

SPRING BAYOU – Aquatic Vegetation Control Plan
Updated October 2012

Introduction

Floating and emersed aquatic vegetation

In 2008, foliar herbicide applications were made on nuisance plants such as water hyacinth, duckweed, pennywort, American lotus, alligator weed, cut grass, frog's bit, parrot feather, sedge, and common salvinia in areas used by recreational fishermen. A total of 1,170 gallons were applied to 1,959 acres. The herbicide 2,4-D was applied at a rate of 0.5 gallons per acre to control water hyacinth, pennywort, alligator weed, and American lotus. Diquat (Knockout and Reward) was applied at a rate of 0.75 gallons per acre for duckweed, frog's bit and parrot feather, and glyphosate (Aquamaster and Aqua Star) at a rate of 0.75 gallons per acre to control common salvinia and sedge.

In 2009, foliar herbicide applications were made on nuisance plants such as water hyacinth, duckweed, pennywort, American lotus, alligator weed, cut grass, frog's bit, parrot feather, primrose, sedge and common salvinia in Spring Bayou. A total of 1,095 gallons were applied to 1,828 acres. To control water hyacinth, pennywort, alligator weed, primrose and American lotus, 2,4-D was applied at a rate of 0.5 gallons per acre. Diquat was applied at 1.0 and 0.75 gallon per acre rates for duckweed, frog's bit and parrot feather, and glyphosate and Imazamox (Clearcast) each at 0.75 gallons per acre to control common salvinia and sedge.

In 2010, foliar herbicide applications were made on nuisance plants such as water hyacinth, duckweed, pennywort, American lotus, alligator weed, cut grass, frog's bit, parrot feather, primrose, sedge and common salvinia in Spring Bayou. A total of 1,710 gallons were applied covering 2,696 acres. To control water hyacinth, pennywort, alligator weed, primrose and American lotus, 2,4-D was applied at a rate of 0.5 gallons per acre. Diquat was applied at 1.0 and 0.75 gallons per acre for duckweed, frog's bit and parrot feather, and glyphosate and imazamox at 0.75 gallons per acre to control common salvinia and sedge.

In 2011, foliar herbicide applications were made on nuisance plants such as water hyacinth, duckweed, pennywort, American lotus, alligator weed, cut grass, frog's bit, parrot feather, primrose, mosquito fern, and common salvinia in Spring Bayou. A total of 1,982 gallons were applied to 2,841 acres. To control water hyacinth, pennywort, alligator weed, primrose and American lotus, 2,4-D was applied at a rate of 0.5 gallons per acre. Diquat was applied at 0.75 gallons per acre for duckweed, frog's bit, and parrot feather. Glyphosate was applied at 0.75 gallons per acre to control common salvinia and mosquito fern.

As of October of 2012, foliar herbicide applications were made on nuisance plants such as water hyacinth, duckweed, pennywort, American lotus, alligator weed, frog's bit, primrose, and common salvinia in Spring Bayou. A total of 1,375 gallons were applied to 3,331 acres. To control water hyacinth, pennywort, alligator weed, primrose and American lotus, 2,4-D was applied at a rate of 0.5 gallons per acre. Diquat was applied at 0.75 gallons per acre for duckweed, frog's bit, and parrot feather. Glyphosate was applied at 0.75 gallons per acre to control common salvinia.

Submersed aquatic vegetation

In January of 2008 a total of 11,215 triploid grass carp (TGC) were stocked in Spring Bayou to reduce hydrilla infestations. Of these TGC, fifty fish were implanted with transmitters, and telemetry equipment was used to track their movements within the lake. In August of 2008, Hurricane Gustav caused heavy flooding and low dissolved oxygen levels, therefore numerous fish perished. Another attempt to stock TGC began in March of 2011, when 10,000 carp were stocked in Spring Bayou. Of these, ten fish were implanted with transmitters and are currently being tracked. (See attached TGC tracking report below). After this stocking, the Flood of 2011 put an additional 3 feet of water in the lake causing low dissolved oxygen levels throughout the system, and again more fish kills occurred.

In 2009, a total of 614 acres of hydrilla in Spring Bayou were treated using a systemic herbicide, Sonar Q (quick release) and Sonar PR (precision release). Areas treated were Tete De Bouef (75 acres), Lac a Deux Boute (97 acres), Coulee Noir (235 acres) and Tee Lac (208 acres). In Tete De Bouef and Lac a Deux Boute only, Sonar PR was applied totaling 1,170 pounds at a rate of 6.8 ppb. The other two areas were treated with a mix of Sonar PR and Sonar Q. Applications of both Sonar formulations were 840 pounds each at a rate of 3.8 ppb. Results were poor in Coulee Noir and Tee Lac but good in the other two areas.

In 2010, an experiment combining a systemic herbicide (Galleon) with a contact herbicide (Aquathol K) was attempted to control the spread of hydrilla. Total Galleon used was 45 gallons and a total of 1,080 gallons of Aquathol K were used. Galleon was applied at a rate of 20 ppb and Aquathol K at a rate of 1 ppb. Areas treated were Old River, Boggy Bayou, Coulee Noir and Lac a Deux Boute. Success of the Galleon/Aquathol treatment was spotty, with submersed plants returning to pre-treatment levels in most of these areas by 2011. Also, a Sonar application was implemented to compare with the experiment. The area treated was in Tete de Bouef (75 acres) with 510 pounds of Sonar PR for a rate of 6.8 ppb. The result from the Galleon/Aquathol treatment was fair, initially reducing the hydrilla biomass, but the plant re-growth was fast. Results from the Sonar application were good as hydrilla growth was minimal and plants have not returned.

In May 2011, a total of 115 acres of hydrilla in Spring Bayou were treated using the systemic herbicides Sonar PR & Q. Areas treated were Old River (70 acres) and Boggy Bayou (45 acres).

In Old River, the total Sonar PR & Q applied was 480 pounds at a rate of 3.42 ppb. In Boggy Bayou the total Sonar PR & Q applied was 270 pounds at a rate of 3.33 ppb. The herbicide was applied 14 days prior to the 2011 flood event that caused water levels in the lake to rise 3 feet above pool stage. Even with this amount of water flowing through the system, results were good as hydrilla growth has been reduced in these areas and continues to remain low.

In May 2012, a total of 250 acres of hydrilla in Grand Lac were treated using the systemic herbicides Sonar PR & Q. The total Sonar PR & Q applied was 480 pounds at a rate of 3.42 ppb. Monthly site investigations were made and results were good as hydrilla growth has been reduced in this area.

Contact and systemic herbicides have both been used to combat the spread of hydrilla in Spring Bayou. Systemic herbicides have reduced hydrilla growth in these treated areas. Hydrilla currently covers approximately 2,000 acres throughout the complex. Water hyacinth, pennywort, primrose and alligator weed cover approximately 1,000 acres; common salvinia and American Lotus cover approximately 950 acres, and duckweed and frog's bit cover approximately 500 acres.

Nuisance Aquatic Vegetation Problems:

Plant growth projections for 2013:

Hydrilla - up to 2,174 acres (80%) widely scattered over the lake.

American Lotus – up to 950 acres widely scattered over the lake

Alligator weed, Primrose, Water Hyacinth & Pennywort - up to 1,000 acres mixed together and located primarily along shoreline on lower end of lake.

Common Salvinia - up to 750 acres located primarily in the center of the lake.

Duckweed & Frog's Bit - up to 500 acres located primarily along shoreline on upper end of the lake.

Proposed Control Measures for 2013:

Biological Control

A total of 11,215 triploid grass carp (TGC) were stocked in 2008 to control the spread of hydrilla. Low dissolved oxygen conditions caused by Hurricane Gustav resulted in an extensive fish kill. An additional 10,000 TGC, were released in Spring Bayou in March 2011. Hydrilla has continued to spread throughout the complex. Additional TGC will be necessary to achieve control.

Considerations for TGC stocking rate include the following:

1. TGC stocked into Spring Bayou will be subject to potential reductions in number due to predation, flood related fish passage, and fish kills
2. Sufficient complex cover exists in Spring Bayou to support a healthy sport fishery even in the event that all submerged vegetation were removed
3. The expense of large scale herbicide applications for control of submerged vegetation is prohibitive and benefits are temporary. Future applications will be smaller in scale and limited to strategic areas to facilitate boater access
4. Hydrilla coverage continues to increase despite prior efforts.

Annual stockings of 10 TGC per vegetative acre are recommended for 2013, 2014, and 2015. To reduce predation, stocked TGC will measure at least 12 inches in length. LDWF personnel will monitor aquatic vegetation coverage on an annual schedule. Sampling will also be conducted to monitor survival, growth and effectiveness of stocked grass carp. Subsequent TGC stockings will be conducted as necessary.

Chemical Control

Foliar herbicide applications at Spring Bayou will be conducted as needed by LDWF spray crews in 2013. Herbicides applied will be 2,4-D (0.5 gal/acre) and glyphosate (0.75 gal/acre) on plants such as water hyacinth, alligator weed, pennywort and primrose. Diquat dibromide (0.75 gal/acre) will be used in conjunction with Red River 90 (non-ionic surfactant) to control plants such as common salvinia, duck weed and frog's bit.

American lotus infestations have spread throughout the complex and, along with hydrilla, limit access in many of Spring Bayou's open waters. Although most of these areas are accessible from the open channel, boat travel through them is very difficult. The open areas containing thick lotus growth comprise an area of approximately 780 acres (Figure 1). Recommended treatment for these areas is the areal application of glyphosate (0.5 gal/acre) and a nonionic surfactant (0.125 gal/acre). The application will require two days with the use of a specially equipped helicopter and will cost approximately \$19,000 (helicopter and herbicide costs

included). The application will be made in late spring/early summer so that the lotus is treated before the seed heads mature and drop. The timing is designed to prevent new plants from sprouting in the following year. Repetition of this process for 3 to 4 successive years will yield long term results.

Recommended herbicide applications for control of hydrilla include:

1. Granular herbicide, SONAR PR (4 thirty pound pails) and Q (2 forty pound pails) applied to approximately 10 acres near the Boggy Bayou launch
2. Aquathol[®] K or Clipper[™] will be used on an experimental basis to clear access routes. Proposed access lanes will be located in areas listed below and are illustrated in Figure 2. These lanes will be treated once during the late spring or early summer of 2013 and will be monitored throughout the growing season. Results will determine if similar treatments are conducted in the future.
 - a. Coulee Noir (6 acres)
 - b. Lac a de Boute to Grand Lac (18 acres)
 - c. Tee Lac (11 acres)

Physical Control

The historic water fluctuation regime of the Spring Bayou Complex is recognized as the most effective and cost-efficient means of aquatic vegetation control. Natural water level fluctuation typically includes highest water levels in springtime and lowest levels in the fall. Water control structures constructed on the Spring Bayou Complex and the Red River have moderated natural water level fluctuation, resulting in increased submerged vegetation coverage. To the extent reasonably possible, the operation of existing water control structures to imitate natural water level fluctuation is desirable and recommended. Unfortunately, sedimentation has occurred in Spring Bayou to the extent that shallow areas now prevent the water flow necessary for dewatering.

Dredging of shallow areas will be necessary to facilitate successful drawdowns of the Spring Bayou Complex. Areas that require dredging are Boggy Bayou and a portion of Little River

It will be necessary to remove approximately 33,000 cubic yards of material. Total costs for necessary dredging, including engineering and surveying is estimated at \$150,000. Annual fall drawdowns are recommended for Spring Bayou. The control structure should be opened soon after Labor Day to allow for a de-watering at a rate of 2-3 inches per day. The control structure should remain open until the end of December. No restrictions to access for recreational activity are recommended during the drawdown periods.

Figure 1. Aerial photo of the Spring Bayou Complex highlighting large areas of American lotus infestation that may be treated with herbicides via helicopter applications.

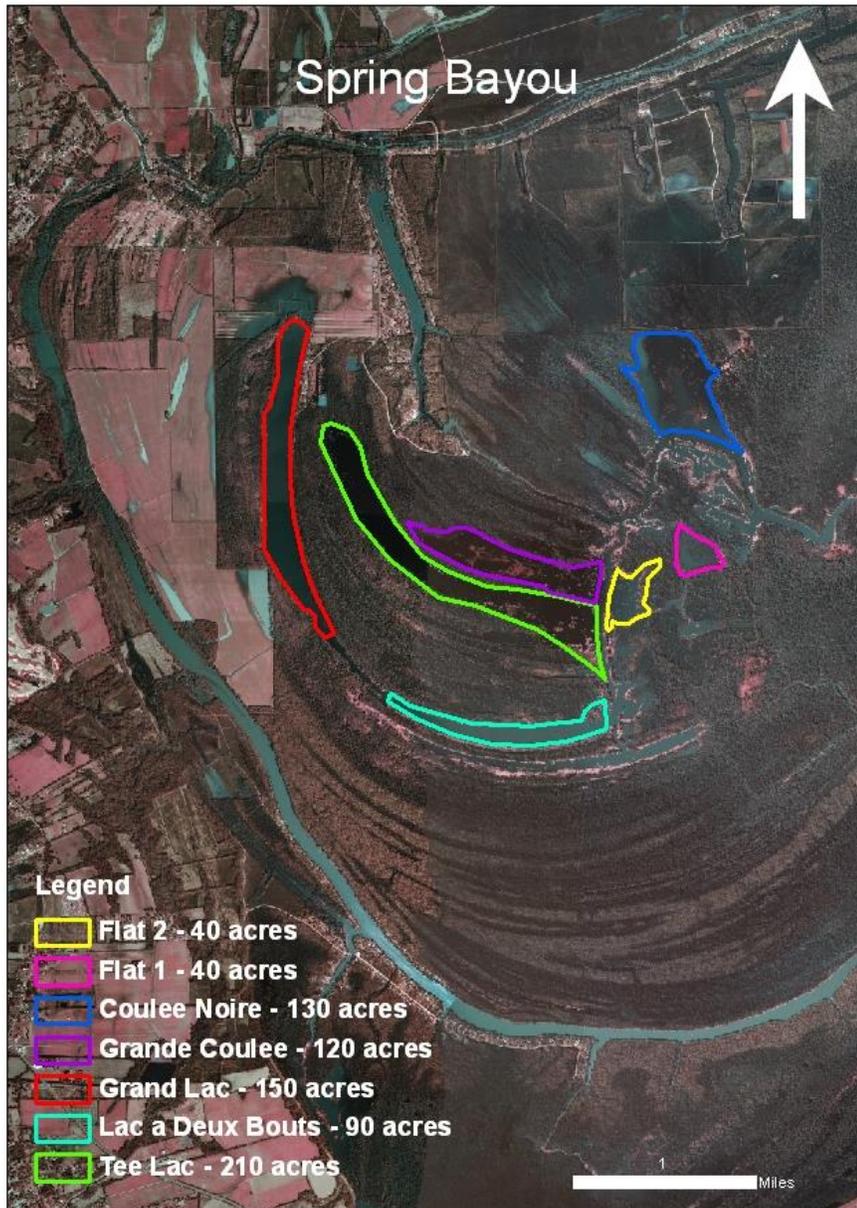


Figure 2. Aerial photo of the Spring Bayou Complex highlighting areas where contact herbicides will be applied to open access lanes.



Spring Bayou - Triploid Grass Carp Tracking Report 2011-2012

Twelve 10" to 12 "grass carp with implanted transmitters were stocked into Spring Bayou WMA on December 09, 2010. Six fish were placed in Grand Lac and six were placed into Tee Lac. Fish were located within the system periodically using a portable transmitter receiver in order to determine if the grass carp would exit the Spring Bayou complex via the Little River spillway structure. A stationary transmitter receiver was placed at the spillway and contained recorded data uploaded monthly. Fish transmitters continued to operate until July of 2012 when transmitter battery life ceased. During the monitoring event, twice the water level in spring bayou exceeded the spillway height of 41". A high water level in the Red and Atchafalaya Rivers resulted in backflow into spring bayou over the spillway followed by an outflow. This occurred between May of 2011 until mid-July of 2011 with water levels exceeding spillway height by 2 feet for multiple weeks.

Fish kills were observed in spring bayou that summer following the receding of the river flood followed by little rainfall. Very few grass carp were observed dead within these fish kills. Number of located transmitter fish remained similar both before and after 2011 summer fish kills with 8 to 10 of the 12 fish being located. An increase in the number of grass carp located in Coulee Noir occurred following the summer of 2011 demonstrating fish movement.

A second high water event occurred during the late winter/ spring of 2012 with water levels again 2 feet above the spillway height in April. This was not an intrusion from the river but rather due to heavy rainfall, especially in March. During this event, four of the twelve transmitter grass carp were located at the spillway by the stationary receiver. Three of these fish, fish 05, 06, and 08 were located within spring bayou following the end of this high water event just as they were before and during the high water. Fish 05 was discovered at both the spillway and in Grand Lac on the same day (2/6/12). This fact injects doubt in the validity of the stationary transmitter receptions although it is possible that these fish did swim to the spillway and then back to their original locations. Fish 11 was the only fish located at the spillway that was never located anywhere else. It is possible that fish 11 escaped during the second high water event during spring of 2012. An attempt to locate these fish was made at the spillway using the portable transmitter receiver. No fish were located at any time at the spillway using the portable receiver. This high water event only had water moving out of spring bayou whereas the first event had both inflow and outflow. There was no reduction in the number of fish located within Spring Bayou using the portable receiver following this high water event.

Sixteen 300" gillnets of four different mesh sizes were deployed in late November 2011. These nets were laden with grass carp comprising 20% of total catch of 350 fish from in Old River and just off the spoil bank channel near Tee Lac/ Lac des Bouttes. No grass carp with implanted transmitters were captured.

Even with the multiple high water events offering ample opportunity for fish to exit Spring Bayou during this monitoring event, the stocked grass carp have remained and are thriving within Spring Bayou.