LOUISIANA DEPARTMENT OF WILDLIFE & FISHERIES

OFFICE OF FISHERIES
INLAND FISHERIES SECTION

PART VI -A

WATERBODY MANAGEMENT PLAN SERIES

ATCHAFALAYA BASIN

LAKE HISTORY & MANAGEMENT ISSUES

CHRONOLOGY

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LAKE HISTORY

GENERAL INFORMATION

History

The Atchafalaya River Basin is located in south-central Louisiana. **(See Maps 1 and 2, Appendix I)**

A full map of features and ownership of land in the basin is available for download from the Office of State Lands online at the following link:
http://www.doa.la.gov/osl/FPP/Publications/Atchafalaya_Basin_Webmap.jpg ;

or for purchase at the following link:
http://www.doa.la.gov/Pages/osl/Forms.aspx .

The history of the Atchafalaya River and its basin is not complete without mention of the geological history of the Mississippi River. The Atchafalaya Basin was formed thousands of years ago as part of the periodic meandering of the Mississippi. Much of the land contained in the basin was formed by the Cypremort/Sale and the Teche lobes of previous Mississippi River delta complexes.

Geologists would not technically classify the Atchafalaya River as a river since it actually has functioned as a distributary of the Mississippi River since the 1500's (van Heerden, I. L., and H. H. Roberts 1980. The Atchafalaya Delta-Louisiana's New Prograding Coast. Gulf Coast Association of Geological Societies Transactions (30):497–506).

The Mississippi River has changed course about every 1000 years. In the 15th century A.D., the meandering Mississippi, in a loop called Turnbull's Bend, broke into the basin of the Red River and captured the Red River. At the same time, it also intersected a small southerly flowing distributary of the Red River later known as the Atchafalaya River. When European settlers came to this area, they discovered the Red River emptying into the Mississippi at Turnbull's bend, and found the Atchafalaya River to be a well-defined distributary flowing out a few miles south in the same bend.

In 1831, Captain Henry M. Shreve dredged a cut across Turnbull's Bend. The Mississippi flow was captured by this cut and the old channel was abandoned. The old channel was filled in at the northernmost reaches and the southern end remained open to eventually become known as Old River.

The Red River no longer flowed into the Mississippi but was diverted into the Atchafalaya River. Water also flowed west from the Mississippi to the Atchafalaya River by way of the Lower Old River. For years, capture of the Mississippi by the Atchafalaya was blocked by a huge 30-mile-long log raft. In 1839, the state of Louisiana began efforts to remove the raft and open up the Atchafalaya for navigation.

With the removal of the log jam, the Atchafalaya began to grow in width and depth, capturing more and more of the Mississippi River flow. The Atchafalaya was a shorter route to the sea at 142 miles, compared to 315 miles for the Mississippi channel.

Until 1928, the entire Atchafalaya flood plain consisted of the basin that occurred between the old natural Mississippi River ridges. On these old ridges, cities were located from Plaquemine to Donaldsonville on the east and from Opelousas to New Iberia and Franklin on the west. Following the great Mississippi flood in 1927, the United States Congress authorized the construction of a floodway through the basin. Until this time the Mississippi River Commission had planned to rely only on levees to control flooding. The 1927 flood was, at that time, the worst peacetime disaster in the history of the United States. Damage estimates were reported between 250 and 500 people killed, 16 million acres flooded, and 41,000 buildings destroyed. The Red Cross reportedly cared for over 600,000 people housed in temporary camps. The magnitude of this event changed plans espoused by the United States Army Corps of Engineers (USACE) over the previous 50 years.

By 1951, it became apparent that without modification, the Mississippi would abandon its channel by Baton Rouge and New Orleans and permanently take the Atchafalaya River to the Gulf of Mexico. Predictions estimated that the abandoned portion of the Mississippi south of Old River would become a saltwater estuary, leading to devastating impacts to everything dependent on freshwater in this region, as well as the potential to severely reduce shipping availability for an already well-established port system. Extensive flooding would also occur in the Atchafalaya Basin, requiring much adaptation by the social and economic patterns along the new course.

The 1953 Mississippi River Commission report recommended that the flow from the Mississippi into the Atchafalaya River should be controlled by a set of structures built on Old River. The proposal was to dam Old River with two control structures. One was to remain open at all times and one would be open only during flood conditions. A lock was included to accommodate navigation between the Mississippi and the Red-Atchafalaya Rivers. The control structures were to sustain the 1950 natural proportion of flow and sediment between the lower Mississippi and the Atchafalaya River. The distribution was about 30 percent of the total combined flow in both the Red River and the Mississippi River above the control structures. This percentage of flow was to be maintained on an annual average (Flood Control Act of 1954, P.L. 780, 83rd Congress). Congress authorized the plan in 1954, and construction was begun in 1955. The structures and accompanying complex were completed in 1962 at a total cost of $67 million dollars.

In 1973, the Old River Low Sill Structure was almost lost to flood waters. A subsequent eight-year improvement project was completed in 1981. Although improvements and repairs were made to the Low Sill, it was not capable of handling the hydraulic changes on the Mississippi that had been occurring since 1951. The Auxiliary Control Structure was completed in 1986 at a total cost of $206 million dollars. The USACE states that the total Old River complex can now provide flood protection and meet the requirements for which it was originally designed in 1951.

In 1985, a prefabricated power plant, the largest vessel ever towed up the Mississippi, was brought 205 miles from the Avondale shipyards in New Orleans to its position above the Low

Sill Structure. The flow through the power plant is adjusted daily to maintain the 70/30 proportions of water distribution required by law.

In addition to the original intent of harnessing the Mississippi and providing flood control, the Old River structures provide water to the Atchafalaya Basin. In the last 100 years the Mississippi has tended to divert more and more of its flow through the Atchafalaya.

In spring 2011, rainfall totals were approximately 300% that of normal precipitation amounts in portions of the Ohio Valley. Rainfall, combined with a nearly double the average size snowpack melt, caused historical flooding along the Mississippi River and its tributaries. On May 14, 2011, one of the floodgates of the Morganza Spillway was opened for the first time since the flood of 1973. This diversion, located along the western bank of the Mississippi River at river mile 280, near the town of Morganza in Pointe Coupee Parish, was constructed to protect levees and prevent major flooding in Baton Rouge and New Orleans. However, once the diversion is open, there is a possibility of severe flooding in the Atchafalaya Basin. During the 2011 opening, the plan first called for diverting 125,000 cubic feet per second (cfs) of water from the Mississippi River to the Atchafalaya Basin during this event (21% capacity). A total of 17 of the 125 steel gates of the Morganza Spillway structure were eventually opened, with the USGS estimating the flow rate at 172,000 cfs. The USACE had estimated that a forecast crest of 45 feet was anticipated to reach Baton Rouge on Tuesday, May 17, 2011. This crest height is the trigger for opening the Morganza Spillway, because the Mississippi River must remain below that height to ensure the integrity of the Baton Rouge levee system.

Based on the diversion of this additional MS River water, the flooding predictions for the Atchafalaya Basin were originally quite severe, as seen in the following link,
http://en.wikipedia.org/wiki/File:NODInundationMay2011Scenario1a.jpg

Flooding in the Atchafalaya Basin was considerably lower than had been anticipated during initial estimates because the Morganza Spillway did not operate at as great a capacity as believed necessary. The MS River crested at 17 feet in New Orleans on May 14, 2011, at 63.09 feet at Red River Landing on May 21, 2011, and the Atchafalaya River crested at 10.35 feet in Morgan City on May 30, 2011. The operation of the Old River Control Structure, along with the Morganza Spillway and other lower Mississippi diversions, proved to be adequate in providing flood protection for the state of Louisiana. The Army Corps estimated that the Mississippi River and Tributaries System (MRTS) used in the flood of 2011 prevented approximately $100 billion dollars in damages.

The following are links to USACE documents concerning flood control, navigation and recreational projects in the basin.

http://www.iwr.usace.army.mil/Missions/FloodRiskManagement/FloodRiskManagementProgram.aspx

http://www.usace.army.mil/Missions/CivilWorks/Navigation.aspx

The following link is an explanation of the evolution of the Old River Control Structure.

http://www.americaswetlandresources.com/background_facts/detailedstory/LouisianaRiverControl.html

Size
833,000 acres of land, swamp, and water. The actual size of water varies with flood stage.

Watershed
River overflow basin that receives 30% of the water draining from 41 % of the continental United States. **(SEE MAP – APPENDIX I)**

Pool stage
Historical crest of 27.28 ft. on May 23, 1973 at the Butte la Rose gauge. Low water record of 0.33 ft. on October 17, 1976 at the Butte la Rose gauge.

Parish/s located
Iberia, Iberville, St. Martin, St. Mary, St. Landry, Pointe Coupee

Border waters
Red River, Mississippi River, Gulf of Mexico, Vermilion Bay

LAKE AUTHORITY

Association
Atchafalaya Basin Program
Louisiana Department of Wildlife and Fisheries
Louisiana Department of Natural Resources

Authorization
Legislature of Louisiana, Act 3 of 1998 and Act 920 of 1999

ACCESS

(SEE MAP - APPENDIX I)

Boat docks

Bayou Benoit	Adam's	Millet (Myette) Point
Catahoula	Belle River	New Verdunville
Butte La Rose	Bayou Pigeon	Old Verdunville
Whiskey Bay	Bayou Sorrel	Russo's
Ramah	Upper Grand Bayou	Doiron's
Sandy Cove	Charenton	Ruiz
Wilson's		

State/Federal facilities
Sherburne Wildlife Management Area (WMA) is located north of I-10 in the upper basin east of the Atchafalaya River. There is a designated campground at the headquarters just south of Highway 190 east of Krotz Springs. The Atchafalaya National Wildlife Refuge is located in

Sherburne and is managed by LDWF for hunting. Link to Sherburne WMA and Atchafalaya National Wildlife Refuge information: http://www.wlf.louisiana.gov/wma/2763

Indian Bayou WMA is a Corps of Engineers recreational area managed by the Corps of Engineers and is located north of I-10 on the west side of the Atchafalaya River, within the Henderson Lake area. Link to Indian Bayou site: http://www.mvn.usace.army.mil/Missions/Recreation/AtchafalayaBasin.aspx

Attakapas WMA is located in the lower basin. There are two designated campgrounds on the area. These are accessible by boat only. Link to Attakapas WMA site: http://www.wlf.louisiana.gov/wma/32640

Atchafalaya Delta WMA is located at the mouths of the Atchafalaya River and the Wax Lake Outlet in St. Mary Parish. The area is located some 25 miles south of the towns of Morgan City and Calumet, and is accessible only by boat. Link to Atchafalaya Delta WMA: http://www.wlf.louisiana.gov/wma/32639

SHORELINE DEVELOPMENT

State/National Parks

The recently established (2006) Atchafalaya National Heritage Area stretches across 14 Parishes in south-central Louisiana, emphasizing the cultural and ecological diversity of the area. Link to site: http://www.atchafalaya.org/index.php

Shoreline development by landowners

Camps and houseboats

PHYSICAL DESCRIPTION OF LAKE

Timber type

Bottomland hardwoods, cypress/tupelo

Average depth

Not calculated

Maximum depth

River depth up to 95 feet at high river stages

Natural seasonal water fluctuation

The water in the Atchafalaya River comes from a huge watershed. This water is thirty percent of a combination of the Red River plus the Mississippi River drainage. The Red and Mississippi Rivers drain 41 percent of the continental United States from North Dakota to West Virginia and even a very small portion of Canada. The area of this catchment, 1,245,000 square miles, is the 3rd largest watershed in the world.

Figure 1 is a map showing the size of the MS River watershed.

Figure 1. Map of the Mississippi River watershed, and sub-basins within. (Image courtesy of www.mvd.usace.army.mil)

The primary river gauge used by District 9 Inland Fisheries personnel for sampling activities within the Atchafalaya Basin is the gauge located at Butte La Rose, LA. This gauge is located just downstream of the split between the main channel of the Atchafalaya River and the Whiskey Bay Pilot Channel. Information for this gauge is listed below:

USGS 07381515 Atchafalaya River at Butte La Rose, LA
St. Martin Parish, Louisiana
Hydrologic Unit Code 08080101
Latitude 30°16'53" ; Longitude -91°41'12" NAD27

The following are links to real-time river gauges showing current water levels as well as historical water levels.

http://waterdata.usgs.gov/la/nwis/uv?site_no=07381515

http://water.weather.gov/ahps2/hydrograph.php?wfo=lix&gage=blrl1

http://www.mvn.usace.army.mil/Missions/Engineering/StageandHydrologicData.aspx

EVENTS/ PROBLEMS

Management priority for the Atchafalaya Basin is flood control and navigation. Efforts to maintain deep water fisheries habitat can be considered only if they do not conflict with flood control or navigation. The dredging of the main channel through historical Grand Lake placed tons of spoil on the sides of the channel and greatly decreased the overflow of river water into the back swamp.

Channel training has cut off sheet flow overbank flooding from the interior swamp and replaced this with channelized overflow that is delivering thousands of tons of sand and sediment into previously productive fisheries habitat. An example is the bank stabilization levee built from Thibodaux Chute to American Pass. This levee was installed to work in conjunction with the rock weir in Grand Lake that distributed the water between the main channel and the Wax Lake Outlet. It was designed so that the water held up by the weir would overtop the weir at higher stages to keep the energy in the main channel and, thus, decrease dredging costs in the river at Morgan City. Without the weir, the water must reach an even higher stage for the river to overtop this levee and sheet flow over the back swamp. In order to get river water to the back swamp, channels have either been cut through the high spoil banks, or existing channels were left to convey this water.

Deep water fisheries habitat is disappearing at an alarming rate. Blue Point Chute has filled in Willow Cove, Blue Point Cove, and Fisher Bayou. It is in the process of filling in Little Bayou Long from the junction of the Current Canal and Duck Lake, and from the Current Canal towards Bayou Long. With the decline in deep water areas, fishing pressure on the remaining habitat has increased.

The decline in publicly accessible water will be greatly exacerbated with enforcement of the statewide trespassing law on flooded private property. Also, the 2006 ruling on Gassoway Lake off the Mississippi River that prohibits the public from pursuing fish into flood waters over private property will severely limit the options to anglers in the Atchafalaya Basin. Many of the fisheries habitats in the basin are actually private canals dredged on private property. Private landowners may eventually begin to ask for enforcement of the trespassing law on their property or begin placing gates at the entrance to private canals. This is already being done in the coastal freshwater marsh and in a couple of places in the basin. When access to these canals is denied, anglers will be limited to natural bayous and lakes presently claimed by the state.

MANAGEMENT ISSUES

AQUATIC VEGETATION

Biomass

Annual weed estimates show that approximately 50,000 acres of aquatic plant coverage occur in the Lower Atchafalaya Basin. Approximately 60% are floating plants, consisting of water hyacinth (*Eichhornia crassipes*), common salvinia (*Salvinia minima*), giant salvinia *(Salvinia molesta)* and occasionally duckweed *(Lemna minor)*. Approximately 30% are submersed plants which consist primarily of hydrilla *(Hydrilla verticillata)*, coontail *(Ceratophyllum*

demersum), and fanwort *(Cabomba caroliniana)*. Approximately 10% are emergent plants which consist primarily of alligator weed *(Alternanthera philoxeroides)*, water primrose (*Ludwigia* spp.), and sedge (*Carex* spp.). The floating exotic species (water hyacinth and salvinia) present the biggest problems by completely covering navigable bayous and canals which limits or prevents boater access to these waterways. Water hyacinth has long been an extremely problematic plant in most Louisiana waters, restricting access ever since it's importation at the 1884 World's Fair in New Orleans. In the early 1900's, it became especially problematic in the lower Bayou Teche area and over into the Atchafalaya Basin.

Treatment history by year available

Aquatic plant control is conducted by LDWF and private contractor spray crews who apply herbicides that are EPA approved for use in aquatic areas. Spray crews in the lower Atchafalaya Basin spray approximately 4,000 acres of aquatic weeds annually. The infestations targeted for spraying consist of approximately 90% water hyacinth and 10% emergent species. Table 1-A below contains LDWF spray records and herbicides used from 2012-2015. Table 1-B contains spray records from 2016-2017, thus far in 2018, and future usage. All LDWF spray crews apply EPA-approved herbicides for nuisance aquatic weeds in accordance with the approved LDWF Aquatic Herbicide Procedures.

Water hyacinth is controlled with 2,4-D (0.5 gal/acre) and a non-ionic surfactant (1 pint/acre). Common and giant salvinia are controlled with a mixture of glyphosate (0.75 gal/acre) and diquat (0.25 gal/acre) with Turbulence (or approved equivalent, 0.25 gal/acre) surfactant from April 1 to October 31. Outside of that time frame, diquat (0.75 gal/acre) and a non-ionic surfactant (0.25 gal/acre) are used. Sedge is controlled with the aforementioned salvinia treatments if it is associated with those plants. If it is targeted specifically, 2,4-D (0.5 gal/acre) is used in conjunction with a non-ionic surfactant (1 pint/acre).

The Department has been introducing giant salvinia weevils (*Cyrtobagous salviniae)* through plant material containing the weevils to serve as an aid in controlling giant salvinia infestations. Since the summer of 2007, approximately 78,000 weevils have been released on giant salvinia infestations in the Bayou Postillion and Bayou Long areas. Weevil damage to salvinia plants has been observed in and around the release sites. Recent surveys have shown that the weevils have survived past winters and were spreading into new areas where salvinia infestations were present. A release conducted in April of 2015 placed an estimated 21,000 adult giant salvinia weevils in the south-eastern portion of the Basin west of Adam's landing, known as the Checkerboard. Approximately 7,000 more adult weevils were released along the western protection levee near the Bayou Benoit area, as well as an estimated 4,200 weevils released in the portion of Bayou Teche that runs between the east and west Atchafalaya Basin protection levees and is located in District 9. It is unknown at this time how the record low winter temperatures of early 2018 affected the weevil survival. Two releases were made in the summer of 2018, the first one in July with an estimated 19,440 weevils released into the Flat Lake/Bear Bayou/lower Bayou Sorrell area, and the second occurring in late August with an approximately 21,420 weevils released near the Checkerboard area around the 16 Inch and 30 Inch Pipeline Canal areas.

During the fall of 2013, LDWF contracted applicators to spray additional vegetation in the Wax Lake Outlet area. Private applicators treated 300 acres of water hyacinth using 150

gallons of Weedestroy AM-40 (2,4-D). All herbicide applications included a non-ionic surfactant at a rate of 0.125 gallons per acre.

During 2014, 3,891 acres of water hyacinth were treated with 2,4-D; 176 acres of a water hyacinth/alligator weed mix with 2,4-D; 65 acres of common salvinia and 94 acres of giant salvinia with either a glyphosate/diquat mixture, or diquat depending on the time of year. During November 1st - March 31st, only diquat was used to spray salvinia species, while a glyphosate/diquat mixture was used from April 1st-October 31st based on the differences in plant metabolism and air temperatures. Also treated in 2014, 20 acres of willow trees; 16 acres of buttonbush; and 12 acres of Cuban bulrush were treated with 2,4-D. Other vegetation treated included 86 acres of frog's bit with diquat; 66 acres of duckweed using diquat; 3 acres of cut grass with glyphosate; 6.5 acres of southern Naiad with penoxsulam; and a 28-acre mixture of 8 different species of plants treated with penoxsulam (Galleon).

In May 2014, LDWF contracted applicators to spray additional areas around the Wax Lake Outlet. Private applicators treated a total of 650 acres of vegetation including: 165 acres of water hyacinth, 170 acres of pennywort, 165 acres of alligator weed, and 150 acres of primrose. A total of 330 gallons of Arsenal (Imazapyr) sprayed at 0.5 gallons per acre (gpa), and 165 gallons of Turbulence (surfactant) sprayed at 0.25 gpa were used during this treatment. No other contract applications were conducted during the year.

During 2015, LDWF spray crews treated a total of 3,650 acres of aquatic vegetation including 14 different species of plants, with 6 different EPA-approved herbicides. Included in that total were 3,043 acres of water hyacinth, 163 acres of a water hyacinth/alligator weed mix, 252 acres of sedge, and 7.5 acres of willow trees treated with 2,4-D. For a complete list of the plants treated with each specific herbicide, see Table 1-A below. Also treated in 2015 in the portion of Bayou Teche mentioned above, were 408 acres of water hyacinth, and 15 acres of alligator weed mixed with hyacinth, both treated with 2,4-D. No contractor applications were conducted in 2015.

During 2016, LDWF spray crews made foliar herbicide applications on nuisance plants such as alligator weed, duckweed, cut grass, frog's bit, primrose, giant salvinia, sedge, water hyacinth, and willow trees. A total of 2,042 gallons were applied to 4,027 acres. Foliar applications of 2,4-D (0.5 gal/acre) were used to control water hyacinth and willow. Giant salvinia was controlled with a glyphosate/diquat mixture of glyphosate (0.75gal/acre) / diquat (0.25 gal/acre). Diquat was applied at 1.0 gal/acre to control duckweed. The alligator weed, cut grass, frog's bit, primrose, and sedge were not the targeted species of plants during those applications, but rather were incidentally treated with those plants that were being targeted. For a complete list of the plants treated in 2016 with each specific herbicide, see Table 1-B below.

In August 2016, LDWF contracted private applicators to spray additional areas within Bayou Teche. Private applicators treated a total of 224 acres of an American lotus/water hyacinth mix with 112 gallons of 2,4-D sprayed at 0.5 gal/acre, and 28 gallons of Activate Plus sprayed at 0.125 gal/acre. No other contract applications were conducted that year.

During 2017, LDWF spray crews made foliar herbicide applications to nuisance plants such as alligator weed, American lotus, duckweed, frog's bit, mosquito fern, parrot's feather,

pennywort, primrose, common salvinia, giant salvinia, sedge, water hyacinth, water lettuce, and water paspalum. A total of 1,919 gallons were applied to 4,851 acres. Foliar applications of 2,4-D (0.5 gal/acre) were used to control American lotus and water hyacinth. Common and giant salvinia were controlled with either a glyphosate (0.75 gal/acre) + diquat (0.25 gal/acre) mixture, or diquat (0.75gal/acre), depending on the time of year as mentioned above. Diquat was applied at 1.0 gallons per acre to control duckweed. The alligator weed, frog's bit, mosquito fern, parrot's feather, pennywort, primrose, sedge, water lettuce, and water paspalum were not the targeted species of plants during those applications, but rather were incidentally combined with those plants that were being targeted. For a complete list of the plants treated in 2017 with each specific herbicide, see Table 1-B below.

Multiple contracts with private applicators were needed in 2017 to treat additional problematic areas. A total of seven work orders were approved and implemented.

The areas, acreage, and associated plant species for each work order were as follows:

- May, upper Grand River flats – 407 acres of water hyacinth treated with 2,4-D.
- July, Ramah & upper flats – 308 acres of water hyacinth treated with 2,4-D.
- August, Schwing Chute – 128 acres of water hyacinth treated with 2,4-D.
- September, Bayou Pigeon – 493 acres of water hyacinth and Cuban bulrush treated with 2,4-D.
- September, Upper Flats/Bayou Pigeon – 315 acres of water hyacinth and Cuban bulrush treated with 2,4-D.
- September, Old River/Bayou Postillion area – 480 acres of water hyacinth and Cuban bulrush treated with 2,4-D.
- September, Bayou Long/Checkerboard area – 960 acres of giant salvinia, water hyacinth, and Cuban bulrush treated with glyphosate and diquat.

The total acreage for those seven contracts in 2017 was 3,242 acres at a cost of $198,617.

Thus far in 2018, LDWF spray crews have conducted foliar herbicide applications on nuisance plants such as alligator weed, cut grass, duckweed, frog's bit, pennywort, primrose, common salvinia, giant salvinia, sedge, water hyacinth, water lettuce, and willow trees. A total of 1,160 gallons were applied to 1,916 acres. Foliar applications of 2,4-D (0.5 gal/acre) were used to control water hyacinth and willow trees. Common and giant salvinia were controlled with either a glyphosate (0.75 gal/acre) + diquat (0.25 gal/acre) mixture, or diquat (0.75gal/acre)

depending on the time of year as mentioned above. Diquat was applied at 1.0 gallons per acre to control duckweed. The alligator weed, cut grass, frog's bit, pennywort, primrose, sedge, and water lettuce were not the targeted plant species during those applications, but rather were incidentally combined with those plants that were being targeted. For a complete list of the plants treated in 2018 with each specific herbicide, see Table 1-B below.

Also thus far in 2018, two contracts have been needed to treat additional problematic areas. The areas, acreage, and associated plant species for these work orders are as follows:

- May, Upper flats area – 960 acres of water hyacinth treated with 2,4-D.
- June, Ramah & upper flats area – 160 acres of giant salvinia and water hyacinth mixture treated with glyphosate, diquat, and surfactant.

Table 1-A. Acres of aquatic vegetation treated by LDWF spray crews and contracted private applicators in the Atchafalaya Basin listed by vegetation type and applied herbicide, for the years 2012 – 2015.

			Year				Total
			2012	2013	2014	2015	
			Area Sprayed	Area Sprayed	Area Sprayed	Area Sprayed	Area Sprayed
			Sum	Sum	Sum	Sum	Sum
Body of Water	Vegetation	Herbicide					
10501 – Lower Atchafalaya Floodway	Alligator weed	2,4-D	55	135	171	163	524
		Imazapyr	.	.	165	.	165
		Penoxsulam	.	.	2.5	0.3	2.8
		Glyphosate	.	127	5	.	132
	Buttonbush	2,4-D	.	.	16	.	16
	Coontail	Penoxsulam	3	.	1	0.3	4.3
	Cut grass	Imazapyr	.	.	3.5	.	3.5
	Duckweed	Glyphosate	.	1	.	.	1
		Penoxsulam	2	.	0.5	0.6	3.1
		Diquat	.	.	66	16.5	82.5
	Frog's Bit	Glyphosate	.	8	.	.	8
		2,4-D	.	.	86	.	86
	Mosquito fern	Penoxsulam	.	.	.	0.3	0.3
	Pennywort	Glyphosate	.	21	.	13.	34
		Imazapyr	.	.	170	.	170
		Penoxsulam	.	.	0.5	.	0.5
	Primrose	Imazapyr	.	.	150	.	150
		Penoxsulam	.	.	2	.	2
		Glyphosate	.	.	.	18.93	18.93
	Salvinia, Common	2,4-D	.	.	5	.	5
		Glyphosate	80	36	35.	.	151
		Penoxsulam	.	.	0.5	0.3	0.8
		Diquat	.	.	43	1.5	44.5
	Salvinia, Giant	2,4-D	.	7.	24.	.	31
		Glyphosate	1140	250	57.	29.	1476
		Diquat	.	.	12	.	12
	Sedge sp.	2,4-D	.	.	12.	252.	264.
		Glyphosate	892	163	.	35	1090
	Southern Naiad	Fluridone	.	.	5	.	5
		Diquat	.	.	2	.	2

			Year				Total
			2012	2013	2014	2015	
			Area Sprayed	Area Sprayed	Area Sprayed	Area Sprayed	Area Sprayed
			Sum	Sum	Sum	Sum	Sum
	Torpedo grass	Glyphosate	.	.	.	0.7	0.7
	Water Hyacinth	2,4-D	1002	3816	4423	3043	12,284
		Glyphosate	.	521	114	41	676
		Imazapyr	.	.	168	.	168
		Penoxsulam	.	.	0.5	0.3	0.8
		Diquat	.	.	56	1	57
	Water lettuce	Penoxsulam	.	.	1	0.9	1.9
		Glyphosate	.	.	.	0.65	0.65
		Diquat	.	.	.	1	1
	Water Paspalum	Glyphosate	.	.	.	23.4	23.4
	Willow tree	2, 4-D	.	.	20	7.5	27.5
Total			3174	5085	5167	3649.5	17,075.5

Table 1-B. Acres of aquatic vegetation treated by LDWF spray crews and spray contracts in the Atchafalaya Basin listed by vegetation type and applied herbicide, for the years 2016-2018, and future use.

			Year				Total
			2016	2017	2018	2019	
			Area Sprayed	Area Sprayed	Area Sprayed	Area Sprayed	Area Sprayed
			Sum	Sum	Sum	Sum	Sum
Body of Water	Vegetation	Herbicide					
10501 – Lower Atchafalaya Floodway	Alligator weed	2,4-D	114	.	120.1.	.	234.1
		Glyphosate	.	.	.	.	.
		Imazapyr	6.3	11.85	.	.	18.15
	American Lotus	2,4-D	112	1.3			113.3
	Cut grass	Imazamox	10.3	.	6.6	.	16.9
	Duckweed	2,4-D	2	20	38.5	.	60.5
		Diquat	29.4	55	75.5.	.	159.9
		Glyphosate	2.6	24.5	42.6	.	69.7
	Frog's bit	Glyphosate	6.6	52.56	3.3	.	62.46
	Mosquito fern	2,4-D	.	1.53	.		1.53
	Parrot's feather	2,4-D	.	2.60	.		2.60

			Year				Total
			2016	2017	2018	2019	
			Area Sprayed	Area Sprayed	Area Sprayed	Area Sprayed	Area Sprayed
			Sum	Sum	Sum	Sum	Sum
	Pennywort	Imazapyr	.	.	.	.	.
		Glyphosate	.	2.25	267	.	269.25
	Primrose	Imazapyr	.	11.16	.	.	11.16
		Glyphosate	6	21.13	53.7	.	80.8
	Salvinia, Common	Diquat	.	81.8	54.4	.	
		Glyphosate	.	120.5	69.9	.	190.4
	Salvinia, Giant	2,4-D	2	.	.	.	2
		Glyphosate	.	213.4	145.3	.	358.7
		Diquat	17	160.7	112.9	.	290.6
	Sedge sp.	2,4-D	39	61.7	4.7	.	105.4
	Water Hyacinth	2,4-D	3645.5	4100.8	857.2	.	8603.5
		Glyphosate	16	.	.	.	16
		Diquat	4.45	.	.	.	4.45
	Water lettuce	2,4-D	.	0.65	4.7		5.35
	Water paspalum	Glyphosate	.	22.4	.	.	22.4
	Willow tree	2,4-D	14	.	60	.	74
Total			4027	4851	1916	.	10,794

HISTORY OF REGULATIONS

Recreational

Statewide regulations are in effect for all fish species. The recreational fishing regulations may be viewed at the link below:
http://www.wlf.louisiana.gov/fishing/recreational-fishing

The 14-inch minimum length limit (MLL) for black bass was implemented as an emergency measure following the fish kill caused by Hurricane Andrew in 1992. The regulation was implemented to protect bass that had survived the storm, as well as bass stocked immediately following the storm, and allow them to spawn at least once before becoming available to harvest. In 1993, the regulation was renewed with a sunset date of 1995. In 1995, the regulation was renewed again for a 2-year period. During this time, biologists were asked to determine if the regulation increased the number of large bass in angler creels. In 1997, the regulation was renewed without a sunset clause with popular support. Most anglers viewed the minimum length limit as a method to control harvest of black bass in the system. In 2012, the Inland Fisheries Section released a report entitled "Evaluation of the 14 Inch Minimum Length Limit for Largemouth Bass in the Atchafalaya Basin and Adjacent Waters, Louisiana." The report described characteristics of the largemouth bass population and the history of the recreational fishery. This study found that slow growth, short life span, and the frequent

catastrophic events are inherent factors that preclude benefits from any recreational harvest regulation, including the 14inch minimum length limit. As such, the 14 inch MLL was determined to be an ineffective regulation. Link to the full report: http://www.wlf.louisiana.gov/sites/default/files/pdf/document/35987-atchafalaya-basin-lmb-technical-report-10-01-2012/atchafalaya_basin_lmb_technical_report_1o-01-2012.pdf

The Louisiana Wildlife and Fisheries Commission promulgated a rule to repeal the 14 inch MLL on black bass in the Atchafalaya Basin and adjacent waters. Effective June 20, 2013, regulations included a 7 fish daily creel limit with no MLL. The revised regulation was in effect for two years. After the two-year period, the modified creel limit expired (June 20, 2015) and statewide regulations of a 10 fish daily creel limit now apply.

Commercial

Statewide commercial regulations and seasons can be found at the following link: http://www.wlf.louisiana.gov/fishing/commercial-fishing

FISH KILLS / DISEASE HISTORY, LMBV

- Largemouth Bass Virus (LMBV) was identified in 1999.
- Low dissolved oxygen events related to Hurricane Andrew in 1992 killed about 800,000,000 fish.
- Low dissolved oxygen events related to Hurricane Lili in 2002 killed a large, but undetermined number of fish.
- Low dissolved oxygen events related to Hurricane Rita in 2005 killed a large, but undetermined number of fish.
- Low dissolved oxygen events related to Hurricanes Gustav and Ike in 2008 killed a large, but undetermined number of fish.
- Low dissolved oxygen events related to Hurricane Isaac in 2012 killed small numbers of fish.
- High river levels lasting into Mid-August of 2015, then a quickly falling river hydrograph resulted in a fish kill of over 3,000 fish in the Whiskey Bay area.
- High river levels lasting into July and August, then quick periods of descending river levels caused two fish kills in 2017. The first was in the Mud Cove area in late July resulting in an estimated 3,600 fish killed, and the second was around two weeks later when the Basin river levels dropped sharply again, this time killing an estimated 1,500 fish in the Buffalo Cove area.
- The record low temperatures of January 2018, followed by unseasonal warm temperatures in February resulted in a large area of water hyacinth plants dying from the freezing temperatures, then rapidly decomposing when the weather quickly warmed up. The rotting plants used the available dissolved oxygen, creating a kill of an estimated 7,500 fish in the Checkerboard area.
- Low dissolved oxygen as a result of oil field barge and rig movements created a small isolated kill of an estimated 5,000 fish in the Berry Lake area in August 2018.

Oil field activity such as moving barges and rigs with tugboats when the water is low and the temperatures are high can kill fish. High river stages that last until the summer will kill fish

when the river stage falls too quickly. Water pushed into back swamps and held at high air temperatures has little oxygen remaining when it drains back into canals and bayous. Localized fish kills occur in isolated areas.

CONTAMINANTS / POLLUTION

Water quality

The following link to the Louisiana Dept. of Environmental Quality's (LADEQ) website gives water quality assessments across Louisiana.

http://deq.louisiana.gov/resources/category/water-quality-management

Mercury Level

The following link to LADEQ's website gives information on their mercury initiative:
http://deq.louisiana.gov/page/mercury-initiative

Mercury levels in individual fish by date, location, species and size can normally be found at the following link to LDWF's website on mercury data:
http://www.wlf.louisiana.gov/fishing/fish-consumption-advisory

Specific alerts pertaining to a particular waterway can be found at the Louisiana Department of Health's (LDH) link:
www.ldh.la.gov/EatSafeFish
Two specific waterways within the Atchafalaya Basin with recent mercury advisories are a 2003 advisory for Big Alabama Bayou located within Sherburne WMA, link below:
http://www.ldh.la.gov/assets/oph/CenterEH/envepi/fishadvisory/Documents/Big_Alabama_Bayou.pdf
An advisory for the I-10 and Work Canal area in 2009 can be found here:
http://www.ldh.la.gov/assets/oph/Center-EH/envepi/fishadvisory/Documents/I-10_2-11-09.pdf

BIOLOGICAL

Fish samples taken by LDWF

History - 1965 to present.

YEAR	WATER	GEAR
1984	Atchafalaya	Electrofishing
1990	Atchafalaya	Electrofishing, Seine
1991	Atchafalaya	Electrofishing, Seine
1992	Atchafalaya	Electrofishing, Seine, Hoop nets, Gill nets
1993	Atchafalaya	Electrofishing, Forage, Seine, Gill nets
1994	Atchafalaya	Electrofishing, Forage, Gill nets
1995	Atchafalaya	Electrofishing, Forage, Hoop nets, Gill nets, Frame nets

YEAR	WATER	GEAR
1996	Atchafalaya	Electrofishing, Forage
1997	Atchafalaya	Electrofishing, Forage, Hoop nets, Gill nets
1998	Atchafalaya	Electrofishing, Forage, Gill nets, Rotenone
1999	Atchafalaya	Electrofishing, Forage, Gill nets
2000	Atchafalaya	Gill nets
2001	Atchafalaya	Electrofishing, Forage, Gill nets
2002	Atchafalaya	Electrofishing, Seine, Hoop nets, Gill nets
2003	Atchafalaya	Electrofishing, Seine, Hoop nets, Gill nets
2004	Atchafalaya	Electrofishing, Forage, Seine, Hoop nets, Gill nets, Otter trawl
2005	Atchafalaya	Electrofishing, Forage, Seine, Hoop nets, Gill nets, Otter trawl
2006	Atchafalaya	Electrofishing, Forage, Seine, Hoop nets, Gill nets
2007	Atchafalaya	Electrofishing, Forage, Seine, Hoop nets, Gill nets
2008	Atchafalaya	Electrofishing, Forage, Hoop nets, Gill nets
2009	Atchafalaya	Largemouth bass population assessment, Electrofishing, Forage, Seine, Hoop nets, Gill nets
2010	Atchafalaya	Largemouth bass population assessment, Electrofishing, Seine, Hoop nets, Gill nets, mortality study
2011	Atchafalaya	Largemouth bass population assessment, Electrofishing, Gill nets; mortality study
2012	Atchafalaya	Electrofishing, Gill nets; mortality study
2013	Atchafalaya	Electrofishing, Gill nets, Larval fish tows; mortality study
2014	Atchafalaya	Electrofishing, Gill nets, Larval fish tows, Coastal Marsh Sampling at Wax Outlet; mortality study
2015	Atchafalaya	Electrofishing, Gill nets, Coastal Marsh Sampling at Wax Outlet; mortality study, mussel abundance and diversity sampling
2016	Atchafalaya	Electrofishing, Coastal Marsh Sampling at Wax Outlet; mussel abundance and diversity sampling
2017	Atchafalaya	Largemouth bass population assessment, Electrofishing, Coastal Marsh Sampling at Wax Outlet; mussel abundance and diversity sampling
2018	Atchafalaya	Largemouth bass population assessment, Electrofishing, Coastal Marsh Sampling at Wax Outlet; mussel abundance and diversity sampling; hoop netting for invasive black carp
2019	Atchafalaya	Largemouth bass population assessment, Electrofishing, Coastal Marsh Sampling at Wax Outlet; mussel abundance and diversity sampling, creel survey, hoop netting for invasive black carp

Lake records

No records specific to Atchafalaya Basin maintained.

Stocking History

From historical data and Inland Fisheries Stocking Data on Inland Server.

YEAR	Florida Largemouth Bass	Northern Largemouth Bass	Bream	Channel Catfish	Blue Catfish
1992	394,000 fingerlings	1,271 adults 5,000 fingerlings	590,000 Bluegill/Redear	92,980 fingerlings	9,020 fingerlings
1993		1,412 adults 185,022 fingerlings	2,065,300 Bluegill/Redear 352,000 Bluegill	1,495,111 fingerlings	306,353 fingerlings
1994			1,075,000 Bluegill	657,928 fingerlings	65,224 fingerlings
1999	330,811 fingerlings				
2000	647,518 fingerlings 451,700 fry				
2001	974,775 fingerlings 295,200 fry				
2002	732,224 fingerlings 25,457 Phase II				
2003	395,347 fingerlings 19,401 Phase II				
2004	200,251 fingerlings				
2005	27,600 fingerlings 12,834 Phase II				
2006	213,733 fingerlings		66,859 Bluegill		
2007	314,081 fingerlings				
2008	206,069 fingerlings				
2009	401,182 fingerlings				

Species profile

FRESHWATER FISHES OF THE ATCHAFALAYA BASIN

Sturgeon Family, ACIPENSERIDAE
- Shovelnose sturgeon, *Scaphirhynchus platorynchus* (Rafinesque)
- Pallid sturgeon, *Scaphirhynchus album* (Forbes and Richardson)

Paddlefish Family, POLYODONTIDAE
- Paddlefish, *Polyodon spathula* (Walbaum)

Gar Family, LEPISOSTEIDAE
- Spotted gar, *Lepisosteus oculatus* (Winchell)
- Longnose gar, *Lepisosteus osseus* (Linnaeus)
- Shortnose gar, *Lepisosteus platostomus* (Rafinesque)
- Alligator gar, *Lepisosteus spatula* (Lacépède)

Bowfin Family, AMIIDAE
- Bowfin, *Amia calva* (Linnaeus)

Freshwater Eel Family, ANGUILLIDAE
- American eel, *Anguilla rostrata* (Lesueur)

Herring Family, CLUPEIDAE
- Skipjack herring, *Alosa chrysochloris* (Rafinesque)
- Gizzard shad, *Dorosoma cepedianum* (Lesueur)
- Threadfin shad, *Dorosoma petenense* (Günther)

Mooneye Family, HIODONTIDAE
- Goldeye, *Hiodon alosoides* (Rafinesque)

Pike Family, ESOCIDAE
- Redfin / grass pickerel, *Esox americanus* (Gmelin)
- Chain pickerel, *Esox niger* (Cook)

Minnow Family, CYPRINIDAE
- Grass carp, *Ctenopharyngodon idella* (Valenciennes)
- Silver carp, *Hypophthalmichthys molitrix* (Valenciennes)
- Bighead carp, *Hypophthalmichthys nobilis* (Richardson)
- Common Carp, *Cyprinus carpio* (Linnaeus)
- Black carp, *Mylopharyngodon piceus* (Richardson)
- Mississippi silvery minnow, *Hybognathus nuchalis* (Agassiz)
- Silver chub, *Hybopsis storeriana* (Kirtland)
- Golden shiner, *Notemigonus crysoleucas* (Mitchill)
- Pallid shiner, *Notropis amnis* (Hubbs and Greene)
- Emerald shiner, *Notropis atherinoides* (Rafinesque)

Pugnose minnow, *Notropis emiliae* (Hay)
Ribbon shiner, *Notropis fumeus* (Evermann)
Taillight shiner, *Notropis maculatus* (Hay)
Silverband shiner, *Notropis shumardi* (Girard)
Weed shiner, *Notropis texanus* (Girard)
Redfin shiner, *Notropis umbratilis* (Girard)
Blacktail shiner, *Notropis venusta* (Girard)
Mimic shiner, *Notropis volucellus* (Cope)
Bullhead minnow, *Pimephales vigilax* (Baird and Girard)

Sucker Family, CATOSTOMIDAE
River carpsucker, *Carpiodes carpio* (Rafinesque)
Smallmouth buffalo, *Ictiobus bubalus* (Rafinesque)
Bigmouth buffalo, *Ictiobus cyprinellus* (Valenciennes)
Black buffalo, *Ictiobus niger* (Rafinesque)
Spotted sucker, *Minytrema melanops* (Rafinesque)
Creek chubsucker, *Erimyzon oblongus* (Mitchill)

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

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

Killifish Family, CYPRINODONTIDAE
Golden topminnow, *Fundulus chrysotus* (Gunther)
Blackstripe topminnow, *Fundulus notatus* (Rafinesque)
Blackspotted topminnow, *Fundulus olivaceus* (Storer)

Livebearer Family, POECILIIDAE
Mosquitofish, *Gambusia affinis* (Baird and Girard)
Sailfin molly, *Poecilia latipinna* (Lesueur)
Least killifish, *Heterandria formosa* (Girard)

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

Temperate Bass Family, PERCICHTHYIDAE
White bass, *Morone chrysops* (Rafinesque)
Yellow bass, *Morone mississippiensis* (Jordan and Eigenmann)
Striped bass, *Morone saxatilis* (Walbaum)
Palmetto bass, *Morone saxatilis* & X *Morone chrysops*

Sunfish Family, CENTRARCHIDAE
Flier, *Centrarchus macropterus* (Lacépède)
Green sunfish, *Lepomis cyanellus* (Rafinesque)
Warmouth, *Lepomis gulosus* (Cuvier)
Orangespotted sunfish, *Lepomis humilis* (Girard)
Bluegill, *Lepomis macrochirus* (Rafinesque)
Longear sunfish, *Lepomis megalotis* (Rafinesque)
Redear sunfish, *Lepomis microlophus* (Günther)
Redspotted sunfish, *Lepomis miniatus* (Jordan)
Bantam sunfish, *Lepomis symmetricus* (Forbes)
Spotted bass, *Micropterus punctulatus* (Rafinesque)
Largemouth bass, *Micropterus salmoides* (Lacépède)
White crappie, *Pomoxis annularis* (Rafinesque)
Black crappie, *Pomoxis nigromaculatus* (Lesueur)

Perch Family, PERCIDAE
Sauger, *Sander canadense* (Smith)
Bluntnose darter, *Etheostoma chlorosomum* (Hay)
Slough darter, *Etheostoma gracile* (Gracile)
Logperch, *Percina caprodes* (Rafinesque)

Drum Family, SCIAENIDAE
Freshwater drum, *Aplodinotus grunniens* (Rafinesque)

ESTUARINE FISHES OF THE ATCHAFALAYA BASIN

Requiem Shark Family, CARCHARHINIDAE
Bull shark, *Carcharhinus leucas* (Valenciennes)

Stingray Family, DASYATIDAE
Atlantic stingray, *Dasyatis sabina* (Lesueur)
Southern stingray, *Dasyatis americana* (Hildebrand and Schroeder)

Tarpon Family, ELOPIDAE
Ladyfish, *Elops saurus* (Linnaeus)

Snake Eel Family, OPHICHTHIDAE
Speckled worm eel, *Myrophis punctatus* (Lütken)

Herring Family, CLUPEIDAE
Gulf menhaden, *Brevoortia patronus* (Goode)

Anchovy Family ENGRAULIDAE
Bay anchovy, *Anchoa mitchilli* (Valenciennes)

Needlefish Family, BELONIDAE

Atlantic needlefish, *Strongylura marina* (Walbaum)

Silverside Family, ATHERINIDAE
Tidewater silverside, *Menidia beryllina* (Cope)

Pipefish and Seahorse Family, SYNGNATHIDAE
Gulf pipefish, *Syngnathus scovelli* (Evermann and Kendall)

Porgy Family, SPARIDAE
Sheepshead, *Archosargus probatocephalus* (Walbaum)

Drum Family, SCIAENIDAE
Atlantic croaker, *Micropogon undulatus* (Linnaeus)
Red drum, *Sciaenops ocellata* (Linnaeus)

Mullet Family, MUGILIDAE
Striped mullet, *Mugil cephalus* (Linnaeus)

Sleeper Family, ELEOTRIDAE
Fat sleeper, *Dormitator maculatus* (Bloch)

Goby Family, GOBIIDAE
Violet goby, *Gobioides broussonetii* (Lacépède)
Clown goby, *Microgobius gulosus* (Girard)
Darter goby, *Gobionellus boleosoma* (Jordan and Gilbert)
Freshwater goby, *Gobionellus shufeldti* (Jordan and Eigenmann)

Left-eye Flounder Family, BOTHIDAE
Bay whiff, *Citharichthys spilopterus* (Gunther)
Southern flounder, *Paralichthys lethostigma* (Jordan and Gilbert)

Sole Family, SOLEIDAE
Lined sole, *Achirus lineatus* (Linnaeus)
Hogchoker, *Trinectes maculatus* (Bloch and Schneider)

Sea Catfish Family, ARIIDAE
Gafftopsail catfish, *Bagre marinus* (Mitchill)

Largemouth bass Genetics

Liver samples were collected and analyzed in 1994, 1995, 1997, 2001, 2003, 2004, and 2006-2013 to determine the percent composition of northern, Florida, and hybrid largemouth bass.

Age and Growth

Age and growth data were collected in 1990, 1994-1999, 2001, 2003, 2004, 2006-2015, 2017, and will be collected in 2018 and 2019 for a follow-up 3-year population assessment.

Threatened/endangered/ and exotic species

Sturgeon Family, ACIPENSERIDAE
Pallid sturgeon, *Scaphirhynchus albus* (Forbes and Richardson), federally and state endangered.
Shovelnose sturgeon, *Scaphirhynchus platyrhynchus* (Rafinesque), federally threatened and state protected.

Pallid and shovelnose sturgeons have been recorded at the Old River Control Structure and other points downstream as far as Morgan City (**Appendix II - research**).

Exotics
Minnow Family, CYPRINIDAE
Grass carp, *Ctenopharyngodon idella* (Valenciennes)
-Gill net sampling has generated records of these fish in the Basin.
Silver carp, *Hypophthalmichthys molitrix* (Valenciennes)
-The catch of silver carp in the Basin is increasing in gill net sampling.
Bighead carp, *Hypophthalmichthys nobilis* (Richardson)
-Although these fish have not been represented in gill net sampling, their presence has been noted in fish kills that have occurred in the Basin.
Black carp, *Mylopharyngodon piceus* (Richardson)
- Almost annual reports from the Atchafalaya River by commercial fishers since 2000.
Common Carp, *Cyprinus carpio* (Linnaeus)
- Found commonly throughout Louisiana.
Long-whiskered Catfish Family, PIMELODIDAE
Spotted tiger shovelnose catfish, *Pseudoplatystoma punctifer* (Castelnau)
-Caught on rod and reel, July 2017, in main stem Atchafalaya River near Melville, LA.

CREEL

The historical creel surveys conducted were access point surveys conducted on random days and times at randomly selected boat ramps that had been weighted by use. All anglers returning to the boat ramp were interviewed and all other users were counted. Anglers interviewed were asked what they were fishing for and their catch was measured and weighed.

Historic information

Table 2 below lists historical data for angler creel surveys conducted in the Atchafalaya Basin. Surveys from 1993 to 1996 included total counts of boat trailers at all boat ramps. Total estimates of all user types and creel data, including commercial anglers and crawfishermen as well as recreational anglers are available.

Table 2. Historical data of creel surveys conducted in Atchafalaya Basin. CPUE = catch per unit effort; LMB = largemouth bass.

YEAR	DURATION	DATA COLLECTED	TARGET GROUP
1989	12 months	CPUE only	Rec. anglers only
1990	5 months	CPUE only	Rec. anglers only
1991	4 months	CPUE only	Rec. anglers only
1993	6 months	Total estimates	All users counted
1994	12 months	Total estimates	All users counted
1995	12 months	Total estimates	All users counted
1996	12 months	Total estimates	All users counted

2003	12 months	CPUE only	All users counted
2004	12 months	CPUE only	All users counted
2008	12 months	CPUE only	All users counted
2009	12 months	CPUE only	All users counted
2013	6 months	Total estimates	LMB anglers only
2014	12 months	CPUE only	LMB anglers only

Opinion surveys were conducted at the boat ramps during creel census interviews in 1995, 1996 and 2003. The data was combined for 1995 and 1996. The opinions collected were from all recreational anglers concerning bass regulations for all three years. The 2003 opinions collected included those of crappie regulations.

Recent methods

An angler creel survey was conducted from July 1, 2013 through Dec. 31, 2014. The survey method used was a fixed access point survey of completed fishing trips. For the first 6 months of this 18-month creel, access point surveys of the entire Atchafalaya Basin were conducted on six randomly selected days per month. Sampling was conducted on two weekdays and four weekend days. The latter 12 months were conducted on three randomly selected days per month, with one weekday, and two weekend days. Start times were also randomly chosen for AM or PM creels. Morning sampling was started two hours after sunrise. Evening surveys were started five hours before sunset. For the first 6 months of the 18-month creel, all trailers at every launch in the Basin were counted. For the latter 12 months, trailers only at the selected ramp were counted. All recreational anglers returning to the ramp were interviewed and only the black bass of their harvest were counted, measured, and weighed. All other user types were identified and counted.

The next creel survey for the Atchafalaya Basin is scheduled to begin in 2019.

HYDROLOGICAL CHANGES

Atchafalaya Basin Levees

All levees in the Atchafalaya Basin, except the guide levees for the Morganza Floodway, are included under this heading. The levee system is designed to protect agricultural areas and towns from the normal high waters of the Mississippi-Red River backwater area, floods on the Atchafalaya River, and when necessary to contain excess floodwaters of the Mississippi and Red Rivers on their way south to the Gulf of Mexico. The levees also protect valuable agricultural lands from backwaters created by the flooding. The system includes about 449 miles of levees and currently will contain a flood of about 1.4 million cubic feet per second (cfs). Work is under way to raise the floodway levees to an elevation that will confine a design flow of 1.5 million cfs. Individual levee features within the existing Atchafalaya system include the following:

East Atchafalaya Basin Protection Levee (EABPL).

The levee begins at the lower end of the east guide levee of the Morganza Floodway, extends southward to and through Morgan City to the Avoca Island Cutoff, and includes the Bayou Boeuf and Bayou Sorrel locks. The length of this system is 106.7 miles, including 1.3 miles of floodwall along the Morgan City front and about 0.4 mile of floodwall below Morgan City.

The Atchafalaya Basin Levee District and the city of Morgan City are responsible for operation and maintenance of this feature.

West Atchafalaya Basin Protection Levee (WABPL).
The levee begins near the town of Hamburg, where it joins the Bayou des Glaises fuse-plug levee. It extends in a south and southeasterly direction to the Wax Lake Outlet at the latitude of the East and West Calumet Floodgates and thence eastward through Berwick to the Gulf Intracoastal Waterway. This levee extends 128.7 miles and connects with 3 miles of floodwall along the front of the town of Berwick. Structures along the levee include Bayou Darbonne and Courtableau drainage structures, the Charenton Floodgate, and the Berwick Lock, described subsequently. The Red River, Atchafalaya, and Bayou Boeuf Levee District, the Atchafalaya Basin Levee District, the town of Berwick, and the St. Mary Parish Government (formerly Police Jury) are responsible for operation and maintenance.

East Atchafalaya River Levee.
The levee extends from the junction of the Atchafalaya, Old, and Red Rivers along the east bank of the Atchafalaya River to approximately 10 miles below Alabama Bayou, a distance of 52.5 miles. The Atchafalaya Basin Levee District is responsible for maintenance.

West Atchafalaya River Levee.
The levee extends southward from Bayou des Glaises levee at Simmesport along the west bank of the Atchafalaya River and Bayou La Rose, to approximately 2 miles below Butte La Rose, a distance of 60.1 miles. Additional levees include the Simmesport ring levee, 1.6 miles in length, and its drainage outlet, Brushy Bayou Drainage Structure, Melville ring levee, 4.1 miles in length and its drainage structures, and the Krotz Springs ring levee, 1.7 miles in length. The total length of levee in this system is 67.5 miles. The Red River, Atchafalaya, and Bayou Boeuf Levee District are responsible for maintenance of the portion of this levee from Simmesport to Bayou Courtableau. The remaining portion is maintained by the Atchafalaya Basin Levee District.

Bayou des Glaises Fuseplug Levee.
The levee extends from the town of Simmesport west and along the south bank of Bayou des Glaises, to the WABPL near Hamburg, a distance of approximately 8 miles. This levee protects the lands in the West Atchafalaya Floodway from floodwaters in the Mississippi-Red River backwater area until stages requiring the use of the West Atchafalaya Floodway are reached. Floodwaters will then enter the floodway by overtopping the levee. The Red River, Atchafalaya, and Bayou Boeuf Levee District are responsible for maintenance.

Mansura Hills to Hamburg Levee.
The levee extends from the Mansura Hills along the north bank of Bayou des Glaises across the structure and southward to the junction of the WABPL and the Bayou des Glaises fuseplug levee, near the town of Hamburg. This 20.5-mile levee protects the area west of the floodways and west of Marksville from Mississippi-Red River backwater flooding. The Red River, Atchafalaya, and Bayou Boeuf Levee District is responsible for maintenance.

Levees West of Berwick.
A total of 56.5 miles of levees tying into high ground are located west of Berwick. They have been designed to protect the agricultural lands along the Teche and Sale ridges from the back

waters created by the introduction of floodwaters from the Mississippi and Red Rivers through the floodways, the Wax Lake Outlet, and Lower Atchafalaya River. The levee system begins at the lower end of the WABPL below Berwick and extends westward generally along the north bank of the Intracoastal Waterway and Wax Lake Outlet, to the Charenton Drainage Canal near Baldwin. It also encloses the Bayou Sale Ridge. Drainage for the enclosed area is through about 38 miles of canals, 3 drainage structures, 20 gated culverts, an inverted siphon, and 11 pumping stations, all of which were completed by 1965.

The Atchafalaya Delta development and coincident rising Gulf-side water levels would progressively reduce pumping capacities of these pumping stations. Formal notification was given to the local operating agencies in 1983 that the Federal government assumed responsibility for modifications needed to regain pumping capacities and was studying means that could be employed. Accordingly, refurbishment of pumps, replacement of aged drive-engines and equipment as necessary, and modifications and repairs were commenced in 1990 and completed in 1993 at the Bayou Yokely, Maryland, Franklin, Centerville, and Wax Lake East and Wax Lake West pumping stations to regain lost capacities.

Removals of some of the 20 gated culverts that are no longer useful or functional for effective gravity-control, collection and transmission of surface drainage waters through flood protection levees are scheduled to be completed by 2002.

Atchafalaya River Improvement Dredging

Improvement dredging of the leveed channel of the Atchafalaya River and its outlets is provided under this feature. Work includes the enlargement of the openings of existing railroad and highway bridges across the Atchafalaya River and such alterations of existing crossings of this river as are deemed necessary to the execution of the plan. Other restricted sections of the channel are to be enlarged to increase the flood flow capacity of the Atchafalaya River. The improvement extends the confluence of the Red, Old, and Atchafalaya Rivers to Alabama Bayou, at mile 57. All work has been completed, unless at a later date it is found that additional improvements are required. The cost of construction to date is $4,578,000. Work was completed in 1953.

Atchafalaya Basin Main Channel Improvement Dredging

The flood-carrying capacity of the Atchafalaya was developed by dredging a continuous main channel through the swamps of the central portion of the basin. The capacity of the floodway was being reduced by sedimentation in the floodway. The main channel preserves floodway capacity and reduces wetland loss by reducing overbank sedimentation in the Lower Atchafalaya Floodway. The dredging extended from the Atchafalaya River at Alabama Bayou to the main body of Six Mile Lake near Morgan City. No work has been performed on this feature since December 1968. The need and feasibility of continued channel dredging were addressed in the Phase I General Design Memorandum approved February, 1983.

This document concluded that the river was enlarging naturally and that flows could be confined to the main channel by slightly raising its natural banks. This channel training work would also significantly reduce sedimentation into the back wetlands. The initial channel training work above Morgan City was completed in 1989 when rock weirs were installed at Blue Point Chute and American Pass. Additional channel training and channel realignment work above Morgan City was completed in 1993. Material for enhancing the natural banks to

confine the river came from within the construction right-of-way instead of the main channel which reduced environmental impacts by one third.

Wax Lake Outlet

The Corps constructed this outlet to convey floodwaters from the Atchafalaya Basin. The outlet, with an initial design capacity of 300,000 cubic feet per second, provides an additional means of safely passing flood waters to the Gulf of Mexico. The dredged channel is about 10 miles west of Berwick and extends from Six Mile Lake through the Teche Ridge and Wax Lake into Atchafalaya Bay, a distance of about 15.7 miles.

The channel was initially constructed to a bottom width of 300 feet from Six Mile Lake to a point one-half mile below Bayou Teche, 400 feet below that point, and a uniform depth of -45 feet NGVD. The excavated material from the channel dredging was used to construct guide levees extending from the WABPL to the Intracoastal Waterway on each side of the outlet.

The Wax Lake Outlet Control Structure was constructed in 1987 to stabilize the distribution of low to normal floodway outlet flows to approximately 70 percent/30 percent between the Lower Atchafalaya River and the Wax Lake Outlet and to increase the channel development of the Lower Atchafalaya River, thereby increasing the combined capacity of the Lower Atchafalaya River and the Wax Lake Outlet to convey flood flows. Flooding of riverfront businesses along the Lower Atchafalaya River in Morgan City/Berwick, Louisiana occurred more frequently after the completion of the Wax Lake Outlet Control Structure. Local interests claimed that the control structure was primarily responsible for the more frequent flooding and requested a complete removal of the weir and dredging of the channel above the weir. The President of the Mississippi River Commission directed the removal of the weir, as requested. The weir removal was completed in March, 1995 and the dredging of Six Mile Lake was completed in June, 1995.

The East and West Calumet floodgates, described below were constructed where the guide levees cross Bayou Teche to allow continued navigation. New bridges were constructed to carry U.S. Highway 90 and the Southern Pacific Lines over the dredged channel. This improvement was completed in 1942 at a cost of $7,122,000, and is maintained by the U.S. Army Corps of Engineers, except for the bridges, which are maintained by their owners.

East and West Calumet Floodgates

These floodgates are located in the East and West Wax Lake Outlet guide levees where the levees cross Bayou Teche. Each floodgate is a reinforced-concrete structure 161 feet long, with a 45-foot clear width, a sill depth of -9.8 feet NGVD, and steel sector gates.

The floodgates allow navigation in Bayou Teche and regulate flows to some extent. They were completed in 1950 at a cost of $1,320,000. Operation and maintenance are the responsibility of the U.S. Army Corps of Engineers. Detailed engineering to modify the existing structures to the project flood flow line had been suspended because of the removal of the Wax Lake Outlet weir and pending the results of the lower Atchafalaya Basin Reevaluation Study.

Charenton Floodgate

This floodgate is located in the WABPL, about 1-mile north of Charenton. It is a reinforced, concrete structure 175 feet long, with a clear width of 45 feet, a depth of -10.8 feet NGVD,

and steel sector gates. The floodgate regulates flows between Bayou Teche and the Atchafalaya Basin Floodway and affords a navigation connection between Grand Lake and the WABPL borrow pit and Charenton Drainage Canal. In 1951, a removable bridge with a low steel elevation of 20.7 feet NGVD was constructed across the structure. The floodgate was completed in 1948 at a cost of $298,000. Charenton Floodgate is operated by the U.S. Army Corps of Engineers. A study is underway to provide modifications to the existing floodgate through consultation and a public meeting with local interests. A navigable structure was determined to be no longer required. A non-navigable closure is planned. In 1994, a scour hole was repaired with rock removed from the Wax Lake Outlet weir.

Berwick Lock

Located in the WABPL near its crossing of the Lower Atchafalaya River, about 2 miles north of the town of Berwick, this lock is a reinforced-concrete structure 45 feet wide, with sills at an elevation of -9.8 NGVD and a usable length of 300 feet between steel sector gates. It affords a navigation passage through the levee and permits navigation up the Lower Atchafalaya River to Patterson and Bayou Teche. The lock was completed in 1951 at a cost of $2.1 million and is maintained by the U.S. Army Corps of Engineers.

Bayou Sorrel Lock

This lock, located in the EABPL at its intersection with the Morgan City-Port Allen Route to the Gulf Intracoastal Waterway, about 15 miles below Plaquemine, provides a navigation connection through the levee. The structure consists of reinforced-concrete gate bays equipped with steel sector gates and connected with an earth chamber having a timber guide wall on both sides. The usable length is 790 feet, the clear width is 56 feet, and the depth over the sill is 14 feet below NGVD. The navigation route between Port Allen and Morgan City through the lock is about 22 miles shorter than the landside waterway. The lock was completed in 1952 at a cost of $4,700,948, and is operated and maintained by the U.S. Army Corps of Engineers.

Bayou Boeuf Lock

This lock is located in the EABPL below Morgan City at a point where it crosses Bayou Boeuf and the Intracoastal Waterway. It consists of two reinforced-concrete gate bays, equipped with steel sector gates connected by an earth chamber which has a timber guide wall on both sides. The lock has a length of 1,136 feet, a clear width of 75 feet, and a depth over sills of 13 feet at NGVD. The Bayou Boeuf Lock provides for navigation through the levee, which protects the areas and communities east of Morgan City from the floodwaters from the Atchafalaya Basin. It was completed in 1955. The lock, excluding approach channels, was completed at a cost of about $2,754,000. It is operated and maintained by the U.S. Army Corps of Engineers.

Atchafalaya River

Channel work on the Atchafalaya River, completed in February, 1956 at a cost of $303,500, is a navigation feature of the MR&T project. The channel, 12 feet deep over a bottom width of 125 feet, extends from the Gulf Intracoastal Waterway at Morgan City to the Mississippi River via the Atchafalaya and Old Rivers. As a shortcut from the Gulf to the upper Mississippi, this project affords travel savings of 172 miles and eases port congestion at New Orleans. Average annual traffic, 1986-1995, was 10,458,000 tons.

Atchafalaya Basin Floodway System

The Atchafalaya Basin Floodway system resulted from a combination of a general investigation (GI) study with a Phase I General Design Memorandum (GDM). The GI study, Atchafalaya Basin (Water and Land Resources), Louisiana, was authorized, by resolutions of the Senate and House Committees on Public Works in 1972. The Phase I GDM was authorized in June, 1976 under the discretionary authority of the Secretary of the Army acting through the Chief of Engineers to address alternative plans for accomplishing the previously authorized purposes of the Atchafalaya Basin project. Because of the interrelationships of the separately authorized studies, they were combined into a single study.

The primary goal of the study was to develop an implementable multipurpose plan that will protect southeast Louisiana from Mississippi River floods by ensuring safe passage of one-half the MR&T project design flood through the Atchafalaya Basin Floodway system, while retaining and restoring the unique environmental values of the floodway and maintaining or enhancing the long-term productivity of the wetlands and woodlands.
The new plan was recommended in the Atchafalaya Basin Floodway system final report/EIS, which was submitted to the Mississippi River Commission in January, 1982, and was approved by the Office of the Chief of Engineers in February, 1983. The recommended plan provides for the following features under existing MR&T project authority:

- continued operation of the Old River Control Structure to maintain the authorized 70/30 flow division;
- continued construction of bank stabilization works above mile 55.0 on the main channel;
- modification of existing features, such as floodway guide levees, floodgates, pumping plants, etc.;
- further channel dredging only to the extent required for providing dredged/excavated material to construct training works along the main channel that will achieve the desirable degree of flow confinement and natural channel enlargement from mile 90.0 to 116.0;
- construction of the Wax Lake Outlet Control Structure to stabilize the distribution of low to normal floodway outlet flows to approximately 70 percent/30 percent between the Lower Atchafalaya River and the Wax Lake Outlet, with possible future restriction of Wax Lake Outlet flows to about 20 percent depending upon ecosystem response (as noted on page 49 the Wax Lake Outlet Control Structure rock weir has been removed and the connecting levee was removed in 1995);
- enlargement of the Wax Lake Outlet overbank area to allow passage of up to 50 percent of flood flows;
- realignment of the four principal distributaries of the main channel for sediment control;
- enlargement of the outlet channels for construction of training works along both channels below the latitude of Morgan City;
- construction of further extensions of the Avoca Island levee and/or other measures for backwater protection east of the floodway after completing additional detailed studies of the Atchafalaya Bay-wetlands-backwater complex;
- and construction of fresh water diversion structures for the Henderson Lake and Sherburne areas.

The recommended plan also included the following features that required additional authorization: acquisition of additional real estate in the Lower Atchafalaya Basin Floodway in the interest of flood control and environmental improvements, construction of recreation

facilities, construction of two pilot management units and miscellaneous canal closures and water circulation improvements. These latter features were authorized by the Supplemental Appropriations Act of 1985 and the Water Resources Development Act of 1986.

The following features were authorized under the discretionary authority of the Chief of Engineers. The Wax Lake Outlet Control Structure in Six Mile Lake, which stabilized the distribution of low to normal floodway outlet flows, was completed in 1988 at a cost of $11,610,000. Removal of this structure was completed in March, 1995. This was necessary to reduce stages and stage durations in the vicinity of Morgan City. The Wax Lake Outlet Control Structure rock weir removal was completed in March, 1995, and the connecting levee was removed in February, 1996. All channel training work above the latitude of Morgan City was completed in February, 1992. The channel realignment work, which consists of two distributary realignments, was completed in 1992. Enlargement of the Wax Lake Outlet overbank has been indefinitely postponed pending recommendations of the Lower Atchafalaya Basin Reevaluation Study. In order to solve the problem of backwater flooding northeast of Morgan City, a 5.5-mile extension of the existing Avoca Island levee was considered. However, a recommendation against the action was made and approved by the Mississippi River Commission in December, 1991 citing:

- limited support
- high cost
- local and state opposition
- the high probability that the area would continue to flood from sources other than the Atchafalaya River backwater (even if the Avoca Island Levee were constructed)

At the present time, the study is being reevaluated. The issue of providing backwater protection for Morgan City is being studied as part of the Lower Atchafalaya Basin Reevaluation Study.

Excessive Atchafalaya River flows over the past several years have necessitated a project reevaluation to assess the project function. The Lower Atchafalaya Basin Reevaluation Study is addressing this concern and investigating conditions at Wax Lake Outlet, Bayou Black, and other locations and will recommend modifications desirable for flood protection, navigation, and environmental management. The study is investigating several alternatives aimed at reducing the volume of flood waters passing Morgan City for flows less than project flood. In conjunction with this study, the Corps of Engineers has initiated an intensive public involvement program intended to provide an avenue for local interest groups to express their concerns and to allow technical exchange of information. The expected completion date is July, 2000.

Improvements for Access, Fish and Wildlife, and Recreation

A program has been initiated to develop a plan to minimize disruption to basin access and damage to the fish and wildlife resource occasioned by the construction of the flood control improvements. Features for fish, wildlife, and recreation are provided for by the Atchafalaya Basin Floodway system project.

East and West Access Channels

This feature consists of channels, 7 feet deep by 80 feet wide, which provide navigable connections between the East and West Atchafalaya guide levees. The East

Access Channel consists of a canal connecting the Atchafalaya River Main Channel with Bayou Sorrel. The West Access Channel connects the Main Channel to Lake Fausse Pointe Cut via Bayou Crook Chene and Little Gonsolin Bayou. They are used by both commercial and recreational craft and permit basin-wide access to and from the main channel. Another function of these channels is to distribute fresh water to the overbank areas which they traverse. The West Access Channel was realigned in 1991, and the old entrance (Little Bayou Chene) was closed.

East and West Freshwater Distribution Channels
These channels are being maintained to distribute fresh water on the east and west sides of the Atchafalaya Basin during seasons of low water on the Atchafalaya River system. The East Freshwater Distribution Channel consists of Little Tensas Bayou and Upper Grand River. The West Freshwater Distribution Channel connects the Main Channel with Lake Fausse Point Cut via Bayou LaRompe, Lake Long, and Bayou L'Embarras. The intermittent overflow from these channels is beneficial to fishing and hunting activities in the area. In 1992, a new entrance to the East Freshwater distribution channel was excavated, and the old entrance at Little Tensas Bayou was closed.

Sherburne Structure
This structure will be constructed in the Atchafalaya River levee at Sherburne to supply fresh water from the Atchafalaya River to the wetlands on the east side of the river. The structure at Sherburne would distribute water by gravity flow through Little Alabama Bayou, Bayou des Glaises, and connecting channels into the Ramah area of the Atchafalaya Basin Floodway, east of the Atchafalaya River.

Retention Dikes
Prior to dredging in the Atchafalaya Basin, a system of dikes, ditches and weirs was constructed to prevent damage to the high-value habitat. The purpose of the dikes is to confine dredged material to carefully chosen areas, while the ditches and weirs return spill waters from the dredging process to the main channel. This system precludes the incursion of sediments into existing off-channel open water areas and minimizes alteration of the basin's unique environment.

Buffalo Cove Pilot Water Management Unit (BCPWMU)In accordance with congressional authorization, the USACE identified the Buffalo Cove area of the Atchafalaya Basin as one of thirteen units that needed restoration due to environmental degradation associated with construction of the ABFS. Specific goals for this project included improved water circulation, restricted sediment movement and restoration of historic overflow patterns. From 2000 to present, water management features such as dredging, sediment trap creation and cleaning, and dike notching activities were conducted in tandem with fish, water quality and habitat monitoring. This project is on-going as of 2018. http://data.dnr.louisiana.gov/ABP-GIS/Publications/Buffalo%20Cove%20EA.pdf

WATER USE

Activities related to the oil and natural gas industry and to commercial navigation are widespread throughout the Atchafalaya Basin.

Non-consumptive
Bird watching, related eco-tours, sight-seeing, canoeing, kayaking, camps and houseboats.

Hunting
Duck hunting, small game hunting, deer hunting, turkey hunting, alligator harvesting, fur trapping.

Fishing

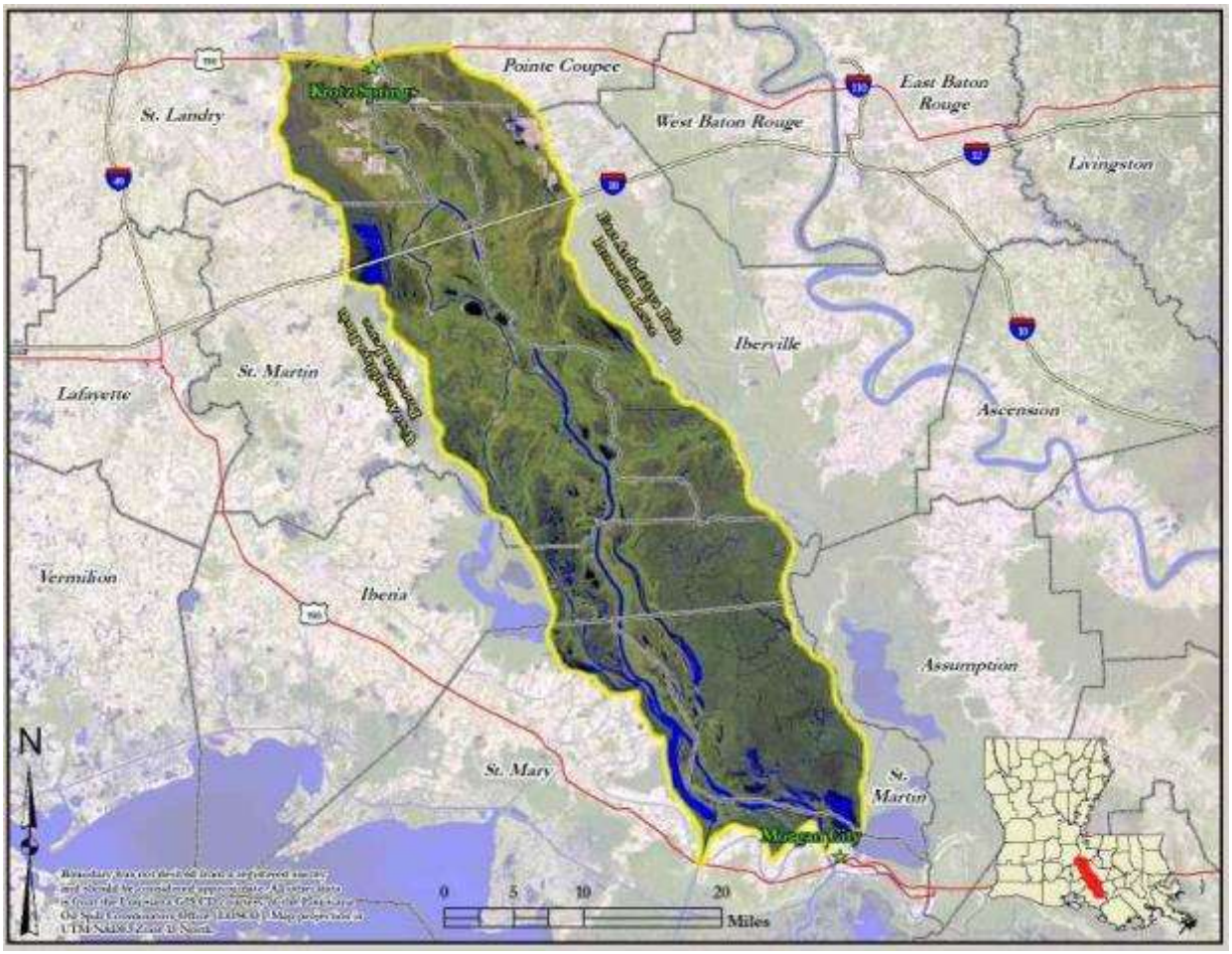
Accessible to all anglers via boat from 19 boat ramps from inside the protection levees. Recreational angler surveys conducted in 1991 and 1998 list the Atchafalaya Basin as the most popular freshwater fishing destination in Louisiana.

Recreational and commercial fishing, recreational and commercial crawfishing, recreational and commercial frogging, plus recreational and commercial crabbing are all part of the many activities occurring in the basin at one time or another.

APPENDIX I – MAPS

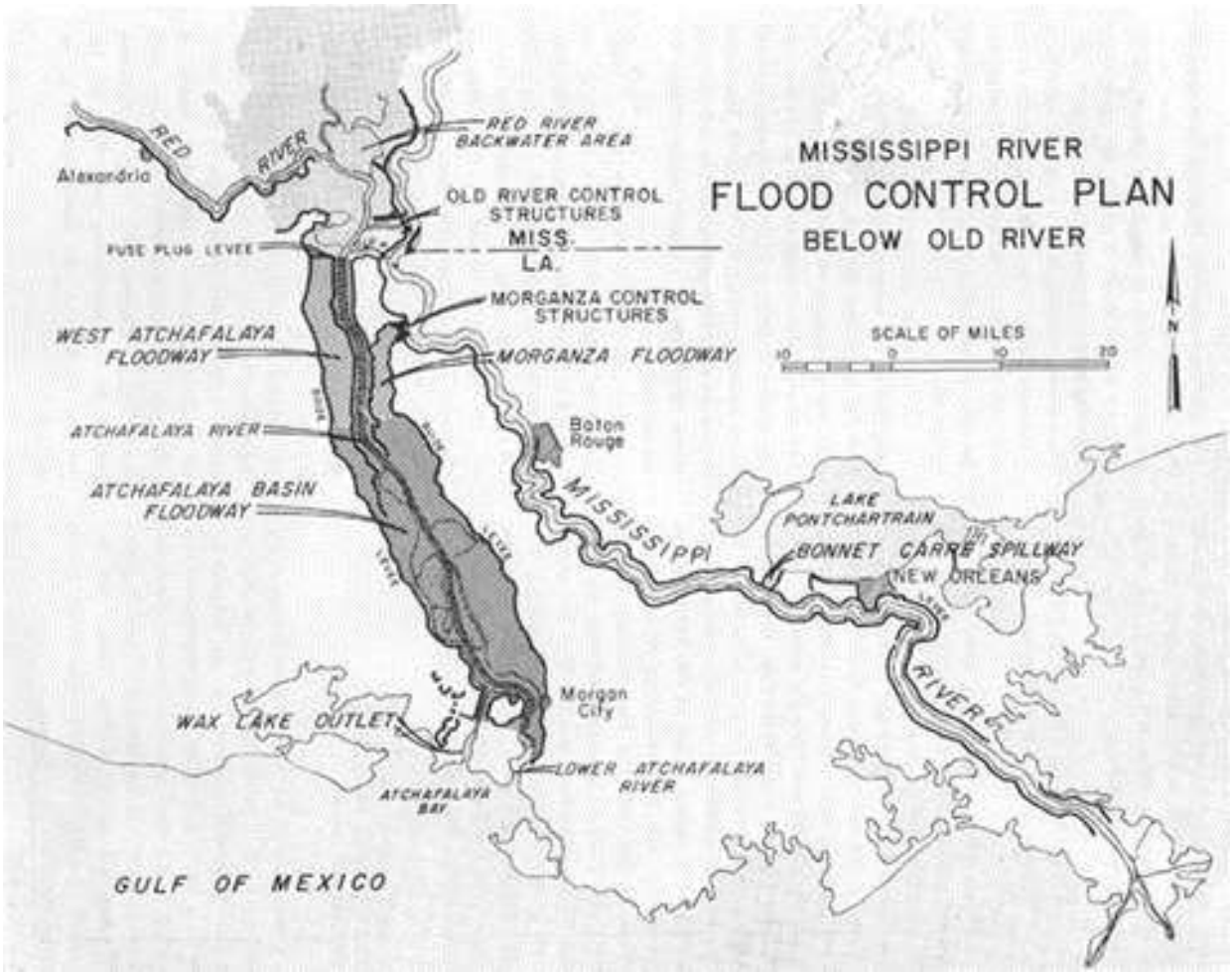
Map 1.
Atchafalaya Basin below Hwy 190.

(Click here to return)



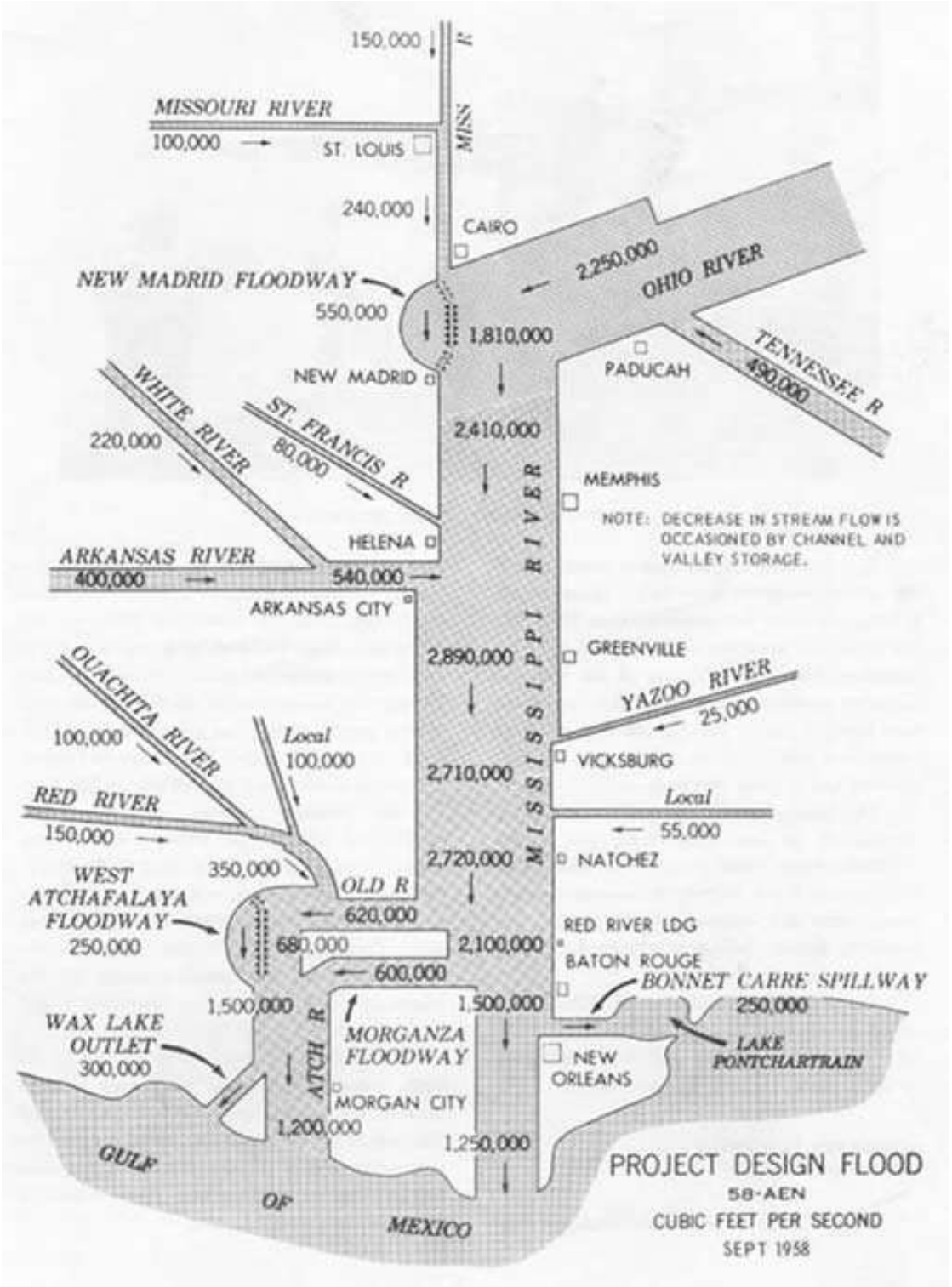
Map 2.
Geographical relationship of the Atchafalaya Basin to the Red and Mississippi Rivers.

(Click here to return)



Map 3.
A schematic view of the watershed of the Atchafalaya River and how the cubic feet per second of project flood is calculated.

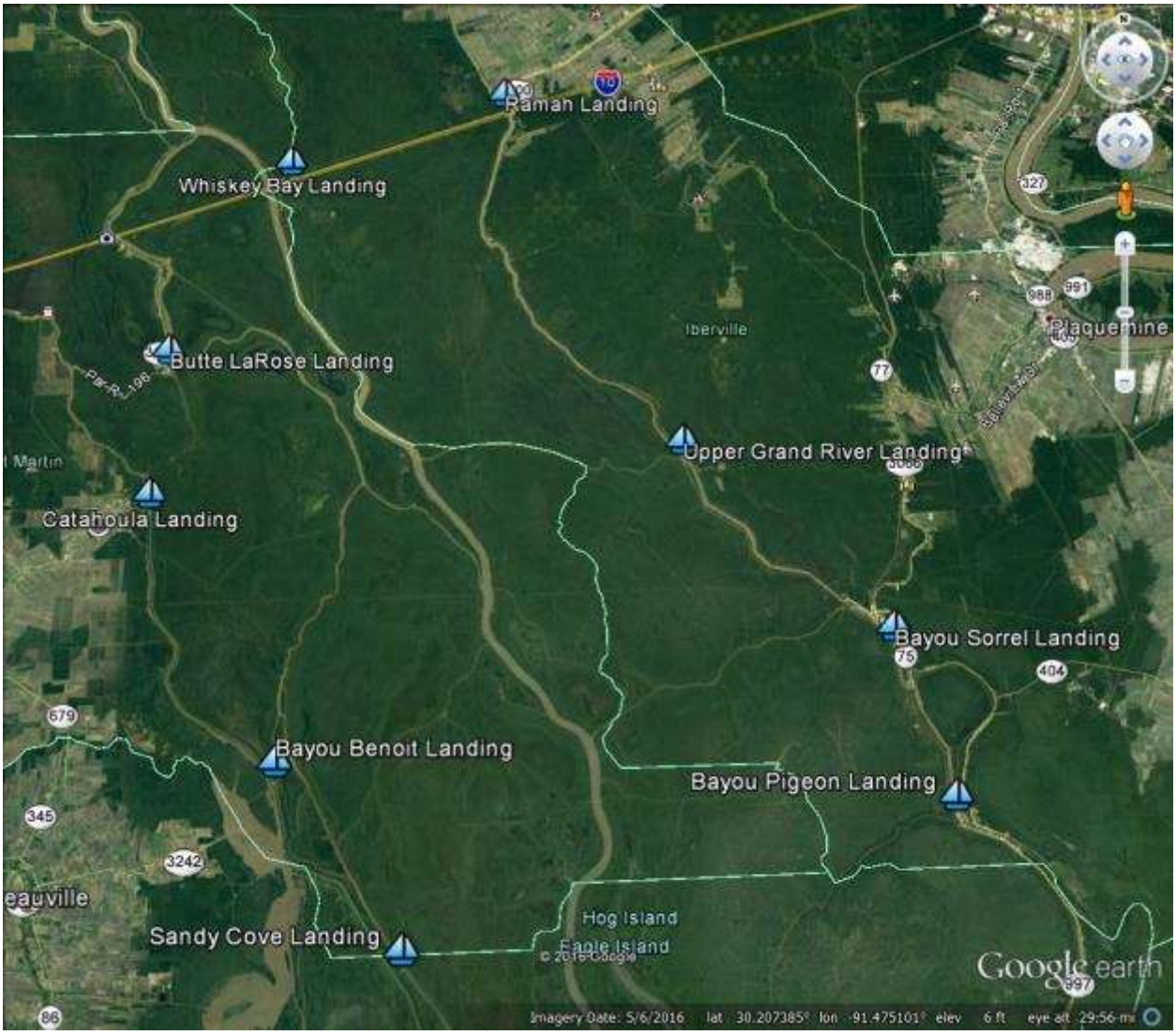
(Click here to return)



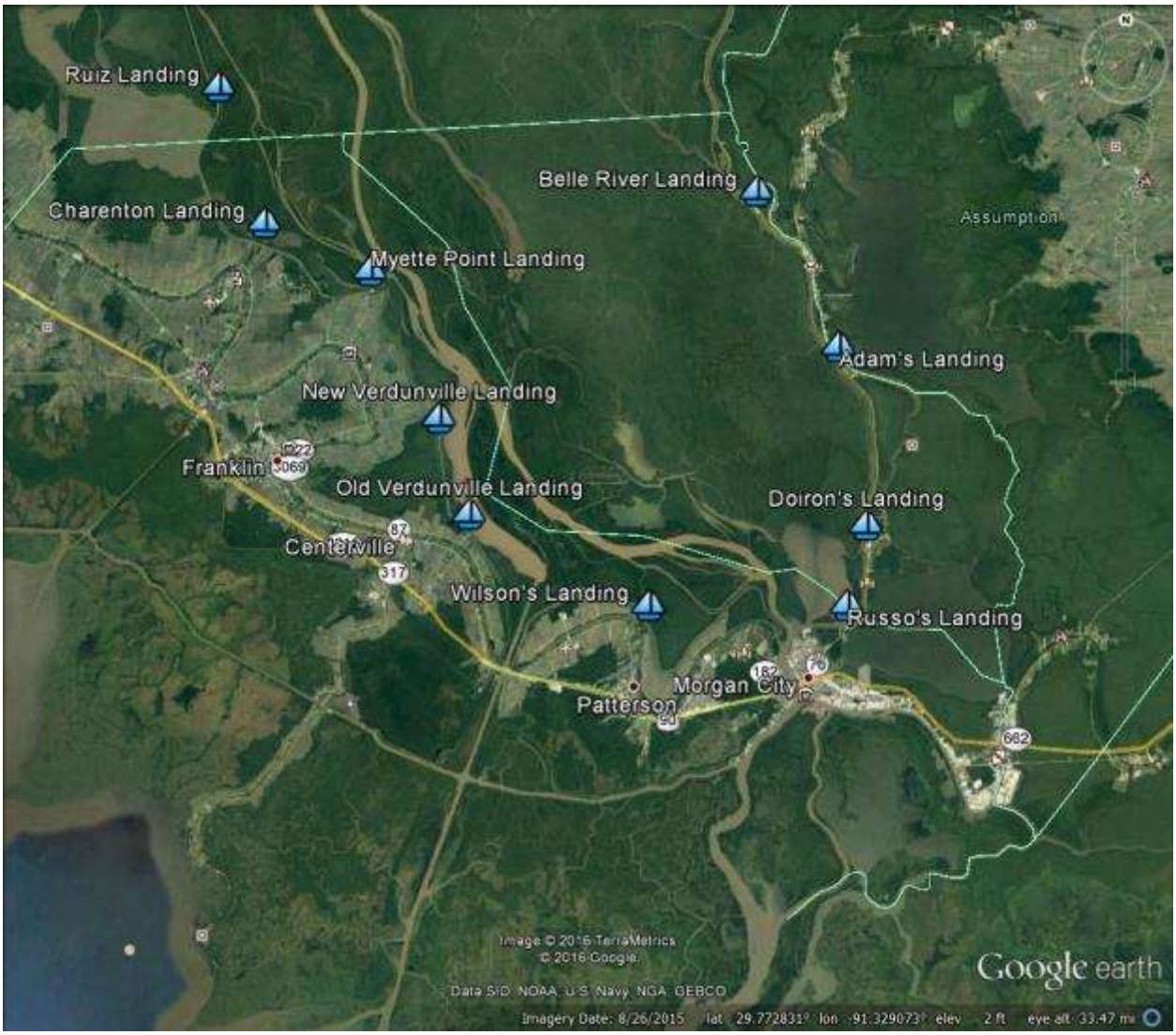
Map 4.
Boat Landings on the Atchafalaya from I-10 to Morgan City. (2 maps)

(Click here to return)

Upper Half Atchafalaya Basin Boat Launches



Lower Half Atchafalaya Basin Boat Launches



APPENDIX II
(return to T & E fishes)

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