Lake Bistineau – Update on Giant Salvinia Control Efforts

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Giant salvinia is a free floating aquatic fern native to Brazil. This plant has the potential to double in biomass every 3-5 days, on Lake Bistineau the plant is growing at a tremendous rate, doubling every week to 10 days during the prime growing season. Lake Bistineau is heavily forested in many areas with cypress trees which provide quiet sheltered nursery areas where the salvinia grows prolifically and also makes foliar herbicide applications difficult in many areas and impossible in others.

In February of 2006 the invasive aquatic plant giant salvinia was discovered on Lake Bistineau. Early efforts were aimed at total eradication of the plant and included physical removal and foliar herbicide applications with assistance from spray crews from other districts. It soon became evident that the plant was too widespread for eradication to be a possibility.

Giant salvinia covered approximately 500 acres in April of 2007. By December of 2007 the plant had expanded to cover approximately 4500 acres, despite herbicide applications to 4156 acres of giant salvinia which included 3946 acres treated by LDWF spray crews and 210 acres sprayed by private contractors.

The giant salvinia on Lake Bistineau was impacted over the winter by several nights of subfreezing temperatures in January 2008 which imparted frost damage to the salvinia in the more open areas of the lake, yet had very little effect on the salvinia protected by the cypress tree canopy where the plants were still green and exhibiting new growth in many instances. High water also impacted the salvinia flushing a large amount from the lake as water flowed over the crest of the spillway. These natural controls left an estimated 2208 acres covered by giant salvinia early in the growing season in April of 2008. The giant salvinia had formed mats several inches thick in many areas.

Seventeen LDWF spray crews from throughout the state participated in an intensive herbicide application effort during April 7-11, 2008. The crews covered 2,016 acres of giant salvinia, using 1,499 gallons of EPA-approved Aquamaster herbicide in that time frame. A second week of extensive herbicide applications for giant salvinia control on Lake Bistineau was deemed necessary and eighteen LDWF spray crews were utilized April 28 to May 1, 2008. During the four days of spraying, approximately 2,886 acres of aquatic vegetation consisting primarily of giant salvinia were treated with 2,157 gallons of Aquamaster herbicide. For the two combined spray projects at Lake Bistineau, over 4,900 acres of aquatic vegetation have been sprayed, expending a total of 3,656 gallons of herbicide. These efforts had a significant impact on the biomass of giant salvinia in the lake as the mats of giant salvinia were thinned significantly; however the overall coverage was only reduced by about 25%. Since the large-scale efforts, despite ongoing herbicide applications by District 1 crews, the level of coverage had increased to

approximately 3,340 acres by June 26, 2008 and an estimated 4500 acres prior to the start of the July 15, 2008 drawdown for salvinia control.

A drawdown of Lake Bistineau for control of giant salvinia began on July 15, 2008 and continued through January 30, 2009. The lake was dewatered 7 feet at a rate of 2-3 inches per day to minimize the downstream transfer of giant salvinia and to maximize the amount of salvinia stranding on the bank to desiccate. Foliar herbicide applications by LDWF spray crews continued on the salvinia remaining in open water areas accessible by boat throughout the drawdown period.

Dewatering the lake to allow the giant salvinia to dry and desiccate has been the only control measure which has allowed us to gain any significant headway in reducing the coverage of salvinia on Lake Bistineau. Rough estimates made on October 11, 2008 indicate that coverage levels had been reduced to 730 – 1000 acres from the 4500 acres present when the drawdown began. A typemap survey conducted during March 13 – 19, 2009 indicates 850 acres of giant salvinia present following the drawdown. The majority of this vegetation was located in the midlake area which contains areas that could not be dewatered during the drawdown including old slough channels that could not be reached by boat for foliar herbicide applications during the drawdown period.

The coverage of giant salvinia on Lake Bistineau had increased to approximately 1500 acres by May 1, 2009, and remained concentrated in the middle section of Lake Bistineau with the largest infestation located in the areas adjacent to Bistineau State Park Areas 1 and 2. This reduction in acreage was shortlived as heavy rains and a resulting rise in lake level beginning on May 3, 2009 flushed large quantities of salvinia down to the lower end of the lake and with warming temperatures the salvinia began growing very prolifically and is causing problems in these areas with boating and fishing access and aesthetics issues for shoreline property owners. During the past month, the coverage of salvinia has almost certainly more than doubled to over 3000 acres on the lake despite ongoing herbicide applications and a significant quantity being flushed over the spillway during the recent high water event. The continually changing wind direction has made accurate coverage estimates impossible at this time as the salvinia is blowing around and moving throughout the lake.

Foliar herbicide applications have been made by LDWF spray crews to over 2600 acres of giant salvinia on Lake Bistineau thus far in 2009. In addition to these applications a private contractor was utilized to make foliar herbicide applications to 800 acres of giant salvinia. Evaluations of the effectiveness of the herbicide applications conducted by the contractor are ongoing at this time in areas where the salvinia is being held in place by containment boom.

Expenditures for salvinia control efforts on Lake Bistineau in fiscal year 2008/2009 include:

Labor and herbicide for contractor to treat 800 acres -	$95,745
4000' of oil spill containment boom and accompanying trailers with hydraulically operated storage reels -	$78,000
Shoreline conveyor -	$32,000
Herbicide for foliar applications by LDWF crews -	$161,868
Galleon herbicide	$425,000

In addition to these figures there are two LDWF spray crews assigned to Lake Bistineau and their efforts are often supplemented by the other three spray crews in District 1. Foliar herbicide applications to control giant salvinia in Lake Bistineau have been ongoing since the plant was discovered in the lake. Plans are to once again utilize spray crews from throughout the state in intensive herbicide applications either by bringing all the crews at once for 5 days at a time if lodging arrangements can be worked out or by rotating 3 – 4 crews in at a time and housing them at the Bistineau Lab.

Several areas of the lake have been selected for an application of the aquatic herbicide Galleon, which will be utilized on an experimental basis on Lake Bistineau. This herbicide is placed directly into the water and requires a minimum of a 60 days and up to 90 days contact time to kill the salvinia. Strategically placed containment boom, foam core float line, or other means to minimize movement of the giant salvinia out of the treatment areas by wind or water currents will be utilized and the effects of the Galleon on the giant salvinia and other aquatic vegetation in the area documented. Areas of the lake selected for the experimental Galleon application include: Brushy Creek, Titus Arm, Big Toodlum, Little Toodlum, Spring Branch, and Clark's Bayou. These applications will be made June 11.

Salvinia weevils were introduced into two enclosures on the lake in August of 2007. The weevils survived the first winter and their populations increased in the enclosures. The weevil infested salvinia in the two original enclosures was transferred to floating enclosures designed to fluctuate with the water level and sustain the weevils through a drawdown prior to the July 15 start date for the drawdown. Weevil infested salvinia was also distributed to difficult to access "nursery areas" which cannot be sprayed due to the dense stands of cypress trees. Additional weevil infested salvinia was stocked in Lake Bistineau in October of 2008 from the nursery ponds near Gheens. Plans are to transport large quantities of this material up again this year beginning in mid June and stock this material in a heavily forested area of the lake which is difficult to access for herbicide applications and will retain water throughout a drawdown. Assistance from Inland Fisheries Division Personnel from other areas of the state will be utilized and possibly assistance from the police juries of the three parishes involved. It will take 3 to 5 years to see noticeable results from the introductions of salvinia weevils if they are effective at all.

In order to try and maintain the coverage of giant salvinia on Lake Bistineau at a level where at least part of the lake is useable for boating and fishing activities it will be necessary to conduct a drawdown once again this year. The drawdown will be conducted after the 90 day contact time for the Galleon treatment. Plans are to lower the lake

immediately after Labor Day, dewatering the lake at a rate of 4 to 6 inches per day until the level reaches 7 feet below normal pool stage which is the maximum drawdown depth that can be obtained with the control structure that is in place. This should allow the salvinia to strand in place and dry and desiccate. The water level may be cycled during the drawdown period to allow the salvinia that remains in areas that cannot be dewatered to float into areas which can be dried out and then the drawdown gates opened again to obtain the maximum benefits possible during the drawdown period. The gates will be closed and the lake allowed to begin refilling on February 1, 2010. The only tool LDWF has available at this time which has proven to significantly reduce the coverage of giant salvinia is the drying and desiccation which occurs during a drawdown. This reduction in coverage will likely be short lived as has been the case following the 2008-2009 drawdown which began on July 15, 2008, but without this drawdown combined with the foliar herbicide applications conducted last year the lake would likely have coverage levels of 85% - 95% giant salvinia.