

LOUISIANA DEPARTMENT OF WILDLIFE AND FISHERIES



**OFFICE OF FISHERIES
INLAND FISHERIES SECTION**

**AQUATIC VEGETATION MANAGEMENT PLAN
2018**

**HORSESHOE LAKE – CALDWELL
PARISH**

1. Waterbody type – natural, historic oxbow lake of the Ouachita River
2. Type of control structure – 24” culvert only, with screen to contain grass carp
3. Water level range (MSL)– unknown, very little fluctuation
4. Surface area – approximately 110 acres
5. Average depth – 6 feet; max. depth less than 10 feet
6. Watershed ratio – small watershed
7. Drawdown potential of structure – none
8. Waterbody Board or Lake Authority –

Boeuf River WMA - LDWF Wildlife Division – Horseshoe Lake lies almost entirely within the Boeuf River Wildlife Management Area (See attached map). Boeuf WMA is owned by, and is under exclusive authority of the Louisiana Department of Wildlife and Fisheries.

Primary contact information –

- a. Lowery Moak, LDWF District II Wildlife Biologist Manager.

Horseshoe Lake Commission

- a. Legacy advisory board comprised of concerned citizens. Appointments made by the Caldwell Parish Police Jury.
- b. Primary contact information – Kent Nugent, Chairman (318) 614-9688

9. Significant stakeholders -
Horseshoe Lake lies almost entirely within the Boeuf River WMA. The extreme northern end of the lake is privately owned. Fishing and waterfowl hunting are the primary activities. Boeuf River WMA provides recreational opportunities for public users and habitat for wintering waterfowl.
Private landowners – own property where culvert is located
General public – access, vegetation control/management
10. History of aquatic vegetation complaints -
Nuisance vegetation has reportedly been a long term problem.
11. Controversial issues -
Recent requests have been made by the Horseshoe Lake Commission for aquatic vegetation control, fish stocking, implementation of bass regulations, and elevation of lake pool stage.

Aquatic Vegetation Status:

Historic

Status of Nuisance Plant Species (February, 2014)

Submerged vegetation, mostly fanwort (*Cabomba caroliniana*) is abundant, especially on the southern half of the lake where coverage is approximately 70%. Current coverage of floating and emergent species is minimal.

Coverage and Status of Beneficial Plant Species (February, 2014)

Duckweed (*Lemna spp.*) is considered desirable for waterfowl species and is currently at a desirable level. WMA technical staff request that no duckweed control be conducted during fall and winter. Fanwort is a native submersed species and could be beneficial to the fisheries if the current coverage is reduced.

Status of Vegetation (November, 2014)

Coverage of fanwort is primarily limited to the south end (approx. 500 m north of boat launch to south end) of the lake, with plants found growing in depths up to nine feet. Total coverage in this portion of the lake is approximately 75%. Very little SAV was observed in the north half of the lake. Duckweed was observed along much of the shoreline around the entire lake, in an amount considered beneficial to waterfowl. Very little live water hyacinth (*Eichhornia crassipes*) was seen, as recent herbicide applications and freezing temperatures have minimized its coverage.

Status of Vegetation (2015)

No aquatic vegetation surveys were conducted on Horseshoe Lake in 2015. There were no reports of excessive vegetation or requests for control.

Coverage and status of nuisance plant species (2016)

-February 2016: giant salvinia (*Salvinia molesta*) was discovered for the first time in Horseshoe Lake, mostly along the shoreline

-May 19, 2016: 90% coverage of submerged aquatic vegetation (SAV) in shallows and southern third of mid-lake; SAV=90% fanwort and 10% coontail (*Ceratophyllum demersum*); approximately 1 acre of giant salvinia, mostly mixed with water hyacinth on the north end; water hyacinth = 10 acres, duckweed = 5 acres

-June 2016: approx. 15 acres of giant salvinia observed in forested area on north end of lake

Current

In 2017, giant salvinia coverage reached nearly 50 acres throughout the lake by early summer. The coverage was reduced to less than 1 acre by November. Coverage of submerged vegetation was much less in 2017 than in recent years. Much of the open water in the lake is now void of vegetation. All other vegetation remained minimal throughout 2017.

Status of Beneficial Plant Species (Nov. 2017)

-Submerged species (fanwort, coontail): near desirable amount, total coverage of approximately 25 acres

-Duckweed: minimal, desirable for waterfowl

Status of Nuisance Plant Species (Nov. 2017)

-Giant salvinia: less than 1 acre, but had reached nearly 50 acres in early summer

-Water hyacinth: minimal; less than 5 acres lakewide

2018 Prediction

Coverage and status of nuisance plant species is expected to be minimal in 2018. The coverage of beneficial species (fanwort, coontail) is expected to be near optimal for the purpose of fisheries habitat.

Past Control Measures:

Chemical:

Routine herbicide treatments have been made with boats equipped with high volume spray pumps. Diquat dibromide (1.0 gal/acre) has been used for duckweed. Glyphosate (0.75 gal/acre) and 2,4-D (0.5 gal/acre) have been used for water hyacinth. A combination of diquat dibromide and glyphosate has been used recently for the treatment of giant salvinia. Treatments are typically made in response to requests by Boeuf River WMA personnel or the Horseshoe Lake Commission. Control of giant salvinia is a priority for LDWF Inland Fisheries spray crews.

Biological:

A total of 1,328 triploid grass carp (*Ctenopharyngodon idella*) were stocked in 2008 for control of SAV.

Recent Control Efforts:

2014 - 2017 Control Efforts

Chemical

Recent control efforts have mostly included herbicide applications to floating species such as water hyacinth and duckweed. Glyphosate (0.75 gal/acre) and 2,4-D (0.5 gal/acre) have been used. Duckweed has been treated with diquat dibromide (1.0 gal/acre) when infestations have become severe. Only one herbicide application was necessary in 2014 for control of nuisance vegetation on Horseshoe Lake. No herbicide applications were made in 2015. Table 1 (below) shows the individual acreages of vegetation treated.

Herbicide control of giant salvinia became a priority following its discovery in 2016, with multiple applications being made. All applications were made using the standard LDWF recommendation for giant salvinia: mixture of glyphosate (0.75 gal/acre) and diquat dibromide (0.25 gal/acre) with Turbulence surfactant (0.25 gal/acre) from April 1 to October 31. Outside of that time frame, diquat (0.75 gal/acre) and a non-ionic surfactant will be used.

Table 1. Acres of vegetation treated with herbicides on Horseshoe Lake, 2014 - 2017.

Species	2014	2016	2017
Water Hyacinth	10	54	2
Duckweed	2	5	-
Miscellaneous Emergent Species	18	3	-
Giant Salvinia	-	177	50

Biological

An additional 1,000 triploid grass carp were stocked into the lake in April of 2013. An evaluation of survival and growth of carp was made with gill nets in January 2014. Four carp in excess of 40 inches were captured. These fish were likely from the 2008 stocking. It should be noted that there was a significant reduction in SAV coverage from 2012 – 2014. Little reduction occurred 2015 – 2016. In 2017, a significant reduction was observed.

Recommendations:

Evaluate growth and survival of grass carp in 2018. If submerged vegetation is too dense for netting or electrofishing, a visual survey by boat should be conducted in the shallows.

*no grass carp have been observed in multiple visual surveys

Conduct type map of aquatic vegetation in summer of 2018.

Maintain duckweed and water hyacinth at minimal coverage during the growing season with use of herbicides. The following herbicides and rates should be used:

Duckweed: diquat dibromide (1.0 gal/acre) with a non-ionic surfactant or approved alternative (0.25 gal/acre)

Water hyacinth:

Waiver Period (March 15 – Sept. 15) – glyphosate (0.75 gal/acre) with Turbulence (0.25 gal/acre) or approved alternative

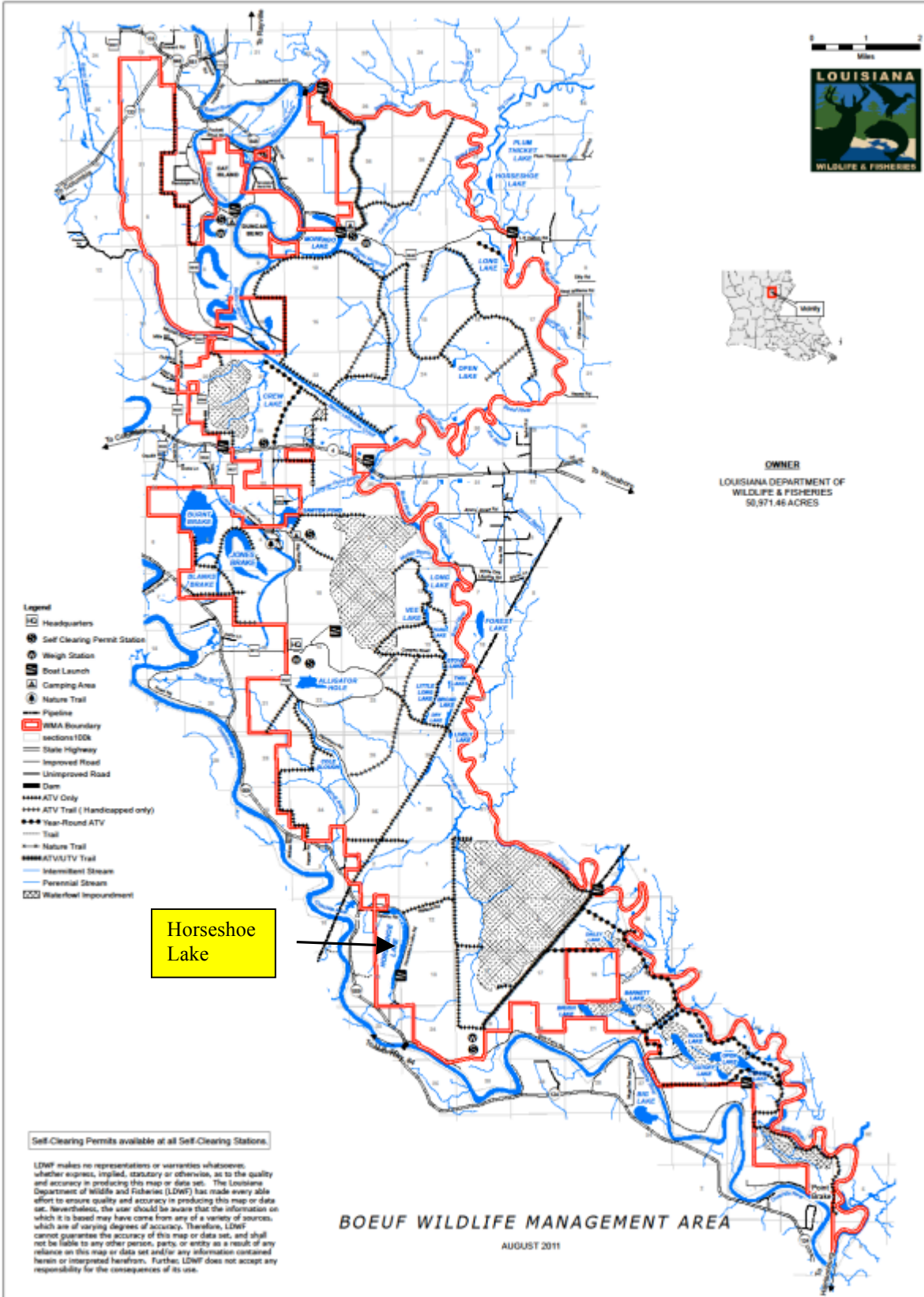
Non-waiver Period (Sept. 16 – March 14) – 2,4-D (0.5 gal/acre) with a non-ionic surfactant (1 pt./acre) or approved alternative

Emergent Vegetation:

Imazapyr (0.5 gal/acre) with Turbulence surfactant (0.25 gal/acre) or approved alternative

Monthly applications for control of giant salvinia should be conducted throughout 2018. Efforts should be made to spray all visible plants. The following herbicide mixture will be used: glyphosate (0.75 gal/acre) and diquat dibromide (0.25 gal/acre) with Turbulence surfactant (0.25 gal/acre) or approved alternative from April 1 to October 31. Outside of that

period, diquat (0.75 gal/acre) and a non-ionic surfactant will be used.



Horseshoe Lake

