

LOUISIANA DEPARTMENT OF WILDLIFE AND FISHERIES



**OFFICE OF FISHERIES
INLAND FISHERIES SECTION**

**2018 AQUATIC VEGETATION MANAGEMENT
PLAN**

IVAN LAKE

Date Lake Formed –1958

Waterbody Type – Upland Reservoir

Maximum depth: 20 feet

Parish – Bossier Parish, owned by the United States Army Corps Of Engineers (USACOE), and is leased to LDWF as part of the Bodcau Wildlife Management Area. Ivan Lake lies completely within the bounds of the management area. There are no residences on the shore.

Age and condition of control structure –Good condition. Control structure and dam renovated in 2011 as part of Ivan Lake Restoration Project.

Type of control structure – 36 inch corrugated plastic pipe (CPP) with circular gate and concrete structure with trash gate. Outlet structure consists of 36 inch CPP set in concrete headwall with grouted rip-rap outflow channel.

Description of Dam

Ivan Lake has 1,300 feet of earthen embankment with a 35 foot wide crown across Caney Creek. The crown includes an 18 foot blacktop roadway. Slope is approximately 3 to 1. The spillway is a 200 foot non-gated, ogee spillway and stilling basin.

Average depth – 6.46 feet

Watershed ratio – 55 square miles of area (35,200 acres drain into Ivan Lake for a ratio of watershed to lake surface of 68:1.

Drawdown Potential of structure –Ivan Lake can be dewatered to the existing creek channel.

Lake Commission – None

Ivan Lake is managed by LDWF as part of the Bodcau WMA. Ivan Lake is part of the 25-year lease from the USACOE totaling 34,355 acres.

Drawdown History:

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- December 15	6 Feet	Vegetation control and maintenance & repair of 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 4 th .
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-3 rd 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	All year	18 Feet Maximum	Fifth in series of 5 for hydrilla control. Maximum depth to get most drying benefits. Gates were left open until further notice pending action by LDWF to take control of lease and renovate lake bottom.
2009	All Year	18 Feet Maximum	Renovation
2010	All Year	18 Feet Maximum	Renovation
2011	All Year	18 Feet Maximum	Renovation
2012	Gate closed February 14, 2012	18 Feet Maximum	Renovation

What significant stakeholders use the lake?

Ivan Lake is primarily used by anglers and hunters. Personal watercrafts and towable

watersports are not allowed.

What are their needs and concerns?

Boating access for fishing and hunting.

What is the history of aquatic vegetation complaints?

Historical complaints involved excessive vegetation (hydrilla, lotus, and lily pads) on the upper end of the lake preventing access. Since completion of the lake renovation, no complaints have been received.

Have there been any controversial issues on the lake?

The only controversial issue was the accidental dewatering and subsequent fish kills associated with the 2004 drawdown. Local residents expressed frustration with the lack of progress on renovations prior to 2010.

Aquatic Vegetation Status:

See 2017 Ivan Lake Vegetation Type Map attached.

Limitations:

Large expanses of shallow water in the upper portions of both the Caney and Phillips Creek arms of the lake are suitable habitat for submerged vegetation and emergent plants such as American lotus (*Nelumbo lutea*) and water lily (*Nymphaea odorata*). These areas have historically had vegetation problems. Underwater stumps in the area make navigation slow. Fishing pressure has increased on the lake since the renovation. The excessive number of boats has limited herbicide application efficiency at times, as spray boats have needed to work around and not disturb anglers.

Past Control Measures:

Prior to completion of the Ivan Lake Restoration Project, drawdowns were the only management method used to treat the large expanses of submerged vegetation on the lake. Since 2012, foliar herbicide applications have been made to control American lotus and giant salvinia (*Salvinia molesta*) as needed on the reservoir.

Giant salvinia was introduced into the lake in 2012 shortly after completion of the project. A containment boom has been installed across the spillway in an effort to prevent the plants from escaping the lake and entering the Bodcau swamp and associated green-tree reservoirs on the WMA. Giant salvinia has been controlled through herbicide applications and wind/wave action.

Triploid grass carp have been introduced into Ivan Lake to control submerged aquatic vegetation (SAV). Adequate complex cover (marginal shoreline vegetation and woody debris) exists in the lake to support a balanced fish population. Six hundred adult triploid grass carp were introduced in early 2013 (three fish/vegetated acre) in response to an increase in Eurasian watermilfoil (*Myriophyllum spicatum*) coverage. The SAV coverage declined by the fall of 2013, but continued to threaten boating access in many areas of the lake in 2014. An additional 600 triploid grass carp (five fish/vegetated acre) were added

in November 2014. Submerged vegetation continues to persist in Ivan Lake despite annual stockings of triploid grass carp. However, vegetation levels are significantly reduced from the historical levels that caused problems prior to the lake renovation. It is possible that some grass carp are leaving the lake each year during flood pulses and may explain why total control has yet to be achieved.

Triploid grass carp (TGC) stockings and associated vegetation coverages of Ivan Lake, 2013-2017.

Year	# TGC stocked	Rate (#/vegetated acre)	Acres of submerged vegetation present
2013	600	5	121.5
2014	600	5	117
2015	250	2.5	~100
2016	250	2.5	100
2017	200	2.5	80

In 2017, American lotus and fragrant water lily again caused access problems in the upper reaches of both arms of Ivan Lake along with giant salvinia. The District 1 spray crew successfully treated 258 acres of aquatic vegetation in 2017 during 19 operations. Coverage was greatly reduced by late summer.

Recommendations:

1. Aquatic vegetation control: due to the shallow nature and history of aquatic vegetation problems associated with Ivan Lake, an integrated approach to control and maintain desirable aquatic habitat is recommended. Control measures available to LDWF for Ivan Lake include water level fluctuation, stocking of triploid grass carp, and herbicide applications. Since Ivan Lake is newly renovated, drawdowns will not likely be implemented as a management tool to control vegetation for the next few years; therefore, grass carp will serve as the primary tool to manage submerged aquatic vegetation. If SAV acreage exceeds 80 acres (15% total coverage) in August 2018, grass carp will be stocked at a rate of three carp per vegetated acre in the winter of 2018/2019. There are no plans to use herbicide for SAV control at this time.
2. Giant salvinia coverage will be monitored during 2018, and herbicide applications will be conducted as needed in accordance with the LDWF Aquatic Herbicide Application Procedures.
3. American lotus and water lily should be treated aggressively on Ivan Lake in 2018. An aerial application using triclopyr (0.5 gal/acre) and a non-ionic surfactant (0.25 gal/acre) should be the first treatment option. This application should take place after the leaves fully emerge from the water, but prior to the plants flowering. This will likely occur in May and should require only 1/2 day of aerial application labor. The current aerial application contract requires at least 1 day of labor and may be a limiting factor. LDWF has an approved waiver to apply 2,4-D on Ivan Lake from the Louisiana Department of Agriculture and Forestry. If

an aerial application is not possible, boat applications should be made using 2,4-D (0.5 gal/acre) and a 90:10 non-ionic surfactant (1 pint/acre) in the spring or early summer. Follow up applications should be made throughout the year to treat new growth as necessary.

**VEGETATION TYPE MAP
IVAN LAKE
2017**

A vegetation typemap survey was performed by Kevin Houston on August 15, 2017. The lake was around pool stage during the survey.

Species Present

The following species were identified in Ivan Lake: American lotus (*Nelumbo lutea*), Eurasian watermilfoil (*Myriophyllum spicatum*), bladderwort (*Utricularia spp*), southern naiad (*Najas guadalupensis*), hydrilla (*Hydrilla verticillata*), primrose spp. (*Ludwigia spp.*), horned pondweed (*Zannichellia palustris*), fragrant water lily (*Nymphaea odorata*), giant cutgrass (*Zizaniopsis miliacea*), common reed (*Phragmites australis*), pennywort (*Hydrocotyle spp.*), alligator weed (*Alternanthera philoxeroides*), watershield (*Brasenia schreberi*), filamentous algae (*spp unknown*) and giant salvinia (*Salvinia molesta*).

Severity

Aquatic vegetation covered approximately 27% (141 acres) of Ivan Lake. The vast majority of coverage was found in the upper reaches of each arm. American lotus and fragrant water lily account for most of the vegetation present-approximately 100 acres. A fringe of both pad species can be found along any bank; while larger mats can be found in the backs of pockets and the upper ends of creeks. Submerged vegetation can be found in large clusters within open areas of emergent vegetation. Salvinia was observed intermittently around the bank and tertiary mats were found in the backs of coves. Salvinia acreage was estimated at less than 20 acres on the lake.

In Caney Creek, emergent vegetation covered 90% of the surface from markers #45 and #46 upwards to the bridge. Most of the emergent vegetation was fragrant water lily with mixed patches of lotus, watershield, pennywort, primrose, and alligator weed interspersed. Each small cove in the Caney arm had a mat of tertiary salvinia in the upper reaches in addition to the intermittent plants along the bank. Submerged vegetation in Caney Creek was primarily milfoil, fanwort, coontail, and naiad. Only the upper end of Caney Creek was severe as access became limited to the creek channel.

In Phillip's Creek, essentially 100% of the arm west of marker #11 was covered with American lotus and fragrant water lily. Any space that was not shaded by emergent vegetation contained 100% submerged vegetation including coontail and milfoil. The creek channel and portions of the boat road remained open. Although coverage was high, severity was only moderate as all areas were still accessible.

The lower reaches of the lake contain scattered clumps of vegetation including lotus, watershield, and coontail. Mixed patches of emergent plants and marginal plants were providing habitat for giant salvinia.

Discussion

Ivan Lake continues to contain a mix of aquatic vegetation. Efforts to control vegetation by District 1 herbicide spray applications have totaled 157 acres through August, 2017. Aquatic coverage (27%) in this report includes areas that have been recently treated with herbicides and will soon have diminished

plant populations. Essentially, the 141 acres of vegetation likely represents the maximum coverage that will exist on Ivan Lake for 2017.

Giant salvinia continues to build on Ivan as it has in all District 1 waterbodies. Two successive mild winters have certainly played a role in the increased acreage, and the District 1 crew has done a good job keeping salvinia in check.

Submerged vegetation persists in amounts similar to 2015-16 type maps. Stockings of triploid grass carp from 2013-2016 have been 600, 600, 250, and 250 respectively. Hydrilla was not observed in locations where it had been persistent historically. Grass carp are likely keeping hydrilla in check and limiting expansion of native submerged vegetation.



