LOUISIANA DEPARTMENT OF WILDLIFE & FISHERIES

OFFICE OF FISHERIES
INLAND FISH SECTION

PART VI-A

WATERBODY MANAGEMENT PLAN SERIES

IVAN LAKE

LAKE HISTORY & MANAGEMENT ISSUES

CHRONOLOGY

DOCUMENT SCHEDULED TO BE UPDATED ANNUALLY

April 2011—Prepared By:

James Seales, Biologist III, District 1
Jeff Sibley, Biologist Supervisor, District 1
Kevin Houston, Biologist III, District 1

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Lake History

GENERAL INFORMATION

Parish/ location:
Bossier

Date Lake Formed:
Dam project started in 1955, completed in 1958 and flooded shortly thereafter, reaching pool stage at an unknown date in the spring of 1958.

Impoundment:
Ivan Lake dam consists of a 1,300 ft. earthen embankment with a 35ft. wide crown. The crown includes an 18ft. blacktop roadway running total length and beyond with an approximate 3 to 1 slope. Dam extends across Caney Creek and a branch of Philips Creek. The entire project lies within the Bodcau Wildlife Management Area (WMA).

Size (surface area):
520 acres

Watershed:
55 square miles of area (35,200 acres) drain into Ivan Lake. The ratio of watershed to lake surface is 68:1.
Watershed characteristics: Plantation pine, mixed hardwoods, and pasture. Soils are acidic, sandy, and somewhat infertile. Soil pH is low. Tests from lake soil indicate a pH ranging from 5.15 to 5.28.

Pool Stage:
Surface elevation of Ivan Lake is set at the spillway elevation of 200 feet MSL (mean sea level).

Spillway Width:
200 ft. non-gated ogee spillway and stilling basin

Drawdown (outlet) structure description:
Intake Structure—42 inch CMP (Corrugated Metal Pipe) with circular gate and concrete structure with trash gate
Outlet Structure—42 inch CMP set in concrete headwall with wing-walls and toe-wall

Who Controls:
Owned by U.S. Army Corps of Engineers (USACE), the Louisiana Department of Wildlife and Fisheries (LDWF) was granted license to manage the lake on October 22, 2009. Prior to this time, the Bossier Parish Police Jury (BPPJ) was licensed to manage the reservoir. (**APPENDIX I** contains a copy of the current license). See "Events/Problems" section below for more details. The dam and spillway structure are controlled and maintained by the Louisiana Department of Transportation and Development (DOTD).

LAKE AUTHORITY

The lake is owned by the USACE, and LDWF is licensed to manage Ivan Lake and Bodcau WMA which contains the lake. See "Events/Problems" section below for more details.

Association:
None

Authorization:
Not Applicable

ACCESS

Boat Ramps:
One public launch is located near the dam with limited facilities (primitive camping area with outdoor toilets). To reach ramp, travel west on LA Hwy 160 from Cotton Valley. Turn right on Ivan Lake Rd, and then travel northward across dam to ramp facility. Coordinates for the boat ramp on Ivan Lake are 32.830714º N and 93.492836º W. See Ivan Public Boat Ramps - **APPENDIX II.**

Permits:
As Ivan Lake is contained in the Bodcau WMA, a LDWF self-clearing permit is required for all activities on Ivan Lake. A permit station is located near the public

launch facility. In addition to a self-clearing permit, persons using the WMA for any purpose other than hunting must possess one of the following: a valid Wild Louisiana Stamp, a valid Louisiana fishing license, or a valid Louisiana hunting license. Persons younger than 16 or older than 60 years of age are exempt from this requirement. A WMA Hunting Permit is required for persons age 18-59 to hunt on the WMA. For more information concerning permit requirements refer to the current Louisiana Hunting Regulations Pamphlet, or visit the Department of Wildlife and Fisheries website; http://www.wlf.louisiana.gov/

Piers:
A public pier is associated with the public boat launch at the dam.

State/Federal Facilities:
Ivan Lake lies within Bodcau Wildlife Management Area which is owned by the USACE and managed by LDWF. Persons using Ivan Lake are subject to the same regulations, permit and license requirements as those utilizing other areas of Bodcau WMA. See the section above on "Permits" and consult the current Louisiana Hunting Regulation Pamphlet for more information.

A small park area including picnic tables, primitive camp sites, and outdoor toilets are associated with the public boat launch.

Artificial Reefs:
None

SHORELINE DEVELOPMENT

The majority of the lake is surrounded by woodlands, with a few residential properties located adjacent to the lake on the southeast shoreline.

PHYSICAL DESCRIPTION OF LAKE

Shoreline Length:
9.5 miles

Timber Type:
Prior to impoundment the bottom of Ivan Lake consisted of a mixed pine - deciduous forest with bottomland hardwoods along the creek channel. Very little timber was removed prior to flooding the lakebed. Subsequently, dying timber formed a jungle of dead logs, snags, and stubble. Some of the remaining timber on the lower end of the lake was removed during a drawdown in 1967.

Average Depth:
6.46 feet

Maximum Depth:
20 feet

Total Water Volume at Pool Stage:
3,360 acre feet storage capacity

Natural Seasonal Water Fluctuation:
2-3 feet

EVENTS/ PROBLEMS

Early Drawdowns

According to the undated "Ivan Lake Management Plan" prepared by LDWF biologists, the timber in Ivan Lake died after impoundment of the lake resulting in a tangle of dead logs, snags and stubble. Most likely prepared during the early 1960's, this management plan can be found in **APPENDIX III**. The un-cleared timber precluded much recreational use of the lake, especially skiing, and swimming. When this early plan was prepared, native submergent and emergent aquatic vegetation had become problematic in the shallow areas of the lake.

Several of the recommendations outlined in this early or "Initial Management Plan", were implemented when the lake was completely dewatered in 1967 to allow for clearing and snagging of the timber on the lower end of the lake. A concrete boat ramp was also constructed adjacent to the picnic area near the dam at this time.

The early plan also called for annual fall/winter drawdowns for control of aquatic vegetation and to increase fish production. The suggested drawdowns were to be carried out annually for a period of five years but were never implemented on an annual basis.

The lake was completely dewatered in the latter part of July 1974 in order for the Department of Public Works to make extensive repairs to the earthen dam and renovations to the spillway.

Recent Drawdowns and Lakebed Renovation

Ivan Lake was completely dewatered by accident while undergoing a drawdown for hydrilla control in 2004 (Figure 1). The drawdown was to be the first of five consecutive fall-winter drawdowns for hydrilla control in accordance with the

Ivan Lake Aquatic Vegetation Management Plan prepared by LDWF. A fish kill followed this accidental dewatering, and an investigation showed a large number of sport fish died as a result of this event. Once it was discovered that the lake had been drained, DOTD was contacted, the gate closed, and the lake allowed to refill to the prescribed 6' drawdown level. Evaluations of the remaining fish population by LDWF personnel revealed an abundance of rough fish, with few sport fish remaining in the lake.

Figure 1. Ivan Lake following accidental complete dewatering in the fall of 2004. LDWF file photo.

Ivan Lake has needed lakebed renovation for several years and this unfortunate circumstance yielded an opportune time to implement such a plan. The reservoir was experiencing symptoms associated with the aging or eutrophication process of a lake. Bottom sediments were comprised largely of fine silts, sands, and organic muck from the excessive aquatic plant growth and leaf litter from adjacent forests. A complete drawdown of the lake during the summer would allow for oxidation and compaction of bottom sediments which would improve water quality and spawning habitat. Prolonged desiccation should deplete the tuber and turion stocks in the soil, thereby reducing the overall hydrilla coverage. Additionally, shallow areas may need reshaping and deepening to improve shorelines and reduce aquatic plant growth. The construction of gravel spawning beds and fishing piers are other potential improvements that could be achieved during the drawdowns. Removal of the remaining fish population with the pesticide rotenone will be necessary prior to any restocking efforts. Species to be

stocked following renovation would include Florida largemouth bass, black crappie, bluegill, redear, and channel catfish.

During the second scheduled drawdown, the lake was completely dewatered at the request of the Louisiana Department of Transportation and Development (DOTD), so that a leaking control gate could be inspected. This drawdown began on September 15, 2005. Good drying conditions were observed on many areas of the lake bed that fall.

The third drawdown in the series was delayed until early September 2006, to facilitate repairs being made on the Bodcau dam located downstream from Ivan Lake. The lake was dewatered to the maximum extent once again to allow for maximum drying of the lake bed. The control gate remained open throughout the year as DOTD and the USACE inspected and made repairs to the control structure. The control gate was to remain open indefinitely in preparation for a lake renovation project.

The Bossier Parish Police Jury (BPPJ) was licensed by the USACE for construction, operation and maintenance of dam, lake, and recreational area known as Ivan Lake in April of 1955. This license was renewed in April of 1980 for a second 25 year period. On April 6, 2005 the license expired and the BPPJ decided not to renew the license. The USACE inquired about the possibility of LDWF assuming the operation and maintenance of Ivan Lake following the expiration date of the lease in April of 2005. The letter, which is incorrectly dated April 11, 2004, is displayed in **APPENDIX IV**. The issue of greatest concern expressed in this correspondence was the possibility of Ivan Lake being closed for public use. Upon receipt of the correspondence, LDWF began investigating the possibility of assuming responsibility for Ivan Lake.

Prior to LDWF entering into an agreement for Ivan Lake, several issues related to maintenance and repair had to be resolved. This included repairs to the dam, control structure and outflow pipe, along with ensuring that other entities would continue routine maintenance of the dam, picnic area, and restroom facility. LDWF also wanted to make sure that other improvements to the lake such as fishing piers, fish attractors, channel marking, and shoreline enhancements could be achieved under the terms of the agreement. Once plans and agreements were reached, Ivan Lake was incorporated into the USACE-LDWF Agreement along with Bodcau WMA. The current License, which was granted on October 22, 2009, is for a 25 year period.

A meeting was held during June 2010 to begin planning the renovation of Ivan Lake. The parties involved in the renovation discussions included: BPPJ, DOTD, USACE, state Senator Adley's Office, and LDWF. The primary focus were the repairs or replacement to the outflow conduit and the recent soil slides along the berm of the dam. It was agreed that the BPPJ and DOTD would be responsible

for replacement of the outflow conduit and LDWF would provide funding for construction of a secondary support berm for the dam.

Engineers from DOTD and the BPPJ drew up plans for the repair of the dam. The project was submitted for bids and was completed XXXXXXXXXXXXXX. Soil from the lake bed was tested and confirmed to be suitable for construction of the secondary support berm.

Restoration improvements planned by LDWF include but are not limited to, shoreline improvements for fishing access, fishing piers, boat lanes, artificial reefs, gravel beds, and sportfish restocking. A conceptual design of these improvements to the lake can be found in **APPENDIX V**.

A cultural resource survey was conducted to insure that no significant archeological sites would be impacted by the renovation work on the lake bed. The areas included in this survey are depicted by the map in **APPENDIX VI**.

On October 12, 2010 an application of 5% liquid rotenone was made to the remaining pockets of water found within the lakebed (Figures 2 and 3). The application was made by LDWF personnel with assistance from local USACE personnel. This fish eradication effort was to remove any undesirable fish prior to future restocking efforts. Moribund fish observed following the treatment included spotted gar, bigmouth buffalo, largemouth bass, channel catfish, and gizzard shad. Several weeks after the treatment, 800 yards of 2” flag webbing was deployed in the creek and borrow pit, then checked periodically over the course of a month. One decomposed spotted gar was collected during this effort.

Figure 2. Application of liquid rotenone to water remaining in creek channel at maximum drawdown in an effort to eradicate the existing fish population prior to restocking following renovations to Ivan Lake. LDWF file photo taken October 12, 2010.

Figure 3. Liquid rotenone applied to creek channel and other areas not accessible by boat. LDWF file photo taken October 12, 2010.

MANAGEMENT ISSUES

AQUATIC VEGETATION

Native emergent and submergent aquatic vegetation was becoming problematic on Ivan Lake in the early 1960's by the time the "Ivan Lake Management Plan" was written. The most prevalent submersed species at that time included: bladderwort (*Utricularia spp.*), coontail (*Ceratophyllum demersum*), and two species of pondweed (*Potamogeton spp.*). Prevalent emergent aquatic vegetation consisted of: water-shield (*Brasenia schreberi*), water primrose (*Ludwigia octovalis*), and cat-tail (*Typha spp.*).

A drawdown was conducted in 1967 for clearing timber. During this time the lake was drawn down to the lowest level. Correspondence indicates that another drawdown was requested by the Bossier Parish Police Jury in 1969 for vegetation control. It is not known whether this drawdown occurred, but correspondence indicates that aquatic vegetation was problematic again in 1972.

Ivan Lake has extensive areas of shallow water that are susceptible to aquatic vegetation infestations (Figure 4). It is suspected that aquatic growth increased over time as the lake aged and the eutrophication process accelerated.

Figure 4. Aquatic vegetation is problematic in many areas of Ivan Lake due to the large expanses of shallow water. LDWF file photo.

Little information is noted in the files regarding the specifics of vegetation problems on Ivan Lake until the mid-1990's. In 1997, separate vegetation surveys were conducted by LDWF and the USACE. Problem plants noted were coontail (*Ceratophyllum demersum*), American lotus (*Nelumbo lutea*), alligatorweed (*Alternanthera philoxeroides*), Eurasian watermilfoil (*Myriophyllum spicatum*), variable-leaf milfoil (*Myriophyllum heterophyllum*) and hydrilla (*Hydrilla verticillata*). Hydrilla was first documented during 1996, and was found scattered throughout the lake during the survey conducted by LDWF on June 10, 1997. Total coverage of aquatic vegetation was estimated at 20% or approximately 100 acres during each survey.

Concern from the public and the BPPJ over aquatic vegetation problems and lack of angler success prompted a series of meetings between LDWF, USACE and the BPPJ in 1997. Options discussed included herbicide applications, biological controls, and drawdowns. A decision was reached to proceed with a 6' drawdown for aquatic vegetation control that year.

By 2002, hydrilla infestations were severe enough that a series of drawdowns were recommended as a control measure. Surveys conducted in 2003 revealed submerged vegetation covered approximately 35% of the lake, with the most problematic species being hydrilla. In 2004, a control plan was implemented to reduce hydrilla infestations (**APPENDIX VII**).

Hydrilla coverage was found to be greatly reduced during the 2005 vegetation survey. A determination was made to continue with the existing plan for hydrilla control and continue the drawdowns. Subsequently the lake has been dewatered much of the time since 2005 for various reasons pertaining to lake renovation (see Table 1, Drawdown History section). An aerial view of Ivan Lake during one of the drawdowns from 2005 until present is shown in Figure 5.

Aquatic Vegetation Surveys and Type Maps:

Surveys of aquatic vegetation conducted in 1997 did not include a type map. Type map surveys were conducted in 2002 and 2005. See **Appendix VIII**.

Aquatic Vegetation Treatment History:

Drawdown conducted in 1997 for alligatorweed, lotus, coontail and hydrilla. Drawdowns conducted annually 2004-present for hydrilla.

HISTORY OF REGULATIONS

Recreational

Statewide regulations have been in effect for all species since impoundment.

Black Bass (Largemouth/Spotted) –No size limit, 10 daily bag limit

Crappie -50 daily bag limit

White Bass -50 daily bag limit

Yellow Bass – 50 daily bag limit

Striped Bass or Hybrid Striped Bass (or any combination thereof) – 5 daily, no more than two over 30” maximum total length.

Blue Catfish*- 12" min. total length

Channel Catfish*- 11" min. total length

Flathead Catfish-* 14" min. total length

*The possession limit for catfish caught recreationally shall be 100. A recreational fisherman may possess a maximum of 25 undersized catfish of a single or combination of all three species within the 100 fish possession limit.
Crawfish – 150 pounds daily

Shad—50 pounds daily

Buffalo Fish (or their hybrids) - 16" min. total length and 25/day

Freshwater Drum (Gaspergou) - 12" min. total length and 25/day

Bowfin (Choupique) — 16" minimum total length

Sturgeon—No legal harvest or possession

Paddlefish*– 30” maximum fork length limit (measured from tip of lower jaw to fork of tail), 2/day

*The incidental take and possession of paddlefish is allowed under the following conditions: *The taking or possession of paddlefish is closed in all saltwater areas of the state and in border waters shared with Texas. All possessed paddlefish must be dead. The possession or transportation of live paddlefish is prohibited. All paddlefish possessed on the waters of the state shall be maintained intact. No person shall possess paddlefish eggs on the waters of the state which are not fully*

attached to the fish. The daily take and possession limit of paddlefish is two per person. All paddlefish greater than 30 inches lower jaw fork length must be returned to the water immediately.

Commercial

Commercial fishermen must return all undersized fish to waters without injury. Any commercial species upon which there is no specified size limit may be taken in any size and quantity.

Five percent of each species of commercial fish by number may be smaller than the legal limit, except channel catfish of which 10 percent by number may be smaller than the legal size limit.

Blue Catfish (*Ictalurus furcatus*) – 12 inches minimum total length

Channel Catfish (*Ictalurus punctatus*) – 11 inches minimum total length

Flathead Catfish (*Pylodictis olivaris*) – 14 inches minimum total length

Freshwater Drum (*Aplodinotus grunniens*) – 12 inches minimum total length

Buffalo (*Ictiobus spp*.) – 16 inches minimum total length

Bowfin (*Amia calva*) – 22 inches minimum total length. Fishermen are prohibited, while on the water, from possessing bowfin eggs (roe) that are not naturally connected to a whole fish. The taking of bowfin with nets or bowfin body parts, including eggs (roe), is prohibited during the months of December, January, and February.

DRAWDOWN HISTORY

Ivan Lake has been drawn down for various reasons since its impoundment ranging from construction improvements to vegetation control (Table 1).

Table 1. Drawdown history of Ivan Lake, LA from 1967 to 2008.

Year	Date(s)	Depth Below Pool	Purpose
1967	Unknown	18 Feet-Maximum	Clear timber. Concrete boat ramp built during this time.
1969	Unknown	Unknown	May of 1969, letter from BPPJ letter requesting USACE to lower lake for vegetation control-no further documentation on file.
1974	End of July	18 Feet-Maximum	Dam and spillway renovation. Public Works estimated that approximately 85% water body coverage be reduced for repairs.
1997	August 18-	6 Feet	Vegetation control and maintenance & repair of

	December 15		structures.
2002	Sept 3-Jan 1, 2003	3-4" per day No depth specified	Hydrilla control-did not take place because request processed too late to meet necessary dates for hydrilla control
2003	Sept 13-Jan 19, 2004	6 Feet	Hydrilla control-did not take place- no letter was sent requesting the drawdown from BPPJ.
2004	Sept 13-Jan 24, 2005	6 Feet	Hydrilla control-first in a series of five consecutive drawdowns. Lake was accidentally dewatered at a rapid rate to maximum level by DOTD resulting in major fish kill. Discovered on Oct 4th.
2005	Sept 15-Jan 23, 2006	8 Feet scheduled then to 18ft.	Hydrilla control-Second in series of 5. Proposed 8' but DOTD requested maximum to make repairs to and inspect the control structure.
2006	Aug 28-Jan 31, 2007*	18 Feet Maximum	Hydrilla Control-3rd in series of 5, dewatered to maximum to allow more drying of lake bed in preparations for renovation project. Delayed opening until early Sept due to repairs being made downstream on Bodcau Dam. Gates remained open throughout 2007 as USACE and DOTD made necessary inspections and repairs to control structures.
2007	All Year	18 Feet Maximum	Gates remained open all year for necessary repairs and inspections. Water levels fluctuated drastically during this time as the lake filled and drained several times due to large watershed, thus prevent growth of problematic terrestrial plants such as willow trees. This represents the fourth year of the series of 5 drawdowns for hydrilla control.
2008	Sept 3-indefinitely	18 Feet Maximum	Fifth in series of 5 for Hydrilla control. Maximum depth to get most drying benefits, and possibly to insert repair sleeve into drawdown pipe. Gates are to remain open until further notice pending action by LDWF to take control of lease and possibly renovate lake bottom.

Figure 5. Aerial view of Ivan Lake following complete dewatering in preparation for lake renovations. LDWF file photo.

FISH KILLS/ DISEASE HISTORY, LMBV

1967-Lake completely dewatered for repairs to dam and spillway. There is no record in the files at District 1 office regarding fish kills during this period; however, there are letters in the following years requesting stocking due to apparent reduction in fish populations. Anecdotal information from local residents indicate that a large fish kill may have occurred as these residents recall catching fish that were piping in the creek channel and borrow pit near the dam.

2004- . The Lake was undergoing a prescribed drawdown of 6 feet below pool for hydrilla control when the lake was inadvertently drained to the maximum extent. On October 4, 2004 a major fish kill was reported and investigations made. Due to conditions on the lake, a quantitative count could not be made of all species present or numbers dead. It can be surmised that a majority of fish perished in the event. Subsequent sampling yielded few fish collected. Fish collected were generally small or of an undesirable species.

Largemouth bass from Ivan Lake have not been tested for largemouth bass virus. No fish kills have occurred that would indicate the largemouth bass virus is a problem in Ivan Lake.

CONTAMINATS/POLLUTION

A Fish Consumption Advisory was issued for Ivan Lake on 11/20/00. The advisory indicates unacceptable levels of mercury in bowfin and largemouth bass. See **Appendix IX** for complete details of advisory.

BIOLOGICAL

Fish Sampling History:

Ivan Lake has been sampled for fisheries resources since post impoundment through 2005 (Table 2).

Table 2. Fish samples taken on Ivan Lake, LA from 1963 to 2005.

IVAN LAKE SAMPLING	
YEAR	**GEAR**
1963	2, 1-acre rotenone samples
1967	2, 1-acre rotenone samples
1972 (July)	2, 1-acre rotenone samples
1977 (May)	1, 1-acre rotenone sample
1992 (Fall)	Electrofishing 1-15 minute sample Age and Growth samples collected
1993 (June)	Electrofishing 3+-15 minute samples (3,000 seconds)
1997 (April)	Electrofishing 4-15 minute samples
1998 (May)	Electrofishing 4-15 minute samples
2001 Spring and Fall	Electrofishing 4-15 minute samples Spring 5-15 minute samples in Fall (including forage sample plus age and growth)
2004 (December)	Gill nets 2 stations 2 samples each
2005	Electrofishing(March) 3-15 minute samples Shoreline seine 3 stations (July)

Lake Records:

There are no records kept specifically for Ivan Lake by LOWA. For more information on state records, visit http://www.laoutdoorwriters.com/LinkClick.aspx?fileticket=raz4WbMqdQY=&tabid=87

Stocking History:

Ivan Lake received initial fish stockings in 1958, just after impoundment, then a stocking of channel catfish in 1970 (Table 3).

Table 3. The stocking history of Ivan Lake, LA from 1958 to 1970

Date	Number stocked/Species stocked
1958	Initial stocking of bluegill and largemouth bass actual numbers stocked unknown
1970	35,000 channel catfish fingerlings

Species Profile:

List of indigenous freshwater fishes found in Ivan Lake through standardized sampling efforts.

Gar Family, LEPISOSTEIDAE
Spotted gar, *Lepisosteus oculatus* (Winchell)

Bowfin Family, AMIIDAE
Bowfin, *Amia calva* Linnaeus

Herring Family, CLUPEIDAE
Gizzard shad, *Dorosoma cepedianum* (Lesueur)

Minnow Family, CYPRINIDAE
Golden shiner, *Notemigonus crysoleucas* (Mitchill)

Sucker Family, CATOSTOMIDAE
Lake chubsucker, *Erimyzon sucetta* (Lacépède)
Bigmouth buffalo, *Ictiobus cyprinellus* (Valenciennes)

Freshwater Catfish Family, ICTALURIDAE
Black bullhead, *Ameiurus melas* (Rafinesque)
Yellow bullhead, *Ameiurus natalis* (Lesueur)
Channel catfish, *Ictalurus punctatus* (Rafinesque)
Flathead catfish, *Pylodictis olivaris* (Rafinesque)

Pike Family, ESOCIDAE
Chain pickerel, *Esox niger* Lesueur

Pirate Perch Family, APHREDODERIDAE
Pirate perch, *Aphredoderus sayanus* (Gilliams)

Killifish Family, CYPRINODONTIDAE

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

Livebearer Family, POECILIIDAE
Western mosquitofish, *Gambusia affinis* (Baird and Girard)

Silverside Family, ATHERINIDAE
Brook silverside, *Labidesthes sicculus* (Cope)

Sunfish Family, CENTRARCHIDAE
Flier, *Centrarchus macropterus* (Lacépède)
Green sunfish, *Lepomis cyanellus* Rafinesque
Warmouth, *Lepomis gulosus* (Cuvier)
Bluegill, *Lepomis macrochirus* (Rafinesque)
Longear sunfish, *Lepomis megalotis* (Rafinesque)
Redear sunfish, *Lepomis microlophus* (Günther)
Spotted sunfish, *Lepomis punctatus* (Valenciennes)
Northern largemouth bass, *Micropterus salmoides* (Lacépède)
White crappie, *Pomoxis annularis* Rafinesque
Black crappie, *Pomoxis nigromaculatus* (Lesueur)

Largemouth Bass Genetics:
No Largemouth Bass Genetic information has been collected for Ivan Lake.

Comment [TEL1]: Is this still the case?

Threatened/Endangered/Exotic Species:
No threatened or endangered fish species are known to inhabit Ivan Lake.

CREEL

No creel surveys have been conducted on Ivan Lake.

HYDROLOGICAL CHANGES

Ivan Lake was impounded in 1958. The lake was completely dewatered in 1967 and again in 1974 for repairs and renovation work. In 2004, the lake was accidentally completely dewatered during the first in a series of five scheduled drawdowns for hydrilla control. From 2004 until 2012 Ivan Lake remained dry with the control gates open for renovation efforts. The gate was closed in ??? and water allowed to pool. Ivan reached pool stage in ??????Due to the large watershed, the lake fills rapidly following periods of heavy rain.

WATER USE

Fishing, waterfowl hunting, swimming, boating, some water sports (limited due to excessive timber/snags).

APPENDIX I – Current License Agreement

DEPARTMENT OF THE ARMY
VICKSBURG DISTRICT, CORPS OF ENGINEERS
4155 CLAY STREET
VICKSBURG, MISSISSIPPI 39183-3435

REPLY TO
ATTENTION OF:

RECEIVED
APR 26 2010
LEGAL DIVISION

April 23, 2010

Real Estate Division
Realty Services Branch

SUBJECT: Bayou Bodcau Wildlife Management Area, Louisiana, Louisiana Department of Wildlife and Fisheries, License Contract No. DACW38-3-10-5

Louisiana Department of Wildlife and Fisheries
Attention: Ms. Yolanda Martin
Suite 462
Post Office Box 98000
Baton Rouge, Louisiana 70898

Dear Ms. Martin:

Enclosed for your files is an executed original of subject license allowing the Louisiana Department of Wildlife and Fisheries to continue to operate and maintain the Bayou Bodcau Wildlife Management Area (enclosure 1).

If you should have any questions concerning this instrument, please contact Mr. Guy Barnett of my staff at (601) 631-7294.

Sincerely,

Robert S. Wood
Chief, Real Estate Division

Enclosure

LOUISIANA DEPARTMENT OF
WILDLIFE AND FISHERIES

CONTRACT NO. DACW38-3-10-5

DEPARTMENT OF THE ARMY LICENSE

FOR FISH AND WILDLIFE ACTIVITIES ON

BAYOU BODCAU RESERVOIR

BOSSIER AND WEBSTER PARISHES, LOUISIANA

THE SECRETARY OF THE ARMY, hereinafter referred to as the Secretary, under authority of Section 4, Act of Congress, 22 December 1944, as amended (16 U.S.C. 460d) and Section 3, Fish and Wildlife Coordination Act of 1934, as amended (16 U.S.C. Sec. 663), hereby grants to **THE LOUISIANA DEPARTMENT OF WILDLIFE AND FISHERIES**, hereinafter referred to as the grantee, a license to operate and maintain 32,766.08 acres, more or less, for fish and wildlife activities over, across, in, and upon lands of the United States, as identified in Exhibits "A-1", "A-2", and "A-3", attached hereto and made a part hereof, hereinafter referred to as the premises.

THIS LICENSE is granted subject to the following conditions:

1. **TERM**

This license is granted for a term of twenty five (25) years, beginning 22 October 2009 and ending 21 October 2034, but revocable at will by the Secretary.

2. **CONSIDERATION**

The consideration for this license is a support role in the operation and maintenance of the premises by the grantee for the benefit of the United States and the general public in accordance with the conditions herein set forth.

3. **NOTICES**

All correspondence and notices to be given pursuant to this license shall be addressed, if to the grantee to:

Louisiana Department of Wildlife and
Fisheries
Attention: Secretary
Post Office Box 98000
Baton Rouge, Louisiana 70898

Enclosure 1

and if to the United States, to the:

USAED, Vicksburg District Engineer
Attention: Chief, Real Estate Division
4155 Clay Street
Vicksburg, Mississippi 39183-3435

or as may from time to time otherwise be directed by the parties. Notice shall be deemed to have been duly given if and when enclosed in a properly sealed envelope, or wrapper, addressed as aforesaid, and deposited, postage prepaid, in a post office regularly maintained by the United States Postal Service.

4. AUTHORIZED REPRESENTATIVES

Except as otherwise specifically provided, any reference herein to "Secretary", "District Engineer", or "said officer" shall include their duly authorized representatives. Any reference to "grantee" shall include any duly authorized representatives.

5. SUPERVISION BY THE DISTRICT ENGINEER

The use and occupation of the premises shall be subject to the general supervision and approval of the District Engineer, hereinafter referred to as said officer, and to such rules and regulations as may be prescribed from time to time by said officer.

6. STRUCTURES AND EQUIPMENT

The grantee shall have the right, during the term of the license, to erect such structures and to provide such equipment upon the premises to accomplish the purposes of the license and as provided for in the Annual Management Plan. Those structures and equipment shall be and remain the property of the grantee, except as otherwise provided in the condition on **RESTORATION**.

7. ANNUAL MANAGEMENT PLANS

The grantee shall administer the premises in accordance with an Annual Management Plan which shows the management and development activities to be undertaken by the grantee. No later than 1 October of each year, the grantee will submit the Annual Management Plan to be mutually agreed upon between the grantee and the said officer. Such Annual Management Plan shall include but is not limited to the following:

a. Plans for management, maintenance, and development activities to be undertaken by the grantee or jointly by the Corps of Engineers and the grantee which shall include plans for any proposed structures and improvements.

b. The areas to be utilized for agricultural purposes.

c. The variety and scope of crops to be planted, as well as any rotations.

d. The type of wildlife cover to be cultivated, if any.

e. The areas designated for various species of fish and wildlife propagation.

8. FISH AND WILDLIFE ACTIVITIES

a. The grantee may plant or harvest crops, either directly, by service contract, by sharecrop agreements with local farmers, or by agricultural agreements to provide food and/or habitat for wildlife and for the development and conservation of land, fish and wildlife, forests, and other natural resources. Where feasible, contracts and agreements with third parties shall be by competitive bid procedures.

b. Any lands not being managed by the grantee for wildlife habitat will be made available for lease by the said officer for agricultural or grazing purposes under conditions which would not be incompatible with the grantee's use of the premises.

c. The grantee may take, trap, remove, stock, or otherwise control all forms of fish and wildlife on the premises, and may place therein such additional forms of fish and wildlife as it may desire from time to time, and shall have the right to close the area, or any parts thereof from time to time, to fishing, hunting or trapping, provided that the closing of any area to such use shall be consistent with the state laws for the protection of fish and wildlife.

9. ACCOUNTS, RECORDS AND RECEIPTS

a. All monies received by the grantee from operations conducted on the premises may be utilized by the grantee for the administration, maintenance, operation, and development of the premises. Beginning 5 years from the date of this license and continuing at 5-year intervals, any such monies not so utilized or

programmed for utilization within a reasonable time shall be paid to the said officer. The grantee shall provide an annual statement of receipts and expenditures to the said officer. The said officer shall have the right to perform audits of the grantee's records and accounts.

b. Payment of direct expenses is authorized for planning and development of optimum wildlife habitat including planting of wildlife food plots, necessary timber clearing, erosion control, or habitat improvements such as shelter, restocking of fish and wildlife, and protection of endangered species. Payment of grantee's employees who are directly engaged in such activities at the project is also authorized. However, proceeds will not be used for the payment of general administrative expenses.

c. Proceeds derived from the sale of fishing and hunting leases are not subject to this condition.

10. APPLICABLE LAWS AND REGULATIONS

The grantee shall comply with all applicable federal, state, county, and municipal laws, ordinances, and regulations wherein the premises are located.

11. CONDITIONAL USE BY GRANTEE

The exercise of the privileges herein granted shall be:

a. without cost or expense to the United States;

b. subject to the right of the United States to improve, use, or maintain the premises.

c. subject to other outgrants of the United States on the premises.

d. personal to the grantee, and this license, or any interest therein, may not be transferred or assigned.

12. CONDITION OF PREMISES

The grantee acknowledges that it has inspected the premises, knows its condition, and understands that the same is granted without any representations or warranties whatsoever and without any obligation on the part of the United States.

13. **PROTECTION OF PROPERTY**

The premises shall at all times be protected and maintained in good order and condition by and at the expense of the grantee. The grantee shall be responsible for any damage that may be caused to the property of the United States by the activities of the grantee under this license, and shall exercise due diligence in the protection of all property located on the premises against fire or damage from any and all other causes. Any property of the United States damaged or destroyed by the grantee incident to the exercise of the privileges herein granted shall be promptly repaired or replaced by the grantee to a condition satisfactory to said officer, or at the election of said officer, reimbursement made therefore by the grantee in an amount necessary to restore or replace the property to a condition satisfactory to said officer.

14. **RESTORATION**

On or before the expiration of this license or its termination by the grantee, the grantee shall vacate the premises, remove the property of the grantee, and restore the premises to a condition satisfactory to said officer. If, however, this license is revoked, the grantee shall vacate the premises, remove said property, and restore the premises to the aforesaid condition within such time as the said officer may designate. In either event, if the grantee shall fail or neglect to remove said property and restore the premises, then, at the option of said officer, the property shall either become the property of the United States without compensation therefore, or said officer may cause the property to be removed, and no claim for damages against the United States or its officers or agents shall be created by or made on account of such removal and restoration work. The grantee shall also pay the United States on demand any sum which may be expended by the United States after the expiration, revocation, or termination of this license in restoring the premises.

15. **NON-DISCRIMINATION**

a. The grantee shall not discriminate against any person or exclude them from participation in the grantee's operations, programs, or activities conducted on the licensed premises, because of race, color, religion, sex, age, handicap, or national origin. The grantee will comply with the Americans with

Disabilities Act and attendant Americans with Disabilities Act Accessibility Guidelines (ADAAG) published by the Architectural and Transportation Barriers Compliance Board.

b. The grantee, by acceptance of this license, is receiving a type of Federal assistance and, therefore, hereby gives assurance that it will comply with the provisions of Title VI of the Civil Rights Act of 1964, as amended (42 U.S.C. 2000d); the Age Discrimination Act of 1975 (42 U.S.C 6102); the Rehabilitation Act of 1973, as amended (29 U.S.C. 794); and all requirements imposed by or pursuant to the Directive of the Department of Defense (32 CFR Part 300) issued as Department of Defense Directive 5500.11 and 1020.1, and Army Regulation 600-7.

16. **TERMINATION**

This license may be terminated by the grantee at any time by giving the said officer at least thirty (30) days notice in writing.

17. **NATURAL RESOURCES**

The grantee shall cut no timber, conduct no mining operations, remove no sand, gravel, or kindred substances from the ground, commit no waste of any kind, nor in any manner substantially change the contour or condition of the premises, except as may be authorized under and pursuant to the approved Annual Management Plan. The grantee may salvage fallen or dead timber; however, no commercial use shall be made of such timber. Except for timber salvaged by the grantee when in the way of construction of improvements or other facilities, all sales of forest products will be conducted by the United States and the proceeds therefrom shall not be available to the grantee under the provisions of this license.

18. **ENVIRONMENTAL PROTECTION**

a. Within the limits of their respective legal powers, the parties to this license shall protect the premises against pollution of its air, ground, and water. The grantee shall comply with any laws, regulations, conditions, or instructions affecting the activity hereby authorized if and when issued by the Environmental Protection Agency, or any Federal, state, interstate, or local governmental agency having jurisdiction to abate or prevent pollution. The disposal of any toxic or hazardous materials within the premises is specifically

prohibited. Such regulations, conditions, or instructions in effect or prescribed by said Environmental Protection Agency, or any Federal, state, interstate, or local governmental agency are hereby made a condition of this license. The grantee shall not discharge waste or effluent from the premises in such a manner that the discharge will contaminate streams or other bodies of water or otherwise become a public nuisance.

b. The grantee will use all reasonable means available to protect the environment and natural resources, and where damage nonetheless occurs from the grantee's activities, the grantee shall be liable to restore the damaged resources.

c. The grantee must obtain approval in writing from said officer before any pesticides or herbicides are applied to the premises.

19. HISTORIC PRESERVATION

The grantee shall not remove or disturb, or cause or permit to be removed or disturbed, any historical, archeological, architectural, or other cultural artifacts, relics, remains, or objects of antiquity. In the event such items are discovered on the premises, the grantee shall immediately notify said officer and protect the site and the material from further disturbance until said officer gives clearance to proceed.

20. DISCLAIMER

This license is effective only insofar as the rights of the United States in the premises are concerned; and the grantee shall obtain any permit or license which may be required by Federal, state, or local statute in connection with the use of the premises. It is understood that the granting of this license does not preclude the necessity of obtaining a Department of the Army permit for activities which involve the discharge of dredge or fill material or the placement of fixed structures in the waters of the United States, pursuant to the provisions of Section 10 of the Rivers and Harbors Act of 3 March 1899 (33 USC 403), and Section 404 of the Clean Waters Act (33 USC 1344).

THIS LICENSE is not subject to Title 10, United States Code, Section 2662, as amended.

LOUISIANA DEPARTMENT OF
WILDLIFE AND FISHERIES

CONTRACT NO. DACW38-3-10-5

IN WITNESS WHEREOF, I have hereunto set my hand by authority of the Secretary of the Army, this 22nd day of April, 2010.

SECRETARY OF THE ARMY

ROBERT S. WOOD
Chief, Real Estate Division

THIS LICENSE is also executed by the grantee this 14th day of April, 2010.

LOUISIANA DEPARTMENT OF WILDLIFE
AND FISHERIES

ROBERT BARHAM
Secretary of the Department of
Wildlife and Fisheries

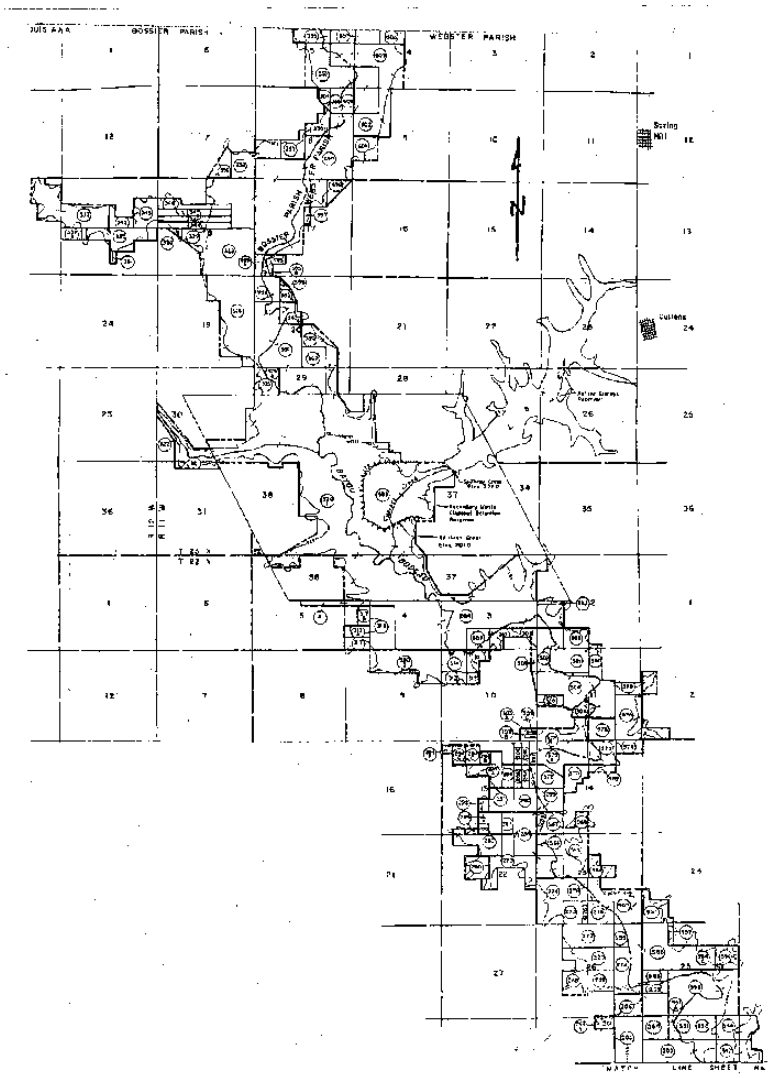
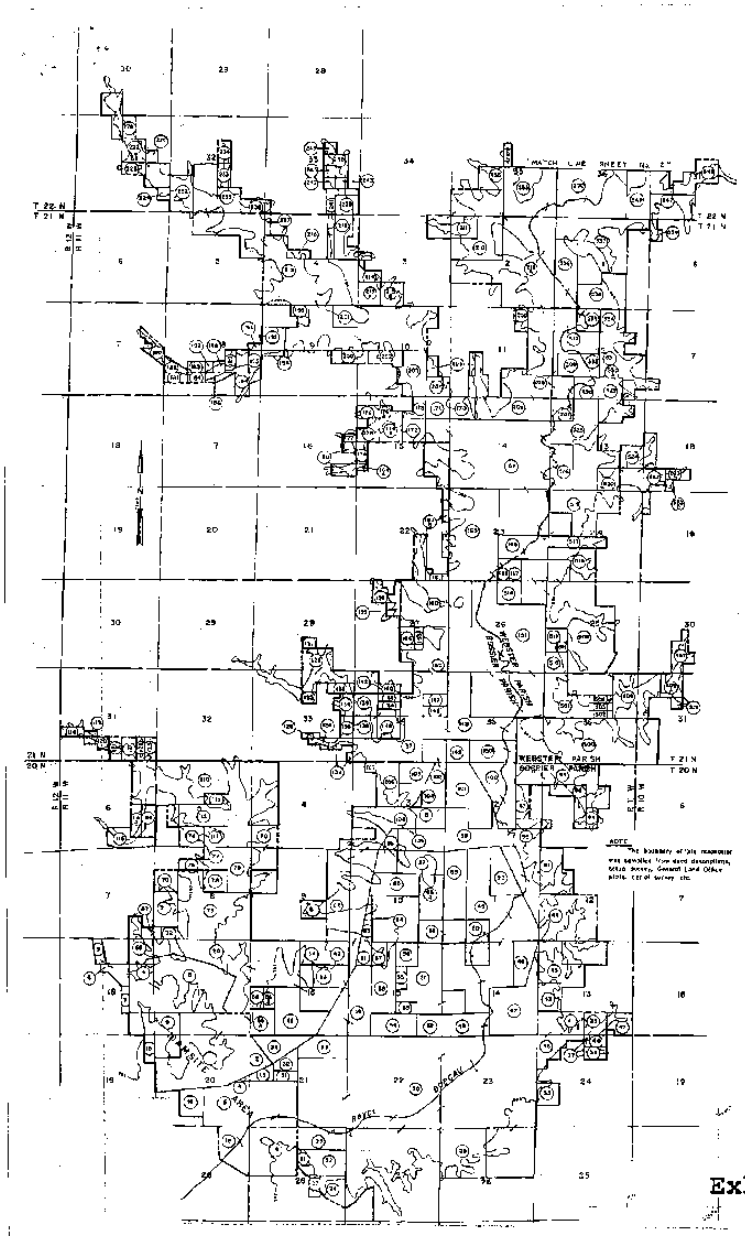


Exhibit "A-1"

BAYOU BODCAU, LOUISIANA
LOUISIANA DEPARTMENT OF WILDLIFE & FISHERIES
LICENSE CONTRACT NO. DACW38-3-10-5,
32,766.08 ACRES, MORE OR LESS



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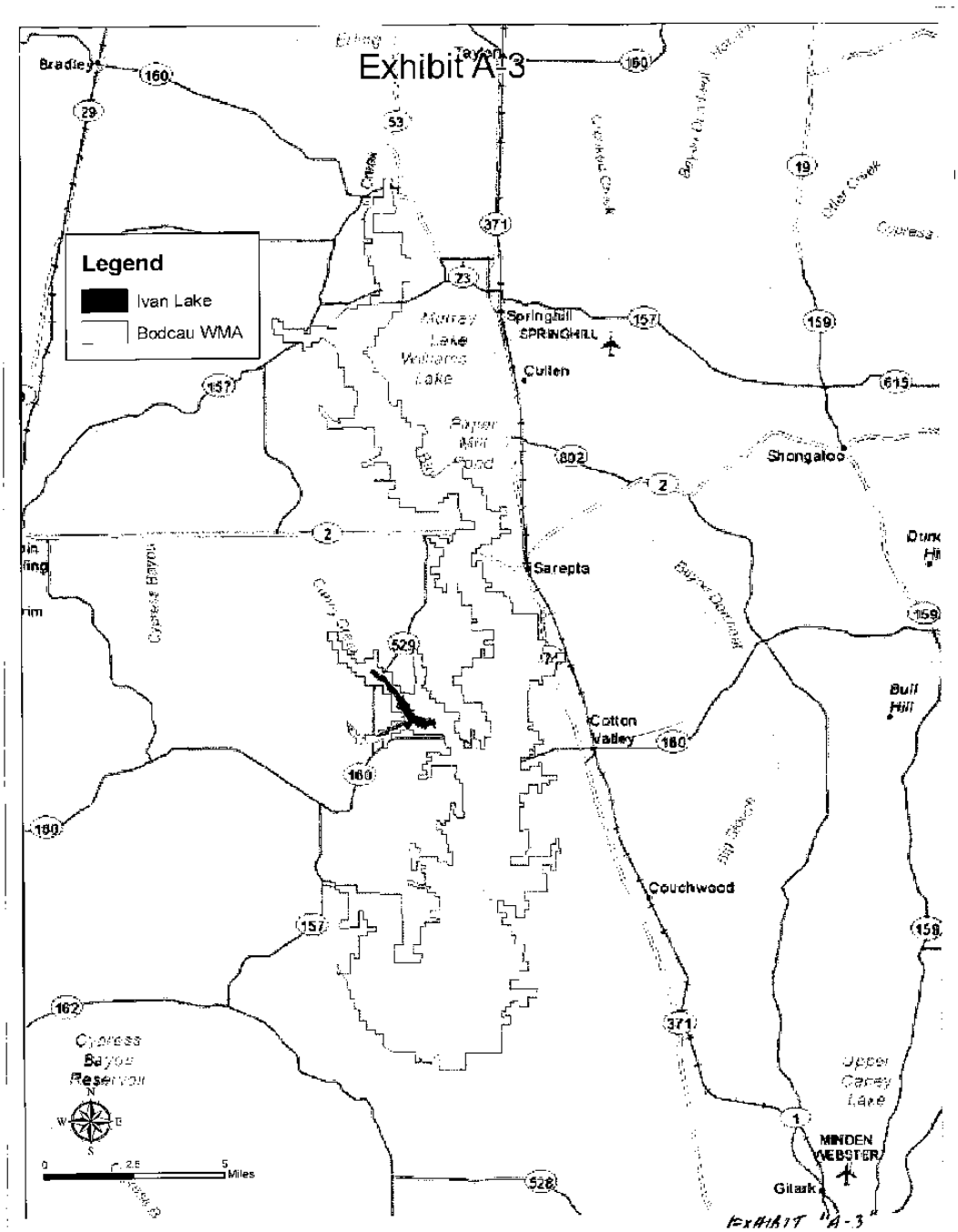


Exhibit A-3
Legend
Ivan Lake
Bodcau WMA
Bradley
Springhill
SPRINGHILL
Cullen
Shongaloo
Sarepta
Cotton Valley
Couchwood
Bull Hill
Upper Caney Lake
MINDEN WEBSTER
Gilark
Cypress Bayou Reservoir
Miles
EXHIBIT "A-3"

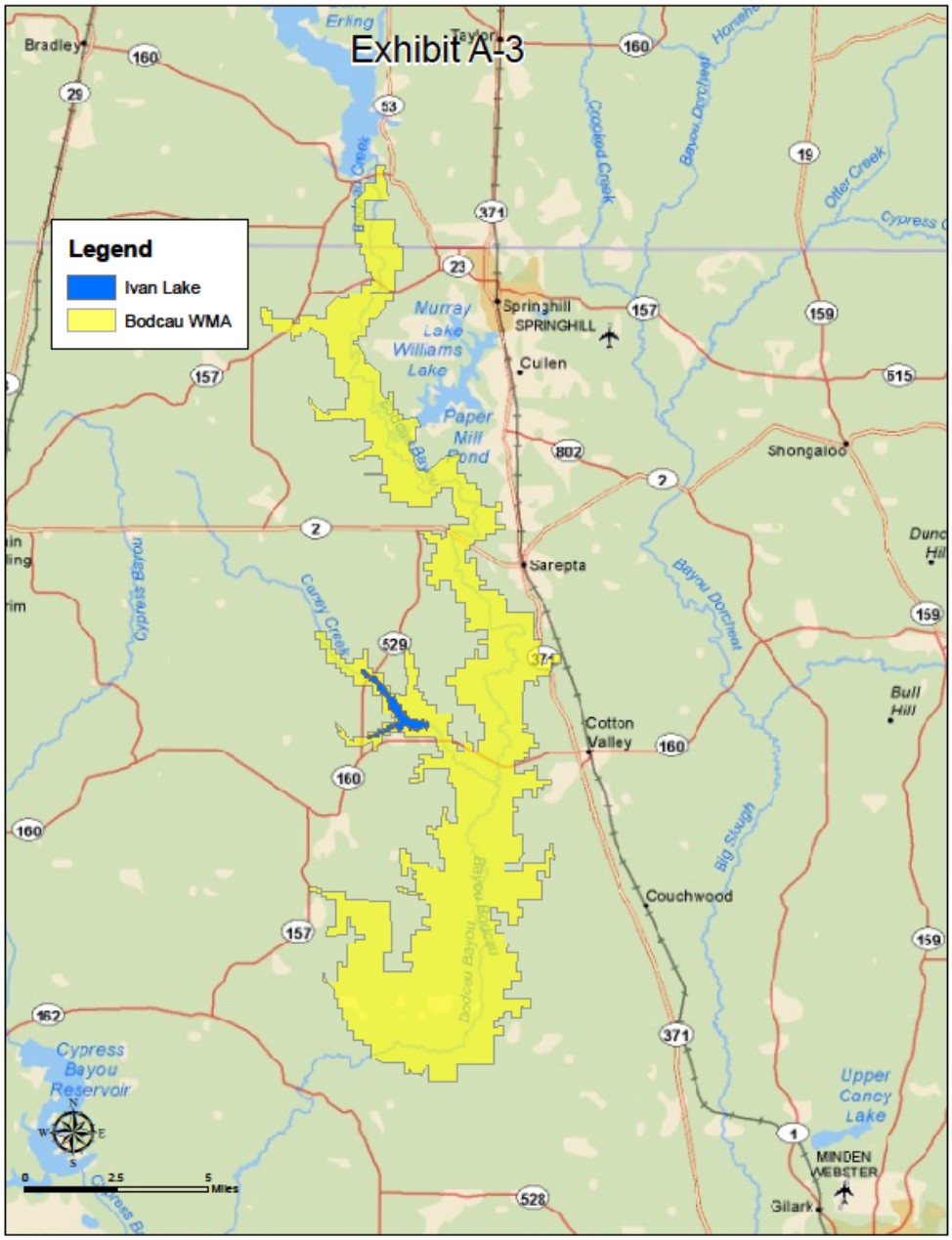
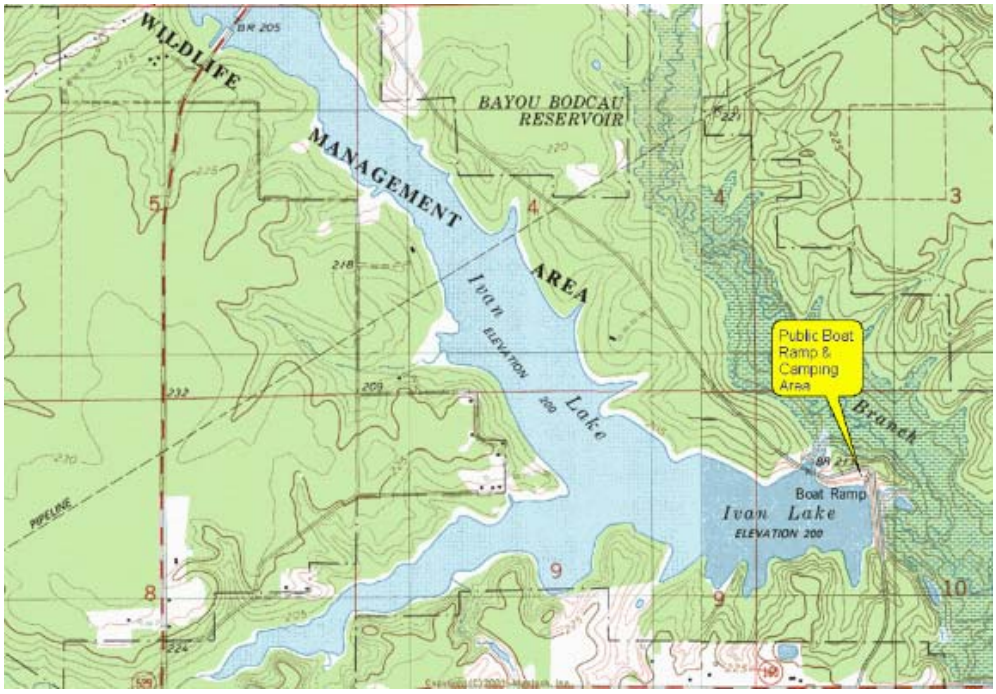
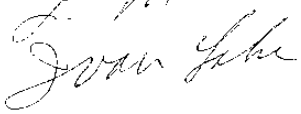


Exhibit A-3
Legend
Ivan Lake
Bodcau WMA
Bradley
Taylor
Springhill
SPRINGHILL
Cullen
Murray Lake
Williams Lake
Paper Mill Pond
Shongaloo
Sarepta
Cotton Valley
Couchwood
Cypress Bayou Reservoir
Upper Caney Lake
MINDEN WEBSTER
Gilark
Bull Hill
Bayou Dorcheat
Big Slough
Caney Creek
Cypress Bayou
Crooked Creek
Otter Creek
Miles

APPENDIX II - Ivan Public Boat Ramps NEEDS UPDATING!!!



APPENDIX III – Original Management Plan



IVAN LAKE MANAGEMENT PLAN

Introduction

Ivan Lake, located in northeast Bossier Parish, is an impoundment covering approximately 520 acres. The lake was created in 1956 with an earthern dam constructed across Caney creek approximately 3½ miles west of Cotton Valley, Louisiana. The lake has an area of about 520 acres at spillway level (200 Ft. M.S.L.).

The lake was constructed without prior removal of timber. Upon flooding, this timber died forming a jungle of logs, dead snags, and stubble. This created a multitude of problems resulting in little recreational usage of the lake. The density of this dead timber prohibits water skiing entirely and limits swimming. Fish production, as a rule, is extremely poor in a lake that has had the timber left in it. Ivan is no exception to this rule.

Obnoxious aquatic vegetation is becoming a problem in the shallow area of the lake. At least seven (7) species of aquatic vegetation are found in the lake at this time. The most prevalent are of the submersed types to include, bladderwort, coontail, and two (2) species of pondweed. The emergent types consist of water-willow, water primrose, and cattail. Aquatic vegetation is presently found from the shore line to water five feet deep (195 M.S.L.) in moderate to heavy growths. This vegetation creates problems in fish management and economically eliminates other water activities such as [illegible] and skiing.

The picnic area has been the victim of vandelism and is in need of repair and expansion to promote more usage.

The fertility of this lake is impossible todetermine without an extensive study. From observation and taking into consideration the soil fertility of the surrounding area it appears that the water is infertile resulting in poor fish production.

Based on the above observations and findings the following management plans are suggested to give the citizens of Bossier Parish a place of recreation. The management plans are presented in two segments:

A. A plan to rework this lake making it of such type that future management can be accomplished.

B. A five year management plan to be initiated one year following completion.

INITIAL MANAGEMENT PLAN

Recommendations

I. Ivan Lake should be completely drained and allowed to dry. This should be publicized to allow the citizens to harvest as many fish as possible before the lake becomes dry.

A. The entire lake should be cleared of dead timber and debris. This can be accomplished with a dozer. This dead matter should be wind rowed and burned. This would create an open area for boating and water skiing and would also increase fish production.

B. If the above recommendation is found to be overly expensive or too extravagant an alternate plan is suggested.

1. The debris should be cleared, wind rowed and burned from the dam to the Phillip's Creek area (see map). Additional boat roads should be cleared from Phillip's Creek to Louisiana Highway 184. The small area northwest of highway 184 should remain wooded to provide a roosting area for waterfowl.

2. Subsequent areas should be cleared annually. This practice will eventually clean the lake of debris and at the same time distribute the cost over a longer period.

II. A concrete launching ramp should be constructed at the north end of the dam to provide fishermen and pleasure boat operators access to the lake.

III. A swimming area from the launching area to the spillway should be constructed by filling in with sand to produce a beach effect. This area should be marked and piling driven around it to prevent power boats from entering and creating a safety hazard.

IV. Construction of a T shaped pier would be benefical to swimmers, sun bathers, and possibly provide angling for children.

V. The entire picnic area should be landscaped and concrete picnic tables constructed with at least two (2) tables being covered in the event of adverse weather conditions.

VI. A shallow well should be drilled and equipped with a hand pump to provide a source of safe useable water.

VII. The present rest room facilities are run down and should be rebuilt with expanded facilities to accommodate more people.

VIII. The picnic area should be fenced from livestock and treated for ticks.

IX. Additional gravel is needed to improve parish access roads.

X. Underbrush around the lake should be cleared to provide a park like area for hikers and campers. All green timber should remain as to provide habitat for wildlife such as birds and squirrels.

Upon completion of clearing and burning the dead matter, Ivan Lake will be filled with water and stocked with large mouth bass and bluegill sunfish by the Louisiana Wild Life and Fisheries Commission. Periodic checks will be made by commission personnel to promote a balanced fish population and provide technical advice when necessary.

When the above suggestions are completed the citizens of Bossier Parish will have a recreational area that will provide water skiing, boating, swimming, picnicing, fishing, and in general enjoyment of the out of doors. The overall conditions of Ivan Lake and immediate area will be 100% improved and should be an attraction to Bossier Parish.

ANNUAL MANAGEMENT PLAN

Recommendations

This plan is suggested for five (5) years with a possible revision at the end of this time. This plan is to begin one year after restocking operations.

I. WATER LEVEL FLUCTUATION

An annual water level fluctuation program is recommended for

Tvan Lake. Basically this constitutes dewatering the level of the lake a prescribed amount for a designated period then reflooding. This is a management tool designed to improve fishing, control obnoxious vegetation, and increase the fertility of the water.

Quite often the fish population of an impoundment tends to get "out of balance". This means the ratio between carnivorous and forage fish becomes upset, with the forage fish out numbering their predators. This is especially true in a body of water having excessive quantities of aquatic vegetation or large areas of trees and stubble. This aquatic jungle provides extensive habitat for forage species such as bluegill and minnows and give them refuge from carnivorous fish such as large mouth bass. These forage fish reproduce at such a rate that they soon exceed the available food supply. The result is "stunted" fish. Their numbers are large; but few reach a desirable size. By lowering the water level, the forage fish are forced from hiding and concentrated in a smaller area. At this point the carnivorous fish can easily reduce the number of forage fish thereby continuing a "balanced population". Upon reflooding, the remaining fish will grow faster, with their off-springs having a higher growth rate, presenting the angler with desirable size fish.

Water fluctuation is also used to control obnoxious aquatic vegetations. It will not eliminate aquatic vegetation but will keep growth to a minimum. By drying and exposing the vegetation to the

sun, air, and freezing temperature, the mature plants will be killed and decomposed. This will delay the development of plants the following growing season, thereby, furnishing six (6) to nine (9) weeks more fishing time the next spring. A fluctuation program carried on for several consecutive years can gradually reduce the quantity of undesirable plants and provide more open water for fishing and aquatic sports.

A fluctuation program will also increase water fertility. The nutrients utilized by aquatic plants will be released upon decomposition of these plants and will be available to the fish population. The nutrients ~~chemically tied~~ up in the soil will also be ~~released on~~ exposure of the soil to air. Annual fluctuation must be practiced consecutively for a number of years to obtain full benefits.

The drawdown should begin on Labor Day. The level should be dropped at the rate of four (4) inches per twenty-four hour period until elevation 195 is reached. This level is to be held unless further drawdown is deemed necessary upon inspection by commission personnel.

Close the gates on December 15 and allow the lake to refill. Under normal conditions this should be accomplished by the last week in January.

This program should be carried out annually for five years.

A program such as the one suggested for Ivan Lake will provide aquatic weed control, better fish production, increase the water fertility, and provide and productive and useful lake.

Respectfully submitted:

Charles E. Boenke
Fisheries Biologist

Robert Kimble
District I Supervisor

Lloyd Posey
Lake Management Project Leader

APPENDIX IV – Letter From USACE Concerning License Agreement

DEPARTMENT OF THE ARMY
LOUISIANA FIELD OFFICE
VICKSBURG DISTRICT, CORPS OF ENGINEERS
3505 SOUTH GRAND STREET
MONROE, LOUISIANA 71202-5273
PHONE (318) 322-6291

REPLY TO
ATTENTION OF:

April 11, 2004

James Seales
Fisheries Biologist Supervisor
Louisiana Department of Wildlife and Fisheries
Inland Fisheries Division District 1
1401 Talton Street
Minden, LA 71055

Dear Mr. Seales:

The purpose of this letter is to inquire about the possibility of your agency assuming the operation, maintenance, and management of Ivan Lake and dam. As you know, Ivan Lake is located on U.S. Army Corps of Engineers property at Bayou Bodeau Dam and Reservoir. This lake has been leased by the Bossier Parish Police Jury for recreational purposes for the past 25 years. Their lease expired on April 6, 2005, and they have decided to not to renew it.

The Louisiana Department of Wildlife and Fisheries has done an excellent job in managing the wildlife and fisheries resources in the Ivan Lake area and Bayou Bodeau Reservoir. Unfortunately, our regulations do not allow us to assume operation, maintenance, and management of relinquished facilities. Therefore, unless another agency, local governmental body, or qualified quasi-public organization agrees to lease this area, then we may have no choice but to close it for public use. We may also have to drain the lake in the event that the dam becomes a safety hazard.

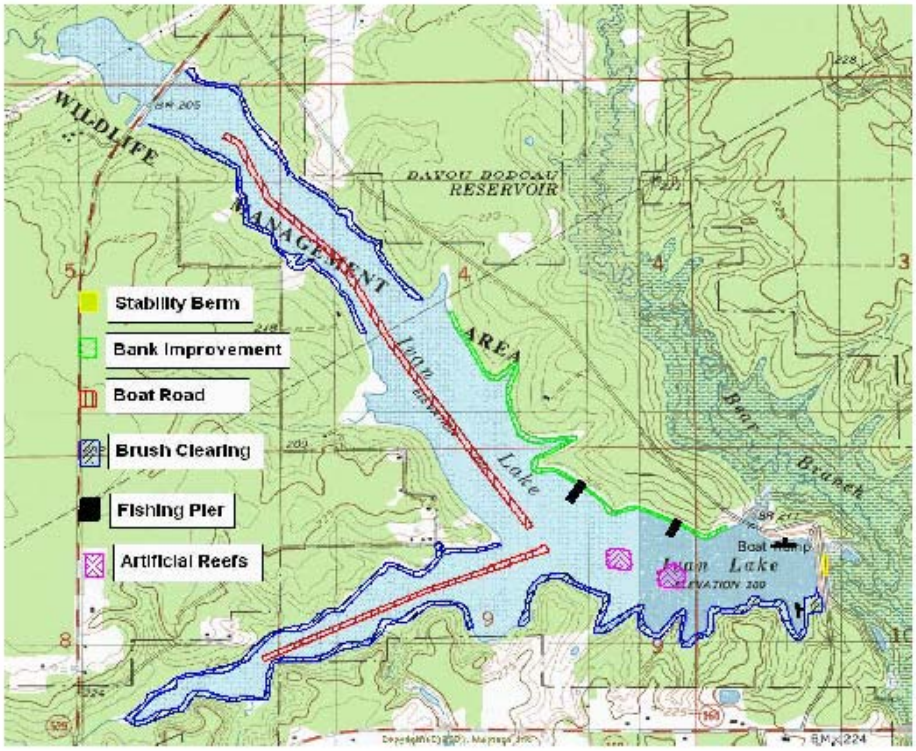
We certainly do not want to close Ivan Lake for public use or drain this lake, and we are seeking assistance from your agency to avoid adverse impacts. Please call me as soon as possible at 318-322-6391, Ext. 104 so we may discuss this matter. I will appreciate any assistance that you can offer.

Sincerely,

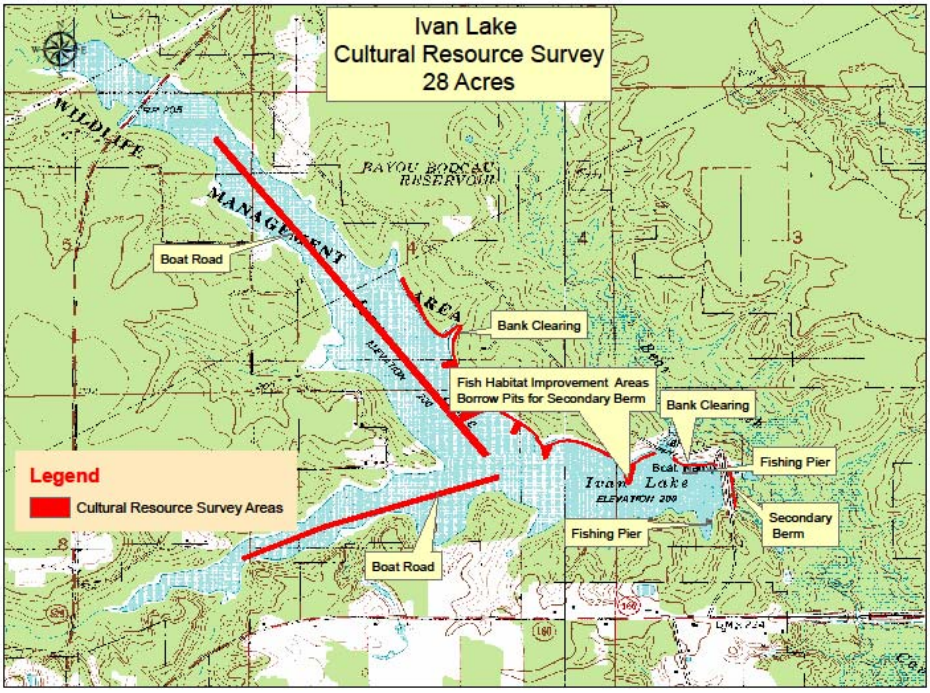
Wayne R. Stogsdill, Jr.

Wayne R. Stogsdill, Jr.
Park Manager

APPENDIX V –Improvements involved in the Lake Renovation Plan possibly aerial photo??



APPENDIX VI – Cultural Resource Survey



APPENDIX VII – Hydrilla Management Plan

Ivan Lake Aquatic Vegetation Management Plan
Prepared by Aquatic Plant Research & Control Section
Inland Fisheries Division
August 3, 2004

Ivan Lake is a 520 acre waterbody in Bossier Parish, created in 1954 by the United States Army Corps of Engineers. Ivan drains a fifty-five square mile area which calculates to a watershed ratio of 68:1. The lake was surveyed again this year to determine the presence and coverage of aquatic vegetation.

Hydrilla (*Hydrilla verticillata*), variable leaf milfoil (*Myriophyllum heterophyllum*) and coontail (*Ceratophyllum demersum*) are present in severe to moderate amounts in a fringe around the lake out to the six foot contour. The area of the lake approaching the Highway 529 bridge is most severely impacted with boating access restricted to the creek channel. Bladderwort (*Utricularia spp*.) and fanwort (*Cabomba caroliniana*) are also present in problematic levels throughout the lake. All submerged species combined cover approximately 40% of the waterbody.

Several emergent species of aquatic vegetation were recorded in the lake. White water lily (*Nymphaea odorata*) covers large areas of the lake along with smaller areas of American lotus (*Nelumbo lutea*). The shoreline is lined by lizard's tail (*Saururus cernuus*), giant cutgrass (*Zizaniopsis miliacea)*, cattail (*Typha spp.)* and smartweed (*Polygonum spp*.).

Hydrilla is an exotic species that is difficult to control and nearly impossible to eradicate. Hydrilla can usually out-compete native vegetation and when left unchecked will form monotypic stands of dense vegetation. Hydrilla produces reproductive structures, turions and subterranean turions, from which it can regenerate after control efforts. The subterranean turions, hereafter called tubers, are produced up to a foot deep in the hydrosoil where they can remain viable for up to five years. These tubers are resistant to drying especially in heavy clay, organic soils. The main production of tubers is triggered when periods of daylight fall below thirteen hours.

One method of control for hydrilla and other submerged aquatics is the use of triploid Grass Carp (TGC). These sterile fish are very effective in the control of hydrilla when stocked in appropriate numbers and contained within the waterbody. To use TGC in Ivan Lake would require the construction of a permanent barrier on the spillway to prevent escape. This would also require routine maintenance for repairs and to remove debris that would collect against the barrier. Unless a funding source can be found for the construction and maintenance of the spillway barrier and purchase of the TGC this method is not an option.

The second method of control for hydrilla infestations is the use of EPA approved aquatic herbicides. These herbicides, when used correctly can give one or possibly two years of control. There are two types of herbicides, systemic and contact. The systemic herbicide applicable to this infestation, fluridone, is applied to the waterbody in appropriate amounts to treat the entire water column and be taken up by the plant causing chlorosis and eventually death. Fluridone is generally recommended in a total lake

treatment due to problems with dilution in spot treatments. Fluridone is extremely effective but is cost prohibitive in a waterbody of this size, a total lake treatment would cost an estimated $59,000. Contact herbicides, such as endothol and diquat dibromide, although effective on hydrilla are also labor intensive. Contact herbicides, as the name implies, must be placed on the individual plants in the correct concentration for control. These herbicides must be diluted with the proper amount of water and injected into the masses of vegetation wherever control is desired. A cost estimate for an application to the existing vegetation with contact herbicides ranges from $45,000 to $90,000 dependent upon choice in herbicide.

The third method of control is habitat manipulation or drawdowns. Drawdowns are the low cost alternative which can give the desired results when used correctly. As stated previously hydrilla is resistant to drawdowns. A single drawdown will actually aid hydrilla by eliminating competing vegetation that is less drawdown resistant. Hydrilla tubers can survive five years in the hydrosoil and can therefore survive infrequent dewatering. However, if a drawdown management plan is understood and adhered to, hydrilla can be controlled. The first fact that must be understood is that drawdowns stimulate tuber sprouting. This means that after one drawdown the vegetation will not be controlled and may actually appear worse. The drying of the water bottom stimulates approximately 80% of the tubers to sprout. This correlates to an 80% reduction in the amount of existing tubers in the hydrosoil for next year. The drawdowns are also timed to prevent the main production of tubers in the fall. In summary the benefits of drawdown are the destruction of existing plants, the prevention of tuber production and the stimulation of existing tubers to sprout. The negative side of drawdowns is the impacts to recreational activities and irrigation.

The last method of control to be discussed is integrated pest management (IPM). This method is a combination of two or all three methods described above. Use of IPM could consist of a minimal drawdown in conjunction with herbicide applications to reduce the level of infestation. This reduction in vegetation would be followed in the fall by a light stocking of triploid grass carp. The advantage of IPM is the ability to reap the benefit of several control methods and not be dependent on the success or failure of just one method of control. The drawback to IPM is the combined cost of several control methods in addition to their individual disadvantages discussed previously.

Due to the infestation of submerged aquatic vegetation and lack of funding, it is recommended that a five-year, six-foot drawdown plan be considered. We recommend that the gates be opened September 13, 2004 allowing the lake to fall at the rate of 3-4 inches per day until it reaches the 194’ MSL contour. The Department will survey the lake after the lake level reaches 194’ MSL to assure dewatering of the majority of the vegetation. This six foot drawdown should continue until January 24, 2005 when the gates should be closed to allow the lake to refill. The Department will conduct yearly surveys to monitor vegetation levels and adjust the management plan as necessary.

APPENDIX VIII – Aquatic Vegetation Type Maps

USACE Aquatic Plant Survey - 1997

CELMK-OD-CR Martin/rm/1-7637 14 May 1997

MEMORANDUM FOR CELMK-OD-MN
ATTN: Julie Marcy

SUBJECT: Aquatic Plants in Ivan Lake, Bayou Bodcau Reservoir

1. On 13 May 1997, George Chandler, biologist, and David Oliver, park ranger, from the Monroe Area Office for Operations traveled to Ivan Lake and identified aquatic vegetation by species and approximate coverage on the lake. The following information is the result of their findings:

SPECIES	COVERAGE
Fragrant Water-lily (Nymphaea odorata)	2.96 acres
Watershield (Brasenia schreberi)	1.01 acres
Green Cotton-ball Alga (Pithophora)	1.00 acres
Smartweed (Polygonum hydropiperoides)	8.30 acres
Slender Pondweed (Potamogeton pusillus)	0.39 acres
Alligatorweed (Alternanthera philoxeroides)	46.29 acres
Illinois Pondweed (Potamogeton illinoensis)	0.01 acres
Eurasian Watermilfoil (Myriophyllum spicatum)	6.06 acres
Variable-leaf Watermilfoil (Myriophyllum heterophyllum	3.00 acres
Mix (Fragrant Water-lily, Yellow Lotus (Nelumbo lutea))	9.04 acres
Mix (Brazilian Elodea (Egeria densa), Water Primrose (Ludwigia uruguayensis), Green Cotton-ball Alga, Slender Pondweed)	1.72 acres
Mix (Coontail (Ceratophyllum demersum), Fragrant Water-lily, Eurasian Watermilfoil)	11.00 acres
Mix (Eurasian Watermilfoil, Coontail)	2.00 acres
Mix (Slender Pondweed, Green Cotton-ball Alga)	1.00 acres
Mix (Eurasian Watermilfoil, Coontail, Slender Pondweed)	5.00 acres

CELMK-OD-MN 14 May 1997
SUBJECT: Aquatic Plants in Ivan Lake, Bayou Bodcau Reservoir

SPECIES	COVERAGE
Mix (Variable-leaf Watermilfoil, Coontail, Slender Pondweed)	0.23 acres
Total in aquatic vegetation on 13 May 1997	99.01 acres

2. Point of contact is Robert "Skip" Martin, ext. 1-7637.

J.E. McCormick
JOSEPH E. McCORMICK
Acting Area Engineer

LDWF Aquatic Vegetation Survey - 1997

NOTES:

Upper 1/3 of lake – milfoil predominant submerged plant – moderate infestation, white water lily 20% coverage of this area

Middle and lower 2/3 of lake – fringe of water shield and white water lily, 10% coverage. Hydrilla present in a fringe band all the way around the lake 10% - 15% coverage.

Vegetation on the lower 2/3 with the exception of hydrilla about ideal for fisheries.

Fringe of alligatorweed and lizardtail around entire lake with some bulrush.

West Arm (Phillips Creek) – large areas of lotus infestation, very little submersed vegetation. Fringe of alligatorweed and bulrush.

Survey conducted by Melvin Bagwell and James Seales, 6-10-97

No type map generated.

Aquatic Vegetation Type Map – 2002

Notes:

Survey conducted 6-25-02

At the time of assessment Ivan Lake was at pool stage. The water color ranged from fairly clear to a brown stained color.

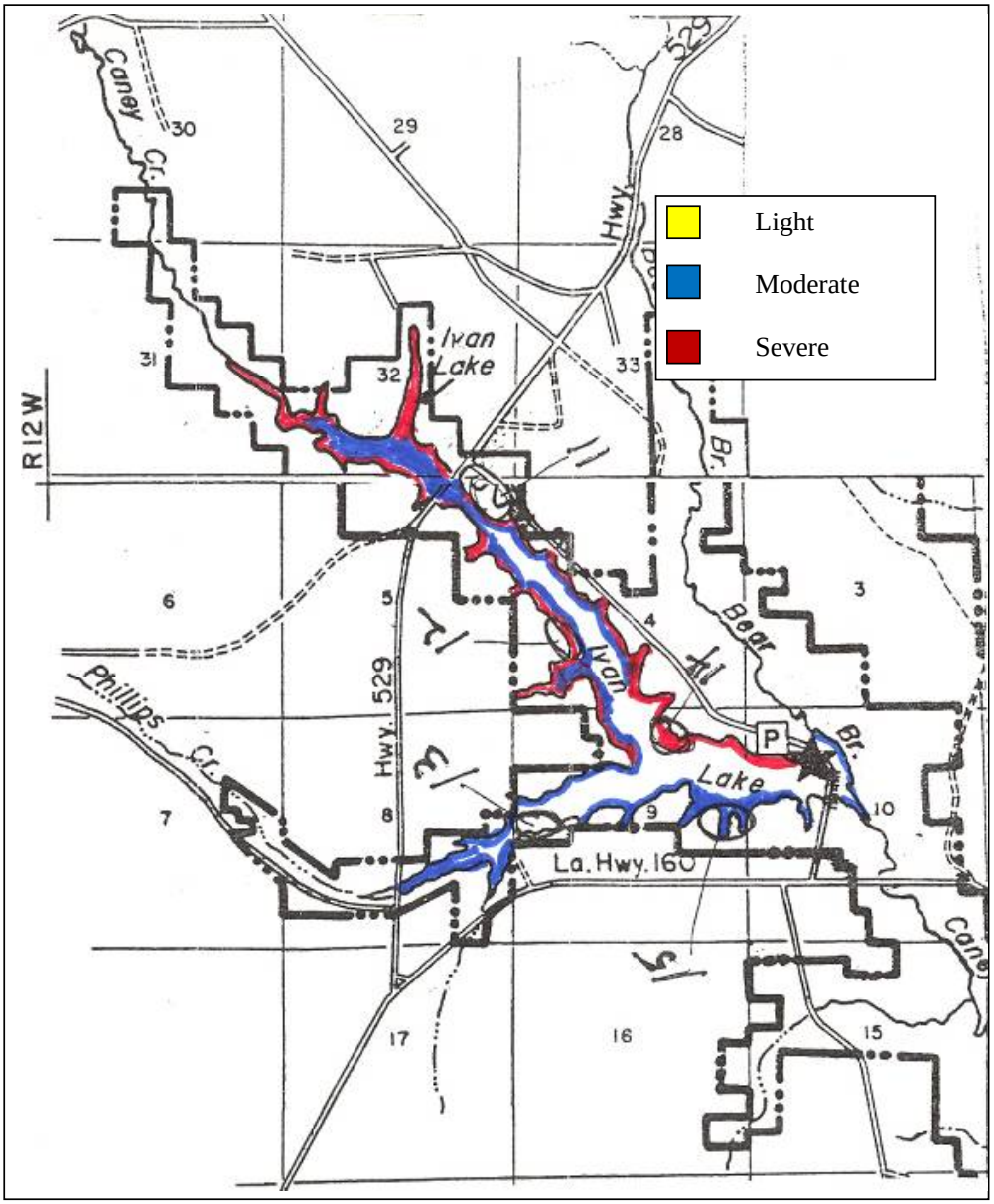
The submersed aquatic plants noted were hydrilla, southern naid, coontail, whorled milfoil, Potamogeton, and Utricularia.

The emersed plants noted were lotus, white water lily, alligator weed, smartweed, lizardtail and miscellaneous sedges and rushes.

The severe infestation noted on the type map was hydrilla, whorled milfoil and coontail primarily.

The moderate infestation noted on the type map was hydrilla, milfoil, and coontail primarily.

The extreme upper end of each arms have a severe lotus and white water lily problem.


Light
Moderate
Severe
Caney Cr.
Ivan Lake
Hwy. 529
R 12 W
Phillips Cr.
Bear Br.
La. Hwy. 160
P
30
29
28
31
32
33
6
5
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Aquatic Vegetation Type Map - 2005

VEGETATION TYPE MAP
IVAN LAKE
2005

The vegetation type mapping survey was conducted on July 22, 2005 by Louisiana Department of Wildlife and Fisheries personnel. Jeff Sibley, Biologist Supervisor District 1, was assisted by Todd Bridges in identifying the major aquatic plant species present in the lake and assessing the extent of coverage around the lake. At the time of the survey, the lake was one foot below pool and the water color was clear.

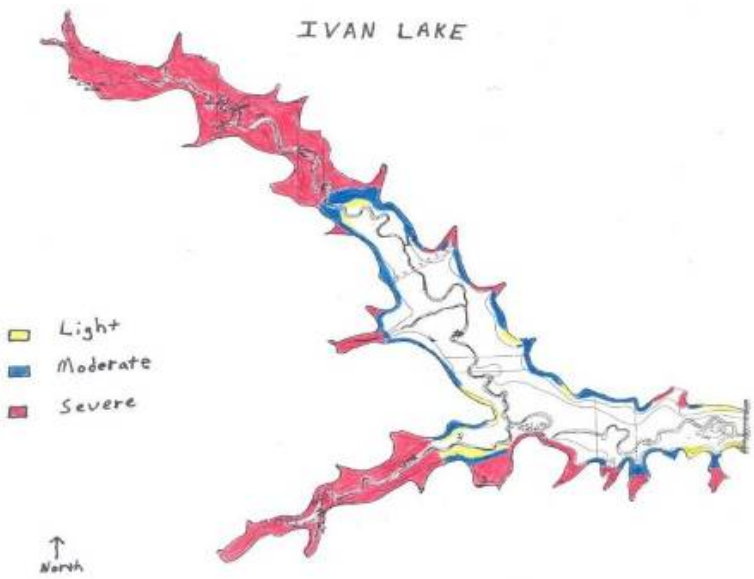
Species Present
The following species of aquatic macrophytes were identified in Ivan Lake: hydrilla (*Hydrilla verticillata*), coontail (*Ceratophyllum demersum*), cattails (*Typha spp*.), giant cutgrass (*Zizaniopsis miliacea*), American lotus (*Nelumbo lutea*), fragrant water lily (*Nymphaea odorata*), water hyacinths (*Eichhornia crassipes*), primrose species (*Ludwigia spp*.), lizard tail (*Saururus cernuus*), spatterdock (*Nuphar luteum*), alligatorweed (*Alternanthera philoxeroides*), variable leaf milfoil (*Myriophyllum heterophyllum*), pennywort (*Hydrocotyle spp*.), duckweed (*Lemna minor*), frog's-bit (*Limnobium spongia*) and chara grass (*Chara spp*.).

Severity
Aquatic vegetation covers approximately 30-35% of Ivan Lake. Gently sloping shorelines and vast areas of shallow water contribute to the vegetation problems. American lotus and fragrant water lilies pose the largest problems to access on the lake, as the upper ends of both major arms of the lake are nearly 100% covered (see attached map). Access is restricted to the creek channels in these upper reaches. The vegetation community here becomes a conglomerate of all the species listed above.

Ivan Lake has a 10-20'fringe of vegetation around almost the entire shoreline. A combination of giant cutgrass, cattails, lily pads and lotus line the shores of the lake. The shallow ends of all coves are wrapped up with either lilies or lotus. Submerged vegetation is scattered throughout the lake, but is most dense on the shallow points and in the far upper reaches of lake. Submergents were growing in as deep as 7' of water. There are some areas of the lake with dense, localized stands of hydrilla or chara; but emergent plants pose more of a threat to public access.

Management/History
Ivan Lake is currently in the second year of a five year series of proposed Fall/Winter drawdowns for hydrilla control. The lake was slated to be drawn down 6' below pool stage in September of 2004; however, the lake was accidentally dewatered before the gates were closed and a large fish kill occurred. The lake quickly refilled with heavy

rains, and was only down for a few weeks. Little drying action was observed and the drawdown likely had little effect on the vegetation. During the 2005 drawdown, the lake has again been dewatered in order for Louisiana Department of Transportation and Development to assess the control structure, as it had been leaking. Drought conditions and extreme heat have likely aided the success of the drawdown. The organic layer on the lake bottom has dried and cracked and is decomposing. The vegetation has been exposed to dry conditions and several light frosts. The lake has remained down from late September until the time this document was completed (12/8/05). The lake is currently being assessed for possible renovation, and these future projects will likely affect the aquatic vegetation community of the lake.



APPENDIX IX – Fish Consumption Advisory

M. J. "Mike" Foster, Jr.
GOVERNOR

David Hood	J. Dale Givens	James H. Jenkins, Jr.
Secretary	Secretary	Secretary
Department of	Department of	Department of
Health & Hospitals	Environmental Quality	Wildlife & Fisheries
P. O. Box 629	P. O. Box 82215	P. O. Box 98000
Baton Rouge, LA	Baton Rouge, LA	Baton Rouge, LA
70821-0629	70884-2215	70898-9000

The following fish consumption advisory was issued on 11/20/00 by the Department of Health & Hospitals, the Department of Environmental Quality, and the Department of Wildlife & Fisheries. For more information, please contact:

DHH	DEQ	DWF
Robert Starszak	Chris Roberie	Gary Tilyou
(504) 568-8537	(225) 765-0634	(225) 765-2343

FISH CONSUMPTION ADVISORY FOR IVAN LAKE

Based on fish sampling of Ivan Lake in Bossier Parish, unacceptable levels of mercury have been detected in bowfin and largemouth bass. Therefore, the Louisiana Department of Health & Hospitals, Department of Environmental Quality, and Department of Wildlife & Fisheries advise that the following precautions be taken when eating fish taken from Ivan Lake.

- **Pregnant women, breast-feeding women, women planning to be pregnant, and children less than seven years of age should NOT consume bowfin from the advisory area and should consume no more than ONE MEAL PER MONTH of largemouth bass (a meal is considered to be half a pound of fish for adults and children). There are no limits on other species.**

- **Non-pregnant women, women not planning to become pregnant, men, and children seven years of age and older should consume no more than TWO MEALS PER MONTH of bowfin but do not have to limit consumption of other species.**

Mercury is an element that occurs naturally in the environment. It is released into the environment through natural processes and human activities. Consequently, there are small amounts of mercury in lakes, rivers, and oceans. Nearly all fish contain trace amounts of mercury. They absorb mercury from the water and sediment as they feed on aquatic organisms. Larger predator fish contain more mercury than smaller fish. Therefore, in general, it is recommended that smaller fish be consumed instead of larger ones.

People are exposed throughout their lives to low levels of mercury. One way they can be exposed to mercury is from eating contaminated fish. Health effects from harmful levels of mercury can include nervous system and kidney damage. Developing fetuses are more sensitive to the toxic effects of mercury, especially in the first trimester. In addition to developing fetuses, infants and children are more sensitive to the effects of mercury; therefore, consumption advisories are issued at lower fish tissue concentration levels for these groups.

This advisory is issued as a precaution. Further sampling will be carried out by the Louisiana Department of Environmental Quality to determine the need for modifications to this advisory. If you have consumed bowfin and/or largemouth bass from these waters, it is not likely that there is an immediate need to be concerned about the effects of mercury. However, you should consult your personal doctor if you are concerned.

Jimmy Guidry, M.D.
State Health Officer and Medical Director
Department of Health & Hospitals

Madeline McAndrew
Assistant Secretary, Office of Public Health
Department of Health & Hospitals

David Hood
Secretary
Department of Health & Hospitals

J. Dale Givens
Secretary
Department of Environmental Quality

James H. Jenkins, Jr.
Secretary
Department of Wildlife & Fisheries