

LOUISIANA DEPARTMENT OF WILDLIFE AND FISHERIES



**OFFICE OF FISHERIES
INLAND FISHERIES SECTION**

**AQUATIC VEGETATION MANAGEMENT PLAN
2018**

LAKE BRUIN

Location: Tensas Parish

1. Waterbody type – Inactive Mississippi River oxbow lake (Map shown in Appendix A)
2. Age and condition of control structure – replaced in 2011, good condition
3. Type of control structure – 22 ft. spillway with (2) 6 x 6 ft. manually operated gates
4. Water level range (MSL) – Pool stage = 62.0 ft., annual fluctuation typically < 2.0 ft.
5. Surface area – 2,842 acres, no significant change with annual fluctuation
6. Average depth – 15 ft.; just over 50% of the lake is greater than 23 ft. deep
7. Watershed ratio – 4.8:1
8. Drawdown potential of structure – 6 ft.
9. Waterbody Board or Lake Commission – Lake Bruin Recreation and Water Conservation District
 - a. Creation / Nomination – Louisiana State Legislature, Act No. 1045 1995 Regular Session by Representative Bryant Hammett (R.S. 38:3087.91-107). Members are appointed by the Tensas Parish Police Jury.
 - b. Primary contact information – Steve Maynord (current president)
LBRWCD, P.O. Box 38, St. Joseph, LA 71366
 - c. Procedure for spillway openings – operated by the LBRWCD for normal water level manipulation
10. Drawdown History - Lake drawdowns were conducted in 1988, 1989, 1990, 2005, and 2011. Typically, the lake was lowered 4 – 5 feet below pool from September 1 to December 31. Stated purposes were to maintain fish population balance, improve game fish spawning substrate, control submerged vegetation, and to allow for shoreline property maintenance. Increased abundance of game fish and forage were indicated by sampling following the 1988-1990 series of drawdowns. Only temporary reduction in submerged vegetation was observed. One goal of the 2011 drawdown was to de-water Brushy Lake to allow the parish to manipulate the lake bottom in an effort to reduce aquatic vegetation and increase access into this shallow area. Though the drawdown exceeded over five feet, an earthen dam prevented complete drainage of this area, thus the project was not completed.
11. Significant stakeholders and needs/concerns
 - Farmers – minimal agricultural irrigation
 - Homeowners – stable water levels, vegetation control, aesthetics
 - Town of St. Joseph – L. Bruin is the municipal water supply
12. History of aquatic vegetation complaints - At times, nuisance vegetation has been a problem on the shallow ends of the lake and in Brushy Lake, which has an average depth of 2 feet and is subject to infestations of American lotus *Nelumbo lutea* and coontail *Ceratophyllum demersum*. Other species that have prompted complaints are alligator weed *Alternanthera philoxeroides*, southern naiad *Najas guadalupensis*, and water hyacinth *Eichhornia crassipes*. Infestations in the main lake are typically confined to small canals and shallow areas, where access becomes limited by homeowners and boaters. They have occurred infrequently, whereas infestations in Brushy Lake have persisted for years and likely will continue to do so because of its shallow depth.
13. Controversial issues on the lake - Lake level has become partially influenced by the level of the Mississippi River, though it is unknown for how long this has been occurring. During extremely high river stages, the water level will rise in Lake Bruin from seepage

through sand deposits. Also, when the river reaches very low levels, seepage will occur in the opposite direction, causing the lake level to drop.

Low abundance of submerged vegetation in recent years in the main lake has become a cause for concern as it may be limiting the fishery. Research into the decline has begun and re-vegetation efforts are currently being investigated.

Past Control Measures:

Nuisance aquatic vegetation on Lake Bruin has recently been confined to the Brushy Lake area, and the extreme southern end of the main lake where the two lakes connect. In recent years, herbicide treatments were made primarily for the control of American lotus and alligator weed in Brushy Lake. No significant treatments were made in other parts of the lake. The treatments in Brushy Lake were made as part of a continuing management program (see below). A summary of the acres of vegetation treated with herbicides on Lake Bruin since 2013 is shown in Table 1. See Lake Bruin Management Plan Part A for a complete history of herbicide applications.

Table 1. Total acres of nuisance aquatic vegetation treated with herbicides on Lake Bruin from 2013 - 2017.

YEAR	SPECIES				
	Alligator weed	American Lotus	Coontail	American Pondweed	Water Hyacinth
2013	23	85	20	7	-
2014	50	124	-	-	-
2015	35	35	-	-	-
2016	54	18	-	-	10
2017	21	63	-	-	0.6

In the spring of 2014, a request was made by the Lake Bruin Commission for an aerial treatment of American lotus in Brushy Lake. The LDWF agreed to furnish the herbicide, while the Lake Commission agreed to provide the application services. A written MOU between both parties was signed. This treatment was to occur near peak emergence, which usually occurs in mid-May. An aerial treatment was eventually determined to be too risky to adjacent crops and residential areas, and was cancelled. Waiting for this determination resulted in a delay in treatment by LDWF boat-equipped crews. Initial treatments were not made until late June of that year.

In 2015, multiple treatments were made by a LDWF boat-equipped crew in Brushy Lake. American lotus coverage has been significantly reduced from the timely herbicide applications, which have been made prior to flowering and seed production. Control of alligator weed was necessary to maintain navigation and provide relief to homeowners.

In 2016, herbicide applications were applied to control alligator weed, American lotus, and water hyacinth. There was a total of 54 acres of alligator weed, 18 acres of American lotus,

and 10 acres of water hyacinth treated.

The only herbicide treatments necessary in 2017 were in Brushy Lake and in a canal on the east side of the lake, south of the State Park. American lotus and alligator weed reached nuisance levels in Brushy Lake by summer and required treatment. Herbicide applications in Brushy Lake were delayed until August at the request of the Lake Bruin commission. It was agreed to treat the east shore of Brushy Lake out to a distance of approximately 100 yards primarily to provide shoreline and boat access to the homeowners in this area.

Aquatic Vegetation Status:

General:

The Lake Bruin shoreline is lined with bald cypress (*Taxodium distichum*) trees that cover about 5% of the lake area. Submerged aquatic vegetation (SAV) has included coontail, southern naiad, slender naiad (*Najas minor*), pondweed (*Potamogeton sp.*), and filamentous algae. Coontail has been the most abundant SAV species in recent years. To date, no submerged invasive species have been found in Lake Bruin. Floating and emergent vegetation has included American lotus, water hyacinth, American pondweed (*Potamogeton nodosus*), alligator weed, and water primrose (*Ludwigia spp.*). Alligator weed and American pondweed have been the only emergent and submerged species of significance, with the former being mostly confined to Brushy Lake and the latter found scattered around the main lake. Total aquatic vegetation coverage has ranged from 5%-15% and although it has not posed a threat to the fishery, occasional complaints from lakeshore residents are received. Maintenance spraying is periodically used to keep public access areas open to boating. Because the lake can be lowered only 4 - 5 feet below pool stage, and submerged vegetation occurs at depths up to 6 feet, drawdowns have been only partially successful in temporarily controlling submerged vegetation. In recent years, the main lake area has not had any serious vegetation issues. Vegetation management has been mostly limited to the Brushy Lake area and Ruth's Ditch, where the drawdown structure is located. Water hyacinth sometimes forms dense mats in this area and requires herbicide treatment.

In 2017, unusually low coverage of all species of aquatic vegetation was observed throughout the main lake area. The reason for this is unknown. American pondweed, coontail, and naiad, which had been moderately abundant in 2016, were largely absent throughout 2017.

Coverage and Status of Problematic Plant Species in 2017

Alligator weed— moderate amounts, mostly along shoreline in Brushy Lake where it affects homeowners (approximately 20 acres)

American lotus – significant coverage in Brushy Lake developed by mid-summer, when herbicide treatments began (approximately 150 acres)

Water hyacinth – forms small mats on occasion, can impede water flow in Ruth's Ditch, insignificant coverage in 2017

SAV (mostly coontail and slender naiad) – observed in low amounts in Brushy Lake, but not problematic; insignificant coverage in main lake (<10 acres lake wide)

Coverage and Status of Beneficial Plant Species in 2017

Coontail –was found in very low amounts throughout the lake; total coverage was less than desirable

Giant cutgrass (*Zizaniopsis miliacea*) – an invasive species, found along shoreline in much of the lake, provides protection from shoreline erosion and shallow cover for fish

American pondweed – mostly absent in 2017 (less than 5 acres); total coverage less than desirable

Aquatic Vegetation Prediction for 2018

Coverage amounts for species common to Lake Bruin are expected to be similar to those observed in 2017. There appears to be no problematic areas on the main lake, though Brushy Lake will require continued herbicide treatment. The reason for the overall decline in vegetation throughout the lake in 2017 remains unknown, thus it is difficult to predict coverage for 2018.

Recommendations:

An LDWF spray crew should make monthly vegetation assessments on Lake Bruin from March through November to determine if control measures are needed. Nuisance floating and emergent vegetation will be treated in accordance with the approved LDWF Aquatic Herbicide Application Procedures. Water hyacinth should be treated with 2,4-D (0.5 gal./acre) except from March 15 – September 1, which is the 2,4-D waiver period. Glyphosate (0.75 gal/acre) should be used during this period. Appropriate surfactants will be used in conjunction with all foliar herbicide applications.

Currently, control of nuisance vegetation in Lake Bruin is primarily limited to the ongoing treatments in Brushy Lake. The management plan for Brushy Lake remains the same as for the past two years, summarized by the following:

Apply glyphosate (0.75 gal/acre) to control American lotus in Brushy Lake by spraying at first emergence. Conduct spraying throughout the growing season as needed. Maintain a navigation channel approximately 30 ft wide from the entrance to the main lake to the last private pier location. If coontail becomes dense, periodic sub-surface applications of diquat dibromide (2 gal/acre) should be made in the navigation channel. Alligator weed and water primrose should be treated with imazamox (Clearcast) (0.5 gal/acre) around residential areas or with imazapyr (Ecomazapyr, Arsenal) (0.5 gal/acre) in areas with no irrigation concerns. Appropriate surfactants shall always be used in conjunction with herbicides.

Because of the current low abundance of desirable vegetation throughout the lake, it is recommended that a drawdown be conducted in 2018 for the purpose of property maintenance and improvement of the spawning substrate. The last drawdown conducted on Lake Bruin was in 2011. Drawdowns had been tentatively scheduled to occur every 5 years, but none were scheduled in 2015 or 2016 due to increases in desirable aquatic vegetation. The drawdown should be initiated immediately after Labor Day, and the control gates will be

closed on or about December 31, 2018. The lake should be lowered at a rate of no more than 4 inches per day to a level of 4 - 5 ft below normal pool stage.

APPENDIX A. Map of Lake Bruin

