rotenone has shown that common commercial fish species have long existed in Turkey Creek Lake (Figure 6), though little commercial fishing activity has been documented. Buffalo fish have been the most abundant commercial species and catfish, freshwater drum, and gar are also common.

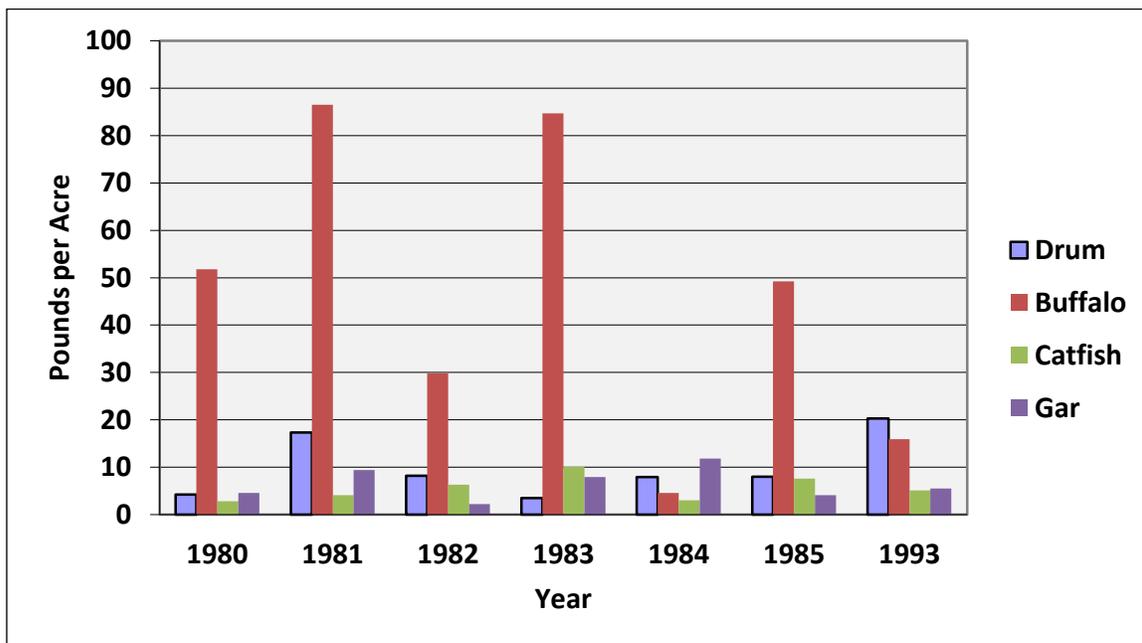


Figure 6. Biomass of commercial species in Turkey Creek Lake , Louisiana from sampling conducted in 1980, '81,'82, '83, '84, '85, and 1993.

HABITAT EVALUATION

Aquatic Vegetation

Historically, floating vegetation such as duckweed (*Lemna spp.*), water hyacinth (*Eichhornia crassipes*), and water pennywort (*Hydrocotyle spp.*) have been the most abundant species, especially in the heavily forested upper reaches. Giant salvinia (*Salvinia molesta*) was discovered in the lake in 2007 and has since become a priority for control. At times, it has formed surface mats covering several hundred acres in the upper reaches. When this occurs, dissolved oxygen levels become critically low under these mats and native plant species are negatively impacted. Dense thickets of cypress (*Taxodium distichum*) and button bush (*Cephalanthus occidentalis*) serve as nursery areas for the floating species, allowing coverage to expand to nuisance levels while being protected from wind action, frost, and herbicide application.

Submerged vegetation has historically been comprised of coontail (*Ceratophyllum demersum*) and southern naiad (*Najas guadalupensis*), both native species. Hydrilla (*Hydrilla verticillata*), an exotic species, has been present in Turkey Creek Lake for several years, though it has not reached nuisance levels. No control efforts have been necessary for any submerged species.

Vegetative abundance continues to be affected by backwater flooding from the Boeuf River. Extended flood events will temporarily decrease the coverage of submerged species. Receding water and rainfall will often create a flow through the upper ends of Turkey Creek Lake, and can “flush” floating vegetation out of these areas where they will be blown onto the shoreline by wind and wave action, or made vulnerable to herbicide applications.

Vegetation control for 2013 included herbicide treatment by LDWF spray crews, stocking of salvinia weevils (*Cyrtobagous salviniae*), and placement/movement of containment booms to

hold floating vegetation in the upper reaches of the lake. The majority of the herbicide applications were focused on giant salvinia (2,860 acres sprayed), though other floating species such as water hyacinth (105 acres), duckweed (90 acres), and water pennywort (236 acres) were also treated. The following LDWF salvinia treatment recommendation has been followed since 2012:

Time Period	Herbicide Treatment and Rate
April 1 – October 31	glyphosate (0.75 gal/acre)/diquat (0.25 gal/acre)/Aqua King Plus (0.25 gal/acre)/Thoroughbred (12 oz/acre)
November 1 – March 31	diquat (0.75 gal/acre)/surfactant (0.25 gal/acre)

The other species of vegetation are effectively treated with these formulations as well. The herbicide 2,4-D (0.5 gal/acre) may be used for control of water hyacinth from September 15 March 15, and diquat dibromide (1.0 gal/acre) may be used for duckweed control year around. No formal vegetation survey was conducted in 2013, though coverage was similar to that reported in 2012 (below). The most significant change was an increase in hydrilla from approximately 10 acres to 50 acres in 2013. Estimates of vegetation coverage for 2013 are listed below:

-Water Hyacinth - 100 acres; scattered in clumps throughout both upper arms of the lake

-Giant Salvinia -300 acres; abundant in Big Brake area of eastern arm, with denser mats forming amongst other vegetation in northern end of arm. There is a small amount in the Little Brake area of the eastern arm. Approximately 95% of the total coverage is located north of both containment booms.

-Alligator weed– 50 acres, mostly shoreline fringe, scattered throughout the lake

-Pennywort.-75 acres; scattered in clumps throughout both upper arms of the lake

-Duckweed - 100 acres; located in both upper arms, mixed in with giant salvinia and water hyacinth

-Hydrilla– less than 10 acres in 2012, scattered, mostly on south end of lake, now nearly 50 acres in 2013, mostly on southern half of lake

The giant salvinia weevil introductions on Turkey Creek Lake have been promising, as several acres of salvinia in the proximity of the release sites appear to be stressed and dying. Assessments of weevil survival have indicated that weevils are surviving at a higher rate than in other north Louisiana. A total of 52,000 weevils were stocked on three occasions in April, May, and June, 2013. Floating booms were placed across the Little Brake and Big Brake arms in 2011 to contain floating vegetation in areas where herbicide treatment can be conducted. The booms also serve to prevent the floating plants from infesting the more open, southern end of the lake where a majority of recreation occurs. An additional boom was placed above the original boom in the Big Brake arm in 2013. The intent is to clean up the area between the booms and then relocate the original boom to an area just north of the second boom, gradually concentrating the salvinia and other floating vegetation further north. The boom in Little Brake remains in its original location.

Substrate

The natural substrate of Turkey Creek Lake is mostly clay. The senescence of aquatic vegetation and accumulation of leaf litter from surrounding trees has added a significant volume of organic material to the lake bottom.

Available complex cover

The most prominent forms of complex cover in Turkey Creek Lake are live bald cypress trees and submerged woody material (stumps and fallen debris). Cypress trees are common in the shallow areas on the upper end, while other woody material, mostly hardwood and cypress stumps, is found throughout. Submerged vegetation provides a varying amount of shallow water cover, with coontail and hydrilla being the dominant species.

CONDITION IMBALANCE / PROBLEM

The most serious threat to the fisheries and recreational users of Turkey Creek Lake is the continued expansion of giant salvinia. Extensive coverage creates large areas of hypoxic conditions and threatens native vegetation. High volumes of hypoxic water pose a threat of fish kills, especially when disturbances such as severe storms occur during warm months. Large surface mats limit boating access and other recreational activities.

CORRECTIVE ACTION NEEDED

Efforts to control giant salvinia will continue. The discovery of new tools to control giant salvinia remains as a top LDWF priority.

RECOMMENDATIONS

Continue an integrated approach to control giant salvinia on Turkey Creek Lake. LDWF will use an integrated management program of aggressive herbicide applications, biological control and physical measures to achieve combined benefits.

Chemical Control

Herbicide applications for control of giant salvinia and other nuisance aquatic vegetation will be conducted in accordance with LDWF Aquatic Herbicide Application Protocol. Diquat dibromide (1.0 gal/acre) will be used primarily for control of duckweed and 2,4-D (0.5 gal/acre) will be used to treat pennywort and water hyacinth. Giant salvinia will be treated with a mixture of glyphosate (0.75 gal/acre) and diquat dibromide (0.25 gal/acre) with Aqua King Plus (0.25 gal/acre) and Air Cover (12 oz./acre) surfactants from April 1 to October 31. Outside of that time frame, diquat (0.75 gal/acre) and a non-ionic surfactant (0.25 gal/acre) will be used.

An evaluation will be made in mid-March to determine the need for contracted herbicide applicators. When coverage exceeds 250 acres, a contract will be requested.

The removal or thinning of buttonbush *Cephalanthus occidentalis* will be investigated. These areas in the upper reaches of the lake harbor salvinia, duckweed, and water hyacinth, and make herbicide treatments by boat very difficult. Opening these areas would also allow wind action and currents to periodically remove severe infestations.

Biological Control

Giant salvinia weevil introductions have proved promising thus far. The plants at the stocking sites appear to be stressed, with salvinia being browner in coloration than those plants in surrounding areas. Assessments of weevil survival at the site in Big Brake have shown survival to be very good. Weevil introductions will continue, and additional sites in Little Brake will be stocked.

Physical Control

The containment boom will remain in place in order to prevent salvinia from spreading into other areas of the lake. Additional boom may also be used to exclude boat ramps from infestation. A gradual movement of the booms northward has already begun and should continue when possible. This will provide for a smaller treatment area if infestations do not develop south of the booms.

If salvinia coverage expands at a rate greater than can be controlled with the above recommendations, a drawdown will be recommended. The drawdown will be considered when total giant salvinia coverage is expanding at a rate such that the total estimated coverage will exceed 500 acres in a particular growing season and large surface coverage occurs south of the containment booms. Assessments will be performed bi-monthly.

Recommendations to DOTD for drawdowns will be as follows:

1. The target water level will be 6 feet below spillway crest height
2. Dewatering rate will be 2 to 4 inches per day.
3. The drawdown will extend for at least 90 days after the target level of 6 feet below spillway crest height is reached.
4. The gates will be closed no later than January 31 of the following year.

Repairs should be made to the leaking spillway to prevent excessive lowering of the lake level. It is believed that the current seepage through cracks and holes leads to at least an additional foot of dewatering during the summer months. The lower water levels increase the difficulty of spray boats to navigate the upper reaches of Turkey Creek Lake. Coordination with FPPJ and LDOTD should be made prior to the next planned drawdown to remedy this situation.

Alternative sampling methods will be investigated to more accurately assess the sport fish population on Turkey Creek Lake.

1. Experimental electrofishing will be conducted at various locations and also at night in areas that may be safe for boat travel.
2. The use of leadnets will be investigated to assess crappie populations.
3. Sampling with rotenone will be considered.
4. A recreational angler creel survey will also be considered to determine feasibility and viability.