

# **LOUISIANA DEPARTMENT OF WILDLIFE & FISHERIES**



**OFFICE OF FISHERIES  
INLAND FISHERIES SECTION**

**PART VI -A**

**WATERBODY MANAGEMENT PLAN SERIES**

**HARDWATER LAKE**

**LAKE HISTORY & MANAGEMENT ISSUES**

## **CHRONOLOGY**

December 2014 - Prepared by

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# TABLE OF CONTENTS

<b>LAKE HISTORY .....</b>	<b>5</b>
<b>GENERAL INFORMATION .....</b>	<b>5</b>
<i>Date reservoir formed.....</i>	<i>5</i>
<i>Impoundment .....</i>	<i>5</i>
<i>Size.....</i>	<i>5</i>
<i>Water shed.....</i>	<i>5</i>
<i>Pool stage.....</i>	<i>5</i>
<i>Parish/s located.....</i>	<i>5</i>
<i>Drawdown description.....</i>	<i>5</i>
<i>Who controls.....</i>	<i>6</i>
<b>LAKE AUTHORITY.....</b>	<b>6</b>
<i>Boat docks .....</i>	<i>6</i>
<i>Piers.....</i>	<i>6</i>
<i>State/Federal Facilities .....</i>	<i>6</i>
<i>State/National Parks.....</i>	<i>7</i>
<i>Shoreline development by landowners.....</i>	<i>7</i>
<b>PHYSICAL DESCRIPTION OF THE LAKE.....</b>	<b>7</b>
<i>Shoreline length.....</i>	<i>7</i>
<i>Timber type.....</i>	<i>7</i>
<i>Average depth.....</i>	<i>7</i>
<i>Maximum depth .....</i>	<i>7</i>
<i>Natural seasonal water fluctuation.....</i>	<i>7</i>
<b>EVENTS / PROBLEMS.....</b>	<b>7</b>
<b>MANAGEMENT ISSUES .....</b>	<b>8</b>
<b>AQUATIC VEGETATION.....</b>	<b>8</b>
<i>Biomass.....</i>	<i>8</i>
<i>Treatment history by year available .....</i>	<i>9</i>
<b>HISTORY OF REGULATIONS.....</b>	<b>10</b>
<i>Recreational.....</i>	<i>10</i>
<i>Commercial .....</i>	<i>10</i>
<b>DRAWDOWN HISTORY .....</b>	<b>10</b>
<i>Fishing closure .....</i>	<i>10</i>
<i>Depth below pool.....</i>	<i>10</i>
<i>Estimated % exposed.....</i>	<i>11</i>
<i>Who operated structure? .....</i>	<i>11</i>
<i>Fish kills .....</i>	<i>11</i>
<b>FISH KILLS / DISEASE HISTORY, LMBV .....</b>	<b>11</b>
<b>CONTAMINANTS / POLLUTION.....</b>	<b>11</b>
<i>Water level.....</i>	<i>11</i>
<b>BIOLOGICAL.....</b>	<b>12</b>
<i>Fish samples .....</i>	<i>12</i>
<i>Lake records .....</i>	<i>12</i>
<i>Stocking History .....</i>	<i>12</i>
<i>Species profile.....</i>	<i>12</i>
<i>Threatened/endangered/exotic species .....</i>	<i>14</i>
<b>CREEL .....</b>	<b>14</b>
<b>HYDROLOGICAL CHANGES.....</b>	<b>15</b>
<b>WATER USE.....</b>	<b>15</b>
<i>Hunting.....</i>	<i>15</i>

<i>Recreational watersports</i> .....	15
<i>Fishing</i> .....	15
<i>Scuba Diving</i> .....	15
<i>Swimming</i> .....	15
<i>Irrigation</i> .....	15
<b>APPENDIX I</b> .....	<b>16</b>
<b>APPENDIX II</b> .....	<b>17</b>

# LAKE HISTORY

## General Information

### Date reservoir formed

Hardwater Lake is a natural backwater lake of Little River. It was impounded in the early 1970's at 41.0 feet pool elevation mean sea level (MSL).

### Impoundment

Ownership – State of Louisiana

The lake was created to provide recreational opportunities for the citizens of Louisiana.

### Size

513 acres

### Water shed

725 acres (ratio 1.4:1) of adjacent upland pine/mixed hardwood land in southeastern Grant Parish.

### Pool stage

41.0 feet MSL

### Parish/s located

Grant Parish

### Drawdown description

During normal drawdowns for lake management, the water is lowered 3 to 4 inches per 24 hour period. The maximum drawdown rate is undocumented; however based on information gathered during the 2014 drawdown, the lake can only be dewatered approximately 3.5 ft. due to lake bottom contour elevations.

### Spillway

The principle spillway is incorporated as part of the modified stop-log water control structure. The spillway is rectangular in shape. It is 20 feet long by 6 feet wide and constructed of concrete reinforced with steel. The spillway is located on the southern end of the lake. An earthen dam 7,500 feet long was built from high ground on the west side of the lake to high ground on the east side of the lake. The southeast portion of this earthen levee functions as an emergency spillway during flood events.

### Description of the Dam

An earthen dam 7,500 feet long was built from high ground on the west side of the lake to high ground on the east side of the lake. The southeast portion of this earthen levee functions as an

emergency spillway during flood events.

#### Outlet Works (Drawdown Structure)

The drawdown structure is a 6' x 6' modified stop-log structure. The gate is constructed of 4" x 12" timbers held together with metal straps. The gate is lifted with a chain hoist attached to a portable metal frame.

#### Who controls

The outlet works are operated and maintained by the Grant Parish Police Jury (GPPJ). LDWF recommendations for gate openings must be approved by the GPPJ.

### **Lake Authority**

Act 858 of 1981 abolished the Hardwater Lake State Game and Fish Preserve and the corresponding lake commission. The statute transferred duties of the former commission to the LDWF. However, the legislation allows the governing body (GPPJ) to appoint a lake commission to work under the oversight of LDWF. The current Hardwater Lake Commission was appointed by the Grant Parish Police Jury.

Primary contact information:

Grant Parish Police Jury  
200 Main Street  
Colfax, LA. 71417  
Tel: 318-627-3157

### **Access**

Maps with locations (see [Appendix I](#))

1. Public Boat Ramp – single lane, rough concrete ramp with gravel parking; parking available for ten vehicles with boat trailers – No launch fee required. Located at N 31.523229° and -92.299274°.

#### Boat docks

No public boat docks

#### Piers

No public fishing piers are available. A small number of private piers are associated with homes and camps.

#### State/Federal Facilities

No state or federal facilities.

State/National Parks

No state or national parks.

Shoreline development by landowners

Approximately 30% of the shoreline is developed by landowners with homes and camps.

**Physical Description of the Lake**

Shoreline length

4.0 miles

Timber type

The majority of Hardwater Lake is covered with bald cypress and tupelo trees, both dead and living. The northern portion of the lake has an area of open water encompassing approximately 80 acres.

Average depth

3.5 feet

Maximum depth

8.0 feet

Natural seasonal water fluctuation

Due to the small watershed (1.4:1), water levels are fairly stable. However, water fluctuations of 2' to 4' are common during high rainfall periods. Backwater flooding occurs from Little River when river water levels reach 48.0 feet MSL.

**Events / Problems**

Currently, Hardwater Lake has a serious problem with submersed vegetation, primarily hydrilla. Submersed vegetation is matted to the surface in 95% of the lake.

## MANAGEMENT ISSUES

### Aquatic Vegetation

Historically, Hardwater Lake has been plagued by submersed aquatic vegetation due to its shallow clear water. Vegetation problems have been sporadic over the years and are primarily determined by the amount and duration of backwater flooding from Little River. Aquatic vegetation is typically nonexistent following periods of high water. Submersed aquatic vegetation coverage usually reaches levels near 100% following several consecutive years without high water. Initially, native aquatic vegetation was predominantly found in the shallow water areas of the lake. Submersed vegetation species include fanwort (*Cabomba caroliniana*), bladderwort (*Utricularia sp.*), and coontail (*Ceratophyllum demersum*).

A survey conducted on May 8, 2013, indicated that submergent vegetation was causing serious problems in Hardwater Lake. The major problem species were bladderwort and fanwort, with small clumps of hydrilla scattered throughout much of the lake. It is likely that hydrilla will out-compete the native submersed vegetation in the future and become the dominant species. Submersed vegetation covered more than 90% of the lake, approximately 475 acres. Emergent vegetation was not problematic. Less than 30 acres of alligator weed were present in a fringe along the shoreline. Common and giant salvinia were found in the lake but were not a problem at that time (< 10 acres).

Results from a vegetation survey conducted in July of 2014 indicated that Hardwater Lake was 100% covered by submersed vegetation. Hydrilla coverage was estimated at 60% and fanwort coverage was estimated at 40%.

#### Type map

The most recent vegetation survey was conducted in July of 2014. It can be found in [Appendix II](#).

#### Biomass

No biomass sampling has been conducted.

Treatment history by year available

Biological

5,000 triploid grass carp (TGC) are scheduled to be stocked in the spring of 2015.

Chemical

Periodic foliar applications have been applied by LDWF spray crews primarily for the control of common salvinia. Herbicides were applied in 2009 and 2013. No applications were conducted in 2010, 2011 or 2012. For a complete summary of herbicide applications see Table 1.

Table 1. Herbicide applications on Hardwater Lake, Louisiana for 2009 and 2014.

Year	Acres	Vegetation
2009	1	Bladderwort
	0.25	Hydrilla
	72	Common salvinia
2013	20	Common salvinia
	7	Giant salvinia

Herbicide applications in the past have been conducted at the following rates:

Imazapyr (Ecomazapyr): Used at a rate of 0.5 gal/acre with Inergy (0.25 gal/acre) surfactant to treat alligator weed.

Glyphosate (Aquamaster, Aquastar, etc.): Used at a rate of 0.75 gallons per acre to treat alligator weed, water hyacinth, and giant and common salvinia during the active growing period.

Diquat (Reward, Knockout): Used at a rate of 0.75 gallons per acre to treat alligator weed, water hyacinth, and giant and common salvinia during the slower growing period or winter months.

Surfactant is added at a rate of 1:4 (surfactant: herbicide) for all herbicides.

Future herbicide applications for the treatment of giant and common salvinia will be in accordance with the approved LDWF Aquatic Herbicide Application Procedures. Schedule and rates listed below:

**April 1-October 31:** glyphosate (0.75 gal/acre) and diquat (0.25 gal/acre) with Aqua King Plus (0.25 gal/acre) and Air Cover (12 oz. /acre)

**November 1 – March 31:** diquat (0.75 gal./acre) and a non-ionic surfactant (0.25 gal/acre)

Physical

Control measures have been limited in the past. Only two documented drawdowns have

been conducted. They occurred in 1995 and 2014 to help control submersed vegetation.

## History of Regulations

### Recreational

Statewide regulations for all fish species.

The recreational fishing regulations may be viewed at the link:

<http://www.wlf.louisiana.gov/fishing/regulations>

### Commercial

The commercial fishing regulations may be viewed at the link:

<http://www.wlf.louisiana.gov/fishing/regulations>

On February 23, 2004, the Louisiana Wildlife and Fisheries Commission promulgated R.S. 76:171, in accordance with R.S. 56:22 (B). The rule prohibits the use of gill nets, trammel nets, and fish seines in Hardwater Lake.

### Drawdown history

Drawdowns have occurred on two occasions in Hardwater Lake. The first drawdown occurred in 1995 to control native submersed vegetation. The second drawdown occurred in 2014 for submersed vegetation control, primarily hydrilla and fanwort. The results of the first drawdown are unknown. The second drawdown is currently underway. Benefits appear to be limited. A large part of the lake cannot be dewatered. There is an elevated ridge transecting the lake that prevents the majority of the lake from dewatering more than 3.5 feet. This leaves a large area of the lake covered in water and prevents the vegetation from dying. A complete drawdown history is provided in Table 2.

Table 2. Drawdown history of Hardwater Lake, Louisiana for 1995 and 2014.

<b>DRAWDOWN HISTORY</b>				
Date Opened	Date Closed	Purpose	Results	Issues
August 1995	October 1995	Vegetation Control	unknown	None
Sept. 16, 2014	Jan. 5, 2014	Hydrilla control	Minimal	Could not dewater lower than 3.5 feet

### Fishing closure

The lake was not closed to fishing during drawdowns.

### Depth below pool

The maximum depth below pool during the drawdown was approximately 3.5 feet.

Estimated % exposed

Approximately 30% of the lake bottom is exposed during a 3.5' drawdown.

Who operated structure?

Drawdown structure gate opening is handled by Grant Parish Police Jury personnel. Assistance was provided by LDWF personnel.

Fish kills

No documented fish kills have occurred during drawdowns or at any other time.

Fish kills / disease history, LMBV

A review of the records indicated Hardwater Lake was not sampled for LMBV. No fish kills or disease history has been documented.

**Contaminants / Pollution**

There are no documented records of contaminants or pollution. Currently, there are no fish consumption advisories for Hardwater Lake. However, annual updates can be found at the DEQ and LDWF links below:

<http://www.deq.louisiana.gov/portal/tabid/2201/Default.aspx>

<http://www.wlf.louisiana.gov/fishing/fish-consumption-advisories>

Water level

Normal pool elevation for Hardwater Lake is 41.0 feet MSL. Water levels do not normally fluctuate due to the small watershed. However, during periods of high water, backwater from Little River enters the lake. This occurs when the river reaches an elevation of 48.0 MSL.

## Biological

### Fish samples

Table 3. Historical and scheduled fisheries sampling on Hardwater Lake, Louisiana.

YEAR	SAMPLING GEAR
1975	Rotenone – 2 Stations
1984	Rotenone – 2 Stations
1988	Gill Nets (Winter – 2 stations)
1993	Gill Nets (Winter – 2 stations)
1998	Electrofishing DC Prod (Spring – 2 Stations) Frame Net (Summer – 3 Stations)
1999	Seine Net (Summer – 1 Station)
2000	Seine Net (Summer – 1 Station)
2001	Seine Net (Summer – 1 Station)
2002	Electrofishing (Spring and Fall – 2 Stations)
2015	Electrofishing (Spring and Fall – 2 stations) Forage - 1 station

### Lake records

No official records are kept for Hardwater Lake.

### Stocking History

No fish have been stocked in Hardwater Lake.

### Species profile

As per Freshwater Fishes of Louisiana by Dr. Neil H. Douglas, fish species listed in Table 6 have been collected or are likely to occur in Hardwater Lake.

### Table 6. Fishes collected or likely to occur in Hardwater Lake, LA

#### Lamprey Family, PETROMYZONTIDAE

Southern brook lamprey, *Ichthyomyzon gagei* Hubbs and Trautman

Chestnut lamprey, *Ichthyomyzon castaneus* Girard

#### Gar Family, LEPISOSTEIDAE

Spotted gar, *Lepisosteus oculatus* (Winchell)

Bowfin Family, AMIIDAE

Bowfin, *Amia calva* Linnaeus

Freshwater Eel Family, ANGUILLIDAE

American eel, *Anguilla rostrata* (Lesueur)

Herring Family, CLUPEIDAE

Gizzard shad, *Dorosoma cepedianum* (Lesueur)

Threadfin shad, *Dorosoma petenense* (Günther)

Minnow Family, CYPRINIDAE

Blacktail shiner, *Cyprinella venusta* (Girard)

Common Carp, *Cyprinus carpio* Linnaeus

Cypress minnow, *Hybognathus hayi* Jordan

Striped shiner, *Luxilus chrysocephalus* Rafinesque

Golden shiner, *Notemigonus crysoleucas* (Mitchill)

Emerald shiner, *Notropis atherinoides* Rafinesque

Taillight shiner, *Notropis maculatus* (Hay)

Weed shiner, *Notropis texanus* (Girard)

Mimic shiner, *Notropis volucellus* (Cope)

Bullhead minnow, *Pimephales vigilax* (Baird and Girard)

Creek chub, *Semotilus atromaculatus* (Mitchill)

Sucker Family, CATOSTOMIDAE

Lake chubsucker, *Erimyzon sucetta* (Lacépède)

Smallmouth buffalo, *Ictiobus bubalus* (Rafinesque)

Bigmouth buffalo, *Ictiobus cyprinellus* (Valenciennes)

Black buffalo, *Ictiobus niger* (Rafinesque)

Spotted sucker, *Minytrema melanops* (Rafinesque)

Freshwater Catfish Family, ICTALURIDAE

Black bullhead, *Ameiurus melas* (Rafinesque)

Yellow bullhead, *Ameiurus natalis* (Lesueur)

Tadpole madtom, *Noturus gyrinus* (Mitchill)

Channel Catfish, *Ictalurus punctatus*

Flathead Catfish, *Pylodictis olivaris* (Rafinesque)

Pike Family, ESOCIDAE

Grass pickerel, *Esox americanus vermiculatus* (Lesueur)

Chain pickerel, *Esox niger* (Lesueur)

Pirate Perch Family, APHREDODERIDAE

Pirate perch, *Aphredoderus sayanus* (Gilliams)

Killifish Family, CYPRINODONTIDAE

- Golden topminnow, *Fundulus chrysotus* (Günther)
- Starhead topminnow, *Fundulus nottii* (Agassiz)
- Blackstripe topminnow, *Fundulus notatus* (Rafinesque)
- Blackspotted topminnow, *Fundulus olivaceus* (Storer)

Livebearer Family, POECILIIDAE

- Western mosquitofish, *Gambusia affinis* (Baird and Girard)

Silverside Family, ATHERINIDAE

- Brook silverside, *Labidesthes sicculus* (Cope)

Temperate Bass Family, PERCICHTHYIDAE

- Yellow bass, *Morone mississippiensis* (Jordan and Eigenmann)

Sunfish Family, CENTRARCHIDAE

- Banded pygmy sunfish, *Elassoma zonatum* (Jordan)
  - Green sunfish, *Lepomis cyanellus* (Rafinesque)
  - Warmouth, *Lepomis gulosus* (Cuvier)
  - Orangespotted sunfish, *Lepomis humilis* (Girard)
  - Bluegill, *Lepomis macrochirus* (Rafinesque)
  - Dollar sunfish, *Lepomis marginatus* (Holbrook)
  - Longear sunfish, *Lepomis megalotis* (Rafinesque)
  - Redear sunfish, *Lepomis microlophus* (Günther)
  - Spotted sunfish, *Lepomis punctatus* (Valenciennes)
  - Bantam sunfish, *Lepomis symmetricus* (Forbes)
- 
- Northern largemouth bass, *Micropterus salmoides salmoides* (Lacépède)
  - White crappie, *Pomoxis annularis* (Rafinesque)
  - Black crappie, *Pomoxis nigromaculatus* (Lesueur)

Perch Family, PERCIDAE

- Swamp darter, *Etheostoma fusiforme* (Girard)
- Slough darter, *Etheostoma gracile* (Girard)

Drum Family, SCIAENIDAE

- Freshwater drum, *Aplodinotus grunniens* (Rafinesque)

Threatened/endangered/exotic species

No threatened, endangered, or exotic species have been documented.

Creel

No creel survey has been conducted on Hardwater Lake.

## **Hydrological Changes**

No hydrological changes have occurred since the lake was impounded in the early 1970's.

## **Water Use**

### Hunting

Hardwater Lake is utilized for duck hunting. Duck blinds are regulated by the Grant Parish Police Jury.

### Recreational watersports

Recreational water sports are not popular on Hardwater Lake. The majority of the lake is covered by timber and the small open water area is shallow and covered by aquatic vegetation. Some residents spend time canoeing on the lake.

### Fishing

Hardwater Lake is utilized for recreational fishing – primarily during the winter and early spring for largemouth bass and crappie.

### Scuba Diving

No scuba diving occurs on Hardwater Lake.

### Swimming

Swimming is not popular on Hardwater Lake.

### Irrigation

Hardwater Lake is not utilized for irrigation.

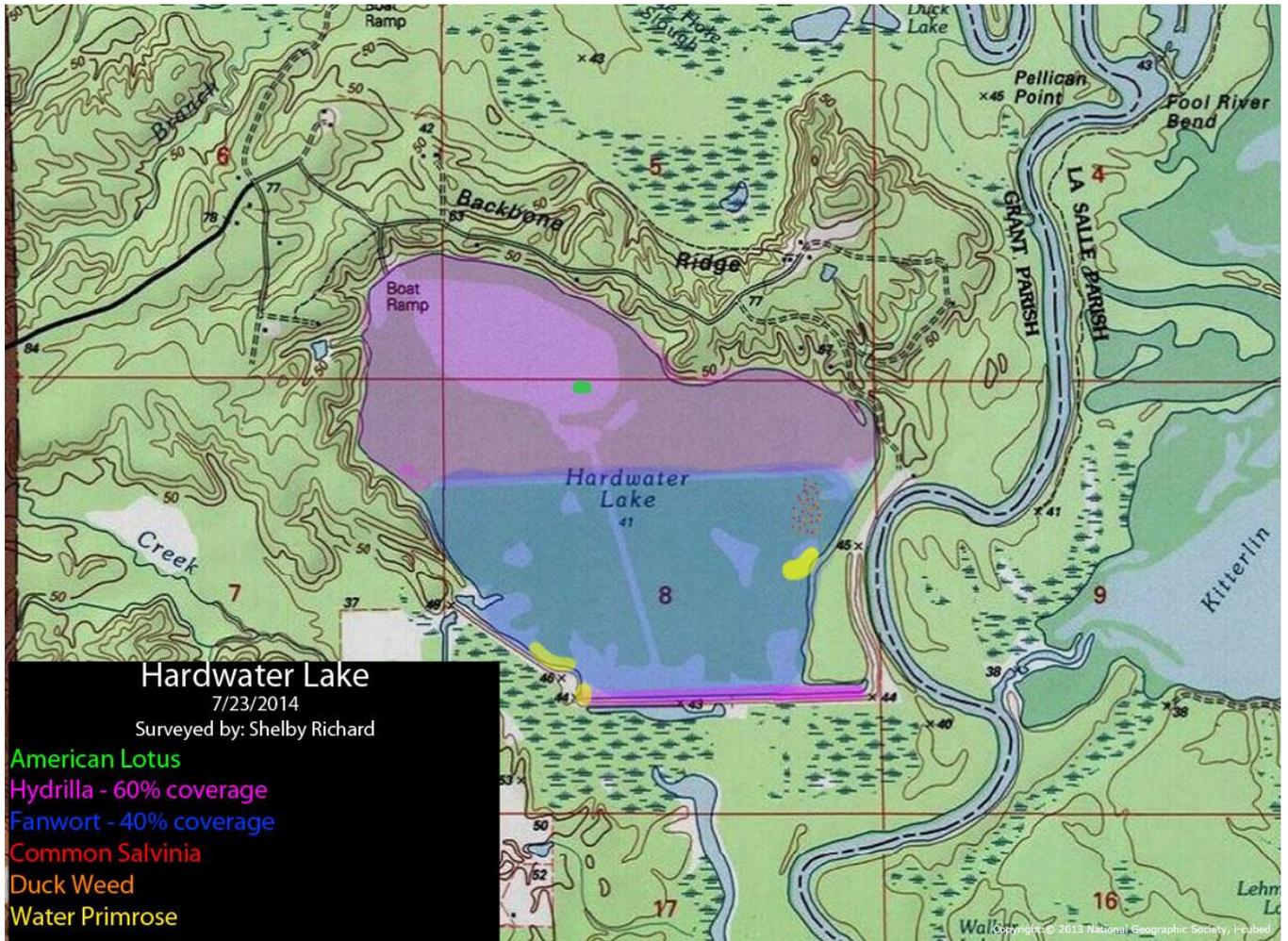
Appendix I  
([return to boat ramps](#))

Map of Hardwater Lake boat ramp.



Appendix II  
([return to Typemap](#))

Hardwater Lake vegetative type map conducted on July 23, 2014



The lake is 100% covered by submersed vegetation. Hydrilla covers the northern 300 acres and fanwort covers the southern 200 acres.