LOUISIANA DEPARTMENT OF WILDLIFE & FISHERIES

OFFICE OF FISHERIES
INLAND FISHERIES SECTION

PART VI –A

WATERBODY MANAGEMENT PLAN SERIES

BUNDICK LAKE

LAKE HISTORY & MANAGEMENT ISSUES

CHRONOLOGY

December 2007 - Prepared by
Bobby Reed, Biologist Manager, District 5

June 2010 – updated by
Bobby Reed, Biologist Manager, District 5
Edited by:
Mike Wood, Technical Advisor, Inland Fisheries

November 2012—updated by
Eric Shanks, Biologist Manager, District 5
Edited by:
Bobby C. Reed, Technical Advisor, Inland Fisheries

November 2014—updated by
Eric Shanks, Biologist Manager, District 5
Edited by:
Bobby C. Reed, Technical Advisor, Inland Fisheries

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LAKE HISTORY

GENERAL INFORMATION

Parish/ location:
Bundick Lake is located 5 miles west of Dry Creek, in east central Beauregard Parish, situated in south-west Louisiana. The dam and spillway are located 500 meters north of LA Hwy 394 in Section 5 & 6, T4S, R7W (30° 44' 30" N & 093° 06' 00" W). The reservoir is located on Bundick Creek approximately 25 miles up-stream of the Calcasieu River, which drains into the Gulf of Mexico at Cameron.

Date Lake formed:
Bundick Lake was constructed in 1958/61 and reached pool elevation in1962.

Impoundment:
Bundick Lake was created by the impoundment of Bundick Creek with an earthen dam at 4,200 feet in length with a 12' crown at elevation 110.0 mean sea level (MSL). Maximum embankment height is 40 feet and is constructed of a homogenous earth fill with stone rip-rap shore protection. Lakeside embankment slope is one-on-three with a 25' and 40' wide berm.

Ownership:
The State of Louisiana owns the water bottom and the Louisiana Department of Wildlife & Fisheries (LDWF) manages the fish and wildlife resources. The Louisiana Department of Transportation and Development (LDOTD) has authority and maintenance over the levees and associated structures as per Act 270 (see below).

Size (surface acres):
Bundick Lake covers a total of 1,750 acres (57,500 acre feet storage) at 95.0 MSL.

Water shed:
An area covering 208 square miles drains into Bundick Lake. The watershed to lake ratio is very large at 73 to 1. Watershed characteristics: Commercial pineland forest, upland hardwood, pasture. Soil is acidic, sandy, and infertile. Soil alkalinity and pH are low (< 10-12 mg/L $CaCO_3$ and 6.5-6.8, respectively). The watershed drains a medium-sized tributary of the Calcasieu River basin.

Pool stage:
95.0 feet Mean Sea Level at spillway crest. Lake levels can be monitored online at the United States Geological Survey site National Water Information System for Bundick Lake: USGS 08014881 Bundick Lake at Spillway near DeRidder, LA.

Drawdown (outlet) structure description:
Under ideal drying conditions, the reservoir can be drawn down about 3" per day with the gate opened to maximum height.
Gate size – 5 foot x 5 foot
Number of gates – 1
Construction – reinforced concrete control structure
Condition – Poor, the 2014 LDOTD inspector's report recommended the following corrective

actions:

1. Surface erosion is occurring on the upstream slope of the embankment near the drawdown structure intake tower. The erosion is to be monitored and repaired, as necessary.
2. Erosion is occurring next to the drawdown discharge structure, on both sides. The erosion is to be repaired, and alternate drainage is to be provided for the surface water runoff.

Flow rate – 25 cfs

Spillway:
Spillway location – the spillway is located on the southern end of Bundick Dam at the spillway park.
Spillway crest length – 200' at 95' MSL
Condition – poor with some weathering/pitting of concrete face as the structure is approaching 55 years of age; The LDOTD inspector's report for 2014 recommended the following corrective actions:

1. There are several concrete spalls as well as some sealant missing from the concrete joints of the spillway retaining walls. The spalls are to be sealed to prevent further erosion on the concrete and, where needed, joints in the concrete spillway and retaining walls are to be cleaned and resealed.
2. .

Capacity – 38,100 cubic feet per second (cfs)
Flow rate – present spillway design flood – 17.36"/5 days

Who controls: Louisiana Department of Transportation and Development is responsible for the maintenance and operation of 19 reservoir embankments, including Bundick Reservoir, to maintain their integrity and to prevent any breach or damage to the existing facilities as per RS 38:23 of Act 270 of 1984, which reads in part: "All dams, as hereinabove described, both federal and non-federal but excluding the Toledo Bend Dam, shall be under the jurisdiction of the state acting through the chief engineer of the Department of Transportation and Development, office of public works. The chief engineer, or his authorized representative, shall have supervision and overview of the construction, modification, operation, and maintenance of the dams to the extent required to protect life and property and to provide for the safety and welfare of the public."

As per this Act, LDOTD is responsible for operating the structure for emergency flood control. While the structure does not provide flood relief, it is often opened at the request of the public and local government for this purpose. Local LDOTD operation procedures consist of opening the gate when lake elevation reaches 97' MSL and closing it when the lake returns to pool elevation (per. comm. Steve Young, LDOTD). The LDOTD is also responsible in the event of a dam breach. Emergency Action Plans for Bundick Lake are on file with the Dam Safety and Water Resources Section of LDOTD in Baton Rouge, LA. Any non-emergency request for structure openings must be directed to the Secretary of LDOTD in writing from the Secretary of the Department of Wildlife and Fisheries (LDWF) or his designee. Verbal requests are not to be accepted. The letter from LDWF to LDOTD is to indicate the date for gate opening and the rate of drawdown desired for wildlife or lake management purposes**.** If a drawdown is requested by another agency for maintenance or repair purposes, LDWF still must send a letter to LDOTD.

Lake Authority:
Act 858 of the 1981 Legislature abolished approximately 19 special game and fish commissions including the Bundick Lake Game and Fish Commission which governed Bundick Lake. Authorities for lakes & structures were transferred to LDWF. However, parish government under state law can select/appoint a panel of interested/concerned citizens to serve on committees in an advisory capacity. Beauregard Parish has never exercised the option of appointing such a committee.

Lake Commission:
None

Private organization:

Bundick Lake Improvement Association
Marvin Brochette, President
Jerry Cobur, Vice President
Dry Creek, LA 71446

The Association is comprised of interested home and camp owners bordering or living near Bundick Lake. Membership is open to anyone interested in the use of the lake for recreation.

PUBLIC ACCESS

Boat launches:
Currently four boat ramps are associated with the public boat landings on Bundick Lake. They are located at the Spillway Park, Hopewell Bridge, Ray Coonce Landing and Clark's Landing Road **(SEE APPENDIX I – LAKE MAP W/BOAT LAUNCHES).** There are numerous private wharves and piers around the lake.

Piers:
While there are no public fishing piers on Bundick Lake, there are numerous private piers around the lake.

State/Federal facilities:
There is one state-owned facility – the Spillway boat ramp and wharf, is maintained by LDWF and DOTD. The grounds are cared for and maintained by Beauregard Parish.

Reefs:
There are currently no state-owned/operated artificial reefs.

SHORELINE DEVELOPMENT

State/National Parks:
There are currently no state or federally owned parks on Bundick Lake.

Shoreline Development by Landowners:
Approximately 40% of the shoreline is developed with homes and camps.

PHYSICAL DESCRIPTION

Shoreline length:
There are 14 miles of shoreline around Bundick Lake of which about ½ mile is armored with bulk heads, boat sheds and piers.

Timber type:
Forests surrounding Bundick Lake consist primarily of mixed upland pine/hardwood communities.

Average depth:
5.0 feet

Maximum depth:
24.0 feet

Natural seasonal water fluctuation:
0.5 – 5.0 feet

EVENTS / PROBLEMS

The floods of 1982, 1984 , 1989, and 2012:
In all instances, massive flooding occurred when heavy rains fell on the large watershed. In 1984, the lake was being held at 8 feet below pool elevation (87 MSL) during a planned drawdown event. Within a 24 hour period, the lake elevation rose to 103' MSL, for a total increase of 16' in water level. It was noted that the hydrostatic pressure of the water below the spillway sent water rushing upstream through the open drawdown gate and back into the lake. In March 2012, heavy rainfall from one event raised lake elevation to over 102' MSL in less than 24 hours. All events caused considerable flooding around the shoreline.

Since impoundment of Bundick Lake in 1962, a number of private structures have been constructed below the flood design elevation of 103.00 feet MSL (1962 LDOTD correspondence, Appendix III). Because of the extensive watershed, flooding was frequent in Bundick Creek before construction of the reservoir. Future flooding is expected to occur for the same reason. Private structures exist on foundations constructed at elevations of 97.00 MSL (flood stage) and above, with flood frequency being contingent on seasonal rainfall, gulf storm events, and land use practices within the 208 square mile watershed. Additionally, flood events will become more exacerbated in the future with land use changes in the watershed. Operation of the draw down gate by LDOTD for "flood control" (see who controls section above) has led to damage and untimely repairs on more than one occasion. Unfortunately, operation of the gate for such a purpose has negligible flood relief benefit. Since the installation of USGS gauges on Bundick Creek near DeRidder and at the spillway, residents have additional tools for forecasting flood events in the watershed.

MANAGEMENT ISSUES

AQUATIC VEGETATION

Bundick Lake had moderate to severe aquatic plant problems in the early years following impoundment. Water hyacinth and alligator weed infestations were prevalent in the western and northern sections of the lake. Repeated summer/fall drawdowns of 8.0 feet below pool to control noxious plants from 1963 until 1975, combined with aggressive spraying eventually controlled the vegetation. Recent drawdowns, employed primarily for fisheries management, have further reduced the growth of submersed and emergent aquatic plants. While hyacinth still exists in small "background" amounts, the problematic invasive plant in the past ten years has been common salvinia. The drawdown in the fall of 2004 was initiated because common salvinia coverage reached >70% of the lake surface by August of that summer. Peruvian water grass was first observed in 2008 and the invasive plant began to spread rapidly despite chemical treatment efforts. Use of the active ingredient imazapyr, in 2010, proved to be an effective control.

WATER QUALITY

There are several types of pollution that have, and still are affecting Bundick Lake. Prior to 1989, a point-source discharge of domestic sewage from Fort Polk Military Installation and the City of DeRidder contributed heavily (three to five million gallons daily) to the nutrient loading of Bundick Creek and Lake. Resulting plankton blooms and die-offs have resulted in extensive fish kills in the past, resulting from plankton-induced deficits in dissolved oxygen. Efforts to control water hyacinth during the 1960's and 1970 have resulted in considerable die-offs of vegetation following treatments. As the hyacinth decayed and blooming plankton died off, dissolved oxygen was removed from the water, and a considerable build-up of hydrogen sulfide (H_2S) occurred in the lower water column near the dam. There have been no reported H_2S problems since the late 1970's. The general seepage of sewage and lawn fertilizers from camps and homes adjacent to the lake continue to cause enrichment, with some controls being enforced by parish and state health officials. Silvicultural practices (clear cutting) and agricultural activities (row crops and pasture), combined with the unusually large watershed is responsible for increased "sediment loading" into Bundick Lake. The conversion of historic timber lands over time has resulted in more rapid and intensive runoff following rainfall events. This has resulted in a "delta" building process in the upper end of Bundick Lake, causing the lake to become shallower thru time. Excessive sedimentation and accompanying turbidity continue in the watershed today.

Type map:

SEE APPENDIX II for most recent type map.

Biomass:
No biomass sampling conducted.

Treatment history by year available:
Biological:
Common salvinia weevils were stocked in August 2008. Localized (<1km^2) control was observed from this stocking through spring 2009. No long term control was observed after this period.

Chemical:
During the 1960's and 1970's, 2,4-D was used regularly to control infestations of water hyacinth. In recent years, common salvinia, Peruvian water grass, and alligator weed have been the problematic plants treated most frequently by LDWF crews (Table 1).

Table 1. Bundick Lake herbicide treatment measures 2006-2014

Year	Number of Treatments*	Acres Treated	Primary Vegetation Treated
2006	13	148.6	Alligator weed, Common Salvinia, Primrose
2007	7	74.9	Water Hyacinth, Peruvian Watergrass, Alligator weed, Common Salvinia
2008	27	474.6	Water Hyacinth, Alligator weed, Common Salvinia, Peruvian Watergrass, Sedge
2009	10	225.4	Common Salvinia, Alligator weed, Peruvian Watergrass
2010	2	14.7	Alligator weed, Common Salvinia, Peruvian Watergrass
2011	10	199	Common salvinia, Peruvian watergrass, Water Hyacinth, Alligator weed
2012	8	210	Common salvinia, Peruvian watergrass, Alligator weed, Primrose
2013	5	122	Peruvian Watergrass, Common Salvinia, Primrose
2014	10	254	Common Salvinia, Cut Grass, Alligator weed, Peruvian Watergrass

*For reporting purposes, a treatment is defined as one crew for one day.

Herbicide selection and application rates are based on LDWF Herbicide Application Procedures and determined by the estimated coverage of target plant species. Historically, water hyacinth, alligator weed, and primrose were treated with 2,4-D (0.5 gal/acre), and common salvinia was treated with glyphosate (0.75 gal/acre) or diquat (0.75 gal/acre). Currently, water hyacinth is still treated with 2,4-D (0.5 gal/acre) while salvinia spp. are treated with a mixture of 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) surfactants. Imazapyr (0.5 gal/acre) and imazamox (0.5 gal/acre) are alternated for control of Peruvian watergrass, alligator weed, and primrose. These broad spectrum herbicides are the only ones that have proven effective at controlling Peruvian watergrass.

A small amount (<5 acres) of giant salvinia was observed for the first time during routine spraying operations in 2011. It was observed again in the same location in 2014 in similar amounts.

Physical:
The 2014 fall drawdown was initiated because common salvinia covered >70% of the lake surface by August. The overall biomass of common salvinia was reduced as a result of the drawdown. A fall/winter drawdown was conducted in 2013 at the request of shoreline residents which also provided additional control of aquatic vegetation. The drawdown history of Bundick Lake is provided in Table 2 and includes drawdown dates, purpose, and successes of the drawdowns.

HISTORY OF FISHING REGULATIONS

Recreational:
Statewide regulations applied for all fish species since impoundment in 1959.

Included: Black Bass (largemouth, spotted): 15 daily of any size

April 1, 1991 - Black bass management plan was implemented with state-wide daily creel limit of 10 with no minimum length as a conservation measure. A listing of Louisiana recreational fishing regulations can be found at: http://www.wlf.louisiana.gov/regulations

Commercial:
The 2015 commercial fishing regulations may be viewed at the link below:
http://www.wlf.louisiana.gov/fishing/regulations

The use of gill nets, trammel nets, and hoop nets are prohibited in Bundick Lake.

DRAWDOWN HISTORY

In 2013, Bundick Lake drawdowns were scheduled for a 5 year rotation. The drawdowns will provide biological benefits, but the primary purpose is to allow for maintenance of shoreline properties. The lake will be dewatered to an elevation of 5-7 feet below spillway crest height. Drawdowns will start in mid-September and extend to mid-January.

There may be instances when conditions require a Bundick Lake drawdown before the scheduled period. Examples could include spillway maintenance or vegetation control. In that event, the rotation will reset the five year period between drawdowns.

Table 2. Bundick Lake, LA drawdown descriptions from 1966 – 2014.

Drawdown Date	Fall/Winter 2013/2014—September 10 to January 15
Purpose	Shoreline maintenance, boat lane maintenance, public boat ramp/pier maintenance and construction, drawdown structure and spillway maintenance
Success	Good—90% of all planned work items accomplished (see Appendix III)
Fishing Closure	No
Depth Below Pool	Initially 4’-5’, then 5’-7’ from mid-October to drawdown conclusion

Estimated % Exposed	40%-60%
Who Operated Structure	DOTD
Any Fish Kills	None reported
Drawdown Date	Fall/Winter 2004/2005 – September 15 to January 15
Purpose	Control aquatic plants - salvinia
Success	Excellent
Fishing Closure	No
Depth Below Pool	8 – 10’
Estimated % Exposed	60%
Who Operated Structure	DOTD
Any Fish Kills	None reported
Drawdown Date	Fall/winter 1997/1998 – September 15 to January 15
Purpose	Correct fish imbalance
Success	Good
Fishing Closure	No
Depth Below Pool	8 – 10’
Estimated % Exposed	60%
Who Operated Structure	DOTD
Any Fish Kills	None reported
Drawdown Date	Fall/winter 1992/1993 – September 15 to January 15
Purpose	Correct fish imbalance
Success	Fair – excessive rainfall
Fishing Closure	No
Depth Below Pool	8 – 10’
Estimated % Exposed	60%

Who Operated Structure	DOTD
Any Fish Kills	None reported
Drawdown Date	Fall/winter 1987-1988 – Sept. 15 to Jan. 15
Purpose	Correct imbalance of fish populations; property owner repairs
Success	Good
Fishing Closure	No
Depth Below Pool	8 – 10’
Estimated % Exposed	60%
Who Operated Structure	DOTD
Any Fish Kills	None reported
Drawdown Date	Fall/winter 1983-1984 – Sept. 15 to Jan. 15
Purpose	Correct fish imbalance
Success	Good
Fishing Closure	No
Depth Below Pool	8 – 10’
Estimated % Exposed	60%
Who Operated Structure	DOTD
Any Fish Kills	None reported
Drawdown Date	Summer/fall 1976 – Aug. 1 to Jan. 30
Purpose	Control nuisance aquatic vegetation – water hyacinth
Success	Good
Fishing Closure	No
Depth Below Pool	6 – 8’
Estimated % Exposed	50%

Who Operated Structure	LDWF
Any Fish Kills	None reported
Drawdown Date	Summer/fall 1973 – Aug. 1 to Nov. 30
Purpose	Control nuisance aquatic vegetation – water hyacinth
Success	Fair to good
Fishing Closure	No
Depth Below Pool	6 – 8’
Estimated % Exposed	50%
Who Operated Structure	LDWF
Any Fish Kills	None reported
Drawdown Date	Summer/fall annually 1966-71 – Aug. 1 to Nov. 30
Purpose	Control nuisance aquatic vegetation – water hyacinth & other floating and submersed aquatic vegetation
Success	Poor to fair
Fishing Closure	No
Depth Below Pool	6 – 8’
Estimated % Exposed	50%
Who Operated Structure	LDWF
Any Fish Kills	None reported

FISH KILLS / DISEASE HISTORY

LMBV:
Largemouth bass were sampled in Bundick Lake in 2002 for the presence of Largemouth Bass Virus. In a sample of 11 bass, 1 fish or 9.1%, tested positive for LMBV. No LMBV kills have been documented.

Fish Kills:
There were scattered reports of dead fish following Hurricane Rita in September of 2005.

CONTAMINANTS / POLLUTION

Contaminants/pollution:
Water quality in Bundick Lake and creek is monitored regularly by the Louisiana Department of Environmental Quality (LDEQ) – Water Resources Division. Samples are taken monthly during the years the lake is surveyed. Fish flesh is tested annually by LDEQ for mercury levels. No health advisories are posted for Bundick Lake.
http://www.deq.louisiana.gov/portal/default.aspx?tabid=1631

Water quality:
The Louisiana Department of Environmental Quality (LDEQ) measures water quality in Bundick Lake on a monthly basis. Individual sample sites are listed in the table below. Parameters include dissolved oxygen, pH, temperature, alkalinity, specific conductance, total hardness, TDS, and TSS. Water quality data is available through written request at the LDEQ website at: http://www.deq.louisiana.gov/portal/DIVISIONS/WaterPermits/WaterQualityAssessment/AmbientWaterQualityMonitoringData.aspx
Water quality parameters (pH, Temp., DO, and conductivity) are measured in association with LDWF fisheries samples.

Table 3. Louisiana Department of Environmental Quality water quality sample site information.

Station Type	Site ID	Site Name	Site Location	Subsegment
STREAM	0834	Bundick Creek northwest of Bundick Lake	Hopewell Crossing Road bridge, (PR 291), northwest of Bundick Lake, 9.2 miles SE of Ikes	LA030506_00
LAKE	0835	Bundick Lake northwest of Dry Creek, Louisiana	end of wharf at dam boat launch in Bundick Lake, 4.9 miles NW of Dry Creek, 11.3 miles NE of Longville, 9.2 miles SW of Sugartown	LA030507_00
STREAM	0836	Bundick Creek Southeast of Dry Creek, Louisiana	at Marrow Bridge Road Bridge, 1.5 miles SE of Dry Creek, 7.5 miles SW of Mittie, 8.0 miles NW of Harmony	LA030508_00

Water level:
Water fluctuation considered to be normal includes levels of 0.5 to 2.0 feet above spillway crest. Lake levels can be monitored online at the United States Geological Survey (USGS) site National Water Information System for Bundick Lake: USGS 08014881 Bundick Lake at Spillway near DeRidder, LA. Current and historic data are available at: http://waterdata.usgs.gov/la/nwis/uv/?site_no=08014881.

Fish Samples:

Gear:
From 1966 through 1989, biomass (rotenone) surveys were the preferred method of sampling fish populations in Bundick Lake. Biomass surveys have been greatly scaled back primarily due to negative public sentiment. LDWF standardized sampling methods including; electrofishing, gillnets, seines, leadnets, and creel surveys have been employed to assess population attributes from 1989 – 2014. Table 4 lists the historical, and planned sampling efforts for Bundick Lake since 1989.

Rotenone (standing crop estimates) sampling was conducted on Bundick Lake in: 1966, 1967, 1968, 1970, 1974 - 1976, 1979, 1982, 1984, 1988, 1989 and 1993.

Historical, Recent and Scheduled Sampling:

Table 4. Bundick Lake, LA historical and scheduled sampling from 1989 – 2016.

1989	Aquatic Type Map Electrofishing 4-15 minute samples (spring and fall) Gill Nets - 3 samples each, 2.5, 3.0, 3.5, & 4.0 Shoreline seining – 3 hauls Water quality sampling
1990	Aquatic Type Map Electrofishing 4-15 minute samples (spring and fall) Gill Nets - 3 samples each, 2.5, 3.0, 3.5, & 4.0 Shoreline seining – 3 hauls Water quality sampling
1991	Aquatic Type Map Electrofishing 4-15 minute samples (spring and fall) Gill Nets - 3 samples each, 2.5, 3.0, 3.5, & 4.0 Shoreline seining – 3 hauls Water quality sampling
1992	Aquatic Type Map Electrofishing 4-15 minute samples (spring and fall) Gill Nets - 3 samples each, 2.5, 3.0, 3.5, & 4.0 Shoreline seining – 3 hauls Water quality sampling

1993	Aquatic Type Map Electrofishing 4-15 minute samples (spring and fall) Gill Nets - 3 samples each, 2.5, 3.0, 3.5, & 4.0 Shoreline seining – 3 hauls Rotenone 4-one acre sets Water quality sampling
1994	Aquatic Type Map Electrofishing 4-15 minute samples (spring and fall) Gill Nets - 3 samples each, 2.5, 3.0, 3.5, & 4.0 Shoreline seining – 3 hauls Water quality sampling
1995	Aquatic Type Map Electrofishing 4-15 minute samples (spring and fall) Gill Nets - 3 samples each, 2.5, 3.0, 3.5, & 4.0 Shoreline seining – 3 hauls Water quality sampling
1996	Aquatic Type Map Electrofishing 4-15 minute samples (spring and fall) Gill Nets - 3 samples each, 2.5, 3.0, 3.5, & 4.0 Shoreline seining – 3 hauls Water quality sampling
1997	Aquatic Type Map Electrofishing 4-15 minute samples (spring and fall) Gill Nets - 3 samples each, 2.5, 3.0, 3.5, & 4.0 Shoreline seining – 3 hauls Water quality sampling
1998	Aquatic Type Map Electrofishing 4-15 minute samples (spring and fall) Gill Nets - 3 samples each, 2.5, 3.0, 3.5, & 4.0 Shoreline seining – 3 hauls Water quality sampling
1999	Aquatic Type Map Electrofishing 4-15 minute samples (spring and fall) Gill Nets - 3 samples each, 2.5, 3.0, 3.5, & 4.0 Shoreline seining – 3 hauls Water quality sampling

2000	Aquatic Type Map Electrofishing 4-15 minute samples (spring and fall) Gill Nets - 3 samples each, 2.5, 3.0, 3.5, & 4.0 Shoreline seining – 3 hauls Water quality sampling
2001	Aquatic Type Map Electrofishing 4-15 minute samples (spring and fall) Gill Nets - 3 samples each, 2.5, 3.0, 3.5, & 4.0 Shoreline seining – 3 hauls
2002	Aquatic Type Map Electrofishing 4-15 minute samples (spring and fall) Gill Nets - 3 samples each, 2.5, 3.0, 3.5, & 4.0 Shoreline seining – 3 hauls Creel Survey
2003	Aquatic Type Map Electrofishing 4-15 minute samples (spring and fall) Gill Nets - 3 samples each, 2.5, 3.0, 3.5, & 4.0 Shoreline seining – 3 hauls
2004	Aquatic Type Map Electrofishing 4-15 minute samples (spring and fall) Gill Nets - 3 samples each, 2.5, 3.0, 3.5, & 4.0 Shoreline seining – 3 hauls
2005	Aquatic Type Map Electrofishing 4-15 minute samples (spring and fall) Gill Nets - 3 samples each, 2.5, 3.0, 3.5, & 4.0 Shoreline seining – 3 hauls
2006	Aquatic Type Map Electrofishing 4-15 minute samples (spring and fall) Gill Nets - 3 samples each, 2.5, 3.0, 3.5, & 4.0 Shoreline seining –4 hauls Lead nets – 3 sets Water quality sampling

2007	Aquatic Type Map Electrofishing 4-15 minute samples (spring and fall) Gill Nets - 3 samples each, 2.5, 3.0, 3.5, & 4.0 Shoreline seining – 4 hauls Water quality sampling
2008	Aquatic Type Map Electrofishing 4-15 minute samples (spring and fall) Gill Nets - 2 samples each, 2.5, 3.0, 3.5, & 4.0 Shoreline seining – 4 hauls Water quality sampling
2009	Aquatic Type Map Electrofishing 4-15 minute samples (spring and fall) Gill Nets - 3 samples each, 2.5, 3.0, 3.5, & 4.0 Shoreline seining – 4 hauls Water quality sampling
2010	Aquatic Type Map Electrofishing 4-15 minute samples (spring and fall) Gill Nets - 3 samples each, 2.5, 3.0, 3.5, & 4.0 Shoreline seining – 4 hauls Water quality sampling
2011	Aquatic Type Map Electrofishing 4-15 minute samples (fall) Water quality sampling
2012	Aquatic Type Map Electrofishing 4-15 minute samples (spring and fall) Lead nets -3 stations (age/growth) Water Quality Sampling
2013	Aquatic Type Map Electrofishing 4-15 minute samples (spring) Lead nets -3 stations (age/growth) Water Quality Sampling Fall Drawdown
2014	Aquatic Type Map Electrofishing 4-15 minute samples (spring and fall) Lead nets: 3 stations (age/growth) Water Quality Sampling

2015	Aquatic Type Map Electrofishing 4-15 minute samples (spring and fall) LMB Age/Growth/Mortality and stocking evaluation Water quality sampling
2016	Aquatic Type Map Electrofishing 4-15 minute samples (spring and fall) LMB Age/Growth/Mortality and stocking evaluation Water quality sampling Creel Survey

Age and Growth:

Age and growth of largemouth bass was determined by otolith analysis from bass collected in the fall of 1989 and spring of 1990. Largemouth bass otoliths were also collected in 2000, 2004, 2006, 2008 and 2009. Crappie age & growth analysis was conducted in 2003 and 2006. A standardized age, growth, and mortality project was conducted on crappie from 2012-2014. Results of this study should be available in 2015.

Stocking:

The stocking history for Bundick Lake is listed in Table 5. Introductions at the impoundment included: largemouth bass (Northern and Florida sub-species, bluegill, redear, blue catfish and hybrid stripers).

Table 5. Stocking history of Bundick Lake, LA from 1961 – 2005.

Year	LMB (Florida)	LMB (Northern)	Bluegill	Redear	Blue Catfish	Hybrid Striped Bass
1961		X	X	X		
1981						5,070
1982					20,809	10,000
1983						10,000
1984						10,545
1985						10,000
1986	34,000					10,400
1987						10,000
1988						10,000
1989						20,000
1990						20,000
1991						20,000
1993						102,250 fry
1994						350,000 fry
2002						6,250
2003	11,125					
2004	33,950					
2005	43,300					
2014	40,724*					
TOTALS	**163,099**				**20,809**	**588,265**

*Includes 25,100 phase II fingerlings.

Species profile:

A checklist of fishes collected or historically known to occur in the Bundick Creek drainage, Beauregard Parish, Louisiana is listed in Table 6 below.

Table 6. Fishes collected or known to occur in the Bundick Creek drainage of Louisiana.

Family, Scientific and Common Names

Petromyzontidae - lampreys {2}
- *Ichthyomyzon castaneus* Girard, 1858 - chestnut lamprey
- *Ichthyomyzon gagei* Hubbs and Trautman, 1937 - southern brook lamprey

Polyodontidae - paddlefishes {1}
- *Polyodon spathula* (Walbaum, 1792) – paddlefish

Lepisosteidae - gars {2}
- *Lepisosteus oculatus* Winchell, 1864 - spotted gar
- *Lepisosteus osseus* (Linnaeus, 1758) - longnose gar

Amiidae - bowfin {1}
- *Amia calva* Linnaeus, 1766 – bowfin

Clupeidae - herrings {2}
- *Dorosoma cepedianum* (Lesueur, 1818) - gizzard shad
- *Dorosoma petenense* (Günther, 1867) - threadfin shad

Cyprinidae - carps and minnows {13}
- *Cyprinus carpio* Linnaeus, 1758 - common carp [Introduced]
- *Cyprinella venusta* Girard, 1856 - blacktail shiner
- *Hybognathus nuchalis* Agassiz, 1855 - Mississippi silvery shiner
- *Hybopsis amnis* (Hubbs, and Greene, 1951) - pallid shiner
- *Lythrurus fumeus* (Evermann, 1892) - ribbon shiner
- *Lythrurus umbratilis* (Girard, 1856) - redfin shiner
- *Notemigonus crysoleucas* (Mitchill, 1814) - golden shiner
- *Notropis atrocaudalis* Evermann, 1892 - blackspot shiner
- *Notropis sabinae* Jordan and Gilbert, 1886 - Sabine shiner
- *Notropis texanus* (Girard, 1856) - weed shiner
- *Notropis volucellus* (Cope, 1865) - mimic shiner
- *Opsopoeodus emiliae* Hay, 1881 - pugnose minnow
- *Pimephales vigilax* (Baird and Girard, 1853) bullhead minnow

Catostomidae - suckers {4}
- *Erimyzon sucetta* (Lacépède, 1803) - lake chubsucker
- *Ictiobus bubalus* (Rafinesque, 1818) - smallmouth buffalo
- *Minytrema melanops* (Rafinesque, 1820) - spotted sucker
- *Moxostoma poecilurum* Jordan, 1877 - blacktail redhorse

Ictaluridae - North American catfishes {7}
- *Ameiurus melas* (Rafinesque, 1820) - black bullhead
- *Ameiurus natalis* (Lesueur, 1819) - yellow bullhead
- *Ictalurus furcatus* (Lesueur, 1840) - blue catfish

Ictalurus punctatus (Rafinesque, 1810 - channel catfish
Noturus gyrinus (Mitchill, 1817) - tadpole madtom
Noturus nocturnus Jordan and Gilbert, 1886 - freckled madtom
Pylodictis olivaris (Rafinesque, 1818) - flathead catfish

Esocidae - pikes {1}
Esox americanus Gmelin, 1789 - redfin pickerel

Aphredoderidae - pirate perch {1}
Aphredoderus sayanus (Gilliams, 1824) - pirate perch

Atherinopsidae - New World silversides {1}
Labidesthes sicculus (Cope, 1865) - brook silverside

Fundulidae - topminnows {2}
Fundulus notatus (Rafinesque, 1820) - blackstripe topminnow
Fundulus olivaceus (Storer, 1845) - blackspotted topminnow

Poeciliidae - livebearers {2}
Gambusia affinis (Baird and Girard, 1853) - western mosquitofish
Heterandria formosa Agassiz, 1855 - least killifish [Introduced?]

Moronidae - temperate basses {1}
Morone mississippiensis Jordan and Evermann, 1887 - yellow bass

Centrarchidae - sunfishes {13}
Centrarchus macropterus (Lacépède, 1801) - flier
Lepomis cyanellus Rafinesque, 1819 - green sunfish
Lepomis gulosus (Cuvier, 1829) – warmouth
Lepomis humilis (Girard, 1858) - orangespotted sunfish
Lepomis macrochirus Rafinesque, 1819 – bluegill
Lepomis marginatus (Holbrook, 1855) - dollar sunfish
Lepomis megalotis (Rafinesque, 1820) - longear sunfish
Lepomis microlophus (Gunther, 1859) - redear sunfish
Lepomis miniatus Jordan, 1877 - redspotted sunfish
Lepomis symmetricus Forbes, 1883 - bantam sunfish
Micropterus salmoides (Lacépède, 1802) - largemouth bass
Micropterus punctulatus (Rafinesque, 1819) - spotted bass
Pomoxis annularis Rafinesque, 1818 - white crappie
Pomoxis nigromaculatus (Lesueur, 1829) - black crappie

Percidae - perches {9}
Ammocrypta vivax Hay, 1882 - scaly sand darter
Etheostoma chlorosomum (Hay, 1880) - bluntnose darter
Etheostoma collettei Birdsong and Knapp, 1969 - creole darter
Etheostoma gracile (Girard, 1859) - slough darter
Etheostoma histrio Jordan and Gilbert, 1887 - harlequin darter
Etheostoma proeliare (Hay, 1880) - cypress darter
Percina macrolepida Stevenson, 1971 - bigscale logperch
Percina maculata (Girard, 1859) - blackside darter
Percina sciera (Swain, 1883) - dusky darter

Sciaenidae - drums and croakers {1}

Aplodinotus grunniens Rafinesque – Freshwater drum

Elassomatidae - pygmy sunfish {1}

Elassoma zonatum Jordan, 1877 - banded pygmy sunfish

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:

Genetic analysis was conducted on largemouth bass liver tissue samples collected on Bundick Lake during the 1988, 2003, 2006, 2008, and 2009 fall electrofishing samples. Allozyme starch gel electrophoresis analyses were conducted at the Louisiana State University School of Renewable Natural Resources genetics laboratory.

Table 7. Results of genetic testing of largemouth bass in Bundick Lake from 1988, 2003, 2006, 2008, and 2009.

Year	Sample Size (n)	Northern	Florida	Hybrid	Florida Influence
1988	30	94.4%	0%	6.6%	6.6%
2003	31	81%	0%	19%	19%
2006	41	90%	0%	10%	10%
2008	50	88%	2%	10%	12%
2009	53	81%	0%	19%	19%

Threatened/endangered/exotic species:

Bald eagles have been known to nest annually since 2004 along the north central shoreline of Bundick Lake.

Figure 1. Photograph of bald eagle taken on Bundick Lake courtesy Bobby Reed, LDWF.

CREEL

Historic Information/Type:
A recreational angler survey (creel survey) was conducted over a 12-month period during 2002 to determine angler effort and catch rates. Roving boat/angler counts were made at random during each scheduled interview period to allow expansion of data to estimate total angler attributes. Creel survey results are discussed in Part B of the management plan.

WATER USE

Hunting:
Waterfowl hunting is permitted during the legal open season.

Water Skiing:
Recreational water sports are limited due to the many stumps in Bundick Lake.

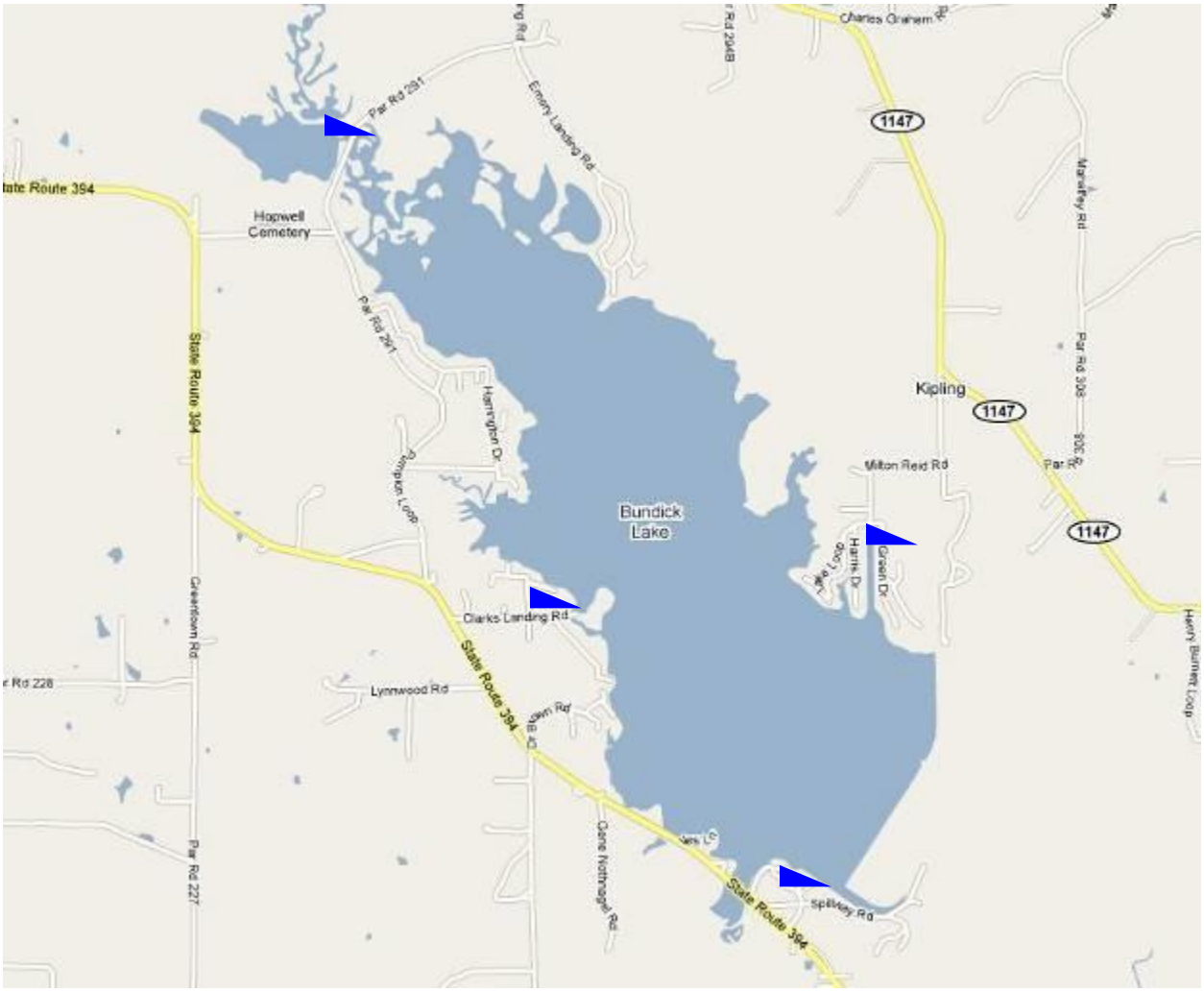
Swimming:
There are no public swimming areas on Bundick Lake. Where it does occur, it is swim at your own risk.

Irrigation:
There are no agricultural or municipal water withdrawals for the purpose of irrigation. Several private property owners have personal irrigation systems designed for yard and garden watering only.

APPENDIX I

LAKE MAP W/BOAT LAUNCHES AND PIERS

(Click here to return)



Ramp Name – clockwise from lower center	Coordinates	Ramp	Parking
Spillway Park	30°43’36.64” N - 93°05’43.76” W	concrete	Dirt, 25 trailers
Clark’s Landing	30°44’26.95” N - 93°06’ 35.25” W	gravel	Dirt, 5 trailers
Hopewell Bridge	30°45’56.52” N - 93°07’26.44” W	concrete	Gravel 10 trailers
Ray Coonce Landing	30°44’42.73” N - 93°05’ 35.29” W	concrete	Asphalt, 5 trailers

APPENDIX II

(return to previous page)

BUNDICK LAKE
September 2014
Robby Maxwell

Bundick Lake, in Beauregard Parish, was surveyed for the presence of aquatic vegetation on September 24, 2014. On the day of the survey, water clarity was 61 cm as measured by secchi disk. The lake was slightly less turbid than it was during last year's vegetation survey. Water levels were at pool stage of 95'.

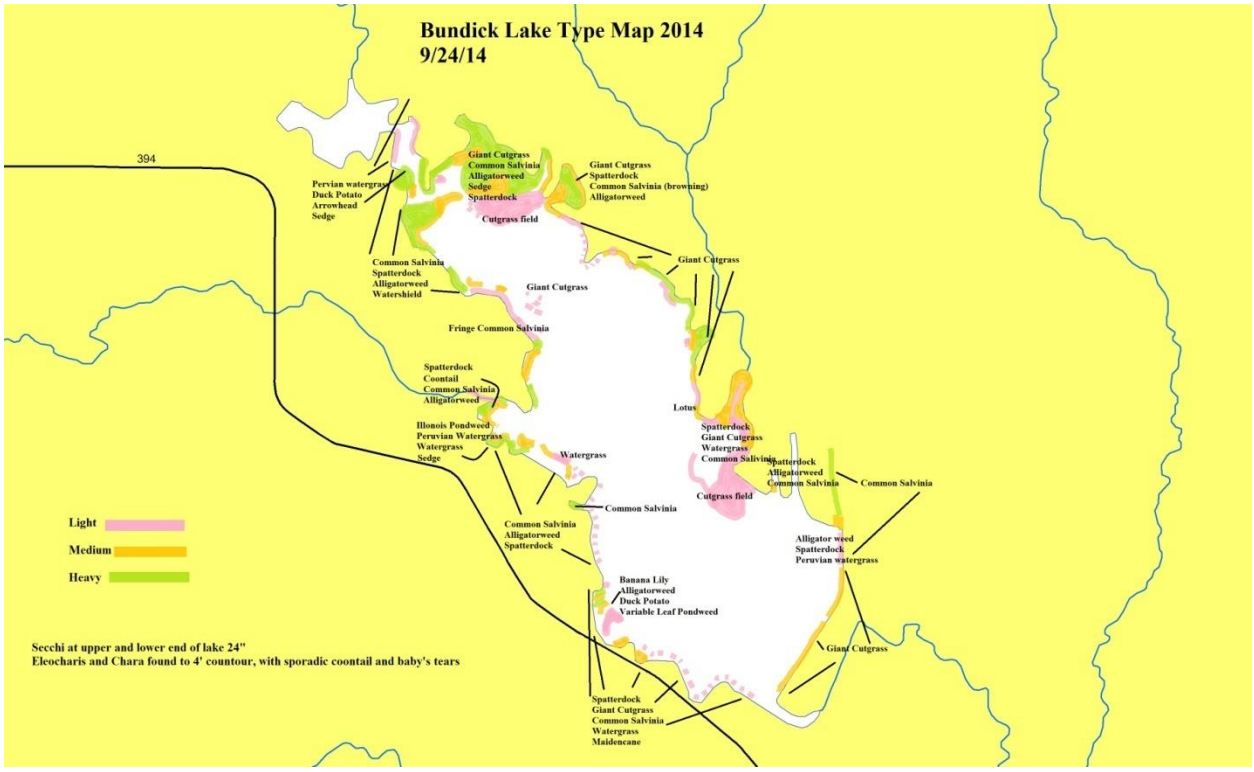
Plant densities on the type map were designated as "Low," "Medium," or "High." Heaviest infestations were on the flats in the northwestern portion of the lake. Other heavily infested areas were in shallow coves. Giant cutgrass (*Zizaniopsis* miliacea) has become a very significant cause of concern, with large stands on the northern end, eastern end, and along the dam. The other most common species of concern in these areas were common salvinia (*Salvinia minima*) and alligator weed (*Alternanthera philoxeroides*). Other species of concern that occurred more sporadically included Peruvian water grass (*Luziola peruviana*), and Cuban bulrush (*Oxycaryum cubense*).

Other species that were noted in varying densities included spatterdock (*Nuphar luteum*) on multiples shorelines, elephant ear (*Colocasia esculenta*) on multiple shorelines, American lotus (*Nelumbo lutea*) on the western end, arrowhead (*Sagittaria sp.*), maidencane (*Panicum hemitomon*), and water shield (*Brasenia* schreberi).

Submerged aquatic vegetation was observed in varying amounts throughout the lake, and was found up to the 3' contour of the lake. Species observed included coontail (*Ceratophyllum demersum*) in the northern half of the lake, variable leaf pondweed (*Potamogeton diversifolius*) on the western shoreline, Illinois pondweed (*Potamogeton illinoensis*), and stonewort (*Nitella sp.*) though out the lake.

Giant cutgrass has become a very large problem since the drawdown, and spray crews are addressing it. There are large stands on the northern and eastern shores of the lake that could impede access, drastically.

Common salvinia continues to be a chronic problem on the lake, and Cuban bulrush is sporadically observed wherever salvinia is found. We will continue our efforts to control the problem. Many areas of high coverage are filling in and too shallow to access. We will address these areas as much as our equipment and water levels will allow.


Bundick Lake Type Map 2014
9/24/14
394
Pervian watergrass
Duck Potato
Arrowhead
Sedge
Giant Cutgrass
Common Salvinia
Alligatorweed
Sedge
Spatterdock
Cutgrass field
Giant Cutgrass
Spatterdock
Common Salvinia (browning)
Alligatorweed
Common Salvinia
Spatterdock
Alligatorweed
Watershield
Giant Cutgrass
Giant Cutgrass
Fringe Common Salvinia
Spatterdock
Coontail
Common Salvinia
Alligatorweed
Lotus
Illonois Pondweed
Peruvian Watergrass
Watergrass
Sedge
Watergrass
Spatterdock
Giant Cutgrass
Watergrass
Common Salvinia
Spatterdock
Alligatorweed
Common Salvinia
Common Salvinia
Cutgrass field
Common Salvinia
Common Salvinia
Alligatorweed
Spatterdock
Alligator weed
Spatterdock
Peruvian watergrass
Banana Lily
Alligatorweed
Duck Potato
Variable Leaf Pondweed
Giant Cutgrass
Spatterdock
Giant Cutgrass
Common Salvinia
Watergrass
Maidencane
Light
Medium
Heavy
Secchi at upper and lower end of lake 24"
Eleocharis and Chara found to 4' countour, with sporadic coontail and baby's tears

APPENDIX III

Work Performed on Bundick Lake During 2013 Drawdown

Work performed by Louisiana Dept. of Transportation and Development:

- Repaired spillway boat launch by filling voids beneath ramp.
- Vegetation removal around spillway and drawdown structure.
- Cleaned spillway of vegetation and debris.
- Repaired drawdown structure.
- Assisted BPPJ with rebuilding of 100' pier.

Work performed by the Beauregard Parish Police Jury:

- Completed construction of new pier at spillway launch.
- Repair and improvement of Hopewell Bridge launch.
- Cleared and remarked existing boat lanes.
- Debris removal in access canals.

Remaining work items:

- Clean and seal joints on spillway and adjacent retaining walls (LDOTD), to be performed by contractor during next drawdown.