

LOUISIANA DEPARTMENT OF WILDLIFE & FISHERIES



**OFFICE OF FISHERIES
INLAND FISHERIES SECTION**

PART VI -A

WATERBODY MANAGEMENT PLAN SERIES

CROOKED CREEK RESERVOIR

RESERVOIR HISTORY & MANAGEMENT ISSUES

CHRONOLOGY

May 2013 - Prepared by
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RESERVOIR HISTORY

GENERAL INFORMATION

Date reservoir formed

Crooked Creek Reservoir is a 400 acre impoundment located five miles northwest of Pine Prairie, Louisiana in Evangeline parish. Crooked Creek Park Reservoir was cleared in 1972 and the levees were completed in 1974 by the Evangeline Parish Police Jury (EPPJ). It was constructed on the west fork of Boggy Bayou, a tributary of the East Fork of Bayou Nezpique within the Mermentau River basin. This waterbody is surrounded by small rolling hills vegetated by a cultured pine forest. The majority of the reservoir is shallow open water with growths of black willow (*Salix nigra*), bald cypress (*Taxodium distichum*) and buttonbush (*Cephalanthus occidentalis*) in coves on the north end of the reservoir.

Impoundment

Owner – Evangeline Parish Police Jury.

Purposes for creation – Recreational Activities (fishing, boating, site seeing).

Size

400 acres

Water shed

4:1 ratio

Pool stage

21.0 feet above mean sea level (MSL)

Parish/s located

Located in the north-west section of Evangeline Parish, approximately five miles north-west of Pine Prairie, LA, and seven miles south-west from Turkey Creek, LA. Road access is by Hwy 13 north and west on parish road 3187. Crooked Creek Reservoir is situated at: Latitude 30.8341485 and Longitude -92.4763414.

Drawdown description

There have been four drawdowns of Crooked Creek Reservoir since 1989.

Dam Length – 2, 150 ft. (entire dam length serves as secondary/emergency spillway)

Spillway size – 16 ft. total, 8 ft. openings on each end of structure serves as primary overflow (Figure 1).

Spillway design – square concrete and steel structure based on standpipe design with openings on each end.

Gate size – drawdown gate with a 4 ft. x 4 ft. opening.

Number of gates - 1

Condition – Good

Flow rate – Gate fully opened can lower the reservoir approximately 2 inches per day for a total drawn down capability of 4 feet below pool elevation.

Who controls

Evangeline Parish Police Jury owns and operates the park and the reservoir.
(337) 363 – 5651.



Figure 1. Looking west along the dam of Crooked Creek Reservoir, LA at the spillway and control structure. LDWF file photo taken October 2, 2012.

RESERVOIR AUTHORITY

Evangeline Parish owns Crooked Creek Reservoir. The Evangeline Parish Police Jury is the lake authority.

Evangeline Parish Police Jury
200 Court St., Ste. 207
Ville Platte, La. 70586
Bryan Vidrine – President (337) 363 – 5651

The Louisiana Department of Wildlife & Fisheries (LDWF) makes recommendations to the EPPJ on fisheries related matters. LDWF office in Opelousas, La. (337) 948-0255.

ACCESS

Map with locations of boat ramp ([Appendix I](#)).

Boat docks

1 boat ramp

Piers

None

SHORELINE DEVELOPMENT

Shoreline development by landowners

Crooked Creek Park/Reservoir Recreation Area is owned and operated by the EPPJ.

The shoreline on the south end of the reservoir consists of camper sites, picnic areas, a swimming area and a boat launch, which is owned by the Evangeline Parish Police Jury. The remaining shoreline consists of rolling hills lined with pine/hardwood forest and owned by Crowell Land & Mineral Co., a timber company. Over half of this woodland has been harvested and replanted in a pine forest.

PHYSICAL DESCRIPTION OF THE WATER BODY

Crooked Creek Reservoir is a 400 acre impoundment that was cleared in 1972 and the levees completed in 1974 by the Evangeline Parish Police Jury. This water body is surrounded by small rolling hills vegetated by a cultured pine forest. The majority of the reservoir is shallow open water with growths of black willow (*Salix nigra*), bald cypress (*Taxodium distichum*) and buttonbush (*Cephalanthus occidentalis*) in coves on the north end of the reservoir. The open water portion is about 4 feet deep and deepens to about 8 feet where the spillway and control structure is located on the south west end of the reservoir. The cove on the north end of the reservoir is shallow, ranging from 2-3 feet in the middle and less than a foot near the shoreline. Logs and submerged vegetation make up the rest of the impoundments complex cover.

Shoreline length

6.22 miles of shoreline

Average depth

3-4 feet

Maximum depth

7 feet

Natural seasonal water fluctuation

Water level fluctuation is typically about 1 foot.

EVENTS / PROBLEMS

Shallow water on the north end of the reservoir (small coves) impedes LDWF spray boats from gaining access to floating and emergent vegetation.

Crooked Creek Reservoir is a small waterbody which is visited by many users groups, such as recreational fishermen, skiers, hunters and boaters. LDWF spray crews often begin work very early in the morning so as not to interfere with the various user groups. Duck hunting activities have limited the ability to treat and control vegetation during fall months.

MANAGEMENT ISSUES

AQUATIC VEGETATION

Crooked Creek has an overabundance of submerged vegetation. The predominant species include hydrilla (*Hydrilla verticillata*), coontail (*Ceratophyllum demersum*) and fanwort (*Cabomba caroliniana*). Emergent/floating vegetation consist of water shield (*Brasenia schreberi*), American lotus (*Nelumbo lutea*), and water hyacinth (*Eichhornia crassipes*). Control efforts for water hyacinth include applications of the herbicide 2,4-D (dichlorophenoxy acetic acid). Reward (diquat dibromide) is used for water shield control. Drawdowns have been conducted in the past to control submerged vegetation.

Since 2008, LDWF spray crews have treated a total of 150 acres of nuisance aquatic plants with herbicides. Other control efforts included the introduction of triploid grass carp, stocked in 2008 and 2011 to control hydrilla growth.

The main issue during 2011 was hydrilla. The invasive plant covered approximately 75% of the reservoir. The EPPJ stocked 500 triploid grass carp (TGC) in 2008 and LDWF stocked 44 adult triploid grass carp in 2011 to aid in the control of this plant. Coontail, water shield and fanwort made up 10% of the vegetation (25 acres). Other plants include American lotus (15 acres), alligator weed (10 acres), water hyacinth (15 acres) and duckweed (8 acres) which made up a small percent of emergent and floating plant coverage. There were no efforts to re-establish any native plant species.

Hydrilla continued to be a problem in 2012. EPPJ purchased 1,200 carp and stocked at a rate of 4 per vegetative acre in February of 2012. LDWF assisted in releasing the carp throughout the reservoir. Corrugated fence has been placed within the control structure to prevent carp escapement.

In 2013, hydrilla covered approximately 200 acres of the reservoir. Submerged vegetation such as watershield, coontail and fanwort cover 150 acres. Emergent and floating vegetation, including American lotus, alligator weed, water hyacinth and duckweed cover approximately 10 acres in the reservoir. Complaints are few and limited to submerged vegetation issues in the backs of coves and watershield (*Brasenia schreberi*) near piers.

Type map

Aquatic vegetative type mapping has been conducted in 2006 and 2012 ([APPENDIX II](#)).

Biomass

No vegetative biomass sampling conducted.

Treatment history by year available

Biological

EPPJ stocked 500 Triploid Grass Carp, ranging from 8-10 inches in 2008, while LDWF stocked 44 adult triploid grass carp in 2011. The EPPJ purchased and stocked 1,200 8-10 inch TGC in

February of 2012 to aid in the control of hydrilla.

Chemical

Table 1 reports the herbicide applications that were used annually to control emergent vegetation including water hyacinth (*Eichhornia crassipes*), duckweed (*Lemna minor*), water shield (*Brasenia schreberi*), American lotus (*Nelumbo lutea*) and various other emergent plants.

Table 1. Herbicide applications on Crooked Creek Reservoir, LA, from 2008 – 2012.

Crooked Creek Herbicide Applications				
Year	Gallons	Herbicide	Acres	Vegetation
2008	10	Aquastar	13	watershield
2009	21	Aquastar, 2,4-D	31.3	watershield/lotus
2010	75	Aquamaster, diquat, 2,4-D	99.3	hyacinth/watershield/duckweed
2011	5	Aquamaster	6.7	watershield
2012				No applications made in 2012

HISTORY OF REGULATIONS

Recreational

Statewide regulations for all fish species, the 2013 recreational fishing regulations may be viewed at the link: <http://www.wlf.louisiana.gov/fishing/regulations>

Commercial

Commercial Fishing is prohibited; however, the 2013 commercial fishing regulations may be viewed at the link: <http://www.wlf.louisiana.gov/fishing/regulations>

DRAWDOWN HISTORY

There have been four drawdowns conducted on Crooked Creek Reservoir (Table 2). The first drawdown was conducted in 1989 to correct a turbidity problem and a fish population imbalance. The drawdown was recommended by LDWF and conducted by EPPJ. In 1995, a drawdown was conducted to reduce coontail and fanwort. In 1999 and 2000, the water level was reduced three feet due to a severe drought. The 2004 drawdown was to reduce vegetation (*Hydrilla verticillata*) and to dredge shallow areas.

Drawdown Dates

There have been a total of four drawdowns on Crooked Creek; three for control of submerged aquatic vegetation and one to correct a fish population imbalance. Drawdowns were all conducted from September – January (Fall/Winter).

Table 2. The drawdown history of Crooked Creek Reservoir, LA, from 1989 – present

Date Opened	Date Closed	Purpose	Issues
Fall 1989	Winter 1990	Excessive turbidity Fish population imbalance	Reservoir lowered 4 feet
Fall 1995	Winter 1995	Submerged vegetation control	Reservoir lowered 2-3 ft.
Fall 1999	Winter 2000	Submerged vegetation control	Reservoir lowered 3 ft.
Sept. 2004	October 2004	Submerged vegetation control (hydrilla)	Reservoir lowered 2-3 ft.

Drawdowns have been used on Crooked Creek Reservoir in the past as a cost effective method to manage aquatic vegetation. Native vegetation, such as coontail and fanwort, were the dominant plants that were historically managed with drawdowns. Hydrilla (*Hydrilla verticillata*) has subsequently become problematic since its discovery in 2002. Since 2008, triploid grass carp have been introduced into the reservoir as a cost effective biological control method for this invasive submersed aquatic plant.

Who operates structure:

Evangeline Parish Police Jury

CONTAMINANTS / POLLUTION

Water quality

Water parameters measured at the surface and near the bottom during each standardized sample include temperature, dissolved oxygen, pH, and conductivity.

The Louisiana Department of Environmental Quality (LDEQ) collects fish species in water-bodies throughout the state, in order to determine mercury concentrations in fish. Samples were taken in Crooked Creek in 2009 and an advisory for the consumption of largemouth bass was subsequently issued (Figure 2).

<http://www.deq.louisiana.gov/portal/PROGRAMS/MercuryInitiative.aspx>



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The following fish consumption advisory was issued on 2-11-2009 by the Department of Health & Hospitals, the Department of Environmental Quality, and the Department of Wildlife & Fisheries. For more information, please contact:

DHH
Adrienne Katner
(888) 293-7020

DEQ
Chris Pichler
(225) 219-3615

DWF
Mike Wood
(318) 343-4045

FISH CONSUMPTION ADVISORY FOR CROOKED CREEK RESERVOIR

In response to recent sampling and analysis of fish tissue data, the Louisiana Department of Health & Hospitals (DHH), Department of Environmental Quality (DEQ), and Department of Wildlife & Fisheries (DWF) are issuing the following advisory for Crooked Creek Reservoir in Evangeline Parish where unacceptable levels of mercury have been detected in largemouth bass.

DHH, DEQ and DWF advise that the following precautions be taken when eating fish taken from Crooked Creek Reservoir:

- **Women of childbearing age and children less than seven years of age should consume no more than ONE MEAL PER MONTH of largemouth bass from the advisory area. (A meal considered to be half a pound of fish for adults and children.)**
- **Other adults and children seven years of age or older should consume no more than FOUR MEALS PER MONTH of largemouth bass from the advisory area. (A meal is considered to be half a pound for adults and children.)**

Louisiana fish consumption advisories are based on the estimate that the average Louisiana resident eats four fish meals per month (1 meal = ½ pound). Adults that eat more than four meals of fish a month, and women of child-bearing age and children that eat more than one meal of fish a month from local waterbodies, might increase their health risks. You can contact the Office of Public Health toll free at 1-888-293-7020 for more information about eating fish that contain chemicals.

Figure 2. The following fish consumption advisory was issued for Crooked Creek, Louisiana 2/11/2009. This advisory is still in effect.

BIOLOGICAL

Fish sampling history

Techniques used for sampling included electrofishing, entanglement gear, and water quality parameters have provided necessary data related to managing Crooked Creek Reservoir fish population (Table 3).

Note: All standardized sampling data collected by Inland Fisheries from 1965 through present are computerized.

Gear

Table 3. Gear types employed to sample fish populations in Crooked Creek, Louisiana

Year	Sampling Method
1984	Gill nets, seine, water quality
1989	Gill nets, water quality
1997	Electrofishing, water quality
2000	Electrofishing, Forage, Frame Nets
2002	Electrofishing, Forage, water quality
2003	Gill Nets, water quality
2004	Electrofishing, Forage, water quality
2006	Gill Nets, water quality
2007	Electrofishing, Forage, water quality
2010	Electrofishing, Forage, water quality
2011	No sampling Scheduled
2012	Electrofishing, Forage, gill nets, aquatic vegetative type map, water quality
2013	No sampling Scheduled
2014	No sampling Scheduled
2015	Electrofishing, Forage, gill nets, aquatic vegetative type map, water quality
2016	No sampling Scheduled

Electrofishing equipment along with other sampling gear such as seines, frame nets and gill nets, allow biologists to understand and evaluate fish populations and return many fish to the water alive and unharmed.

Reservoir records

Based on informal records maintained by LDWF fisheries biologists, the largest bass caught in Crooked Creek Reservoir was in 1996 and weighed 8.3 pounds.

Stocking history

The total number by species of fish stocked into Crooked Creek Reservoir, Louisiana from 1988 – 2012 is presented in Table 4.

Table 4. The fish stocking history of Crooked Creek Reservoir, LA, from 1993 - 2012.

YEAR	FLORIDA LARGEMOUTH BASS	CHANNEL CATFISH	HYBRID STRIPED BASS	TRIPLOID GRASS CARP
1993			*25,000	
2001	4,006			
2003	4,915	4,004		
2008	4,200			500
2011				**44
2012				1,200
Totals	13,121	4,004	25,000	1,744

As listed in Table 4, above all Florida largemouth bass were stocked as fingerlings, ranging from 1- 2 inches in total length. All largemouth bass were released by boat throughout the reservoir in protective cover, such as thick vegetation, button bush, fallen timber, etc. Other stocked species included channel catfish, hybrid striped bass and triploid grass carp.

* Hybrid striped bass were stocked as sac fry and ** triploid grass carp were stocked as adults. Triploid grass carp stocked in 2008 and 2012 ranged from 8 -10 inches in total length.

Species profile

Table 5. List of fish species collected by LDWF or are known to occur in Crooked Creek Reservoir, Louisiana.

Lamprey Family, PETROMYZONTIDAE

Southern brook lamprey, *Ichthyomyzon gagei* Hubbs and Trautman

Garfish 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

Common Carp, *Cyprinus carpio* Linnaeus

Cypress minnow, *Hybognathus hayi* Jordan

Weed shiner, *Notropis texanus* (Girard)
Blacktail shiner, *Cyprinella venusta* (Girard)
Red shiner, *Cyprinella lutrensis* (Baird and Girard)
Golden shiner, *Notemigonus crysoleucas* (Mitchill)
Pugnose minnow, *Notropis emiliae* Hay
Bullhead minnow, *Pimephales vigilax* (Baird and Girard)
Triploid Grass carp, *Ctenopharyngodon idella* (Valenciennes)

Sucker Family, CATOSTOMIDAE

Lake chubsucker, *Erimyzon sucetta* (Lacépède)

Freshwater Catfish Family, ICTALURIDAE

Black bullhead, *Ameiurus melas* (Rafinesque)
Yellow bullhead, *Ameiurus natalis* (Lesueur)
Channel catfish, *Ictalurus punctatus* (Rafinesque)
Blue catfish, *Ictalurus furcatus*, (Lesueur)
Black madtom, *Noturus funebris* (Gilbert and Swain)
Tadpole madtom, *Noturus gyrinus* (Mitchill)

Pirate Perch Family, APHREDODERIDAE

Pirate perch, *Aphredoderus sayanus* (Gilliams)

Killifish Family, CYPRINODONTIDAE

Golden topminnow, *Fundulus chrysotus* (Günther)
Blackstripe topminnow, *Fundulus notatus* (Rafinesque)
Blackspotted topminnow, *Fundulus olivaceus* (Storer)

Livebearer Family, POECILIIDAE

Western mosquitofish, *Gambusia affinis* (Baird and Girard)
Sailfin molly, *Poecilia latipinna* (Lesueur)

Silverside Family, ATHERINIDAE

Brook silverside, *Labidesthes sicculus* (Cope)

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 miniatus* (Valenciennes)
Bantam sunfish, *Lepomis symmetricus* Forbes

Florida largemouth bass, *Micropterus floridanus* Kassler et al.
 Northern largemouth bass, *Micropterus salmoides* (Lacépède)
 White crappie, *Pomoxis annularis* Rafinesque
 Black crappie, *Pomoxis nigromaculatus* (Lesueur)

Perch Family, PERCIDAE

Bluntnose darter, *Etheostoma chlorosoma* (Hay)
 Swamp darter, *Etheostoma fusiforme* (Girard)
 Slough darter, *Etheostoma gracile* (Girard)
 Cypress darter, *Etheostoma proeliare* (Hay)
 Logperch, *Percina caprodes* (Rafinesque)

Drum Family, SCIAENIDAE

Freshwater drum, *Aplodinotus grunniens* Rafinesque

Nomenclature and phylogenetic order follows Nelson, *et al.* 2004. Common and Scientific Names of Fishes from the United States, Canada, and Mexico, 6th Edition. American Fisheries Society Special Publication 29. 386 pp. Exceptions are noted.

Genetics

Largemouth bass are collected during fall standardized electrofishing samples. Otoliths and livers are removed for age/growth and genetic analysis. Otoliths are sent to the age and growth laboratory at LDWF Baton Rouge headquarters and livers are sent to LSU for electrophoresis analysis (Table 6).

Table 6. Florida genome influence on Crooked Creek Reservoir largemouth bass populations during 2007.

Year	N	Northern	Florida	Hybrid	Florida Influence
2007	15	87%	0%	13%	13%
Values expressed as percent of sample by number					

Threatened/endangered/exotic species

No threatened or endangered species have been documented in Crooked Creek Reservoir to date.

Creel

No creel surveys have been conducted on Crooked Creek Reservoir.

HYDROLOGICAL CHANGES

Pine/Hardwood forest was clear cut in the late 1990's that lined the north and the northwest end of the reservoir. The activity caused the reservoir to become turbid after heavy rain events. The reservoir was turbid periodically for two years. Terrestrial forest regrowth has since occurred and turbidity has decreased.

Water use

Hunting - Yes – duck hunting

Skiing - Yes

Scuba Diving - No

Swimming - Yes

Irrigation - No

APPENDIX I
([return to Access](#))

Map of Crooked Creek Reservoir, LA



APPENDIX II

[\(return to Typemap\)](#)

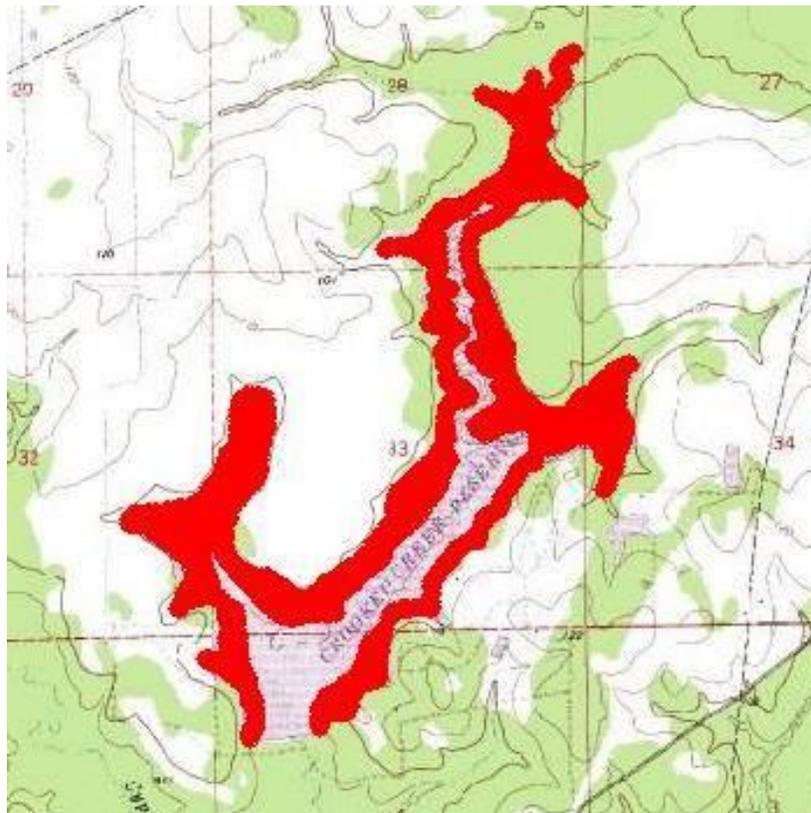
Aquatic Vegetation Type Maps and Narratives

Crooked Creek Reservoir Vegetation Survey - Feb. 2006

Jody David, Martin Plonsky

Red areas are thick with hydrilla (*Hydrilla verticillata*), mature water shield (*Brasenia schreberi*) and water primrose (*Ludwigia spp.*). All area of the reservoir in red is shallow areas of the reservoir with less than 7 feet of water. The location of the historical creek can be seen on the map. All areas of the reservoir outside of the creek bottom, except for the area of the reservoir adjacent to the spillway on the southern end of the reservoir, are shallow and possess the potential for further spread of nuisance vegetation such as hydrilla.

Other vegetation observed included coontail (*Ceratophyllum demersum*), bladderwort (*Utricularia spp.*), fanwort (*Cabomba caroliniana*) and bulrush (*Scirpus spp.*). There was a surprising lack of common salvinia (*Salvinia minima*) observed.



Crooked Creek Reservoir Vegetation Survey - October 2, 2012

Martin Plonsky

Crooked Creek continues to have a heavy infestation of water shield (*Brasenia schreberi*) with a thick mat of this plant covering the entire north end of the reservoir just north of the public swimming area of the reservoir. Patches of water shield were found throughout the reservoir primarily along the bank however these patches were small and not continuous as are the mats located on the north end of the reservoir. This north end location is shallow at an average depth of 4 feet. Within this accumulation of water shield is a very thick growth of fanwort (*Cabomba caroliniana*). Moderate amounts of hydrilla (*Hydrilla verticillata*) were found mixed with the fanwort as well as small amounts of coontail (*Ceratophyllum demersum*). A noticeable decrease in the amount of hydrilla found within the reservoir was observed. The cove across the reservoir from the boat launch was only slightly marked with hydrilla. The same was true of the boat launch and spillway with only a small patch of hydrilla seen adjacent to the boat launch and in corners of the spillway. Shoreline amounts of hydrilla were thin. In spring of 2012, 500 grass carp were stocked into the reservoir. On the shallow shoreline locations found around the reservoir were growing light amounts of duck potato (*Sagittaria lancifolia*), flat sedge (*Cyperus odoratus*), and water primrose (*Ludwigia spp.*). No floating vegetation was observed. No giant salvinia (*Salvinia molesta*) observed. Below are pictures of Crooked Creek Reservoir taken on Oct. 2, of 2012.



Water shield growth on north end of Crooked Creek Reservoir, LA LDWF file photo taken on Oct. 2, 2012.



North end Crooked Creek Reservoir looking left from above picture. Fringe vegetation is primarily water shield. LDWF file photo taken October 2, 2012.



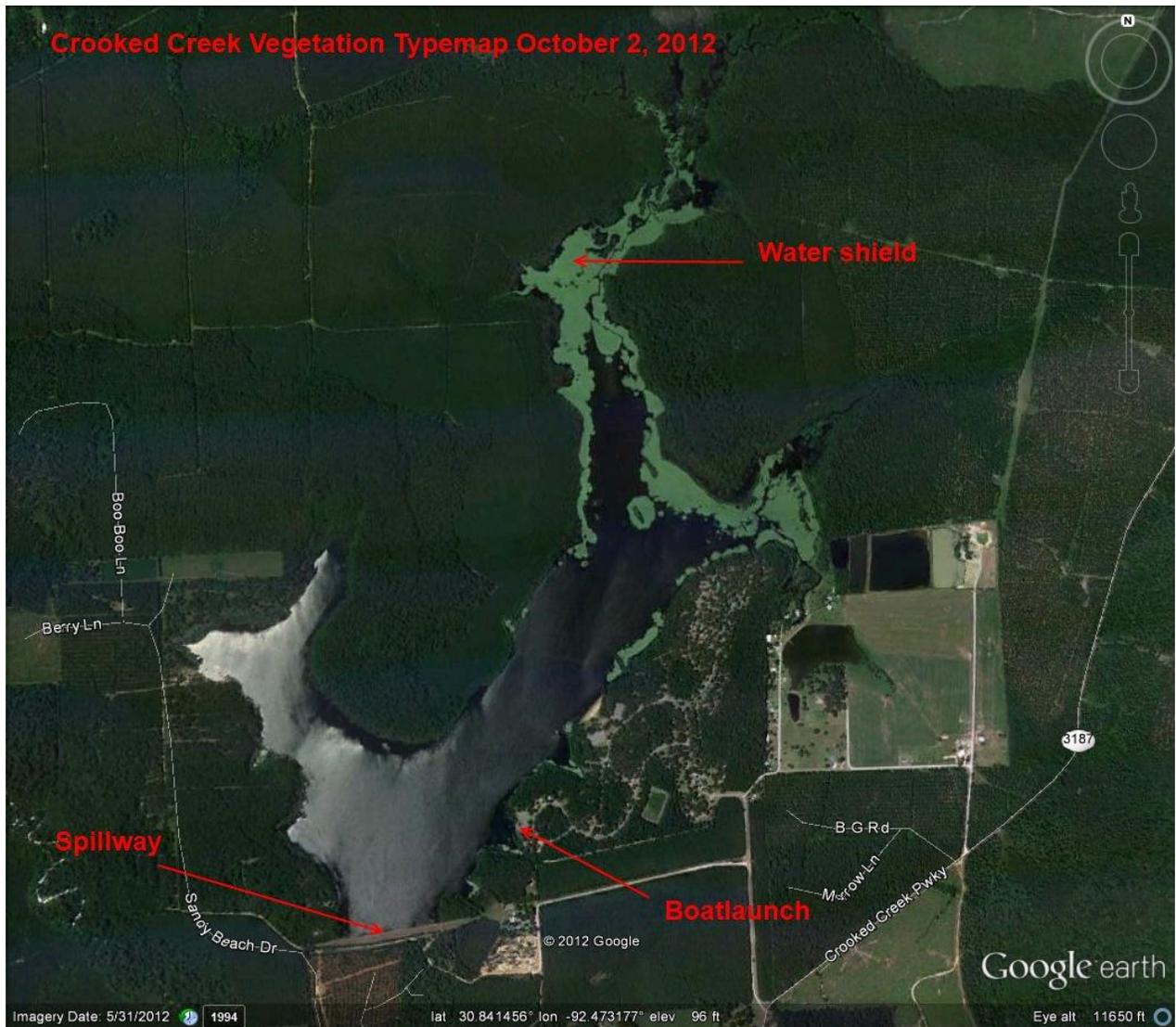
Close up of submerged vegetation found in north end of Crooked Creek Reservoir. LDWF file photo taken October 2, 2012.



Crooked Creek Reservoir looking west from boat launch. LDWF file photo taken October 2, 2012.



Crooked Creek Reservoir looking east towards boat launch. LDWF file photo taken October 2, 2012.



Crooked Creek Reservoir. Green mat on north end is water shield with heavy amounts of fanwort. Google Earth imagery on 5-31-12.

Crooked Creek Reservoir water data collected October 02, 2012 with YSI 6600 Sonde.

Date	Temp	SpCond	Salinity	Depth	pH	Turbidity+	Chlorophyl	d.o. percent	d.o. mg/l	location
10/02/12	24.62	0.793	0.39	0.181	9.43	5.3	11.7	79.50	6.60	mid lake
10/02/12	24.39	0.974	0.48	13.162	7.29	1189.8	27.8	12.00	1.00	mid lake
10/02/12	26.43	0.922	0.45	0.273	7.39	5.7	8.7	80.90	6.49	north flats