

LOUISIANA DEPARTMENT OF WILDLIFE & FISHERIES



**OFFICE OF FISHERIES
INLAND FISHERIES DIVISION**

2024 VEGETATION CONTROL PLAN

SALINE LAKE

Waterbody Information

1. Waterbody type – Wooded tributary impoundment.
2. Age and condition of control structure (if applicable) – Saline Lake Dam is located primarily in Natchitoches Parish with a small portion of the embankment and the entire spillway located in Winn Parish. From the intersection of US Highway 84 and US Highway 71 in Clarence, proceed 6.1 miles easterly on US 84 and turn left onto Chee Chee Dam Road; then proceed 2.2 miles northerly to the south end of the south embankment.

Saline Lake Dam was designed by the Louisiana Department of Public Works, constructed by H & H Construction Company and completed in 1992. The Chee Chee Dam was demolished after completion of the Saline Lake Dam. A photograph of the Saline Lake Dam appears in Figure 1.



Figure 1. Saline Lake Dam, Winn Parish, Louisiana.

According to the Louisiana Department of Transportation and Development's Dam Inspection and Evaluation Report dated July 8, 2022, the Saline Lake Dam is in unsatisfactory condition and fulfilling its intended purpose. The report noted the following maintenance points as needing attention:

- a. Localized damage due to hogs. Sod cover has been removed over a large area of the slope.
- b. There are some minor depressions less than 6 inches deep in the dam section.

- c. Minor vegetation growth or small overhanging/fallen branches within the dam section.
 - d. Significant vegetation growth located on the dam section or in the spillway.
 - e. Lack of regular mowing and maintenance of sod cover observed.
 - f. Minor slope failure effecting a small area with displacement.
 - g. Significant tree and shrub growth along the Northern side of dam section.
 - h. No lift stem covers on any of the gates
3. Type of control structure – Saline Lake Dam consists of approximately 500 feet of earthen embankment on the south side of the spillway, and a 400-foot wide concrete spillway located in Winn Parish. There is also approximately 15,400 feet of earthen embankment to the north and west of the spillway, of which about 400 feet is in Winn Parish and 15,000 feet is in Natchitoches Parish. There is a 6' x 3' fish gate located near each end of the spillway wall. The fish gates are operated by lowering the gate from the water surface. The fish gates were designed to allow fish passage, primarily *Dorosoma* species, to enter the lake at times of high downstream water levels. The outlet consists of three, 6' x 6' sluice gates in the spillway wall. These sluice gates are operated by raising the gates from the bottom of the structure.
 4. Water level range (MSL) – Pool stage = 103.0 MSL; High = 110.47 MSL; Low = 95 MSL (equal to pool stage of Red River).
 5. Surface area – At pool stage = 7,001 acres.
 6. Average depth – At pool stage, avg. depth = 7.0 feet; maximum depth = 16.0 ft.
 7. Watershed ratio – 38:1, 420 sq. miles or 268,799 acres of watershed to 7,001 surface acres.
 8. Drawdown potential of structure – 8 feet maximum potential at a rate of 4.0 inches/day.
 9. Lake Authority – Saline Lake Game and Fish Preserve Commission.
Creation / Nomination – The creation of the Saline Lake Game and Fish Preserve Commission (SLGFPC) is closely tied to the creation of the Northwest Louisiana Game and Fish Preserve Commission (NLGFPC). Originally, Black Lake, Clear Lake and Saline Lake were all under the authority of NLGFPC for which Louisiana Department of Wildlife and Fisheries (LDWF) served as the oversight agency. Subsequently, SLGFPC was created and became the authority over Saline Lake. LDWF also serves as the oversight agency for SLGFPC. A history of these two lake commissions is detailed as follows.

History of the Saline Lake Game and Fish Preserve Commission

The Northwest Louisiana Game and Fish Preserve (Preserve) was established by the Louisiana Legislature and was initially placed under the control of the Louisiana Conservation Commission through Act 191 of 1926. The Preserve was initially comprised of three artificially created lakes (Black Lake, Clear Lake, and Saline Lake) and the

surrounding lands. It was developed for recreation and for the preservation of wildlife and fisheries. After creation of the Preserve, the State constructed a dam, known as the Allen Dam, to keep water in the lakes from draining. In 1928, the Preserve was placed under the control of the Louisiana Department of Conservation through Act 69 of 1928. In 1946, the Louisiana Legislature created the Northwest Louisiana Game and Fish Preserve Commission (NLG&FC) and granted it authority to administer the Preserve and adopt rules and regulations thereof through Act 120 of 1946. While the NLG&FC was originally placed under the supervision of the Department of Wildlife and Fisheries, the NLG&FC was vested with the “*right, power and authority to sue and be sued as a subdivision of the State*” and to “*purchase, lease or expropriate all property necessary to the erection and maintenance of the Preserve*”. The State of Louisiana retained title to the lakes, as well as a portion of the surrounding land and lake bottom. Act 105 of 1976 placed the NLG&FC under control of the Louisiana Wildlife and Fisheries Commission. Additionally, the Act removed Saline Lake from the authority of the NLG&FC and placed it under the authority of the Saline Lake Game & Fish Preserve Commission.

SLGFPC is comprised of seven members serving individual four-year terms. Membership consists of four residents of Winn Parish and three residents of Natchitoches Parish. The respective police juries from each parish appoint members.

Primary contact information – Saline Lake Game & Fish Commission, 200 Riverside Lane, Natchez, La. 71456.

Saline Lake Fish and Game Preserve Commission members as of December 2022:

President – Glynn Jones

Vice President – Gregory Brock

Secretary-Treasurer – Nathan Vercher

Jimmy Atherton

Vacant

Vacant

Wayne Smith

Meetings are quarterly on Thursdays at 4:00 P.M. at the Saline Lake Fire Station, Collins Camp Road, Winnfield La, 71483 and scheduled:

February 22, 2024

April 25, 2024

July 25, 2024

October 24, 2024

Procedure for spillway openings – For lake management objectives, LDWF will initiate recommendations, or consider recommendations from SLGFPC for a drawdown. The LDWF Secretary submits a request to the Secretary of DOTD that includes: requested date of opening, water level desired, desired dewater rate, date of gate closure, and purpose for gate operation.

For flood control purposes, operation of the structure gates is directly requested of DOTD by SLGFPC as per statute below.

RS 38:24

§24. Rules and regulations; inspection of dams

A. ***

B. Notwithstanding any other provisions of law or any rules and regulations to the contrary, the legally constituted boards of commissioners of Black Lake, Clear Lake, and Saline Lake in Natchitoches Parish may recommend directly to the Department of Transportation and Development that the dams situated on said lakes should be opened for flood-control purposes only. The chief engineer, or his authorized representative, shall have the final authority for determining the necessity of opening the dams, and no other department of state government shall be involved in these flood-control activities.

Acts 1991, No. 532, §1; Acts 1995, No. 1049, §1.

10. What significant stakeholders use the lake?

Anglers, recreational boaters, and duck hunters constitute the majority of lake users. No potable water intakes are present at Saline Lake. However, several shoreline property owners utilize lake water for small scale irrigation systems servicing lawns and gardens.

11. What are their needs and concerns?

Anglers and boaters have interest in sufficient water levels to allow pursuit of their activities. Concerns of the irrigation user group include sufficient water level as it affects water intakes and presence of herbicides within waters used for irrigation. All user groups have concerns regarding access to, and use of, the waters of Saline Lake.

12. What is the history of aquatic vegetation complaints?

Vegetation complaints at Saline Lake have been received for the last 40 years. In years past, most complaints were related to water hyacinth (*Pontederia crassipes*), American lotus (*Nelumbo lutea*) and a variety of submersed aquatic vegetation including fanwort (*Cabomba caroliniana*), coontail (*Ceratophyllum demersum*) and bladderwort (*Utricularia spp.*). More recently, giant salvinia (*Salvinia molesta*) has generated the majority of vegetation complaints at Saline Lake. Cuban bulrush (*Oxycaryum cubense*) grows atop the salvinia and prevents treatments and access.

13. Have there been any controversial issues on the lake?

The majority of the controversy related to Saline Lake has been associated with scheduled drawdowns. In each instance, shoreline property owners, anglers or waterfowl hunters have been the primary complainants. In most cases, waterfowl hunters have opposed drawdowns because lower lake levels prohibit access to, and success of, duck blinds on the lake. In some cases, the SLFGPC has voted to abandon planned drawdowns for various reasons.

Aquatic Vegetation Status:

As of May 5, 2021, the total coverage of nuisance aquatic vegetation was estimated to be 2,250 acres, or 31.69% of the lake's surface. This survey was taken while the lake level was approximately 103.0 MSL.

The freezing conditions that were experienced in January and February 2021 did result in some temporary thinning in some of the open areas above the pipeline and boom area. However, areas with dense cypress canopies and salvinia layers appeared to increase coverage very quickly by April/May 2021. Areas of cypress and buttonbush (*Cephalanthus occidentalis*) were noted where open areas once were. These areas are within the Oak 1 to Oak 2 area, and Couley Creek arm of the lake. The buttonbush was treated prior to the summer-fall drawdown and the new-growth cypress was treated approximately 1 month after drawdown opening when the water level reached approximately 98-99 MSL and enough leaf bud was on the target cypress to treat with the appropriate foliar mixture. Herbicides consisted of Triclopyr for buttonbush and Imazapyr for new-growth cypress.

Relatively mild winter and early spring conditions in 2022 were favorable to increased growth of all nuisance aquatic vegetation through May. Heavy areas of coverage along the upper channel, upper and lower Chee Chee Bay were treated with contract applications when contract crews, funding and conditions were available and favorable through June 2022. A drawdown was initiated the first of June as recommended by the LDWF and the SLGFPC. As in previous years, the drawdown and low flow conditions held remaining nuisance vegetation within shallow and dense cypress areas that are inaccessible for herbicide application equipment. Prior to the 2022 drawdown, several areas with button brush and cypress within the Little Lake area and Cedar Bluff area were treated. It is likely and has been discussed that both the LDWF and the SLGFPC may find it necessary to keep the Saline Lake water level at Pool stage through 2023 to suppress growth of woody vegetation. Treatments of giant salvinia would continue in 2023 with available funds. Gates were closed the first week of October and as of December 29, 2022 the lake level is approximately 101.0 MSL. On Christmas weekend 2022, a severe freeze occurred with dry weather and is expected to decrease coverage as decomposition occurs.

Discussions between LDWF and the SLGFPC to maintain pool levels through 2023 were approved in April 2023. Factors for leaving pool stage were mainly to stifle new cypress growth and periodically maintain lake area for fishery management. Treatment efforts were centralized to historic coverage areas above the pipeline, Chee Chee Bay and Little Lake. Saline Lake was expected to have very high salvinia coverage with normal pool level through 2023. However, with both increased treatment efforts and very hot and dry conditions from June-September Saline Lake remained in fair condition from the boom area and Chee Chee Bay.

On September 13, 2023 a survey was conducted while the lake level was approximately 102.50 MSL; the total infestation of the major problem plant species at Saline Lake was estimated to be as listed below:

Giant salvinia – 1,600 acres

Fragrant water lily – 10 acres
Water hyacinth – 40 acres
American lotus – 10 acres
Fanwort – 5 acres
Coontail – 0 acres
Bladderwort – 5 acres
Duckweed – 10 acres
Total vegetation coverage = 1,680 acres or 24.00%

Currently, all aquatic vegetation found at Saline Lake is considered to be in the nuisance category. The above acreage does not include young cypress saplings and buttonbush growth.

Limitations:

- Watershed ratio of 38:1 limits the use of whole-waterbody herbicide treatments
- Dense coverage of bald cypress (*Taxodium distichum*) and water tupelo (*Nyssa aquatica*) (>75%) restricts boat-based foliar applications
- Shallow water requires use of surface drive boats to gain access to problem areas
- Dense layers of Cuban bulrush growing on top of salvinia intercept herbicides from contacting giant salvinia
- The Red River Waterway barge traffic within Pool 3 restricts the river level to no less than 95 MSL, limiting drawdown potential.

No regulatory factors exist that would limit LDWF's vegetation control efforts at Saline Lake. The SLGFPC is cooperative with LDWF in its efforts on this waterbody.

Both Natchitoches and Winn Parishes are located within the Louisiana Department of Agriculture and Forestry's 2,4-D waiver area. A waiver is needed to apply 2,4-D between March 15 and September 15 of each year.

Approximately half of Saline Lake's bottomland and its emergent timber is state owned, and the other half is private and broken into several parcels (Figure 2). Since the 1970's, there has been some interest by LDWF in thinning the stem density in certain areas of the lake to allow nuisance vegetation to move with current and wave action, or to be more accessible for herbicide treatments. Opposition to initial thinning was quite common by both private landowners and other user groups. With increased coverage of giant salvinia and its difficulty to dislodge from areas of high stem density since 2010, a more comprehensive and legal approach to the possibility of tree thinning is being analyzed. Several logging, right of way and private contractors have inquired or demonstrated the capability of equipment operation to remove excess stems from the lakes bottom and out of the lake. Financial restrictions to remove the large volume of trees for a long period of work has resulted in little progress as of 2022.

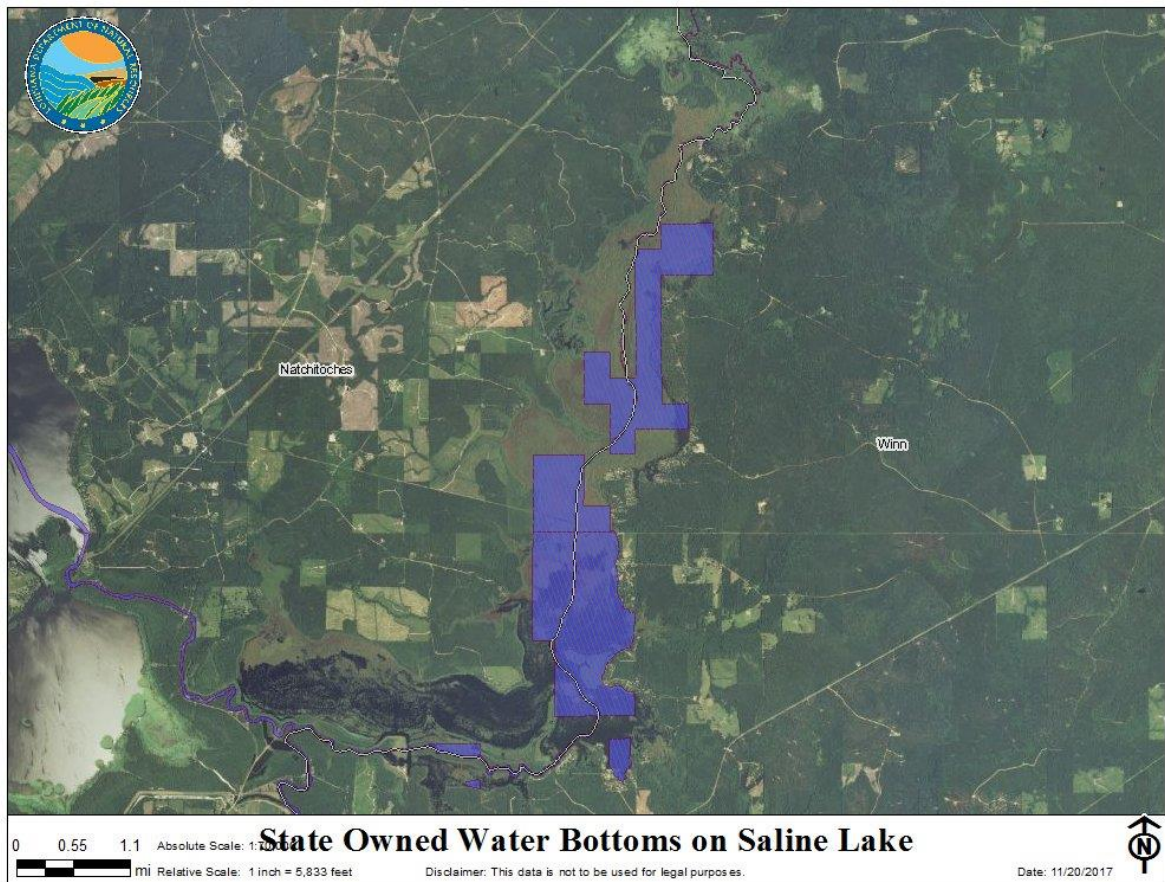


Figure 2. State owned bottomlands within Saline Lake.

Shoreline development is present in the form of residences and camps on approximately 30% of the lake shoreline.

Past Control Measures

Chemical Control:

Annual herbicide applications have been made at Saline Lake for many years. Details regarding acres treated and vegetation types targeted over the past eleven years are in Table 1.

Table 1. Saline Lake herbicide applications 2005 – 2023.

Year	Acres Treated	Vegetation
2005	1127.50	Water hyacinth, Common salvinia (<i>Salvinia minima</i>), Water lily (<i>Nymphaea spp.</i>)
2006	1809.58	Water hyacinth, Common salvinia, American lotus
2007	1737.20	Water hyacinth, Common salvinia, American lotus, Giant salvinia
2008	2308.17	Common salvinia, Water hyacinth, Giant salvinia, Water lily, American lotus
2009	6136.87	Giant salvinia, Water hyacinth, Common salvinia
2010	2996.61	Giant salvinia, American lotus, Water hyacinth, Alligator weed (<i>Alternanthera philoxeroides</i>)
2011	4,254.54	Giant salvinia, Water hyacinth, American lotus
2012	5,612	Giant salvinia, American lotus, Water hyacinth, Water lily, Sedge (<i>Carex spp.</i>), Water pennywort (<i>Hydrocotyle spp.</i>)
2013	4,092	Giant salvinia, Spatterdock (<i>Nuphar luteum</i>), and Fanwort
2014	2,207	Giant salvinia and Common salvinia
2015	3,143	Giant salvinia and Common salvinia
2016	965	Giant salvinia, Water hyacinth and Cuban bulrush
2017	1,588	Giant salvinia, Water hyacinth and Cuban bulrush
2018	3,396	Giant salvinia, Water hyacinth and Cuban bulrush
2019	1,827	Giant salvinia, Water hyacinth and Cuban bulrush
2020	1,107	Giant salvinia, Water hyacinth and Cuban bulrush
2021	1,012	Giant salvinia, Water hyacinth and Cuban bulrush (includes 80 acres of new-growth cypress and 28 acres of buttonbush)
2022	1,188.50	Giant salvinia, Water hyacinth and Cuban bulrush (includes 29 acres of new-growth cypress and buttonbush)
2023	1,697	Giant salvinia, Water hyacinth and Cuban bulrush (includes 155 acres of new-growth cypress and buttonbush)

Water hyacinth, water lily, and American lotus have been treated with foliar applications of 2,4-D at a rate of 0.5 gallons per acre. Giant and common salvinia have been treated with foliar applications of diquat at a rate of 0.75 gallons per acre from November 1 – March 31. Outside of that period, salvinia has been controlled with a mixture of glyphosate (0.75 gal/acre) and diquat (0.25 gal/acre) with Turbulence (or approved equivalent, 0.25 gal/acre) surfactant. Alligator weed has been treated with foliar applications of glyphosate at a rate of 0.75 gallons per acre. In 2009, penoxsulam (Galleon) was used to treat giant salvinia at a rate of 0.068 gallons per acre.

During August 2014, a whole waterbody treatment utilizing 175 gallons of liquid fluridone was conducted to target areas that could not normally be treated with foliar herbicide applications. The application occurred during the lowest level of the drawdown, and at the time of year when precipitation is normally minimal. However, the in-water treatment was unsuccessful due to a rain event that followed two weeks after application and diluted herbicide concentrations.

Penoxsulam was used as a whole waterbody treatment for salvinia on August 7, 2018. The water level at treatment date was 195.5 MSL. A rate of 25 ppb was prescribed and the total

amount used was 165.6 gallons, with 1,319.6 surface acres treated. Amounts were distributed by boat at pre-determined GPS locations from just north of the pipeline area in the channel East of Key Hole Boat Ramp northward until access from the channel could not be obtained by vessel. A bump treatment of 33 gallons throughout the same area was conducted September 26, 2018. Vegetation in less than half of the treatment area had begun to lose buoyancy and fall beneath the water surface in late September. Lake level and inflow increased as the dam and spillway was closed on October 1, 2018. Saline Lake reached pool stage of 103.0 MSL by late October, and the treatment result was considered poor due to inflow during and following the treatments.

Since 2020, salvinia treatments have transitioned to using flumioxazin in the glyphosate mixtures instead of diquat for either spring-summer or fall winter applications. Each mixture is described within the Recommendations of this document.

Biological Control:

Salvinia weevils (*Cyrtobagous salviniae*) have been introduced to provide a biological control agent for giant salvinia. Details of weevil releases appear in Table 2.

Table 2. Salvinia weevil releases at Saline Lake, LA.

Year	Weevil Species	Amount Released
2007	Common salvinia weevils from Florida	Unknown
2008	Giant salvinia weevils	89 ft. ³ of host plant
2011	Giant salvinia weevils	29,141 individuals
2012	Giant salvinia weevils	71,400 individuals
2013	Giant salvinia weevils	25,102 individuals
2014	Giant salvinia weevils	20,100 individuals
2015	Giant salvinia weevils	96,150 individuals
2016	Giant salvinia weevils	65,460 individuals
2017	Giant salvinia weevils	3,699 individuals

Correlation in low giant salvinia weevil larval densities and nitrogen deficiencies have been noted within Saline Lake (Nachtrieb 2018). Dry weight of nitrogen in salvinia on Saline Lake was significantly lower than that of salvinia on Turkey Creek Lake during this particular study, 1.02-1.05% dry weight compared to 2.28-3.19%.

By summer 2022, areas of coverage were noted above the pipeline and boom area as far North as Sand Dump with weevil damage. Several individual weevils were found and documented in isolated areas. With a population possibly beginning to acclimate to Saline Lake, future releases should be considered as stockings become available.

Triploid grass carp (*Ctenopharyngodon idella*) have been stocked into Saline Lake to provide a biological control agent for submersed aquatic vegetation. Dates of stocking and numbers stocked appear in Table 3. Submersed aquatic vegetation has significantly declined since 2012. It is undetermined if this is a result of triploid grass carp stockings or decreased sunlight

penetration caused by giant salvinia.

Table 3. Triploid grass carp stockings at Saline Lake, LA.

Year	Size	Number Stocked
2005	Phase II	7,547
2007	1 year old	29
2014	Minimum 12 inches	3,120

Physical Control:

LDWF initiated a drawdown on November 18, 2015 to control the amount of giant salvinia in Saline Lake. The plan for the drawdown was to lower the lake by two feet until after the first split of the 2015-16 waterfowl season, then lower the lake to the full eight feet below pool stage for the duration. When the gates were opened, the water level was at 104 MSL (one foot above pool). Due to the heavy rains that followed, the lake never reached its full drawdown potential. The drawdown was cancelled and the gates were closed on January 28, 2016. The attempted drawdown resulted in minimal control of giant salvinia. Similar rainfall events affected lake levels and the effectiveness of the drawdowns initiated in both June 2016 and June 2017. The drawdown in June 2018 did reduce salvinia growth during the summer, but lake levels increased during the end of the period and immediately following a whole waterbody treatment. The drawdowns in 2019 and 2020 had similar results, but with slower increases in water level through the fall and winter. The drawdown in 2021 had a very slow fall in early summer due to the high Red River level, but has had an extremely slow rise due to dry fall-winter conditions. As of mid-January 2022, the lake level was still 4-feet below normal pool. The most recent drawdown in 2022 had a very fast fall with dry conditions in early summer with moderate success. Saline Lake was intentionally kept at pool throughout 2023 to stifle continued growth of cypress and buttonbush. Areas with cypress and buttonbush growth caused by annual “early” drawdowns were treated periodically while at pool level to re-open these areas. A history of drawdowns can be viewed in Table 4 below.

Table 4. Drawdown history for Saline Lake, LA.

DATE	PURPOSE	LOWEST LEVEL (MSL)	GATES OPENED	BACK TO POOL STAGE (Closure)	NOTES
1973	Weed Control	100.0	Fall	Spring	Successful
1974	Weed Control	97.0	Fall	Spring	Successful
1975	Weed Control	100.0	10-01-75	02-29-76	Drawdown recommended by LDWF/ No record of occurrence
1978	Weed Control	100.0	Fall	Spring	Successful
1979	Weed Control	94.0	Unknown	Unknown	Successful
1982	Weed Control	96.0	06-15-97	12-30-97	Successful

1987	Shoreline Clearing	96.5	Spring	Fall	Successful
1992	Dam Construction	Unknown	Winter	Winter	Successful
1997	Weed Control	95.0	06-16-97	11-1-97	Successful
2001	Weed Control	99.0	07-01-01	10-15-01	Cancelled by SLGFPC
2004	Weed Control	97.0	06-14-04	10-24-04	Successful
2008	Fish Gate Operation	99.5	04-14-08	04-29-08	Unsatisfactory results
2008	Fish Gate Operation	98.0	Unknown	07-19-08	Unauthorized operation of gates
2012	Weed Control	95.0	09-06-12	01-14-13	Successful
2013	Weed Control	95.0	07-01-13	11-20-13	Moderate control of giant salvinia
2014	Weed Control and Sonar Treatment	95.2	07-01-14	10-09-14	Moderate control of giant salvinia
2015	Weed Control	102.00	11-18-15	01-28-16	Minimal control of giant salvinia. Heavy rains kept lake level above desired drawdown depth.
2016	Weed Control	95.0	06-14-16	11-01-16	Moderate control of giant salvinia. Heavy rains in August prompted a 1-month extension to the drawdown. The lake remained low until the end of December.
2017	Pipeline Repair and Weed Control	96.0	06-01-17	10-02-17	Pipeline was repaired in August before Tropical Storm Harvey brought the lake above pool with gates open. The lake receded and re-stranded vegetation. Moderate control of giant salvinia.
2018	Weed Control	95.0	06-04-18	10-01-18	Moderate control of giant salvinia. Lake level remained at its lowest level until August following Galleon treatment.
2019	Weed Control	95.0	06-03-19	10-01-19	Moderate control during growing months. Salvinia remained in dense bald cypress stands and open areas remained accessible during drawdown.
2020	Weed Control	95.0	06-01-20	10-01-20	Moderate control during growing months. Salvinia remained restricted within dense wooded areas.

					Hurricanes Laura and Delta did disrupt the drawdown from September through October.
2021	Weed Control	95.0	06-01-21	10-01-21	Moderate control during late summer. Red River Pool 3 stayed high through June and 1 month of drying period was delayed. A warm, dry fall and winter has also delayed full pool, but warm enough temperatures and water rise for continued growth and increased coverage.
2022	Weed Control	95.0	5-31-22	10-03-22	Good control in early summer with low water level and fast drawdown. Slow and gradual rise with increased salvinia coverage. Full Pool by Jan 1, 2023.

Floating boom has been placed in 2 areas of Saline Lake to prevent increased salvinia coverage and reduce the possibility of transferring salvinia to other public waterbodies. In November 2018, the Mulligan Inn boat ramp was enclosed with boom except for a small entrance and exit for vessel passage. Treatments of any salvinia within this boomed area are to be made every 2-3 weeks or when needed to prevent transportation. In February 2019, 4,000 feet of boom was placed along the pipeline north of Mulligan Inn boat ramp. The objective of this amount of boom across the entire length of the lake was to essentially partition off the northern area of the lake where vessel access is very limited or non-existent for treatment of giant salvinia with herbicides. Once the lake level is 103.0 MSL or higher, continuous amounts of salvinia have been documented to move or be pushed out of more restricted areas to open areas. Initial results of the pipeline boom placement have been good, increasing access below the boom while confining salvinia upstream of the boom. Treatments have been directed more above the boom placement rather than the lake as a whole (Figure 3). It should be noted that material will continue to move within the channel and boat roads above the boom during peak months of growth or high water. Treatments have been consistent in these areas, but relief is only maintained for short durations of time until coverage increases and access decreases. The boom was temporarily opened for a few hours along the channel in Spring 2020 to allow woody debris to pass and be physically pushed out of the channel, which hindered vessel passage. An additional 2,500 feet of boom was added to the eastern portion of the pipeline boom and positioned in a northerly direction along the eastern shoreline. This boom placement is intended to keep coverage away from the camps and residences along that portion of shoreline once Saline Lake is at full pool.

It is expected that this boom material will slowly deteriorate over time and need to be replaced.



Figure 3. 6,500 feet of boom is used to hold giant salvinia in inaccessible areas of Saline Lake and prevent re-seeding to open areas during full pool of 103.0 MSL or higher water levels.

Recommendations:

A comprehensive vegetation control plan is recommended for Saline Lake to include chemical, biological and physical control measures.

Chemical Control:

Continued foliar herbicide applications are recommended for Saline Lake. These applications will be principally directed toward the control of giant salvinia and water hyacinth, but will also include control of other floating or emergent vegetation as needed. Herbicide applications will be conducted as needed per the LDWF Aquatic Herbicide Application Procedures:

Plant Species	Herbicide	Surfactant
<i>Salvinia</i> spp. Alternative 1 Common/Giant Salvinia (April 1 to October 31)	Glyphosate (0.75 gal/acre) Diquat (0.25 gal/acre)	Turbulence (or approved equivalent, 0.25 gal/acre)
<i>Salvinia</i> spp. Alternative 2 Common/Giant Salvinia (April 1 to October 31)	Glyphosate (0.75 gal/acre) Flumioxazin (2 oz./acre)	Turbulence (or approved equivalent, 0.25 gal/acre)
<i>Salvinia</i> spp. Alternative 3 Common/Giant Salvinia (April 1 to October 31)	MSM (1 oz./acre) Flumioxazin (1 oz./acre)	Turbulence (or approved equivalent, 0.25 gal/acre)
<i>Salvinia</i> spp. Alternative 4 Common/Giant Salvinia (November 1 to March 31)	Diquat (0.75 gal/acre)	Nonionic surfactant (0.25 gal/acre)
<i>Salvinia</i> spp. Alternative 5 Common/Giant Salvinia (November 1 to March 31)	Flumioxazin (12 oz./acre)	Turbulence (or approved equivalent, 0.25 gal/acre)
Water Hyacinth	2, 4-D (0.5 gal/acre)	Nonionic surfactant (1 pint/acre)
Water Hyacinth in waiver areas (March 15 to September 15)	Glyphosate (0.75 gal/acre)	Nonionic surfactant (0.25 gal/acre)
Alligator weed/Giant Cut Grass (undeveloped areas)	Imazapyr (0.5 gal/acre)	Turbulence (or approved equivalent, 0.25 gal/acre)
Alligator weed/Giant Cut Grass (developed areas)	Imazamox (0.5 gal/acre)	Turbulence (or approved equivalent, 0.25 gal/acre)
American Lotus	2, 4-D (0.5 gal/acre)	Nonionic surfactant (1 pint/acre)
American Lotus in waiver areas (March 15 to September 15)	Glyphosate (0.5 gal/acre)	Nonionic surfactant (0.25 gal/acre)
American Lotus in waiver areas with potable water intakes (March 15 to September 15)	Triclopyr (0.5gal/acre)	Turbulence (or approved equivalent, 0.25 gal/acre)
Duckweed	Diquat (1.0 gal/acre) or Flumioxazin (8 oz./acre)	Nonionic surfactant (0.25 gal/acre) or Turbulence (or approved equivalent, 0.25 gal/acre)
Cuban Bulrush (sedge)	2, 4-D (0.5 gal/acre)	Nonionic surfactant (1 pint/acre)
Cuban Bulrush (sedge) in waiver areas (March 15 to September 15)	Glyphosate (0.75 gal/acre)	Nonionic surfactant (0.25 gal/acre)
Water Lettuce	Diquat (1.0 gal/acre) or Flumioxazin (6 oz./acre)	Nonionic surfactant (0.25 gal/acre) or Turbulence (or approved equivalent, 0.25 gal/acre)
Buttonbush and new growth cypress (May to August during full foliage)	Imazapyr or Tryclopyr (0.75 gal/acre)	Turbulence (or approved equivalent, 0.25 gal/acre)

Increased herbicide efforts should be made above the boom. Specifically, this will include areas within the channel, boat roads and any other places of regular public boating access.

Biological Control:

The success of giant salvinia weevils may be limited on Saline Lake due to nitrogen deficiencies as described in Nachtrieb 2018. However, if access to weevils becomes available and with recent stocking success in close bordering waterbodies, stockings within remote areas of the lake will be taken into consideration.

Triploid grass carp will be monitored for efficacy in control of submersed aquatic vegetation. Future stockings of triploid grass carp will be considered if necessary, and if the potential for increased success is determined.

Physical Control:

Drawdowns for Saline Lake will be designed to achieve a reduction in vegetative coverage and organic substrate. Drawdowns will be considered when deemed necessary by LDWF Inland Fisheries personnel based on coverage of floating aquatic vegetation and its impact on boating access and recreation. With the prevalence of giant salvinia on the lake, it is likely that drawdowns will be a regular occurrence to manage coverage of the plant. Dewatering should be conducted at a rate of two-inches per day for the first seven calendar days. After the initial seven days, dewatering will be increased to 3–4 inches per day to a target level of 95.0 MSL (8 feet below spillway crest height). The duration of Saline Lake drawdowns should be no less than 3 months at the target level. Control gates should be opened the first week of June and closed no later than the first week of October each year to allow the lake to refill.

During drawdown periods, LDWF may work with LDOTD to operate the control gates to create flow in an effort to relocate giant salvinia from densely forested areas to sites where it can be subjected to stranding and/or herbicide treatments.

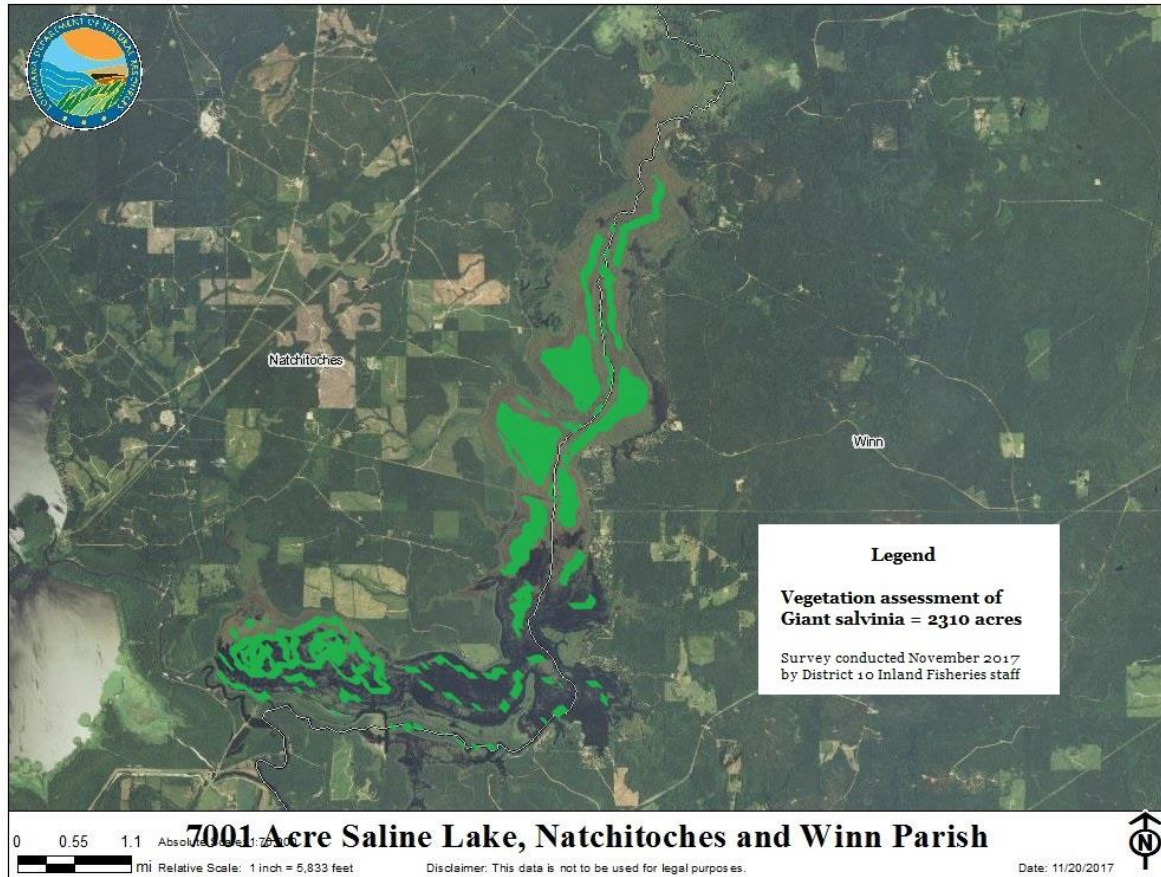
Typemap:

Vegetation surveys were conducted in years 1980 – 1984 and in 1988. Annual surveys and estimates have taken place since 2012.

Type mapping has been conducted at Saline Lake in years 2006, 2007, 2008, 2012 and 2017. Salvinia coverage estimates are conducted multiple times each year. The most recent salvinia assessment results and type maps are included in Attachments A and B. The type map resulting from the 2012 investigation is located in Attachment C. In 2017, the most common and prevalent vegetation was giant salvinia.

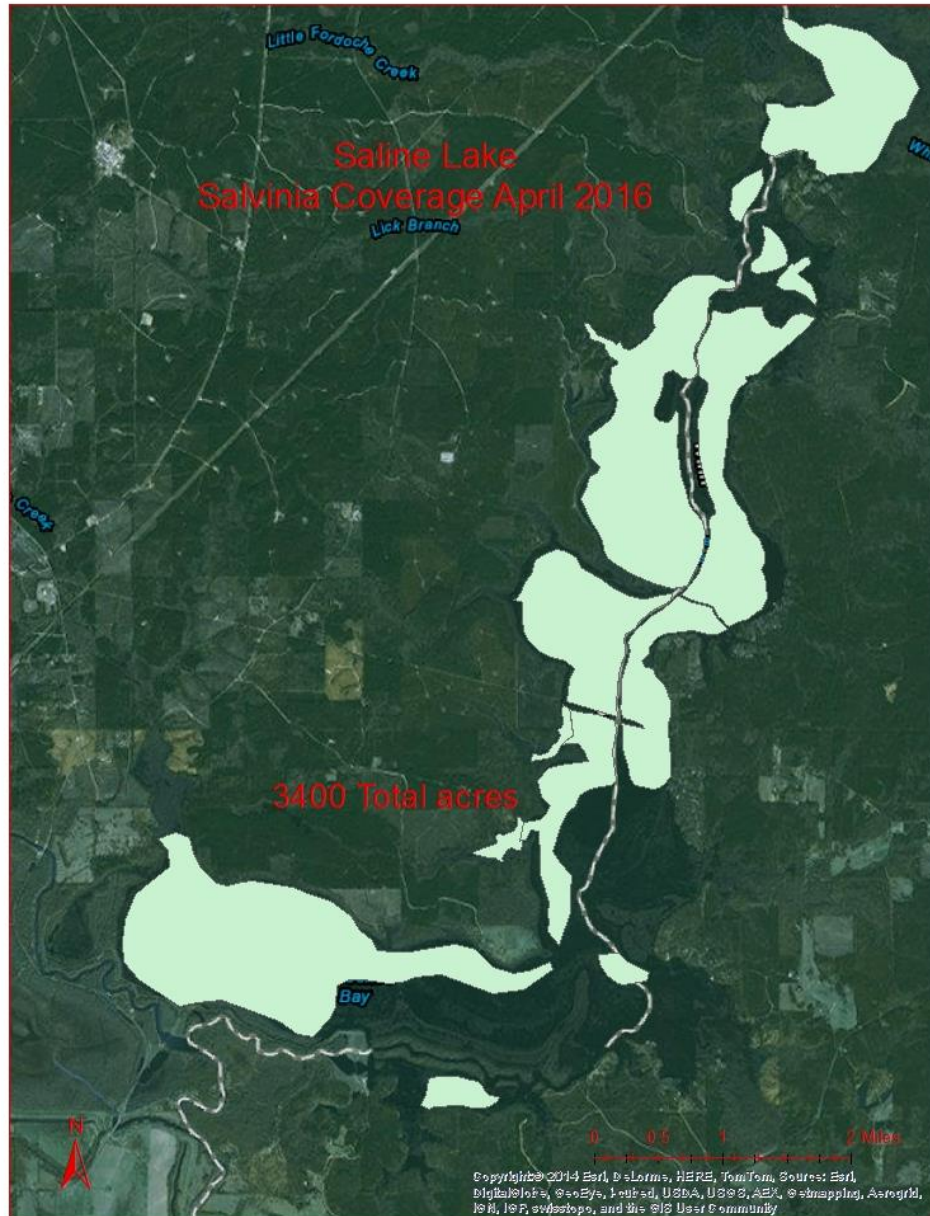
Attachment A

Saline Lake Giant Salvinia Assessment November 22, 2017



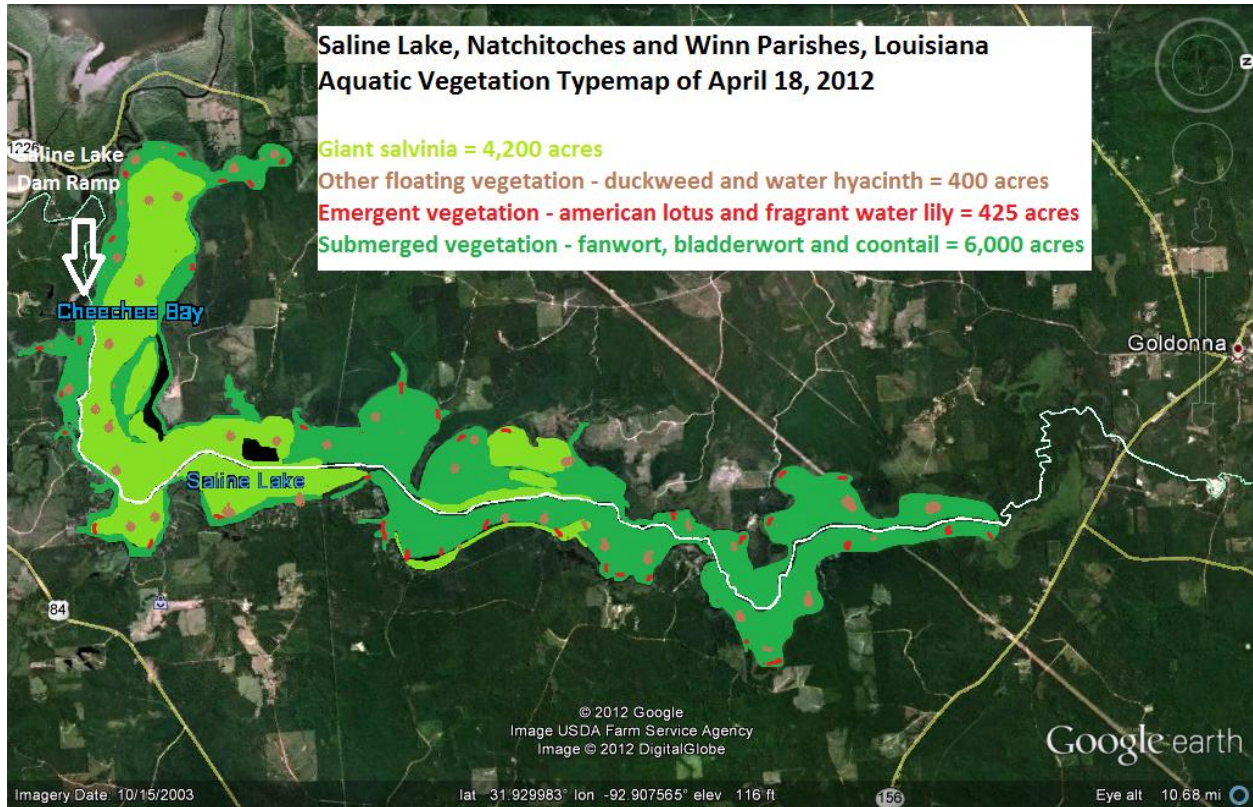
Attachment B

Saline Lake Giant Salvinia Assessment
April 5, 2016



Attachment C

Saline Lake Type Mapping Report April 18, 2012



Literature Cited:

Nachtrieb JG. 2018. Field site analysis of giant salvinia nitrogen content and salvinia weevil density. pp.7-13. In: Journal of Aquatic Plant Management. 57: 7-13.