LOUISIANA DEPARTMENT OF WILDLIFE & FISHERIES

OFFICE OF FISHERIES
INLAND FISHERIES SECTION

PART VI -A

WATERBODY MANAGEMENT PLAN SERIES

TOLEDO BEND RESERVOIR

LAKE HISTORY & MANAGEMENT ISSUES

CHRONOLOGY

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LAKE HISTORY

GENERAL INFORMATION

Date reservoir formed

Land acquisition for Toledo Bend Reservoir (hereafter known as the reservoir) began in 1963 with construction of the dam and spillway. Construction of the powerhouse began in 1964. The dam was finished in October of 1966. By January 1, 1968 the water level was 143.77 MSL. On May 18, 1968 the reservoir reached pool level (172 MSL) for the first time. During the period from January 1st to May 18th the reservoir rose 28.23 feet due to heavy rainfall.

Impoundment

Acting under a memorandum of agreement in 1955, the Sabine River Authority of Texas (established 1949) and Sabine River Authority, State of Louisiana (established 1950) began initial engineering procedures which included a feasibility study for the impounding of water on the Sabine River. After this study was completed in 1959, the two states arranged financing for 35 million dollars in hydroelectric revenue bonds for each state. Louisiana paid 20 million dollars in cash and put up 15 million dollars in bonds.

Owners of the reservoir are the Sabine River authority of Texas (SRA Texas) and the Sabine River Authority; State of Louisiana (SRA Louisiana).These state authorities claim ownership of the reservoir waters as well as the lake bottom. Lands surrounding the reservoir up to the elevation of 175 MSL are also owned by these authorities. The land between elevations 172 MSL and 175 MSL is known as the "leaseback". This land is leased back to shoreline property owners for a period of 99 years at no cost to the lessee. In cases where land between 172 MSL and 175 MSL is less than 50 feet wide, the leaseback extends shoreward 50 feet horizontally from 172 MSL (SRA, 1998). This results in the leaseback being at least 50 feet wide around the entire reservoir. In cases where the bank slopes gently, the leaseback may be much wider. Mineral rights for lands within the Toledo Bend Reservoir Project are retained by the original owners in perpetuity. Retention of mineral rights is evidenced by the individual deeds transferring ownership of lake bottomlands to the Sabine River Authority of Louisiana. Related documents are on file in the Sabine Parish courthouse.

The purpose of the Toledo Bend Project is stated in the project's feasibility study as "hydroelectric power, water conservation and improvement to navigation and recreation". No documentation of priority is given for any of the three stated purposes.

Size

The reservoir has 181,600 surface acres (Forest and Cotton, 1959) of water at pool stage. Of these acres, 98,318 (Chance, Carl; Sabine River Authority of Louisiana, 2007 unpublished data) are found on the Louisiana side of the reservoir. The maximum water surface area is 196,300 acres at 175 MSL. Water levels higher than 175 MSL would result in water flowing over the top of the spillway structure.

Watershed

The Sabine River drains a total of 9732.86 square miles with 7177.55 (Miller, 1961) square miles of this area above the Toledo Bend dam resulting in a watershed acreage to surface

acreage ratio of 25.3 to 1.

Pool stage

The reservoir is operated at a pool level of 172 MSL.

Parish/s located

The reservoir is located along the border between Louisiana and Texas and inundates land in 2 Louisiana parishes (Sabine and De Soto) and 4 Texas counties (Sabine, Shelby, Panola, and Newton).

Border waters

This reservoir is border water between the states of Louisiana and Texas.

Spillway width

The total width of the spillway structure including earthen sections is 838 feet. The working section of the spillway containing the tainter gates which lie inside the wing walls is 530 feet.

Drawdown description

The reservoir has three drawdown mechanisms, the spillway, hydroelectric powerhouse, and sluiceway. Each mechanism is discussed below.

Hydroelectric powerhouse

The hydroelectric powerhouse has 2 units that use 16,000 cubic feet per second (cfs) at full pool (172 MSL) and can be used to draw down the reservoir to elevation 162.2 MSL

Spillway

The spillway gates are 40 feet wide by 28 feet tall.

The spillway has 11 gates.

These gates are in good condition and are capable of reducing the reservoir level to 145 MSL at a total rate of 290,000 cfs.

Additionally, the spillway has two twenty inch pipes that bypass the sluiceway opening and produce the low flow (144 cfs) for the river below the reservoir.

Sluiceway

The sluiceway is located in the center of the spillway structure.

The sluiceway opening is 12.5 feet high by 8 feet wide.

This opening is in good condition and is capable of reducing the level to 100 MSL at a rate of 5,000 cfs.

Who controls

The Toledo Bend dam is controlled by the Toledo Bend Project Joint Operation. This is comprised of the Sabine River Authority of Texas and the Sabine River Authority, State of Louisiana.

LAKE AUTHORITY

Association

The reservoir is controlled by the Toledo Bend Project Joint Operation which receives operating guidelines from the Joint Operating Board and the Joint Technical Board. Both of these boards are comprised of representatives from the SRA of Texas, Board of Directors and the SRA of Louisiana, Board of Commissioners.

Contact information – The contact information for these Boards and their members can be found in Appendix I.

Authorization

Sabine River Authority, State of Louisiana was created by Act 261 in 1950 by the Louisiana legislature (RS 38:2321).

CHAPTER 11. SABINE RIVER AUTHORITY
§2321. Creation - All the territory in the parishes of De Soto, Sabine, Vernon, Beauregard, Calcasieu and Cameron, lying within the watershed of the Sabine River and its tributary streams, shall be embraced in the limits of and shall constitute a conservation and reclamation district to be known and styled "Sabine River Authority, State of Louisiana". Added by Acts 1950, No. 261, §1.

ACCESS

Boat Launches

There are 28 privately owned public boat launches on the Louisiana side of the reservoir. The names, addresses and telephone numbers for these launches are listed in Table 1. Blue Lake boat launch is the only public launch that does not require a fee to launch. In addition to these privately owned launches, boat ramps are located at the park sites listed under State/Federal facilities. Maps of the entire reservoir with boat launches are included in Appendix II.

Table 1. Public access boat launches at Toledo Bend Reservoir, Louisiana.

Bass Haven
664 Bass Haven Resort Dr.
Anacoco, LA 71403
(337)-286-9239

Toledo Bend Resort
350 Toledo Resort Dr.
Anacoco, LA 71403
(337)-286-9257

Red's Point
653 Red's Point Road
Florien, LA 71429
(318)-565-0080

Pirates Cove Marina
1567 Caribbean Drive
Florien, LA 71429
(318)-565-4467

Kites Landing
3740 Kites Landing Road
Florien, LA 71429
(318)-586-7888

Big Bass Marina
363 Big Bass Lane
Many, LA 71449
(318)-586-4721

Shadows Landing
1806 Shadows Road
Many, LA 71449
(318)-586-7334

Bridge Bay Resort
77 Bridge Bay Drive
Many, LA 71449
(318)-256-6604

Southern Leisure
114 Southern Leisure Road
Many, LA 71449
(318)-256-3453

Bar B Campgrounds
27403 Hwy. 191
Many, LA 71449
(318)-645-6573

Griffin’s Lodge
1267 Bray Road
Many, LA 71449
(318)-645-9455

Jackson's Hole Fishing Camp
638 Cove Road
Many, LA 71449
(318)-645-6863

Cozy Point
770 San Miguel Road
Zwolle, LA 71486

Rebecca's
18851 Hwy. 191
Zwolle, LA 71486
(318)-645-6865

Turtle Beach Lodge
3017 Turtle Beach Road
Many, LA 71449
(318)-256-5595

Pendleton Bridge Resort and Marina
971 Merritt Mountain Road
Many, LA 71449
(318)-256-2958

Matthews Lakeview Lodge
1558 Matthews Lodge Road
Many, LA 71449
(318)-256-9261

Lanan Landing
121 Lanan Road
Many, 71449
(318)-645-4118

Sunset Marina
126 Sunset Drives
Many, LA 71449
(318)-645-6966

Tranquility Bay
79 Tranquility Lane
Zwolle, LA 71486
(318)-645-6551

Wildwood Lodge
129 Wildwood Road
Zwolle, LA 71486
1-800-341-3668

Blue Lake Boat launch
End of Hwy. 3229
Ebarb, LA 71486

Table 1. (cont.) Public access boat launches at Toledo Bend Reservoir, Louisiana.

Solan's Camp
3647 Hwy. 482
Ebarb, LA 71486
(318)-645-9485

Sepulvado's Landing
248 Berts Road
Ebarb, LA 71486
(318)-645-9479

Holly Point Landing
624 Holly Point Lane
Noble, LA 71462
(318)-567-3244

Wright's Landing
End of Wright's Landing Road
Noble, LA 71462

Fisherman's Wharf
1694 Fisherman's Wharf Road
Converse, LA 71419
(318)-567-2305

Jolly Roger's Marina
13 Main Street
Converse, LA 71419
(318)-567-2547

Piers

There are three public fishing piers located on Toledo Bend Reservoir. All are owned and operated by the Sabine River Authority of Louisiana.

1.) Cypress Bend (SRA Park Site 11) located off of Hwy 6 south of Toledo Town.
2.) Clyde's Crossing on Hwy. 191 north of Zwolle at the crossing of San Miguel Bayou. This pier has been enhanced by the placement of pea gravel. The gravel surrounds the pier and serves primarily to attract sunfish.
3.) Hot Wells on Hwy 191 north of Zwolle at the crossing of Bayou San Patricio Bayou.

There are no "pay to fish" piers located on Toledo Bend Reservoir.

State/Federal facilities

There are 5 Park Sites on Toledo Bend Reservoir. All are owned and operated by the SRA of Louisiana. There are 2 State Parks located adjacent to the reservoir. Each park is listed in Table 2, beginning with the southernmost site. Information on SRA parks, including reservations can be obtained by calling the numbers listed. Information on reservations for Louisiana State Parks can be found on the following web site: http://www.crt.state.la.us/crt/parks/

Table 2. Louisiana State Parks and Sabine River Authority of Louisiana Parks at Toledo Bend Reservoir, Louisiana.

South Toledo Bend State Park
120 Bald Eagle Drive
Anacoco, LA 71403
(337)-286-9075

Pleasure Point (SRA Park Site 15)
1190 Pleasure Point Road
Florien, LA 71429
(318)-565-4810

Cypress Bend (SRA Park Site 11)
3462 Cypress Bend Drive

San Miguel (SRA Park Site 7-A)
381 San Miguel Road

Many, LA 71449
(318)-256-4118

North Toledo Bend State Park
P. O. Box 56
Zwolle, LA 71486
(318)-645-4715

Oak Ridge (SRA Park Site 2)
316 Oak Ridge Park
Mansfield, LA 71052
(318)-697-1508

Zwolle, LA 71486
(318)-645-6748

Converse Bay (SRA Park Site 4)
679 Rec. Site 4 Road
Converse, LA 71419
(318)-256-4112

Reefs

LDWF has been involved in an artificial reef (fish attracters) program since 2003 on Toledo Bend Reservoir. The goal of this program is to increase angler success by providing underwater structure that attracts forage fish and provides food and cover for game fish. These reefs are made of various materials. Additionally, sand and gravel will be placed in locations that will attract spawning gamefish. Currently, thirty-one artificial reefs and one sand and gravel bed have been placed in the reservoir. Locations and descriptions of these structures appear in Appendix III. Additional artificial reefs are planned.

SHORELINE DEVELOPMENT

State/National Parks

There are 7 parks located on the Louisiana side of the reservoir. Two are owned by the Louisiana Office of State Parks and the other 5 by the Sabine River Authority, State of Louisiana. The addresses and contact info are listed above in Section III Access.

Shoreline development by landowners

There is substantial shoreline development on much of the Louisiana shoreline of Toledo Bend Reservoir. Landowners are permitted by SRA/LA to build docks and piers. These docks and piers provide complex structure and at times can be excellent places to fish.

As part of the relicensing process for the Toledo Bend Project, the SRA/LA has developed a shoreline management plan to address shoreline development at the reservoir. A copy of that document can be viewed at:
http://12.6.56.180/sites/default/files/permits/attachments/Toledo%20Bend%20Final%20SMP.pdf

PHYSICAL DESCRIPTION OF THE RESERVOIR

Shoreline length

Toledo Bend Reservoir has approximately 1200 miles of shoreline. Approximately 503 miles of shoreline are in Louisiana and 762 miles of shoreline are in Texas (Morgan, 1967 unpublished data).

Timber type

The majority of land around the reservoir is owned by timber companies, is covered by loblolly pine and managed for silviculture. Bald cypress, black willow, sweet gum, and water locust occur in low lying areas. Other species found in the region are hickory, red oaks, white oaks, and dogwoods.

Average depth

The average depth in Toledo Bend Reservoir is 24 feet (Gough, 1989 unpublished data).

Maximum depth

The maximum depth in Toledo Bend Reservoir 110 feet (Gough, 1989 unpublished data).

Natural seasonal water fluctuation

The average annual water level fluctuation at Toledo Bend Reservoir is 5 – 7 feet.

EVENTS / PROBLEMS

Federal Energy Regulatory Commission (FERC) Project Relicensing

The Toledo Bend Project, of which Toledo Bend reservoir is a part, is licensed by the Federal Energy Regulatory Commission as Project No. 2305. The original license for the project was issued on October 14, 1963. The license is for a fifty year period with an expiration date of September 30, 2013.

On August 1, 2014, the Sabine River Authority received notice from the FERC that its license had been renewed for an additional fifty years. This relicensing has an expiration date of July 31, 2064.

Water Level

Annual water level fluctuation in the reservoir is typically 5-7 feet. Various user groups have differing opinions regarding water level fluctuation, particularly the minimum level reached during any given year. In 2007, an agreement was reached between SRA/LA, SRA/TX and affected power companies to cease power generation when the reservoir level reaches 168' MSL. This agreement has limited exceptions but should result in measurably higher values for the minimum reservoir level reached during any given year.

Invasive Aquatic Vegetation

Hydrilla (*Hydrilla verticillata*) is a significant submerged aquatic plant in Toledo Bend Reservoir. Hydrilla is both beneficial as fish habitat and problematic to fishing and navigation. Hydroelectric power generation has typically resulted in routine water level fluctuations which have to some extent limited the coverage of hydrilla and other submerged aquatic vegetation. Hydrilla occasionally requires control in areas such as boat ramps, boathouses and swimming areas. Many Toledo Bend bass anglers welcome hydrilla as a complex structure used by largemouth bass. These anglers voice concern when they note a reduction of the plant coverage.

Giant salvinia (*Salvinia molesta)* causes navigational problems in some areas of the reservoir. Localized accumulations of the plant occasionally reach levels harmful to fisheries productivity. Although giant salvinia has been present in the reservoir since 1998, it remains problematic only in areas sheltered from wave action or water currents. Typical areal coverage of giant salvinia ranges from 2%-3% on the Louisiana side of the reservoir.

Commercial Catfish Regulations

In 2001 – 2004, some commercial fishermen made verbal requests to LDWF staff for a reduction in minimum length limit for commercial harvest of blue catfish and channel catfish. The argument presented was that too many small catfish were being caught in commercial gear. A high number of small catfish in these catches requires excessive efforts to remain in compliance with size limits.

Reduction of durable structure

Forty years of impoundment have led to a reduction of complex woody structure through the decay of standing submerged timber.

Historical Studies

1966- A taxonomic study of pre-impoundment fishes was conducted by the Louisiana Wildlife & Fisheries Commission in 1966. Dudley C. Carver published data from the study in 1967 (Carver, 1967). Carver found fishes representing seventeen families, thirty-five genera and sixty-five species. Carver noted that the collection of fishes from the 1966 study compared favorably with the results of Gray (1956).

1979 – Evaluation of Striped Bass Introduction

Evaluation of striped bass introduction in Toledo Bend Reservoir and D'Arbonne Lake was conducted from July 1, 1974 to June 30, 1978 (Walker, 1979). No natural reproduction was found. Survival of stocked fish was considered good. Analysis of foods eaten by striped bass indicated a preference for shad and small sunfishes.

1979 – Largemouth Bass Study

Spawning success and survival of young-of-year largemouth bass were measured during a three year period in Toledo Bend Reservoir (Lantz, 1979). Positive influence on the establishment of strong year classes was found to be associated with high lake levels during spring months.

1986 – Striped Bass Study

During the period from July 1, 1981 to June 30, 1986 seasonal food habits of adult striped bass and their response to water column stratification was studied at Toledo Bend Reservoir (Lantz, 1986). Gizzard and threadfin shad were the principal food items consumed by 1564 fish during the summer, fall and winter months. In the spring of each year striped bass fed more on bluegill and redear sunfish. Crappie, largemouth bass and yellow bass made up less than 3% of the diet during any season.

During the study period 1298 striped bass were marked with Floy tags. Returns (N=76) were obtained for a 5.9% recovery rate. The study indicated that a significant number of the adult striped bass population emigrates from the reservoir through water releases from the reservoir.

The study showed that striped bass movement and feeding were influenced by temperature and oxygen values. Striped bass were observed to move to cooler waters during warm months. These waters did not provide optimal oxygen levels and striped bass feeding was greatly reduced.

1996 - Cormorant Food Habit Study

In response to public concern that double crested cormorants may be negatively impacting gamefish populations, LDWF conducted a food habit study of the birds at Toledo Bend Reservoir. In April of 1996, fifty-one (51) double crested cormorants were collected (Adams, November 4, 1996). Fifteen (15) stomachs were empty and thirty-four (34) contained food items. Analysis of the stomach contents showed that they had fed primarily on threadfin shad (55.23% of all species observed) followed by bluegill (22.09%) and channel catfish (11.63%). Crappie and largemouth bass were found to constitute 1.74% and 1.16% respectively of all species identified in the samples.

During June and July of 1996 one hundred (100) double crested cormorants were collected (Adams, September 20, 1996). Twenty three (23) stomachs were empty and seventy seven (77) contained food items. The percentage of occurrence for threadfin shad was 58.21%. Bluegill and largemouth bass comprised 21.79% of occurrence and 0.6% of occurrence respectively. No crappies were found in those samples.

2000 – Angler Survey

Mail surveys were sent to 1,045 Toledo Bend anglers who fished at between October 1998 and September 1999 (Thailing & Ditton, 2000). The anglers were interviewed as part of the creel survey conducted by Texas Parks & Wildlife and the Louisiana Department of Wildlife & Fisheries. One angler per fishing party was randomly selected to receive the mail survey. Anglers were asked questions in reference to their satisfaction with fishing in Louisiana statewide and more specifically at Toledo Bend. Opinions in reference to existing and proposed management regulations were solicited as was a description of their trip in progress, including species targeted and fishing-related expenditures.

2006 – Crappie Regulation Opinion Survey

From May 2005 through May 2006, crappie anglers at Toledo Bend Reservoir were surveyed to determine their satisfaction with existing crappie regulations (Yeldell, 2006). This opinion survey was conducted over a thirteen month period from May 2005 through May 2006

during creel survey interviews that were being conducted on the reservoir. The survey was presented only to anglers who stated that they fished for crappie at Toledo Bend Reservoir. The survey resulted in 392 angler interviews. When crappie anglers were asked if they were satisfied with the current regulations 90.6% (355 anglers) were satisfied and 9.4% (37 anglers) were not satisfied.

2010 – Catfish Research Project

In 2010, a research project was initiated to collect population information on channel catfish in order to manage this species in a manner that best suits both commercial and recreational user groups. Channel catfish was collected during each quarter for a one year period. The collected data was used to determine the length and age at which 50 % of Toledo Bend channel catfish are sexually mature. Gonad development data was used to construct a gonad somatic index. Length and age data was used to construct a growth model to aid in the development of management recommendations for the recreational and commercial fisheries.

2012 – Trotline Study

In 2011, the Louisiana Department of Wildlife and Fisheries (LDWF) and the Texas Parks and Wildlife Department (TPWD) established standardized regulations on common boundary waters including Caddo Lake, the Sabine River and Toledo Bend Reservoir. Blue and channel catfish are now regulated by a 50 fish daily limit (in the aggregate), no minimum length limits (MLL) and of which no more than five fish may exceed 20 inches (509 mm) total length (TL).

Shortly after implementation of the new regulations, several groups of passive gear fishermen (trotline anglers) voiced concerns that the new regulations greatly restricted their ability to harvest catfish for personal consumption. Passive gear fishing is popular on both reservoirs, but the characteristics of the fishery including size distribution of catch are not well documented.

In October of 2012, a study was initiated to determine the size distributions of blue and channel catfish captured on passive gear similar to that used by local anglers, and to compare the findings with data collected during LDWF sampling on Caddo Lake and Toledo Bend. Using this information, LDWF staff would be able to determine what impacts the existing regulations have on local passive gear anglers.

Trotlines were fished in Caddo Lake and Toledo Bend Reservoir for a 4 month period from October 2012 to January 2013. This time frame coincides with the highest passive gear angler efforts for catfish.

A total of 106 trotline sets were made during 13 days of sampling on Toledo Bend Reservoir from October 2012 to January 2013. A total of 221 blue catfish and 50 channel catfish were captured for a combined CPUE of 2.55 fish per 50 hooks/24 hr. set period. Blue catfish ranged from 11 to 44 inches (280 to 1120 mm) TL and were well represented in the 14 – 25 inch (356 to 636 mm) groups. The 19 – 20 inch (484 to 509 mm) groups were the most represented size classes overall. Channel catfish ranged in size distribution from 9 to 20 inches (229 to 509 mm) and are well represented by the 11 to 17 inch (280 to 433 mm) groups.

Fifty percent of the blue catfish captured in this study were ≥ 20 inches (509 mm) TL, while only 6% of channel catfish captured on trotlines were ≥ 20 inches TL (Table 1). Six percent of the blue catfish were ≥ 30 inches (764 mm) TL.

Previous studies of Toledo Bend catfish populations (LDWF, unpublished data) have indicated that reproduction and recruitment for blue and channel catfish populations is adequate to sustain healthy populations. Results from LDWF gill net sampling suggest that a substantial number of blue and channel catfish ≥ 20 inches TL are present and available for harvest. The size distribution of blue catfish taken with gill nets shows a normal distribution and strong similarity to the size distribution model of fish collected with trotlines. The percentage of blue catfish ≥ 30 inches TL collected with both gill nets and trotlines is the same (i.e., 6%).

The size distribution percentages for channel catfish ≥ 20 inches TL collected with gill nets and trotlines was similar at six and eight percent, respectively. Channel catfish ≥ 20 inches TL are not common in the Toledo Bend population. Harvest restrictions for channel catfish ≥ 20 inches TL would be of minor impact to Toledo Bend anglers and of minor influence to the Toledo Bend channel catfish population.

Results of this study are that passive gear fishery for catfish in Toledo Bend is significant. Additionally the data from this study suggests that harvest regulations that allow no more than 5 catfish ≥ 20" TL restricts a significant proportion of the passive gear catch.

Based upon this study, discussions between LDWF and TPWD are underway at the time of this writing to reach consensus for catfish harvest regulations that will allow for adequate utilization of the abundant catfish resource at Toledo Bend Reservoir. Both state agencies met in September of 2013 and agreed to change the twenty inch maximum length limit to thirty inches for blue and channel catfishes. It is expected that this change will become effective in September of 2014.

MANAGEMENT ISSUES

AQUATIC VEGETATION

Historically, the plant community at Toledo Bend Reservoir has been made up of the following species: alligator weed (*Alternanthera philoxeroides*), American lotus(*Nelumbo lutea*), bald cypress *(Taxodium distichum),* bladderwort *(Utricularia spp.),* button willow *(Cephalanthus occidentalis),* cattail *(Typha* ssp.*),* chara grass (*Chara* spp.*),* coontail (*Ceratophyllum demersum*), common salvinia *(Salvinia minima),* cutgrass *(Zizaniopsis miliacea),* duckweed (*Lemna minor*), eelgrass *(Vallisneria americana),* elodea *(Elodea canadensis),* fanwort (*Cabomba caroliniana*), filamentous algae *(Spirogyra* ssp.*),* fragrant water lily(*Nymphaea odorata*), frog's-bit (*Limnobium spongia*), giant salvinia (*Salvinia molesta*), hydrilla (*Hydrilla verticillata*), Illinois pondweed (*Potamogeton illinoensis*), lizard's tail(*Saururus cernuus*), milfoil *(Myriophyllum ssp.),* parrotfeather (*Myriophyllum aquaticum*), pennywort(*Hydrocotyle umbellata*), primrose (*Ludwigia* spp.), smartweed *(Polygonum hydropiperoides),* sedge (Cuban bulrush) *(Oxycaryum cubense*), southern watergrass (*Hydrochloa caroliniensis*), spatterdock *(Nuphar advena),* torpedograss *(Panicum*

repens), water hyacinth (*Eichhornia crassipes*), water paspalum *(Paspalum modestum),* water shield (*Brasenia schreberi*) and black willow *(Salix nigra)*

Aquatic vegetation types and coverage have changed at Toledo Bend as the reservoir has aged. The earliest problematic vegetation consisted of water hyacinth, *(Eichhornia crassipes).* Water hyacinth produced large mats in sheltered waters in the mid-1970's. These mats would occasionally move to open water areas and hamper boating and angling activities. Water hyacinth remains problematic in backwater areas to date but rarely causes problems in the majority of the lake.

A notable exception to this pattern occurred in 2009 when heavy rains flushed a large amount of water hyacinth and giant salvinia from backwater areas both along the Sabine River upstream of Toledo Bend Reservoir and along the lake shoreline. An extensive mat formed in the main lake and moved downstream to the Pendleton Bridge area. The Sabine River Authorities of Louisiana and Texas contracted a private applicator to treat approximately 2,000 acres of the mat by helicopter-based application.

In the late 1970's, hydrilla, (*Hydrilla verticillata*), became problematic at Toledo Bend Reservoir. Hydrilla thrived in the clear waters of the reservoir and established itself as the dominant plant species. Coverage of hydrilla continued to increase through the 1980's until the plant had colonized all available areas. The primary limiting factor for hydrilla was water clarity. Turbidity provided control in the upper reaches of both the main lake and major coves. Greater water clarity found in the lower half of the lake provided no control and allowed maximum hydrilla coverage. The only control found in these clear water areas was water depth which typically shaded out hydrilla at depths of twenty feet.

Through the 1990's, hydrilla dominated the Toledo Bend plant community. Water level fluctuation caused by hydroelectric power generation typically ranged from five to seven feet. This fluctuation provided some control of hydrilla near the lake's shoreline but the reduced water depth allowed hydrilla to colonize the lake bottom to depths of 20 feet below pool stage.

While hydrilla is fiercely battled in most waterbodies, Toledo Bend anglers, particularly bass anglers have come to appreciate the plant as valuable fish habitat and target hydrilla infested areas when seeking largemouth bass.

By the year 2000, hydrilla was maximized throughout the lake. There was a reduction of submerged aquatic vegetation (SAV), particularly hydrilla, in the summer months of 2002. Anglers expressed concern to LDWF and the Sabine River Authority of Louisiana (SRALA) that valuable fisheries habitat was being lost. The SRALA drafted a resolution requesting that a task force be put together to investigate the decline of hydrilla and other submersed plants in the Toledo Bend Reservoir. LDWF was asked to organize and chair this task force and a group of individuals representing state and federal agencies from Texas and Louisiana, as well as, private interests were invited and agreed to participate.

In October of 2003 and 2004, the reservoir was surveyed by LDWF aquatic vegetation personnel for the presence of aquatic vegetation. Primary consideration was given to spatial coverage of submerged species (Longman, 2003 and 2004 unpublished data). Table 3 lists areal coverage for major species observed.

Table 3. Areal coverage of submerged aquatic vegetation for Toledo Bend Reservoir, LA, for the years 2003 and 2004.

YEAR	HYDRILLA	COON-TAIL	PONDWEED	GIANT SALVINIA
2003	1,600 acres	20 acres	60 acres	0
2004	1,900 acres	30 acres	90 acres	240 acres

The surveys depicted in Table 3 indicate an increasing amount of hydrilla in the reservoir at the time of the surveys and this plant has continued to increase in coverage since that time.

Several possible causes of the temporary hydrilla reduction were investigated but no clear cause was identified. The final report from the Toledo Bend Hydrilla Task Force appears in the archive document, Toledo Bend MP-C.

Giant salvinia (*Salvinia molesta*) was discovered at Toledo Bend Reservoir in 1998. Since that time this invasive plant species has been problematic in areas protected from wind and wave action. The majority of the lake has remained clear of large mats of giant salvinia. The main lake and major coves have proven to be somewhat "self-cleaning" due to long reaches of the water surface being subjected to occasional high winds which expel giant salvinia from those areas.

Areal coverage of giant salvinia on the Louisiana side of the reservoir has fluctuated from a low of 50 acres to a high of 2,500 acres. During the period of maximum coverage, surveys were made and estimates were calculated to determine the costs of controlling this plant species. In March 2005, an aerial survey of Toledo Bend was conducted for estimation of coverage and presence of giant salvinia. A total of 2,150 acres of salvinia was estimated to be on the reservoir at the time of the flight (Longman, 2005 unpublished data). It is also noted in this report that this plant can spread very rapidly and can double in spatial coverage in a time period of 7 to 10 days. Cost estimates to control giant salvinia with herbicides were developed. Costs for options using the herbicides Reward and Aquastar were estimated at $143,190.00 and $51,278.00 respectively. No major herbicide applications were made at that time.

Fall estimates made in 2009 showed 2,500 acres of giant salvinia on the Louisiana side of the reservoir.

Cold weather periods during years 2009 and 2010 reduced areal coverage of giant salvinia at Toledo Bend Reservoir to 200 to 250 acres on the Louisiana side of the reservoir.

Drought conditions during year 2011 resulted in record low lake levels for an extended period of time. This event exposed much of the lake bottom and stranded giant salvinia and other floating vegetation leading to significant reductions in areal coverage of these plant

types.

Giant salvinia coverage increased in years 2012 and 2013 to pre-drought levels. In the fall of 2013, giant salvinia coverage was estimated to be 1,200 acres. The November 2015 estimate for giant salvinia coverage was 1,090 acres.

November 2015 acreage estimates were conducted for other nuisance aquatic vegetation including water hyacinth (*Eichhornia crassipes*), alligator weed (*Alternanthera philoxeroides*), and common salvinia (*Salvinia minima*). Water hyacinth coverage is estimated to be 40 acres, alligatorweed coverage is estimated to be 200 acres and common salvinia coverage is estimated to be 20 acres.

Type map

The Louisiana side of Toledo Bend Reservoir was surveyed for vegetative presence and areal coverage in September of 2013. The survey documented 6,288 acres of hydrilla, 1,209 acres of giant salvinia, 896 acres of American lotus, 167 acres of American pondweed, 132 acres of chara, 83 acres of Eurasian milfoil and 1 acre of spadderdock. The resulting typemaps appear in Appendix IV.

Biomass

The first biomass survey on the reservoir was conducted by Robert Gough in June 1989. In this 1982 study he noted that hydrilla, *Hydrilla verticillata*, was found in water as deep as 18 feet. Samples were collected with a drag in a variety of habitats. Areal vegetation coverage area was estimated at 78,550 acres or 43.25% of the reservoir (Gough 1989, unpublished data). Table 4 shows predominant species and their respective percentage composition. These figures are also broken down by each zone in Gough, 1989.

Table 4. Aquatic Vegetation Species Composition – 1989

SCIENTIFIC NAME	COMMON NAME	PERCENTAGE
Hydrilla verticillata	Hydrilla	31%
Myriophyllum brasiliensis	Water milfoil	25%
Ceratophyllum demersum	Coon-tail	24%
Sagittaria graminea	Grass-leaf arrowhead	18%
Najas guadalupensis	Common water nymph	2%

Treatment history by year available

Biological

The salvinia weevil (*Cyrtobagous salviniae*) is being used as a biological control for giant salvinia at Toledo Bend Reservoir. The weevils have shown an ability to reduce the amount of giant salvinia in areas where they have been released. To date, 65 weevil releases have been made. Many small scale releases were made by Sabine River Authority of Louisiana staff. These were accomplished by transporting small amounts of host plant material to

various locations. Incomplete data for these releases include dates, amounts of material and source locations. However, it is known that the host plant material was collected from known weevil locations on the Louisiana side of the reservoir. Data related to giant salvinia weevil releases are included in Appendix V.

Chemical

The use of herbicides is an important component of the LDWF integrated pest management program. The proper selection and use of herbicides is essential to achieve cost effective benefits and to avoid damage to non-target species. Each product listed has been approved by the Environmental Protection Agency for aquatic use. Aquatic vegetation will be treated according to the standard operating procedures for the application of herbicides as adopted by the LDWF Inland Fisheries Section.

Current methodology includes treatment of certain plant species with specific herbicide/s and adjuvants as follows:

Giant salvinia

April 1 - October 31: glyphosate (0.75 gal/acre)/diquat (0.25 gal/acre)/Aqua King Plus (0.25 gal/acre)/ Thoroughbred (12 oz./acre)
November 1 – March 31: diquat (0.75 gal/acre)/surfactant (0.25 gal/acre).

Water hyacinth

Year-round in non-waiver areas: 2, 4-D (0.5 gal/acre)/Red River 90 (1 pint/acre).
March 15 - September 15 in 2, 4-D waiver areas: glyphosate (0.75 gal/acre)/Red River 90 (0.25 gal/acre).
September 16 - March 14 in 2, 4-D waiver areas: 2, 4-D (0.5 gal/acre)/Red River 90 (1 pint/acre).

Alligator weed

Undeveloped areas: Imazapyr (0.5 gal/acre)/ Inergy (0.25 gal/acre).
Developed areas: Imazamox (Clearcast) (0.5 gal/acre)/ Inergy (0.25 gal/acre).

American Lotus

Year-round in non-waiver areas: 2, 4-D (0.5 gal/acre)/Red River 90 (1 pint/acre).
March 15 - September 15 in 2, 4-D waiver areas: glyphosate (0.75 gal/acre)/Red River 90 (0.25 gal/acre).
September 16 - March 14 in 2, 4-D waiver areas: 2, 4-D (0.5 gal/acre)/Red River 90 (1 pint/acre).

Duckweed

Year-round: Diquat (1.0 gal/acre)/ Red River 90 (0.25 gal/acre).

Cuban Bulrush (sedge)

Year-round in non-waiver areas: 2, 4-D (0.5 gal/acre)/Red River 90 (1 pint/acre).
March 15 - September 15 in 2, 4-D waiver areas: glyphosate (0.75 gal/acre)/Red River 90 (0.25 gal/acre).

September 16 - March 14 in 2, 4-D waiver areas: 2, 4-D (0.5 gal/acre)/Red River 90 (1 pint/acre).

Water Lettuce
Year-round: Diquat (1.0 gal/acre)/ Red River 90 (0.25 gal/acre).

Salvinia Mix - Water Hyacinth, Alligator weed, Cuban Bulrush mix
If less than 75% of either plant: glyphosate (0.75 gal/acre)/diquat (0.25 gal/acre)/Aqua King Plus (0.25 gal/acre)/ Thoroughbred (12 oz. /acre)
If 75% or greater of either plant, follow the recommendations for the plant that makes up the majority of the vegetation.

American Lotus/Water Hyacinth mix
If less than 75% of either plant:
In non-waiver areas: 2, 4-D (0.5 gal/acre)/Red River 90 (1 pint/acre).
March 15-September 15 in 2, 4-D waiver areas: glyphosate (0.75 gal/acre)/Red River 90 (0.25 gal/acre).
If 75% or greater of either plant, follow the recommendations for the plant that makes up the majority of the vegetation.

Water Hyacinth/Alligator weed
If less than 75% of either plant: imazapyr (0.5 gal/acre)/ Inergy (0.25 gal/acre).
If 75% or greater of either plant, follow the recommendations for the plant that makes up the majority of the vegetation.

Complex Vegetation Mixes (Alligator weed, primrose, pennywort, smartweed, frog's bit, salvinia, hyacinth, etc.)
District Inland Fisheries biologists will review options with Aquatic Plant Control Biologists. Areas containing many different plant species including salvinia may need to be retreated with a salvinia-specific application.

LDWF has a two-man crew of permanent employees assigned to make herbicide applications within District 10. That crew targets high use areas where vegetation hampers boat traffic. The use of contracted sprayers is recommended in early season efforts to reduce coverage of giant salvinia. Aerial applications should be used whenever possible to facilitate rapid and widespread treatments. Airboat based contract sprayers should be used in areas not suitable for aerial applications.

Historical records of acreages treated chemically are listed in Table 5.

Table 5. Area of aquatic vegetation treated by year by chemical and by species in Toledo Bend Reservoir, LA – 1996 to 2014.

Treatment Year	Chemical	Vegetation	Acres Treated	Rate
1996			121	
1997			314	
1998			34	
1999			673	
2000			1,918	
2001			737	
2002			654	
2003			563	
2004			1,373	
2005	2, 4-D	Alligator weed	10	0.5 gal./Acre
	2, 4-D	American Lotus	58	0.5 gal./Acre
	2, 4-D	Water Hyacinth	52	0.5 gal./Acre
	Aquastar	Alligator weed	3	0.75 gal./Acre
	Reward	Bladderwort	4	0.75 gal./Acre
	Reward	Hydrilla	3	0.75 gal./Acre
	Reward	Milfoil	2	0.75 gal./Acre
	Reward	Common Salvinia	12	0.75 gal./Acre
	Reward	Giant Salvinia	106	0.75 gal./Acre
2006	2, 4-D	American Lotus	12	0.5 gal./Acre
	Aquastar	Torpedograss	2	0.75 gal./Acre
	Aquastar	Alligator weed	0.5	0.75 gal./Acre
	Aquastar	Giant Salvinia	0.5	0.75 gal./Acre
	Renovate	Giant Salvinia	16	0.75 gal./Acre
	Reward	Alligator weed	9	0.75 gal./Acre
	Reward	American Lotus	4	0.75 gal./Acre
	Reward	Giant Salvinia	364	0.75 gal./Acre
	Reward	Water Hyacinth	5	0.75 gal./Acre
	Sonar AS	Giant Salvinia	1	80ppb
2007	2, 4-D	Alligator weed	45	0.5 gal./Acre
	2, 4-D	American Lotus	53	0.5 gal./Acre
	2, 4-D	Giant Salvinia	7	0.5 gal./Acre
	2, 4-D	Water Hyacinth	1,455	0.5 gal./Acre
	Aquamaster	Alligator weed	131	0.75 gal./Acre
	Aquamaster	Common Salvinia	28	0.75 gal./Acre
	Aquamaster	Giant Salvinia	355	0.75 gal./Acre
	Aquamaster	Sawgrass	1	0.75 gal./Acre
	Aquamaster	Smartweed	6	0.75 gal./Acre

	Aquamaster	Spadderdock	1	0.75 gal./Acre
	Aquamaster	Torpedograss	32	0.75 gal./Acre
	Aquamaster	Water Hyacinth	15	0.75 gal./Acre
	AquaKleen	Alligator weed	1	0.75 gal./Acre
	Aquastar	Alligator weed	94	0.75 gal./Acre
	Aquastar	Giant Salvinia	56	0.75 gal./Acre
	Aquastar	Torpedograss	3	0.75 gal./Acre
	Aquathol Super K	Hydrilla	1	17.6 lbs./Acrefoot
	Cutrine Plus	Milfoil	1	1.75 gal./Acre
	Knockout	Giant Salvinia	17	0.75 gal./Acre
	Renovate	Giant Salvinia	3	0.75 gal./Acre
	Reward	Alligator weed	85	0.75 gal./Acre
	Reward	Milfoil	1	0.75 gal./Acre
	Reward	Common Salvinia	1	0.75 gal./Acre
	Reward	Giant Salvinia	415	0.75 gal./Acre
	Reward	Smartweed	2	0.75 gal./Acre
	Reward	Torpedograss	12	0.75 gal./Acre
	Reward	Water Hyacinth	8	0.75 gal./Acre
	Reward	Water Shield	1	0.75 gal./Acre
	Sonar AS	Alligator weed	2	80ppb
	Sonar AS	Primrose	1	80ppb
	Sonar AS	Giant Salvinia	3	80ppb
2008	2, 4-D	Alligator weed	36	0.5 gal./Acre
	2, 4-D	Water Hyacinth	379	0.5 gal./Acre
	Aquamaster	Alligator weed	27	0.75 gal./Acre
	Aquamaster	American Lotus	27	0.75 gal./Acre
	Aquamaster	Cutgrass	1	0.75 gal./Acre
	Aquamaster	Common Salvinia	16	0.75 gal./Acre
	Aquamaster	Giant Salvinia	242	0.75 gal./Acre
	Aquamaster	Torpedograss	8	0.75 gal./Acre
	Aquamaster	Water Hyacinth	19	0.75 gal./Acre
	Aquathol Super K	Hydrilla	3	17.6 lbs./Acrefoot
	Habitat	Cutgrass	7	0.75 gal./Acre
	Polaris AQ	Cutgrass	23	0.75 gal./Acre
	Reward	Alligator weed	142	0.75 gal./Acre
	Reward	American Lotus	36	0.75 gal./Acre
	Reward	Cutgrass	35	0.75 gal./Acre
	Reward	Common Salvinia	4	0.75 gal./Acre
	Reward	Giant Salvinia	1,282	0.75 gal./Acre
	Reward	Torpedograss	11	0.75 gal./Acre
	Reward	Water Hyacinth	256	0.75 gal./Acre
2009	Aquamaster	Alligator weed	27	0.75 gal./Acre
	Aquamaster	Giant Salvinia	1,027	0.75 gal./Acre
	Aquamaster	Torpedograss	17	0.75 gal./Acre

	Aquamaster	Water Hyacinth	209	0.75 gal./Acre
	Diquat E Pro 2L	Alligator weed	272	0.75 gal./Acre
	Diquat E Pro 2L	American Lotus	34	0.75 gal./Acre
	Diquat E Pro 2L	Cutgrass	3	0.75 gal./Acre
	Diquat E Pro 2L	Common Salvinia	12	0.75 gal./Acre
	Diquat E Pro 2L	Giant Salvinia	3,345	0.75 gal./Acre
	Diquat E Pro 2L	Torpedograss	10	0.75 gal./Acre
	Diquat E Pro 2L	Water Hyacinth	177	0.75 gal./Acre
	Platoon	Water Hyacinth	99	0.5 gal./Acre
	Platoon	Water Lily	5	0.5 gal./Acre
	Reward	Alligator weed	38	0.75 gal./Acre
	Reward	Cutgrass	8	0.75 gal./Acre
	Reward	Giant Salvinia	1,020	0.75 gal./Acre
	Reward	Water Hyacinth	2	0.75 gal./Acre
2010	Aquamaster	Alligator weed	6	0.75 gal./Acre
	Aquamaster	Giant Salvinia	11	0.75 gal./Acre
	Aquamaster	Torpedograss	1	0.75 gal./Acre
	Aquamaster	Water Hyacinth	13	0.75 gal./Acre
	Diquat E Pro 2L	Alligator weed	124	0.75 gal./Acre
	Diquat E Pro 2L	American Lotus	9	0.75 gal./Acre
	Diquat E Pro 2L	Duckweed	3	0.75 gal./Acre
	Diquat E Pro 2L	Common Salvinia	23	0.75 gal./Acre
	Diquat E Pro 2L	Giant Salvinia	477	0.75 gal./Acre
	Diquat E Pro 2L	Spadderdock	10	0.75 gal./Acre
	Diquat E Pro 2L	Torpedograss	5	0.75 gal./Acre
	Diquat E Pro 2L	Water Hyacinth	13	0.75 gal./Acre
	Platoon	Water Hyacinth	20	0.5 gal./Acre
2011	Aquamaster	Giant Salvinia	12	0.75 gal./Acre
	Diquat E Pro 2L	Pennywort	2	0.75 gal./Acre
	Diquat E Pro 2L	Common Salvinia	1	0.75 gal./Acre
	Diquat E Pro 2L	Giant Salvinia	143	0.75 gal./Acre
	Knockout	Alligator weed	1	0.75 gal./Acre
	Knockout	Duckweed	1	0.75 gal./Acre
	Knockout	Pennywort	3	0.75 gal./Acre
	Knockout	Primrose	2	0.75 gal./Acre
	Knockout	Giant Salvinia	239	0.75 gal./Acre
	Knockout	Sedge	1	0.75 gal./Acre
	Sonar AS	Giant Salvinia	28	80ppb
2012	Aquamaster	Alligator weed	20	0.75 gal./Acre
	Aquamaster	American Lotus	6	0.75 gal./Acre
	Aquamaster	Giant Salvinia	1,434	0.75 gal./Acre
	Aquamaster	Spadderdock	2	0.75 gal./Acre
	Aquamaster	Torpedograss	21	0.75 gal./Acre
	Aquamaster	Water Hyacinth	3	0.75 gal./Acre
	Knockout	Alligator weed	29	0.75 gal./Acre
	Knockout	Giant Salvinia	221	0.75 gal./Acre

	Knockout	Torpedograss	1	0.75 gal./Acre
	Knockout	Water Hyacinth	14	0.75 gal./Acre
	Platoon	Alligator weed	3	0.5 gal./Acre
	Platoon	Water Hyacinth	5	0.5 gal./Acre
	Tribune	Alligator weed	30	0.75 gal./Acre
	Tribune	American Lotus	6	0.75 gal./Acre
	Tribune	Duckweed	2	0.75 gal./Acre
	Tribune	Primrose	7	0.75 gal./Acre
	Tribune	Giant Salvinia	2,595	0.75 gal./Acre
	Tribune	Sedge	529	0.75 gal./Acre
	Tribune	Spadderdock	2	0.75 gal./Acre
	Tribune	Torpedograss	1	0.75 gal./Acre
	Tribune	Water Hyacinth	1	0.75 gal./Acre
2013	Aquamaster	Giant Salvinia	5,221	0.75 gal./Acre
	Aquamaster	Primrose	2	0.75 gal./Acre
	Aquamaster	Spadderdock	13	0.75 gal./Acre
	Aquamaster	Torpedograss	44	0.75 gal./Acre
	Aquamaster	Water Hyacinth	15	0.75 gal./Acre
	Aquathol Super K	Hydrilla	4	17.6 lbs./Acre-ft
	Ecomazapyr	Primrose	6.66	0.75 gal./Acre
	Ecomazapyr	Torpedograss	6.66	0.75 gal./Acre
	Ecomazapyr	Alligator weed	67	0.75 gal./Acre
	Diquat	Giant Salvinia	320	0.75 gal./Acre
	Diquat	Alligator weed	13	0.75 gal./Acre
	Diquat	Parrot Feather	1.3	0.75 gal./Acre
	Diquat	Water Hyacinth	15	0.75 gal./Acre
	Diquat	Torpedograss	4.72	0.75 gal./Acre
	Platoon	American Lotus	35	0.5 gal./Acre
	Platoon	Water Hyacinth	61	0.5 gal./Acre
	Clear cast	Water Shield	18.66	0.75 gal./Acre
	Sonar AS	Giant Salvinia	1	80ppb
	Aquamaster	Giant Salvinia	5,221	0.75 gal./Acre
	Aquamaster	Primrose	2	0.75 gal./Acre
	Aquamaster	Spadderdock	13	0.75 gal./Acre
2014	Glyphosate	Giant Salvinia	3935	0.75 gal./Acre
	Glyphosate	Alligator weed	127	0.75 gal./Acre
	Glyphosate	American Lotus	57	0.75 gal./Acre
	Glyphosate	Torpedograss	5	0.75 gal./Acre
	Glyphosate	Water Hyacinth	30	0.75 gal./Acre
	Glyphosate	Yellow Floating Heart	16	0.75 gal./Acre
	Glyphosate	Water Primrose	36	0.75 gal./Acre
	Glyphosate	Duckweed	0.5	0.75 gal./Acre
	Glyphosate	Giant Cutgrass	1	0.75 gal./Acre

	Glyphosate	Parrot Feather	10	0.75 gal./Acre
	Clear Cast	Alligator weed/Water Primrose	7.3	0.75 gal./Acre
	Ecomazapyr	Alligator weed/Water Primrose	7.6	0.75 gal./Acre
	2, 4-D	American Lotus	5	0.5 gal./Acre
	Diquat	Giant Salvinia	79	0.75 gal./Acre

Reduced spray efforts of 2010 and 2011 due to:

1) Cold weather periods of 2009 & 2010 that provided associated reductions in emergent plant coverage.

2) The drought of 2011 that resulted in record low water levels and additional control of aquatic vegetation.

HISTORY OF REGULATIONS

Recreational Fishing Regulations

Louisiana's historical recreational fishing regulations for each species are listed below along with the effective dates of regulation changes. A tabular form of this information is found in Appendix VI. Texas regulations are taken from Texas Parks & Wildlife website: http://www.tpwd.state.tx.us/publications/annual/fish/.

Current Louisiana recreational fishing regulations may be viewed at the link below: http://www.wlf.louisiana.gov/fishing/regulations

Garfish (alligator gar **(***Atractosteus* spatula), ***longnose gar*** **(**Lepisosteus osseus)**,** ***shortnose gar*** **(***Lepisosteus platostomus*) **and** ***spotted gar*** **(***Lepisosteus oculatus*)

1968: No daily limit. No size limit. Garfish may be taken by means of spears, guns, bows and arrows, or traps.

Current Texas regulation: 1 alligator gar daily. No minimum length. Possession limit – 2. All other garfish – no limit –no minimum length.

Black Bass (*Micropterus* spp.*)*

1968: 15 fish daily limit in aggregate. Possession limit - 30.

1988, September 1: 10 fish daily limit in aggregate with 12 inch minimum. This change was the result of joint discussions between LDWF and TPWD. In November of 1987, LDWF proposed a 10 fish creel limit with a 10 inch minimum length limit. TPWD proposed a 5 fish creel limit with a 14 inch minimum length limit. Compromise was reached with a 10 fish creel limit and 12 inch minimum length limit. Possession limit – 20.

1991, April 1: 8 fish daily limit in aggregate with 14 inch minimum length. This regulation change resulted from joint discussions between LDWF and TPWD. At the time, Louisiana was implementing the Louisiana Black Bass Management Plan. LDWF proposed a 14 inch–17 inch slot limit with an 8 inch minimum length limit. TPWD proposed a 5 fish daily creel limit with a minimum length limit of 15 inches. Compromise was reached with an 8 fish daily creel limit and 14 inch minimum length limit. Both states agreed that when appreciable numbers of LMB exceeded 14 inches, that a 14 inch - 17 inch slot would be considered for tabular implementation. Possession limit – 16.

1997, September 1: 8 fish daily limit in aggregate with 14 inch minimum on largemouth bass and a 12 inch minimum on spotted bass. This change was made in the interest of standardization. It matched existing Texas statewide regulations. Possession limit – 16.

1998: Possession limit reduced to one day's creel limit while on the water.

2005, April 1: 8 fish daily creel limit in aggregate with a 14 inch minimum length on largemouth bass with no minimum length limit for spotted bass. Possession limit - 8 in aggregate. This change was made in the interest of standardizing regulations. LDWF and TPWD agreed that reducing the minimum length limit for spotted bass would allow for increased utilization of spotted bass and have no negative effect on largemouth bass populations. This change matched Louisiana's older regulation which imposed no length limit on spotted bass.

Current Texas Regulation: Daily bag limit for all species of black bass is 8 in any combination. Minimum length limit for largemouth bass is 14 inches. No minimum length

currently in effect for spotted bass. Possession limit - 10 in any combination.

Striped Bass (*Morone saxatilis*)
1970: 2 fish daily creel limit. Possession limit - 4.
1980: 5 fish daily creel limit. Possession limit - 10.
1982: 5 fish daily creel limit in aggregate with hybrid striped bass of which no more than 2 may exceed 30 inches in length.
1998: Possession limit reduced to one day's creel limit while on the water.
Current regulation is a 5 fish daily creel in aggregate with hybrid striped bass with no more than 2 fish exceeding 30 inches. Possession limit - 5.

Current Texas Regulation: 5 fish daily creel limit in aggregate with hybrid striped bass. No more than 2 fish may exceed 30 inches. Possession limit - 10.

Hybrid Striped Bass (*Morone saxatilis* X *Morone chrysops*)
1978: 2 fish daily creel limit. Possession limit - 4.
1980: 5 fish daily creel limit. Possession limit - 10.
1982: 5 fish daily creel limit in aggregate with striped bass of which no more than 2 may exceed 30 inches in length.
1998: Possession limit reduced to one day's creel limit while on the water.
Current regulation is a 5 fish daily creel limit in aggregate with striped bass of which no more than 2 fish may exceed 30 inches. Possession limit - 5.

Current Texas Regulation: 5 fish daily in aggregate with hybrid striped bass with no more than 2 fish exceeding 30 inches. Possession limit - 10.

Black Crappie & White Crappie (*Pomoxis nigromaculatus* & *Pomoxis annularis*)
1968: 50 fish daily creel limit in any combination. No minimum length limit. Possession limit - 100.
1982: No limit.
1988: 50 fish daily.
1998: Possession limit reduced to one day's creel limit while on the water.
2011, July 1: 25 fish daily.
2012, August 1: As per Acts 2013, No. 334, the possession limit for crappie caught in Toledo Bend Reservoir shall be one hundred fish.
Current Texas regulation: 25 fish daily. Possession limit - 50.

***Lepomis* ssp.** (all bream species)
1968: 100 fish daily all species in aggregate. Possession limit - 200.
1982: No limit.
2005: No limit
Current Texas Regulation: No limit.

Catfish
1968: No limit.
1982: For blue catfish under 14 inches total length, channel catfish under 11 inches total length, or flathead catfish under 14 inches total length or any combination thereof – a 25 fish daily creel limit in effect in aggregate with buffalo fish under 16 inches total length and

freshwater drum under 12 inches total length. Possession limit – 50 in aggregate.
1983: Blue catfish under 14 inches total length or flathead catfish under 14 inches total length or any combination thereof – 25 fish daily creel in aggregate with buffalo fish under 16 inches total length and freshwater drum under 12 inches. Possession limit – 50 in aggregate. Channel catfish – no daily limit.
1985, Jan. 1: Channel catfish, no daily limit with 11 inch minimum length limit.
1990: Blue catfish under 12 inches total length, channel catfish under 11 inches total length, or flathead catfish under 14 inches total length or any combination thereof – 25 fish daily creel limit in aggregate with buffalo fish under 16 inches total length and freshwater drum under 12 inches total length. Possession limit – 50 in aggregate of undersized fish. No limit on catfish with total lengths equal to exceeding minimum length requirements.
1998: Possession limit reduced to one day's limit while on the water.
1999: August 15: 100 fish daily creel limit in any combination of blue catfish, channel catfish or flathead catfish. Minimum total lengths for the three species are: blue catfish - 12 inches, channel catfish - 11 inches, and flathead catfish - 14 inches. 25 fish daily may be undersized. Possession limit - 100.
2004, July 1 - June 30, 2008 -125 fish in any combination of blue, channel, and flathead catfish. 50 undersized fish allowed daily in any combination of the three species. Minimum total length limits for the three species are: blue catfish - 12 inches, channel catfish - 11 inches, and flathead catfish - 14 inches. Possession limit - 125. This change resulted from passage of Act No. 237, Regular Session, 2004.
2008, July 1: 100 fish daily creel in any combination of blue catfish, channel catfish or flathead catfish. Minimum total lengths for the three species are: blue catfish - 12 inches, channel catfish - 11 inches, and flathead catfish - 14 inches. 25 fish daily may be undersized.
2011, July 1: 50 fish daily in aggregate of blue catfish and channel catfish with no more than five fish over 20 inches in total length. Possession limit – 100. Flathead catfish-10 fish daily with a minimum total length of 18 inches. Possession limit – 20.

Current Texas regulations: 50 fish daily in aggregate of blue catfish and channel catfish with no more than five fish over 20 inches in total length. Possession limit – 100. Flathead catfish-10 fish daily with a minimum total length of 18 inches. Possession limit – 20.

Buffalo Fish (*Ictiobus* spp.)
1968: No limit.
1982: buffalo fish under 16 inches total length – 25 fish daily in aggregate with blue catfish under 14 inches total length, channel catfish under 11 inches total length, or flathead catfish under 14 inches total length or any combination thereof. Possession limit – 50 in aggregate.
1983: buffalo fish under 16 inches total length – 25 fish daily in aggregate with blue catfish under 14 inches total length or flathead catfish under 14 inches total length or any combination thereof. Possession limit – 50 in aggregate.
1990: buffalo fish under 16 inches total length – 25 fish daily in aggregate with blue catfish under 12 inches total length, channel catfish under 11 inches total length, or flathead catfish under 14 inches total length or any combination thereof. Possession limit – 50 in aggregate of undersized fish. No limit on buffalo fish whose total lengths are equal to or exceed minimum length requirements.
1998: Possession limit reduced to one day's creel limit while on the water.
2000: 16 inch minimum length limit. 25 fish daily.
Current Texas regulation: No limit.

Freshwater Drum (*Aplodinotus grunniens*)
1968: No limit.
1982: Freshwater drum under 12 inches total length – 25 fish daily creel in aggregate with blue catfish under 14 inches total length, channel catfish under 11 inches total length, or flathead catfish under 14 inches total length or any combination thereof. Possession limit – 50 in aggregate.
1983: Freshwater drum under 12 inches total length – 25 fish daily creel in aggregate with blue catfish under 14 inches total length or flathead catfish under 14 inches total length or any combination thereof. Possession limit – 50 in aggregate.
1990: Freshwater drum under 12 inches total length – 25 fish daily creel in aggregate with blue catfish under 12 inches total length, channel catfish under 11 inches total length, or flathead catfish under 14 inches total length or any combination thereof. Possession limit – 50 in aggregate of undersized fish. No limit on freshwater drum whose total lengths are equal to or exceed minimum length requirements.
1998: Possession limit reduced to one day's creel limit while on the water.
2000: 12 inch minimum length limit. 25 fish daily.

Current Texas regulation: No limit.

White Bass (*Morone chrysops*)
1968: 25 fish daily creel limit. Possession limit - 50.
1982: 50 fish daily creel limit. Possession limit – 100.
1998: 25 fish daily creel limit. Possession limit reduced to one day's creel limit while on the water.

Current Texas regulation: 25 fish daily creel limit. No minimum length limit. Possession limit – 50.

Yellow Bass (*Morone mississippiensis*)
1968: 25 fish daily creel limit. Possession limit - 50.
1970: 50 fish daily creel limit. Possession limit – 100.
1998: Possession limit reduced to one day's creel limit while on the water.
2005: No Limit.
Current Texas regulation: No limit.

Paddlefish (*Polyodon spathula*)
1968: 15 pound minimum limit.
1989: All recreational fishing for paddlefish prohibited in Louisiana waters.
2007: Recreational fishery re-established in Louisiana waters, except in shared boundary waters with Texas where it remains closed to all paddlefish take as per special status in that state.

Current Texas regulation: no harvest, no possession; listed as a Texas state endangered species.

Bowfin (*Amia calva*)
1968: No limit.
1993: Closed season – December, January, February.
1994: No limit.
1998: Possession limit reduced to one day's creel limit while on the water.
2003, August 15: 16 inch minimum length limit.

Crawfish
1996: All wire traps prohibited for recreational take.
1999:150 pounds daily.

Scuba Diving Season
A special season for scuba diving (spear fishing) for largemouth bass, crappie, and *Lepomis* species resulted from the passage of Act No. 323 of 1984 and was initiated on July 3, 1985. This season was in effect only for Toledo Bend Reservoir south of Highway 6 on the Louisiana side of the reservoir. The season ran from sunrise on June 1st to sunset the last day of September. A special permit was required of participants and a monthly report had to be filed in order to keep the permit. Limits were 5 largemouth bass, 25 crappies, and 50 Lepomis (bream). In addition to the special permit, participants could not have other types of fishing gear in the boat at the time and were required to have a valid recreational fishing license.
This season has continued, but is now limited to crappie and Lepomis (bream). Rules regulating the scuba diving season are presented here as they appear in Title 76 of the Louisiana Revised Statutes;

113. Scuba Diving Game Fish Season
Pursuant to the authority granted under R.S. 56:320(E), the Louisiana Wildlife and Fisheries Commission hereby continues the special scuba game fish season at Toledo Bend Reservoir, but deletes black bass from the list of game fish eligible to be taken.
The rules regulating the special scuba game fish season as amended and re-enacted by the commission are as follows:
(1) The special season shall be limited to Toledo Bend Reservoir, and only in that part of the lake located south of Highway 6 (Pendleton Bridge) on the Louisiana side.
(2) The special season shall be for four months beginning at sunrise on the first day of June and ending at sunset on the last day of September each year.
(3) The taking of game fish species shall be permitted during daylight hours only from sunrise to sunset.
(4) Each diver harvesting game fish is required to have a special permit issued by the secretary of the Louisiana Department of Wildlife and Fisheries, and the permit must be available for inspection upon request.
(5) In addition to the special permit the permit holder must have a valid Louisiana sportfishing license.
(6) Crappie and bream shall be the only game fish species allowed to be taken.
(7) The daily creel limit shall be 25 crappie and 50 bream; the possession limit shall be the same as the daily creel limit.
(8) The scuba diver must be submerged in the water and use only standard underwater spearing equipment.
(9) No permitted diver shall have in his possession (vessel or on his person) any other fishing

gear.
(10) Each permit holder shall submit to the Louisiana Department of Wildlife and Fisheries a monthly report of game fish taken, and other information requested on the forms supplied by the department; the report deadline for a specific month shall be on the fifteenth of the following month. All reports should be sent to Bennie Fontenot, Louisiana Department of Wildlife and Fisheries, Box 98000, Baton Rouge, LA 70898-9000. Each permit holder must submit the monthly report whether they fish or not.
(11) A legal diving flag shall be conspicuously displayed while diving operations are taking place.
(12) Permits will expire at the end of each season and shall be renewed on an annual basis.
(13) Failure of the permittee to adhere to any of the above stipulations shall result in the revocation of the permit by the secretary of the department.
(14) The secretary of the department shall be authorized to recall permits and/or to close the special season if deemed necessary.
AUTHORITY NOTE: Promulgated in accordance with R.S. 56:320(E).

HISTORICAL NOTE: Promulgated by the Department of Wildlife and Fisheries, Wildlife and Fisheries Commission, LR 11:706 (July1985), amended LR 15:393 (May 1989).

Taking of other gamefish is prohibited as stated in current Louisiana Recreational Fishing Regulations:
*Skin divers fishing for sport in freshwater, when submerged in the water and using standard spearing equipment, or any person using a bow and arrow, or any person using or possessing nets or traps, including recreational hoop nets, recreational slat traps, recreational pipes, recreational buckets, recreational drums, recreational tires, recreational cans, recreational wire nets and recreational crawfish traps may not take or possess any largemouth bass (*Micropterus salmoides*), spotted bass (*M. punctulatus*), black or white crappie (*Pomoxis nigromaculatus, P. annularis*), white bass (*Morone chrysops*), yellow bass (*M. mississippiensis*), striped bass (*M. saxatilis*), hybrid striped bass (*striped bass-white bass cross*), or any species of bream.*

Bream Traps
Recreational fishing regulations include the capture of bait in traps in Louisiana and reads as follows:
Bream (Lepomis spp.) may not be taken as bait for sportfishing purposes in any form of trap except at Toledo Bend Reservoir, where a minnow trap not exceeding 24 inches in length and having a throat no larger than one inch by three inches may be used to take bream for non-commercial bait purposes. This regulation is a result of Act No. 545 of 1990.

Commercial Fishing Regulations

Louisiana's historical commercial fishing regulations for each species are listed below along with the effective dates of regulation changes. A tabular form of this information is found in Appendix VII. Texas Parks & Wildlife Commercial Regulations may be viewed at http://www.tpwd.state.tx.us/publications/pwdpubs/media/pwd_bk_v3400_0074.pdf

Louisiana's commercial fishing regulations may be viewed at the following link: http://www.wlf.louisiana.gov/fishing/regulations

With regard to all commercial fish, five percent of the total number of each species in possession may be smaller than the legal limit. [Louisiana Revised Statutes, Title 56:326 B. (1.)] Ten percent of the total number of channel catfish in possession may be smaller than the legal limit. [Louisiana Revised Statutes, 56:326 B (3)]

Garfish (alligator gar. longnose gar, shortnose gar, spotted gar)
1968: No limit.

Current Texas regulation - Alligator gar – 1 fish daily. No length limit. Possession limit – 2.

Buffalo fish
1968 - 16 inch minimum length limit.

Current Texas regulation – No limit.

Freshwater drum
1968 - 12 inch minimum length limit.

Current Texas regulation – No limit.

Paddlefish
1968 - Commercial status statewide, with a 15 lb. minimum size, no limit, however, no commercial nets allowed in impoundment.
1986 - All commercial fishing for paddlefish prohibited in Louisiana waters.

Current Texas regulation – no harvest, no possession; listed as a Texas state endangered species.

Blue catfish
1968 - 14 inch minimum length limit.
1986 – 12 inch minimum length limit.

Current Texas regulation – 25 fish daily in any combination with channel catfish. 14 inch minimum length limit. Blue catfish may be taken only by pole and line (includes rod and reel), trotline, jug line or throw line.

Flathead catfish
1968 - 14 inch minimum length limit.

Current Texas regulation – No commercial harvest.

Channel catfish
1968 - 13 inch minimum length limit.
1972 - 11 inch minimum length limit.
1982 – No limit.
1999 – 11 inches minimum total length, 9 inches collar-boned.
2000 - 11 inches minimum total length, 8 inches collar-boned.

2009 - 11 inches minimum total length.
Current Texas regulation – 25 fish daily in any combination with blue catfish. 14 inch minimum length limit. Channel catfish may be taken only by pole and line (includes rod and reel), trotline, jug line or throw line.

Bowfin
1968 – No regulation.
1993 – 22 inch minimum length limit. 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, February.

Current Texas regulation – No limit.

Shad
2000 – 50 pounds daily.

Current Texas regulation – No limit.

Regulations prohibiting the use of gill nets, trammel nets, flag webbing, and fish seines were implemented on October 20, 1981 for two years. This action resulted from concerns of LDWF biological staff that these gears were negatively impacting sportfish populations. Particular concerns involved the capture of striped bass and largemouth bass in entanglement gear types. This prohibition also included a closure to hoop nets from March 1 through May 15 in the area from the Texas line where the river enters Texas south to a point where the Texas Duck Refuge Canal intersects the old channel of the Sabine River. The intent of this regulation was the protection of striped bass and white bass during the spawning run observed annually in the described area. A three year extension was granted to this rule in October 1983. This regulation was made permanent on September 5, 1986. (Title 76, Part VII, Chapter I, 109.)

DRAWDOWN HISTORY

Drawdown date

The reservoir is typically lowered an average of five to seven feet each year during the summer months as a result of the combination of hydroelectric power generation and decreased rainfall during that time period. The only recorded planned drawdowns that occurred after the prime power generation season were in October of the following years: 1977, 1991, 1993, and 2001.

Purpose

All planned drawdowns for the reservoir are for inspection and repair of the dam face.

Success

Recorded planned drawdowns have been successful in their purpose as stated above. The typical annual water level fluctuation resulting from hydroelectric power generation does not fit the usual definition of a drawdown. However, the results of this regime are identical to results derived from planned drawdowns i.e., control of aquatic vegetation, reduction of organic substrate and opportunity for seawall and boat ramp repair.

Fishing closure

There has never been a closure on Toledo Bend Reservoir due to a drawdown.

Depth below pool

The planned drawdowns that occur periodically for dam inspection result in an average level of 165 MSL (7 feet below pool), but have been as low as 162.87 MSL (9 feet below pool). The lowest reservoir level achieved during any given year is dependent upon rainfall and ranges from 166 MSL to 164 MSL (6 to 8 feet below pool).

Estimated % exposed

The amount of lake bottom exposed during normal hydroelectric power operations varies from year to year. Under the current operating guide, an average of 13% of the lake bottom is exposed annually. This maximum exposure is very brief, averaging 4 days.

Who operated structure

The Toledo Bend Project Joint Operation is the entity that operates the structure if there is a planned drawdown.

Fish kills

There have been no fish kills due to a planned drawdown.

FISH KILLS / DISEASE HISTORY

Three fish kills have been recorded at Toledo Bend. The first occurred in the extreme lower part of the reservoir and was attributed to low dissolved oxygen. An LDWF news release states that 250-300 striped bass in the 10 pound class were lost (Release number 79-44, 7/12/1979). A chronic situation remains at Toledo Bend Reservoir regarding striped bass during the summer months. Striped bass have a low tolerance for heat and seek cooler waters during the summer. The preferred temperature for striped bass occurs near the thermocline that develops as surface temperatures rise. Most forage species are more heat tolerant than striped bass and are located above the thermocline. Striped bass seeking thermal refuge are sometimes forced to forego feeding in order to avoid lethally high water temperatures. Reduced food intake of striped bass can stress individuals to the point of death. This phenomenon is more noticeable in years of extremely high water temperatures. On average, the loss of adult striped bass during any given year is numbered as less than one hundred.

In 1999, a fish kill was attributed to Largemouth Bass Virus (LMBV) at Toledo Bend. No accurate estimate of the number of fish affected exists due to the duration and widespread spatial coverage of the event. This fish kill lasted for several weeks during the summer

months of 1999. The affected fish were adult largemouth bass. Dead fish were observed over the entire reservoir.

A fish kill was recorded on September 28, 2005 in Lanan Creek. LDWF personnel recorded 439 fish of several species. Water quality tests taken by LDWF indicated low dissolved oxygen levels at the site.

LMBV samples have been taken in Toledo Bend since 2002. These samples have showed that LMBV is present in largemouth bass in the reservoir. No major fish kills have been recorded due to this disease since 1999. LMBV test results for largemouth bass appear in Table 6.

Table 6 –Largemouth bass virus test results for largemouth bass sampled at Toledo Bend Reservoir, Louisiana, 2002 – 2010.

Year	N	% Positive LMBV
2002	60	28.3
2003	274	5.5
2004	180	4
2005	180	10
2006	183	3.8
2007	180	2.2
2008	185	2.7
2009	180	2.2
2010	120	1.6

CONTAMINANTS / POLLUTION

Water quality

Water quality information for the reservoir is listed in the attached Louisiana Department of Environmental Quality website: http://www.deq.louisiana.gov/portal/tabid/66/Default.aspx. Data is collected at three sample sites in Toledo Bend; the spillway, Logansport, and San Patricio Bayou.

Fish consumption advisories based upon detected Mercury levels have been periodically issued by the Louisiana Department of Health and Hospitals for fish taken from Toledo Bend Reservoir.

http://www.deq.louisiana.gov/portal/Portals/0/planning/Fish%20Consumption%20Advisory%20Table%20-%203-8-96.pdf

A fish consumption advisory was issued 11/17/97 is currently in effect for the Louisiana side of Toledo Bend Reservoir. Recommendations are listed below:

Women of childbearing age and children less than seven years of age SHOULD NOT CONSUME BOWFIN (Choupique, Grinnel) and should consume no more than ONE MEAL PER MONTH of largemouth bass or freshwater drum combined from the advisory area.

Other adults and children seven years of age and older should consume no more than TWO

MEALS PER MONTH of bowfin (Choupique, Grinnel) and no more than FOUR MEALS PER MONTH of largemouth bass or freshwater drum combined from the advisory area.

Numerous oil, gas and water wells were inundated when Toledo Bend Reservoir filled. To date no significant problems have occurred related to these wells.

Water level

Water level as a management issue is unique at Toledo Bend Reservoir. Whereas some waterbodies are occasionally drawn down to accomplish vegetation control or other habitat management objectives, water levels at Toledo Bend Reservoir have not been intentionally manipulated for such purposes. As previously mentioned, Toledo Bend's water level fluctuates 5 - 7 feet annually as a result of hydroelectric power generation. This regime produces much the same effect as an intentional drawdown in that it controls submerged aquatic vegetation, reduces lake bottom detritus and provides an opportunity for shoreline construction and repair projects.

On May 1, 2004, Act 295 was passed by the Louisiana Legislature. This act prohibits the release of water for hydroelectric power generation when the lake level is below 168 MSL. Exceptions to the rule include dam inspection or repair, emergency power needs, water releases needed to satisfy minimum downstream flow and water releases needed to prevent saltwater encroachment in the Sabine River Estuaries. This change in the reservoir operation will result in a routine annual water level fluctuation of 4 feet as opposed to the 5-7 foot fluctuation experienced under the previous operating guide.

This decrease in annual water level fluctuations, will likely result in an increase of aquatic vegetation coverage with in the reservoir. It is also possible that other fisheries management issues such as fish reproduction and water quality may be affected by this change in reservoir operation. LDWF will monitor such fisheries management parameters into the future.

Historic average lake levels are detailed in Appendix VIII.

BIOLOGICAL

Fish samples

History

Several taxonomic surveys of fishes were made along the Sabine River prior to its impoundment. Kemp (1954) conducted a survey of fish along that portion of Sabine River within and along the boundaries of Gregg County Texas. The survey used seining gear for collecting. Members of the Centrarchidae and Cyprinidae families were most often collected (Carver, 1967).

Gray (1956) conducted a survey of the Sabine River and its watershed from and including Sabine County to its mouth. Gray made sixty-two collections on the tributaries (Texas side of Sabine River) and 120 collections on the river proper. Cyprinidae, Centrarchidae and Percidae were the families most represented. Gray stated that at a glance collections of Ictaluridae indicated this group as scarce. However Gray further stated that he was unable to time collection trips to coincide with best conditions for collecting members of this family (Carver, 1967).

Dorchester (1960) conducted a resurvey of the Sabine River. A seine was used for collecting the fish. Dorchester (1960) concluded that no major changes in the fish population occurred during the years between the surveys (Carver, 1967).

Lantz (1962) conducted a limnological study of four tributaries of Sabine River in Sabine Parish, Louisiana. As part of the study, fishes were collected. Species of the families Cyprinidae and Centrarchidae were most abundant (Carver, 1967).

A pre-impoundment study was conducted by the Louisiana Wildlife & Fisheries Commission in 1966. Dudley C. Carver published data from the study in 1967 (Carver, 1967). Carver found fishes representing seventeen families, thirty-five genera and sixty-five species. Carver noted that the collection of fishes from the 1966 study compared favorably with the results of Gray (1956).

Standardized Sampling

The first records of LDWF standardized sampling on the reservoir start in September of 1976. Standardized sampling involves the use of the same sampling gear in the same location at the same time of year. This type of sampling proves useful for tracking changes in fisheries populations over time. Various types of standardized sampling have been conducted at Toledo Bend Reservoir. A description of each type is offered below. A detailed listing of recorded standardized sampling from 1976 – 2016 appears in Appendix VIX.

Gear

Rotenone Samples

Rotenone sampling was used to determine species composition, prey availability, standing crop (biomass), species relative abundance, and predator/prey relationships. Rotenone sampling was accomplished by placement of a small mesh net of a length that would enclose

a one acre square area of open water. The net extended from the surface to the bottom. Rotenone was applied at a rate of 3 pints per acre foot by means of a gasoline powered water pump. The rotenone was injected through a weighted hose at various depths to provide uniform coverage in the sample area.

Rotenone is a naturally occurring substance found in the roots and stems of several tropical plants. Rotenone works as a fish toxicant by inhibiting a biochemical process in the fish cells, resulting in an inability of fish to use oxygen in the release of energy during normal body processes. In effect, the fish suffocate due to lack of oxygen. But, contrary to popular belief, rotenone does not remove oxygen from the water. All fish thus affected were collected with dip nets by crew members traversing the study area in boats. The fish were sorted by species. The species were sorted by inch groups. Each inch group was counted, weighed and recorded. Crews returned to the study area on the following day to retrieve all remaining fish which had by then floated to the surface. Again, all species were sorted by inch groups, weighed and recorded. This format is referred to as a 2 day pickup rotenone set and is the routine most often used at Toledo Bend Reservoir. On rare occasions a one day or three day pickup may be used to conduct rotenone sampling.

In 1977, rotenone methodology changed from one-acre sets to cove sampling. Cove sampling involved using a fine meshed block-off net to seal an entire cove at its mouth. All other aspects of cove sampling followed the one-acre methodology previously described. One cove set was made at J & L Marina and one at Lanan Cove. The cove sets comprised 3 acres and 5 acres respectively. These samples were repeated in years 1979, 1980, 1981, 1982, 1983, 1984, 1985 and 1986.

In 1988, LDWF returned to one-acre open water rotenone sampling. This move was in response to concerns that increasing shoreline development would result in conflicts with property owners in and near the study area.

In 1998, two (2) cove rotenone sets were made. Rotenone sampling was abandoned at that point in favor of other sampling methods that were less labor intensive and caused fewer concerns with lakeshore residents.

Wire Traps

Wire trap sampling was conducted using gear similar to that being used by the public in some areas of the state. Traps were made from one inch and 1 ½ inch mesh coated wire. Different bonnet styles were used including no bonnet, vertical bonnet and horizontal bonnet. The traps were baited and remained set for several days. At the end of the sample period, fish were identified, weighed, measured for length and data was recorded. Additionally, some traps were fished as “lost”. These traps remained set for several weeks undisturbed other than to have their contents recorded and returned to the trap. This sampling was conducted in 1984, 1985 and 1986.

Electrofishing

Electrofishing is used primarily to determine length frequencies, relative abundance and

relative weight of largemouth bass and crappie. Age, growth and mortality data are also collected for these species.

Electrofishing sampling is conducted by means of a prod pole based system. A generator provides electricity to a control (pulsator) box that regulates voltage, amperage and pulse rate of the current desired for sampling. The prod pole serves as the anode of the circuit, while the boat carrying the equipment and crew serves as the cathode. Fish in the affected area are drawn to the anode by muscular contractions caused by the electric current flowing through their bodies (electrotaxis). When near the anode, the fish are immobilized by the electric current (electronarcosis) and are captured by means of dip nets. The fish are placed into an onboard tank until the completion of designated sample time. The samples are identified by species, measured for length and weight. Data is recorded and the fish are released. Typically, an electrofishing sample is conducted over a period of fifteen minutes of actual shocking time.

The earliest electrofishing samples at Toledo Bend were conducted in 1988. In 1989, the reservoir was divided into three zones for electrofishing purposes. In each zone, a minimum of 6 and a maximum of 9 samples were to be conducted during each sampling period. That sampling regime was continued on an annual basis through year 2012. The current sampling regime calls for samples to be taken every third year. In such years there are to be 30 spring electrofishing samples and 30 fall electrofishing samples plus one fall electrofishing forage sample taken.

Electrofishing forage sets differ from routine electrofishing sets by the requirement that all individuals less than six inches in length of all species be collected. Forage sets are used to give insight into the amount of forage available to predatory fishes.

Gillnetting

Monofilament gillnets are used to collect relative abundance data for large commercial species including catfishes, buffalo, gar and carp. Data related to relative abundance of gizzard shad, striped bass and hybrid striped bass are also obtained through use of this gear type.

LDWF standardized sampling gear for this sampling is three hundred feet in length and six feet deep. Mesh sizes included 2.5 inch bar, 3 inch bar, 3.5 inch bar and 4 inch bar. These nets are set near sunset and retrieved shortly after sunrise the following day. A minimum of 15 gillnet sets is required to conduct this sampling each year. Gillnet sampling at Toledo Bend began in 1989 and continued annually through 2012. The current sampling regime call for gillnet sampling to be conducted every third year.

Shoreline seining

Shoreline seine sampling was first employed in 1990 and continued through 2010. This sampling technique was conducted primarily to determine reproductive success of Micropterus and Lepomis species. Additional information was collected relative to species composition and prey availability. Shoreline seining was conducted by making quadrant hauls with a 25 foot x 6 foot seine of 3/16 inch mesh nylon material. The majority of sample sites were located at boat ramps that provided a suitable site for seining. These samples were taken during the summer season. A minimum of 15 samples were required annually. Data

relative to Micropterus species is currently taken from electrofishing samples while data relative to Lepomis species is currently taken from leadnet sampling.

Frame Nets

Frame nets were fished in 1998, 1999, 2002 and 2003 to determine relative abundance and length frequencies of crappie and sunfish (*Pomoxis* spp. and *Lepomis* spp.) Secondary objectives for this gear type include collection of data relative to species composition, crappie age and growth, and length/weight relationships of target species.

The gear consists of two 3 foot by six foot frames with center braces, made from 5/16" steel and four 2 ½ foot diameter hoops of 5/16 " steel. The 3 foot by 6 foot frames are 30 inches apart and the first hoop is 32 inches from the second frame. The hoops are 24 inches apart. The second 3' X 6' frame has a slit throat and the first hoop has a 6 inch throat. Net material is ½ inch square No. 105 knotless nylon. Cod ends of the net have a draw string closure. Two frame nets are fished at each station. Soak time for each set is at least 24 hours. The nets are set adjacent to physical structures such as shorelines, points or channel. The lead is tied as close to the structure as possible and stretched perpendicular to the structure.

Frame net sampling was conducted in September – December each year. Two (2) sets were made in 1998. Thirty seven (37) sets were made in 1999. Seven (7) sets were made in 2002 and fourteen (14) sets were made in 2003.

In the interest of maximizing catch per unit effort for crappie and sunfish studies, experimental efforts using another gear type, lead nets, were made in several locations statewide. Lead net studies indicated that this gear type would provide sufficient catch rates to accomplish study needs. In 2006, frame nets were eliminated from LDWF standardized sampling procedures and lead nets were adopted.

Lead nets

The use of lead nets for standardized sampling began in 2006. The primary objective of this effort is to determine relative abundance and length frequencies of crappie and sunfish (*Pomoxis* spp. and *Lepomis* spp.). Secondary objectives for this gear type included species composition, gear selectivity, age and growth of crappie and length/weight relationships of target species.

Lead nets consist of two opposing hoop nets connected by a net panel or lead. Each hoop net is sixteen feet long with seven 3½ feet diameter hoops. The first five hoops are fiberglass and the last two are metal. The hoop net is built from #15 nylon of one inch mesh. Each hoop net has two throats of the style known as fingered throats. The first throat starts 8-10 inches from the first hoop and extends into the second throat. The second throat starts 1½ - 2 feet after the beginning of the first throat and extends all the way to the end of the hoop net. Both throats are built on the same main line running from the start of the first throat to the end of the net. The leads are 20 feet in length and 5 feet in depth. Leads are made of #15 nylon of one inch mesh size. The bottom line of each lead is made of weighted lead line (65#). The top line of the lead is 3/16 inch braided polypropylene with 2 inch by 1½ inch foam floats on top of the lead. Lead floats are spaced at three foot intervals. All nets are treated with netcoat®.

Lead nets are fished September – December each year. Two lead nets are set at each sample

station. Current standardized sampling methodology calls for 24 samples to be conducted every third year on Toledo Bend Reservoir.

Lake records

Lake record fish information is collected and published by a local monthly magazine, *The Lakecaster*. The magazine's contact information is: The Lakecaster, 702 South Wheeler St., Jasper, TX 75951. Telephone: 409-384-3441. The lake record fish information given in Table 7 was current as of September 2015.

Table 7. Fishing records for Toledo Bend Reservoir, LA, as collected and published by the *Lakecaster Magazine*.

SPECIES	WEIGHT (lbs.)	DATE	Angler	Method
Largemouth Bass	15.32	07-03-00	Eric Weems	Rod & Reel
Palmetto Bass	15.81	05-25-87	Johnny Pritchett	Rod & Reel
Spotted Bass	3.40	02-07-09	Larry Upshaw	Rod & Reel
Striped Bass	47.50	August, 1991	James L. Taylor	Rod & Reel
White Bass	4.40	06-19-10	Lisle Brook	Rod & Reel
White X Yellow Bass	2.01	06-12-2013	Joy Holden	Rod & Reel
Yellow Bass	1.86	05-19-2013	Grant Ketelers	Rod & Reel
Bluegill	1.12	06-02-2015	Angela H. Eastridge	Rod & Reel
Bowfin	19.00	01-03-75	George E. Lord	Trotline
Bigmouth Buffalo	81.50	07-04-11	Martin McIntyre	Bow & Arrow
Smallmouth Buffalo	84.76	09-09-06	Miles McDaniel	Bow & Arrow
Common Carp	39.50	03-31-2013	Michael Hutto	Bow & Arrow
Grass Carp	53.50	08-02-06	Tontie Pennock	Rod & Reel
Flathead Catfish	97.50	05-24-91	Otis Pleasant	Trotline
Blue Catfish	84.0	04-13-07	Thomas Allcorn	Trotline
Channel Catfish	7.94	04-25-09	Clint Walker	Rod & Reel
Black Crappie	4.00	12-05-02	Hazel Bolton	Cane Pole
White Crappie	3.44	02-21-11	Claude Gilcrease, Jr.	Rod & Reel
Freshwater Drum	31.50	03-03-95	Freddie Keel	Rod & Reel
Alligator Gar	248.0	04-06-13	Nick Procell	Bow & Arrow
Spotted Gar	8.78	03-11-12	Dylan Lyons	Bow & Arrow
Redfin Pickerel	0.66	02-10-09	Bill Ritzell	Rod & Reel
Longear Sunfish	0.54	05-05-12	Hunter Woodward	Rod & Reel
Redbreast Sunfish	0.88	06-04-10	Gage Shepherd	Rod & Reel
Redear Sunfish	0.80	09-05-08	Robert Prejean	Rod & Reel
Warmouth	1.09	04-14-95	William Tawney	Rod & Reel
Other Sunfish	0.75	07-05-10	Gage Shepherd	Rod & Reel

Stocking History

Table 8 details fish stockings in Toledo Bend Reservoir. These records were derived from the LDWF database and historic data (Carver, 1967; Carver, 1969). Texas Parks and Wildlife stocking data is taken from TP&WD website which may be viewed at: http://www.tpwd.state.tx.us/fishboat/fish/action/stock_bywater.php?WB_code=0734 .

Table 8. Fish stocking records by state and by species for Toledo Bend Reservoir, LA from 1967 – 2015.

Year	State	LM Bass	FLMB	Striped Bass	Gulf Strain Striped Bass	Atlantic Strain Striped Bass
1967*	LA	1,500,000	0	48,630	0	0
1967	TX	1,974,000	0	0	0	0
1968**	LA	0	0	17,876	0	0
1973	TX	0	0	0	0	0
1974	TX	0	0	16,290	0	0
1976	TX	0	0	60,178	0	0
1977	TX	0	0	100,200	0	0
1979	TX	0	0	95,000	0	0
1981	TX	0	0	96,249	0	0
1983	TX	0	0	104,133	0	0
1984	TX	0	0	406,920	0	0
1985	TX	0	332,623	484,500	0	0
1986	TX	0	0	203,000	0	0
1987	TX	23,205	0	0	0	0
1988	TX	0	150,000	748,315	0	0
1990	TX	0	446,797	0	0	0
1991	TX	0	402,005	240,364	0	0
1992	TX	0	406,497	0	0	0
1993	LA	0	119,497	254,211	0	0
1993	TX	0	1,821,176	0	0	0
1994	LA	0	146,750	793,698	0	0
1994	TX	0	1,104,101	0	0	0
1995	LA	0	109,200	3,598,296	0	0
1995	TX	0	400,007	0	0	0
1996	LA	0	75,000	619,467	78,840	1,420,000
1996	TX	0	450,015	0	0	0

1997	LA	0	50,394	102,490	14,844	696,839
1997	TX	0	234,875	0	0	0
1998	LA	4,000	51,600	0	205,366	391,120
1998	TX	0	400,735	0	0	0
1999	LA	0	51,000	289,304	0	0
1999	TX	0	1,206,777	0	0	0
2000	LA	0	1,150,371	496,700	1,820	0
2000	TX	0	321,974	0	0	0
2001	LA	0	711,581	11,000	0	0
2001	TX	0	508,505	0	0	0
2002	LA	0	501,749	69,056	0	0
2002	TX	0	740,373	272,179	0	0
2003	LA	0	458,440	239,432	0	0
2003	TX	0	961,015	0	0	0
2004	LA	0	574,681	0	0	476,788
2004	TX	0	492,536	0	0	0
2005	LA	0	195,095	0	0	82,522
2005	TX	0	849,436	0	0	0
2006	LA	0	71,810	0	0	0
2006***	TX	4,592	0	0	0	0
2007	LA	0	236,088	4,842	0	0
2007	TX	0	502,918	0	0	0
2008	LA	0	1,568,824	0	0	68,223
2008***	TX	2,604	512,768	0	0	0
2009	LA	0	907,486	0	0	317,453
2009	TX	0	860,614	0	0	0
2010	LA	0	568,747	0	0	0
2010	TX	0	509,034	0	0	0
2011	LA	0	1,566,443	0	0	0
2011	TX	0	499,321	0	0	0
2012	LA	0	2,396,266	0	0	0
2012	TX	0	500,666	0	0	0
2012***	TX	0	9,051	0	0	0
2013	LA	0	464,166	0	0	0
2013	TX	0	76,838	0	0	0
2013***	TX	0	4,677	0	0	0
2014	LA	0	2,052,200	0	0	0
2014	TX	0	0	0	0	0
2015	LA	0	820,880	0	0	0
2015	TX	0	508,034	0	0	0
Grand Total By Species		3,508,401	30,061,636	9,372,330	300,870	3,452,945

Year	State	Channel Catfish	Flathead Catfish	Black Crappie	Paddlefish	Walleye
1967*	LA	0	0	0	0	73,280
1967	TX	544,745	0	0	0	0
1968**	LA	0	0	0	0	750,000
1973	TX	0	400	0	0	0
1974	TX	0	0	0	0	0
1976	TX	0	0	0	0	0
1977	TX	0	0	0	0	0
1979	TX	0	0	0	0	0
1981	TX	0	0	0	0	0
1983	TX	0	0	0	0	0
1984	TX	0	0	0	0	0
1985	TX	0	0	0	0	0
1986	TX	0	0	0	0	0
1987	TX	0	0	0	0	0
1988	TX	0	0	0	0	0
1990	TX	0	0	0	0	0
1991	LA	0	0	0	35,506	0
1991	TX	0	0	0	0	
1992	LA	0	0	0	0	0
1992	TX	0	0	0	18,497	0
1993	LA	0	0	0	1,625	0
1993	TX	0	0	0	39,680	0
1994	LA	0	0	0	125	0
1994	TX	0	0	0	15,000	0
1995	LA	0	0	0	4,066	0
1995	TX	0	0	0	40,933	0
1996	LA	0	0	0	2,265	0
1996	TX	0	0	0	16,432	0
1997	LA	0	0	0	7,028	0
1997	TX	0	0	0	14,040	0
1998	LA	0	0	0	2,662	0
1998	TX	0	0	0	0	0
1999	LA	0	0	0	20,103	0
1999	TX	0	0	0	0	0
2000	LA	0	0	0	9,974	0
2000	TX	0	0	0	0	0
2001	LA	0	0	0	0	0
2001	TX	0	0	0	0	0
2002	LA	0	0	0	5,511	0
2002	TX	0	0	0	0	0
2003	LA	0	0	3,655	0	0
2003	TX	0	0	0	0	0
2004	LA	0	0	0	0	0

2004	TX	0	0	0	0	0
2005	LA	0	0	0	0	0
2005	TX	0	0	0	0	0
2006	LA	0	0	0	0	0
2006***	TX	0	0	0	0	0
2007	LA	0	0	0	0	0
2007	TX	0	0	0	0	0
2008	LA	0	0	0	0	0
2008***	TX	0	0	0	0	0
2009	LA	0	0	0	0	0
2009	TX	0	0	0	0	0
2010	LA	0	0	0	0	0
2010	TX	0	0	0	0	0
2011	LA	0	0	0	0	0
2011	TX	0	0	0	0	0
2012	LA	0	0	0	0	0
2012	TX	0	0	0	0	0
2013	LA	0	0	0	0	0
2013	TX	0	0	0	0	0
2014	LA	0	0	0	0	0
2014	TX	0	0	0	0	0
2015	LA	0	0	0	0	0
2015	TX	0	0	0	0	0
Grand Total By Species		544,745	400	3,655	177,029	823,280

***Carver (1967), **Carver (1969), ***Share Lunker Largemouth**

Species profile

LDWF collections at Toledo Bend Reservoir include fishes representing 16 families, 34 genera and 71 species is found in Table 9 below.

Table 9. Fish species collected in Toledo Bend Reservoir by LDWF from 1970 – 2015.

Paddlefish Family, POLYODONTIDAE
Paddlefish, *Polyodon spathula*

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

Bowfin Family, AMIIDAE
Bowfin, *Amia calv*a (Linnaeus)

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

Minnow Family, CYPRINIDAE
Blacktail shiner, *Cyprinella venusta* (Girard)
Blackspot shiner, *Notropis atrocaudalis*
Ghost shiner, *Notropis buchanani*
Red shiner, *Notropis lutrensis*
Sabine shiner, *Notropis sabinae*
Redfin shiner, *Notropis umbratilis*
Weed shiner, *Notropis texanus* (Girard)
Mimic shiner, *Notropis volucellus* (Cope)
Golden shiner, *Notemigonus crysoleucas* (Mitchill)
Bullhead minnow, *Pimephales vigilax* (Baird and Girard)
Fathead minnow, *Pimephales promelas*
Suckermouth minnow, *Phenacobius mirabilis*
Carp, *Cyprinus carpio* (Linnaeus)
Grass Carp, *Ctenopharyngodon idella*
Goldfish, *Carassius auratus*

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

Freshwater Catfish Family, ICTALURIDAE
Black bullhead, *Ameiurus melas* (Rafinesque)
Yellow bullhead, *Ameiurus natalis* (Lesueur)
Brown bullhead, *Ictalurus nebulosus*
Blue catfish, *Ictalurus furcatus*
Channel catfish, *Ictalurus punctatus* (Rafinesque)
Tadpole madtom, *Noturus gyrinus* (Mitchill)
Flathead catfish, *Pylodictis olivaris* (Rafinesque)

Pike Family, ESOCIDAE
Grass pickerel, *Esox americanus vermiculatus* (Lesueur)
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)
Blackspotted topminnow, *Fundulus olivaceus* (Storer)

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

Silverside Family, ATHERINIDAE
Inland silverside, *Menidia beryllina*

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

Sunfish Family, CENTRARCHIDAE
Banded pygmy sunfish, *Elassoma zonatum* (Jordan)
Green sunfish, *Lepomis cyanellus* (Rafinesque)
Warmouth, *Lepomis gulosus* (Cuvier)
Orangespotted sunfish, *Lepomis humilis* (Girard)
Bluegill, *Lepomis macrochirus* (Rafinesque)
Redbreast sunfish, *Lepomis auritus*
Dollar sunfish, *Lepomis marginatus* (Holbrook)
Longear sunfish, *Lepomis megalotis* (Rafinesque)
Redear sunfish, *Lepomis microlophus* (Günther)
Spotted sunfish, *Lepomis punctatus* (Valenciennes)
Bantam sunfish, *Lepomis symmetricus* (Forbes)
Florida largemouth bass, *Micropterus floridanus* Kassler et al.
Northern largemouth bass, *Micropterus salmoides* (Lacépède)
Spotted bass, *Micropterus punctulatus* (Valenciennes)

Black crappie, *Pomoxis nigromaculatus* (Lesueur)
White crappie, *Pomoxis annularis* (Rafinesque)

Perch Family, PERCIDAE
Logperch, *Percina caprodes* (Rafinesque)
Big Scaled logperch, *Percina macrolepida*
Dusky darter, *Percina sciera*
Scaly Sand darter, *Ammocrypta vivax*
Western Sand darter, *Ammocrypta clara*
Redfin darter, *Etheostoma whipplei*

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

Genetics

Toledo Bend has been stocked with Florida strain largemouth bass since 1984. Florida strain largemouth bass are stocked into the reservoir to incorporate a genetic trait associated with larger maximum sized adult fish. Samples taken from electrofishing show that over time, the percentage of bass with Florida influence ($F - F_x$) has ranged from .016 percent (1989-1990) to 43 percent (2003-2004). Sampling has indicated that largemouth bass with the genetic signature defined as pure Florida have ranged from .016 percent (1989-1990) to 18 percent (2001-2002). Genetic testing results for largemouth bass are shown in Table 10.

Table 10. Genetic analysis of largemouth bass from Toledo Bend Reservoir, Louisiana, 1988 – 2012.

Year	Number	Northern	Florida	Hybrid	Florida Influence
1988	Unknown	52%	11%	37%	48%
1989	89	98.9%	1.1%	0	1.1%
1990	Unknown	84%	2%	14%	16%
1992	Unknown	85%	3%	11%	14%
1994	Unknown	86.4%	7.2%	6.3%	13.5%
1999	148	68%	8%	24%	32%
2000	50	80%	2%	18%	20%
2001	104	65%	18%	20%	38%
2002	118	61%	16%	23%	39%
2003	170	57%	11%	32%	43%
2004	176	76%	9%	15%	24%
2005	170	67.3%	5.8%	26.9%	32.7%
2006	181	68.50%	4.97%	25.41%	30.38%
2007	171	64%	4%	32%	36%
2009	106	71%	3%	26%	29%

2010	383	71%	7%	22%	29%
2011	382	74.5%	4%	21.5%	25.5%
2012	364	67.3%	4.1%	28.6%	32.7%

Threatened/endangered/invasive species

Paddlefish, *Polyodon spathula* are listed as a species of concern and do occur in Toledo Bend. They are rarely seen by anglers. In 2003-2004 gill net sampling, 2 specimens were captured. In 2004-2005 gill net sampling, 3 specimens were captured. Of these 5 fish, the largest was collected near Fisherman's Wharf and weighed 43 lbs. The remaining four specimens were captured in gill nets north of San Patricio. One paddlefish was collected in 2007-2008 gill net sampling.

The Sabine shiner, *Notropis sabinae* is a species of interest and occurs throughout the reservoir. Sabine shiners are occasionally collected during shoreline seine sampling. Collection years and (number collected) are as follows; 2003 (6), 2004 (6), 2005 (1), 2006 (2), 2007 (3), 2008 (2).

Five suckermouth minnows were captured in the 2002 seining sample at Bass Haven Resort just above the dam. This is also a species of interest and has not been recorded since 2002.

Grass carp, *Ctenopharyngodon idella*, have been collected in gill net samples as well as reported by anglers and bow fishermen. One grass carp was collected during gill net sampling in 2002-2003, one in 2006-2007 and one in 2008-2009.

CREEL SAMPLING

Historic information

Creel surveys on Toledo Bend have evolved over the years with the first being aerial surveys that counted boats and the number of people in boats in specific areas of the reservoir. These boat counts were done randomly and used to stratify the reservoir into zones that are used today in a roving creel survey. The earliest flights were made in June 1998. These aerial surveys provided useful information regarding comparisons of angler use throughout different areas of the reservoir. The aerial surveys were discontinued in 1999. Access point creel surveys were initiated in December of that same year.

In August of 2001 a roving creel survey was initiated in conjunction with TPWD. This survey was conducted on both sides of the reservoir simultaneously by both agencies. The sampling regime was as follows:

1. All surveys were randomly picked by a computer 3 months at a time.
2. Surveys were done 3 days a month, 1 week day and 2 weekend days (or holiday), and were in one of two time periods, morning (1) or afternoon (2). The times for these periods changed with day light savings time and the shortening of days during the winter and both periods had the same probability of being selected.
3. The survey was conducted in one of five geographical zones as per assigned angler use probabilities. These probabilities were derived from previous aerial data. The five zones and their probabilities were as follows:
   a. Dam to Boones crossing (0.27)
   b. Boones crossing to Pendleton Bridge (0.27)
   c. Pendleton Bridge to North Toledo Bend State Park (0.18)
   d. North Toledo Bend State Park to Converse (0.17)
   e. Converse to North end of reservoir (0.11)

Angler data was recorded on interview sheets at the time of the interview. Angler opinion regarding crappie regulations was measured by completion of a separate interview sheet immediately following the creel survey interview. Data collection forms for the roving survey and the angler opinion survey regarding crappie regulations are in Appendix X.

The roving creel survey was terminated on May 31, 2010.

An abbreviated analysis of data from creel surveys conducted during the period of June 2009 to May 2010 indicates the following for angling efforts on the Louisiana side of the reservoir:

Total angler hours for bank fishermen = 12,581.53
Total angler hours for boat fishermen = 370,103.08
Total hours of angling effort = 382,684.61
Angler catch rate (all species) = 1.61306 fish/hour.
Percent of angler hours directed toward a species; Bass = 69%, Crappie = 18%, Catfish = 3.3%, Panfishes (Bream) = 8.0% and Temperate Basses = 0.8%.
Total number of fish caught = 589,562.55.
Total number of fish harvested = 311,339.33 (52.8% of all fish caught were kept).
Total number of fish released =278,223.22 (47.2% of all fish caught were released).

HYDROLOGICAL CHANGES

Changes in the management of Toledo Bend Reservoir water levels have occurred in recent years due to concerns expressed by various user groups. The primary groups involved in discussions regarding minimum lake level have been the Sabine River Authorities of Louisiana and Texas, the utility companies contracted to generate hydroelectric power, anglers, boaters, marina operators, shoreline property owners and downstream residents.

The river authorities and utility companies each strive to meet contractual agreements for production of hydroelectric power. Water use required in their efforts has resulted in lake levels low enough to negatively impact angler access. Criticism was expressed from shoreline property owners who desired better waterfront access to the lake and from anglers denied access through public boat ramps. Anglers also voiced boating safety related concerns due to exposed navigational hazards (stumps and shallow water) during low water periods. Conversely, many downstream residents preferred lower lake levels so that the lake would catch and hold large rain events, thereby reducing the potential for downstream flooding.

Long term public pressure resulted in the passage of Act 295 by the Louisiana Legislature. The act prohibited hydroelectric power generation when the lake level at Toledo Bend Reservoir is below 168 feet MSL. Exceptions to the rule include dam inspection or repair, emergency power needs, water releases needed to satisfy minimum downstream flow and water releases needed to prevent saltwater encroachment in the Sabine River Estuaries. This legislation went into effect on May 1, 2004.

Although incomplete at this time, the federal relicensing process is underway for the Toledo Bend Project. This Federal Energy Regulatory Commission (FERC) process will result in discussions by all stakeholders as to how the project should be operated in the future. The LDWF is involved in this process and will have input relative to future hydrologic practices. The new license is expected to be issued by FERC with operating conditions and environmental remediation features included, in the fall of 2013.

WATER USE

Hunting

Hunting is allowed by the SRA, State of Louisiana on the reservoir for waterfowl. Waterfowl can only be hunted from floating blinds. Blinds can be placed on the reservoir 30 days prior to the waterfowl season and can stay 30 days after the season is closed (includes the September Teal season). Blinds must be marked with name, address, and phone number of owner. No blind can be placed closer than 800 feet from an inhabited shoreline or closer than 600 feet from other blinds or boat lanes. Any blind not properly identified or not removed after the season will be subject to removal or destruction by the SRA (SRA, 1998).

Skiing

Water skiing is allowed by the SRA, but the participants do so at their own risk. The SRA assumes no liability or responsibility (SRA, 1998).

Scuba Diving

Scuba diving in the reservoir is popular. Visibility in late summer at 18 feet of depth can be as much as 10 feet. Spear fishing is allowed on a limited basis by permit. The spear fishing season is open from June 1 to the last day of September and limited to the Louisiana side of the reservoir below the Pendleton Bridge.

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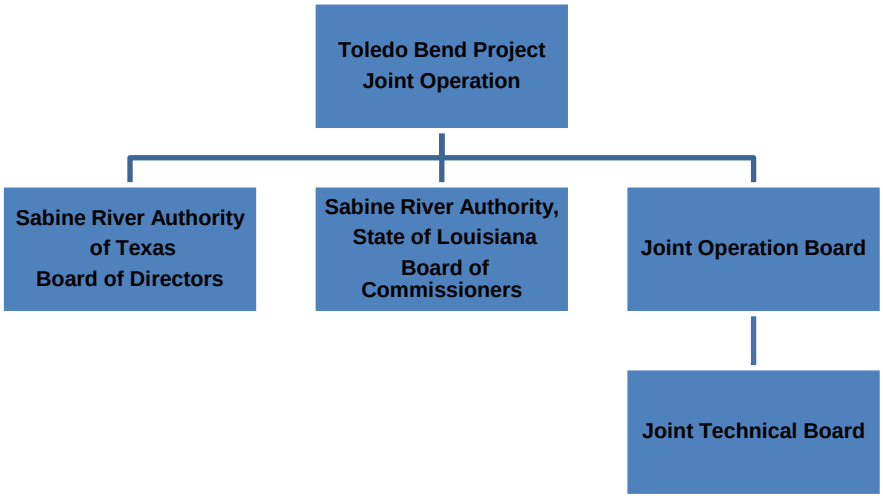
APPENDIX I
(back to association)

SABINE RIVER AUTHORITY

Flow chart for the Sabine River Authority of Texas, Sabine River Authority, State of Louisiana, and the Toledo Bend Project Joint Operation

Contact lists for the Sabine River Authority of Texas Board of Directors, Sabine River Authority, State of Louisiana Board of Commissioners, Toledo Bend Project Joint Operation, Joint Operation Board, and Joint Technical Board



Sabine River Authority, State of Louisiana
Board of Commissioners

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Mr. C.A. Burgess, Jr.

Mr. Daniel Cupit

Mr. Frank T. Davis

Mr. Jimmy Foret, Jr.

Mr. Byron Gibbs

Mr. Ned Goodeaux, Chairman

Mr. Jerry Holmes

Mr. Richard M. "Mike" McCormick

Mr. Therman Nash

Mr. James W. "Jim" Pratt, Exec Dir.

Mrs. Estella Scott

Mr. Stanley Vidrine

Mr. Bobby Eugene Williams

Note: All of these members can be contacted at the Sabine River Authority, State of Louisiana Office. The address and phone number is below.

Sabine River Authority, State of Louisiana
15091 Texas Highway
Many, LA 71449
(318)-256-4112

Sabine River Authority of Texas
Board of Directors

Mr. Stanley N. "Stan" Matthews

Mr. Earl Williams

Mr. David W. Koontz

Ms. Connie Wade
Secretary Pro-Tem

Mr. J. D. Jacobs, Jr.
Secretary

Mrs. M. Sharon Newcomer

Ms. Connie Ware
Vice President

Mr. Cliff R. Todd
Past-President

Mr. Cary "Mac" Abney
President

Note: All of these members can be contacted at the Sabine River Authority of Texas Office. The address and phone number is below.

Sabine River Authority of Texas
P. O. Box 579
Orange, TX 77631
(409) 746-2192

Toledo Bend Project Joint Operation Board

Mr. C.A. Burgess, SRA LA

Mr. Ned Goodeaux, SRA LA

Mr. Stan Matthews, SRA TX

Mr. Earl Williams, SRA TX

Mr. James Pratt, Executive Director SRA LA, member ex-officio

Mr. David Monthene, Executive Director SRA TX, member ex-officio

Note: This board makes policies and procedures for property jointly owned by the two states. This includes the spillway and hydroelectric powerhouse. Members from each state can be contacted through their respective SRA office.

Sabine River Authority, State of Louisiana
15091 Texas Highway
Many, LA 71449
(318) 256-4112

Sabine River Authority of Texas
P. O. Box 579
Orange, TX 77631
(409) 746-2192

Toledo Bend Project Joint Technical Board

Mr. James Pratt, Executive Director SRA LA

Mr. Bartin Rumsey, SRA LA

Mr. David Monthene, Executive Director SRA TX

Mr. Bill Hughes, SRA TX Engineer

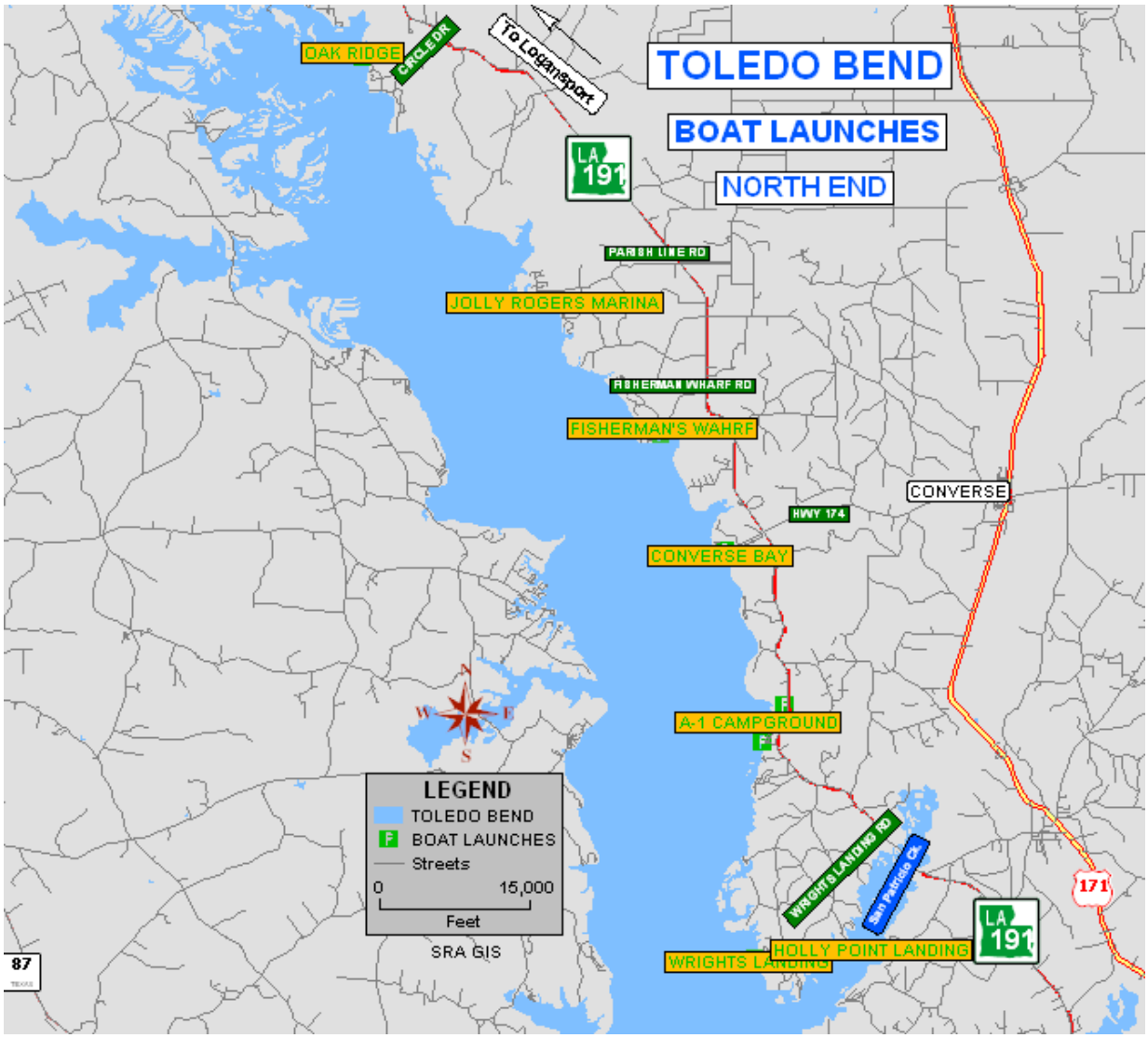
Note: This board handles the day to day operation of the property jointly owned by both states. This includes the releasing of water from the spillway and the generation of electricity in the hydroelectric powerhouse. Members from each state can be contacted through their respective SRA office.

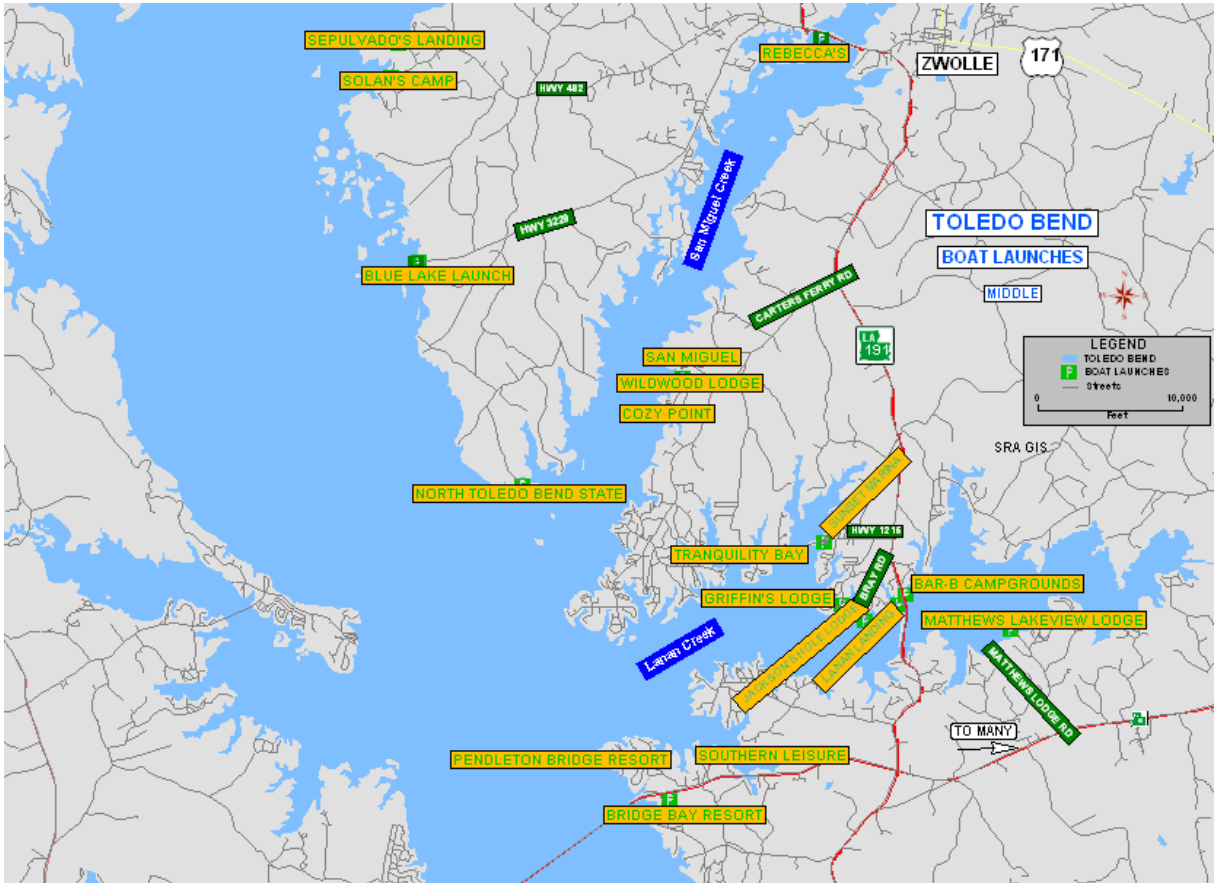
Sabine River Authority, State of Louisiana
15091 Texas Highway
Many, LA 71449
(318) 256-4112

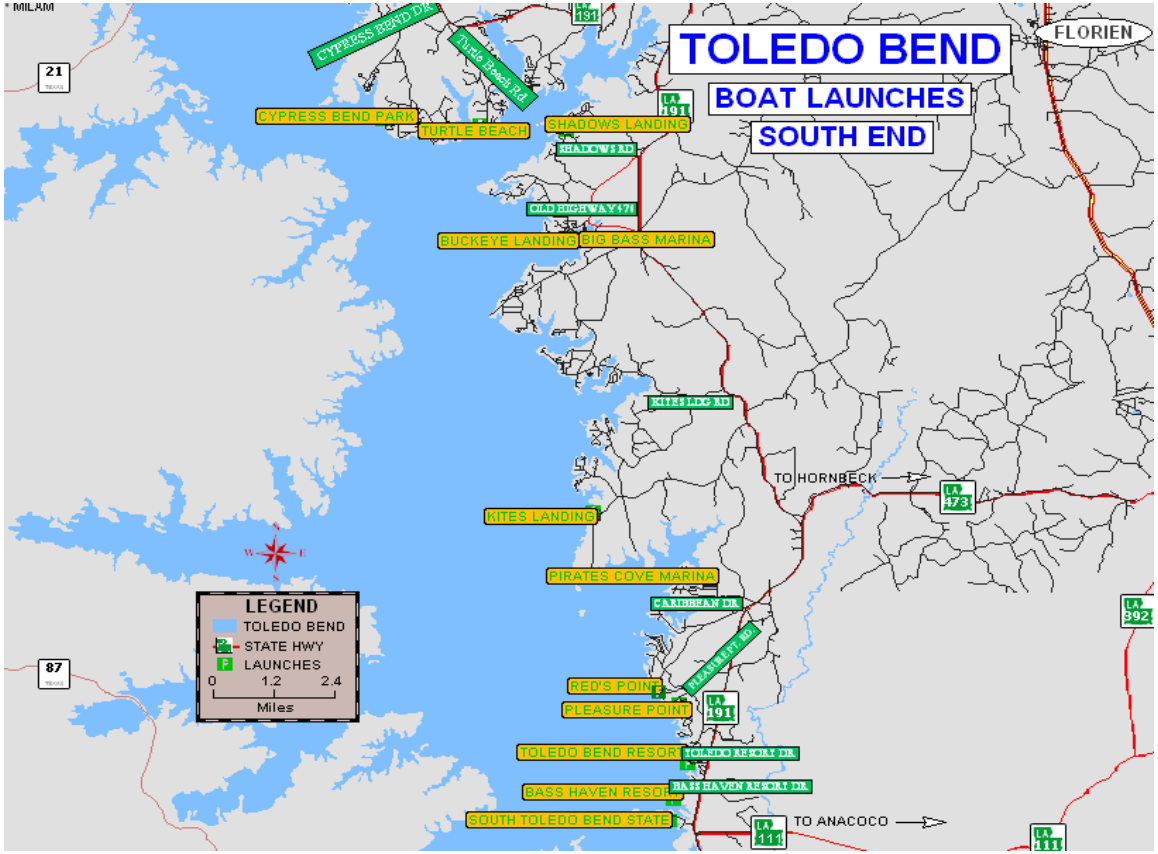
Sabine River Authority of Texas
P. O. Box 579
Orange, TX 77631
(409) 746-2192

APPENDIX II
(back to ACCESS)

Access points on the Louisiana shore of Toledo Bend Reservoir




SEPULVADO'S LANDING
SOLAN'S CAMP
HWY 482
REBECCA'S
ZWOLLE
171
San Miguel Creek
HWY 3229
BLUE LAKE LAUNCH
TOLEDO BEND
BOAT LAUNCHES
MIDDLE
CARTERS FERRY RD
LA 131
LEGEND
TOLEDO BEND
BOAT LAUNCHES
Streets
0
10,000
Feet
SAN MIGUEL
WILDWOOD LODGE
COZY POINT
SRA GIS
NORTH TOLEDO BEND STATE
HWY 1216
TRANQUILITY BAY
BIRAY RD
BAR-B CAMPGROUNDS
GRIFFIN'S LODGE
MATTHEWS LAKEVIEW LODGE
Larian Creek
MATTHEWS LODGE RD
TO MANY
PENDLETON BRIDGE RESORT
SOUTHERN LEISURE
BRIDGE BAY RESORT


TOLEDO BEND
BOAT LAUNCHES
SOUTH END
FLORIEN
CYPRESS BEND DR
Turtle Beach Rd
CYPRESS BEND PARK
TURTLE BEACH
SHADOWS LANDING
SHADOWS RD
OLD HIGHWAY 471
BUCKEYE LANDING
BIG BASS MARINA
KITHS RDG RD
TO HORNBECK
KITES LANDING
PIRATES COVE MARINA
CARIBBEAN DR
MEADOWS RD
RED'S POINT
PLEASURE POINT
TOLEDO BEND RESORT
TOLEDO RESORT DR
BASS HAVEN RESORT
BASS HAVEN RESORT DR
SOUTH TOLEDO BEND STATE
TO ANACOCO
LEGEND
TOLEDO BEND
STATE HWY
LAUNCHES
0 1.2 2.4
Miles

APPENDIX III

ARTIFICIAL REEFS

(back to Reefs)

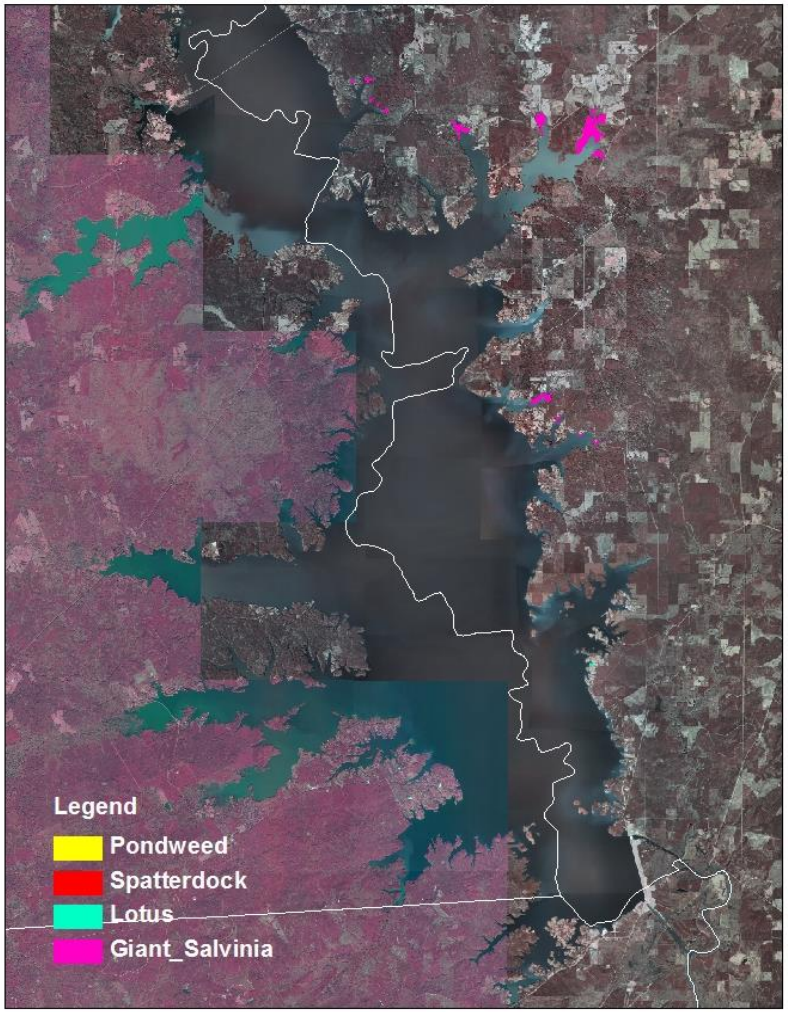
Name	GPS Coordinates (WGS 84 Datum)	Description	Nearest Boat Launch
Spillway Experimental Reef	N 31.19468° W 93.57533°	40 feed pallet trees located on underwater hump along south side of spillway channel. Depth at 172'>MSL = 10-12 ft. Bottom coverage = approx. 1/10th acre.	South Toledo Bend State Park
Megastructure #1	N 31.19825° W 93.57508°	A large one piece structure made from 1 ¼ inch PVC pipe 16 ft. long 11 ft. wide and 8 feet tall. The structure holds 400 plastic feed pallets.	South Toledo Bend State Park
South Toledo Bend State Park Reef #1	N 31.20336° W 93.58069°	50 feed pallet trees located on sloping point. Depth at 172'>MSL = 10-20 ft. Bottom coverage = approx. 1/10th acre.	South Toledo Bend State Park
South Toledo Bend State Park Reef #2	N 31.20680° W 93.58502°	50 feed pallet trees located in middle of cove. Depth at 172'>MSL = 10-22 ft. Bottom coverage = approx. 1/10th acre.	South Toledo Bend State Park
Eagle Scout Reef	N 31.27077° W 93.58096°	50 feed pallet trees located on sloping point. Depth at 172'>MSL = 12-20 ft. Bottom coverage = approx. 1/20th acre.	Pirate's Cove Marina or Army Recreation Site
Pirate's Cove Reef #1	N 31.27168° W 93.58898	(2) 10 foot long sections of 36 inch diameter PVC pipe. Each section has approx. 150 five foot long pieces of ½ inch PVC pipe inserted to serve as limbs or branches. Bottom coverage= approx. 120 sq. ft. for each 10 foot pipe section.	Pirate's Cove Marina
Negreet Cove #1	N 31.39978° W 93.64785°	(2) 10 foot long sections of 36 inch diameter PVC pipe. Each section has approx. 150 five foot long pieces of ½ inch PVC pipe inserted to serve as limbs or branches. Bottom coverage= approx. 120 sq. ft. for each 10 foot pipe section.	Cypress Bend, Turtle Beach Landing or Shadows Landing
Megastructure #2	N 31.30532° W 93.60915°	A large one piece structure made from 1¼ inch PVC pipe 16 ft. long 11 ft. wide and 8 feet tall. The structure holds 400 plastic feed pallets.	Kite's Landing, Pirate's Cove Marina
Cypress Bend Fishing Pier	N 31.41880° W 93.67927°	Plastic shopping carts clustered around outermost 10 pilings of fishing pier. Bottom coverage = approx. 25 sq. ft. at each piling.	Cypress Bend
Twin Island Reef	N 31.42738° W 93.69445°	(2) 10 foot long sections of 36 inch diameter PVC pipe. Each section has approx. 150 five foot long pieces of ½ inch PVC pipe inserted to serve as limbs or branches. Bottom coverage= approx. 120 sq. ft. for each 10 foot pipe section.	Cypress Bend
Louisiana end of Pendleton Bridge (Piling numbers 2 - 12)	N 31.48650° W 93.71259°	20 feed pallet trees clustered around base of each set of pilings. Depth at 172'>MSL = 14-24 ft. Bottom coverage = approx. 800 sq. ft. at each set of pilings.	Pendleton Bridge Resort or Bridge Bay Resort
Louisiana end of Pendleton Bridge Piling number 13	N 31.48557° W 93.71422°	(2) 10 foot long sections of 36 inch diameter PVC pipe. Each section has approx. 360 five foot long pieces of ½ inch plastic pipe inserted to serve as limbs or branches. Bottom coverage= approx. 120 sq. ft. for each 10 foot pipe section.	Pendleton Bridge Resort or Bridge Bay Resort
Louisiana end of Pendleton Bridge (Piling numbers 14 - 27)	N 31.48537° W 93.71457	(8) 3 foot long sections of 18 inch diameter plastic pipe clustered around each of 14 pilings. Each pipe section is placed in a vertical position. Each pipe section has 32 limbs made of ½ inch plastic pipe. Bottom coverage = approx. 500 sq. ft. per piling. 7000 sq. ft. total or 0.16 acre.	Pendleton Bridge Resort or Bridge Bay Resort
Lanan Hump	N 31.518167° W 93.673274°	93 "stumps" constructed from end sections of 30 gallon plastic drums, weighted with concrete and having one-half inch black plastic irrigation tubing "limbs". The "stumps" are arranged in clusters of 5 – 8 stumps in 18 clusters surrounding an underwater mound. Bottom coverage=0.9 acre.	Tranquility Bay
North Toledo Bend State	N 31.54550°	100 feed pallet trees located along side slope of underwater ridge. Depth at	North Toledo Bend State Park

Park Reef #1	W 93.72945 °	172’>MSL = 14-20 ft. Bottom coverage = approx. ¼ acre.	
North Toledo Bend State Park Reef #2	N 31.54433° W 93.72871°	68 feed pallet trees located along side slope of underwater ridge. Depth at 172’>MSL = 14-24 ft. Bottom coverage = approx. ¼ acre.	North Toledo Bend State Park
Clyde’s Crossing	N 31.63277° W 93.66662°	23 yards of pea gravel placed around fishing pier. Bottom coverage = approx. 1/10th acre.	Rebecca’s Landing

APPENDIX IV **2013 VEGETATION TYPE MAPS**

(**return to typemap**)

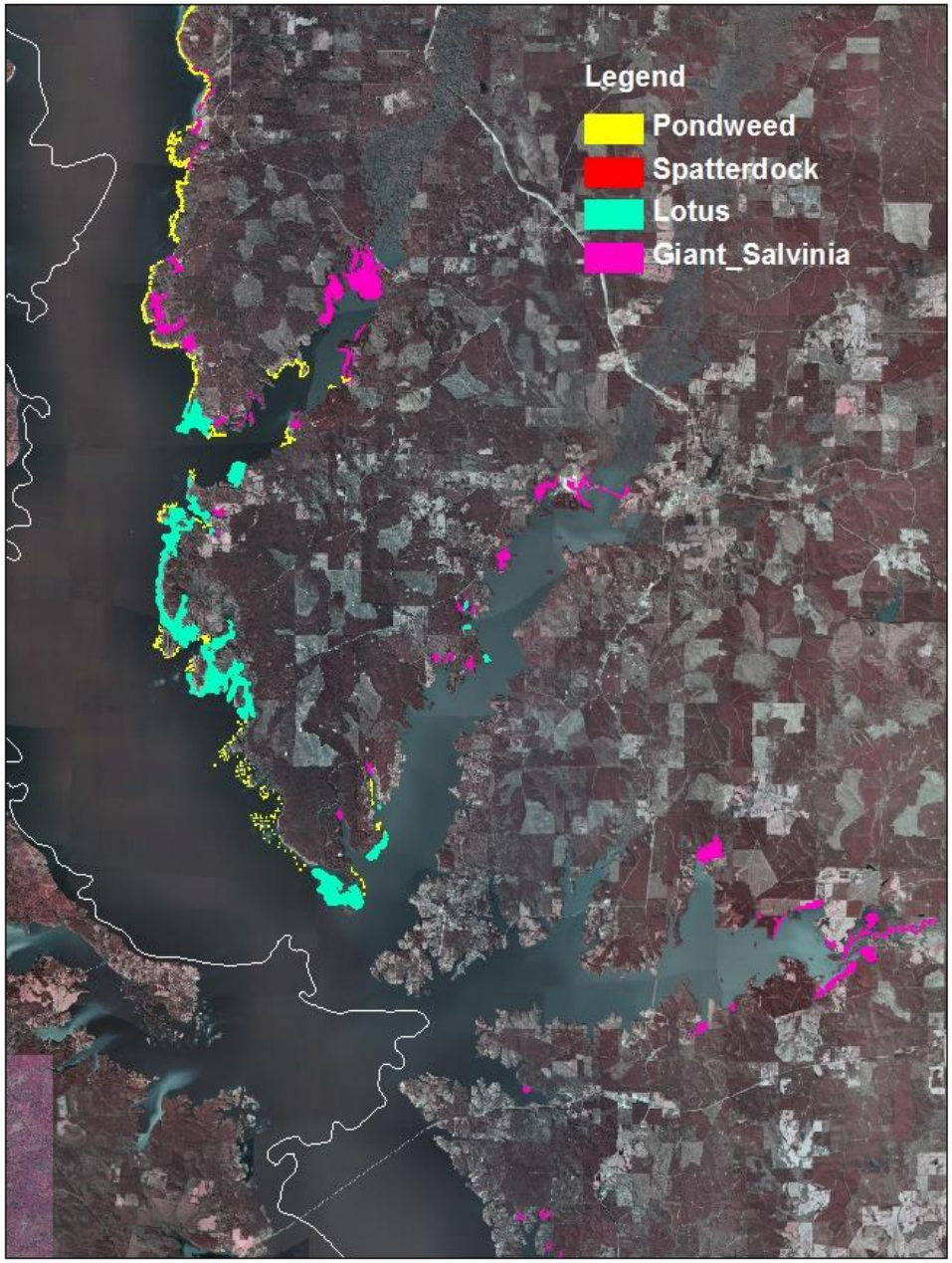
2013 Type Map of Floating and Emergent Vegetation between the Dam and Pendleton Bridge on Toledo Bend Reservoir



Survey was conducted summer of 2013 by District 10 crew

N

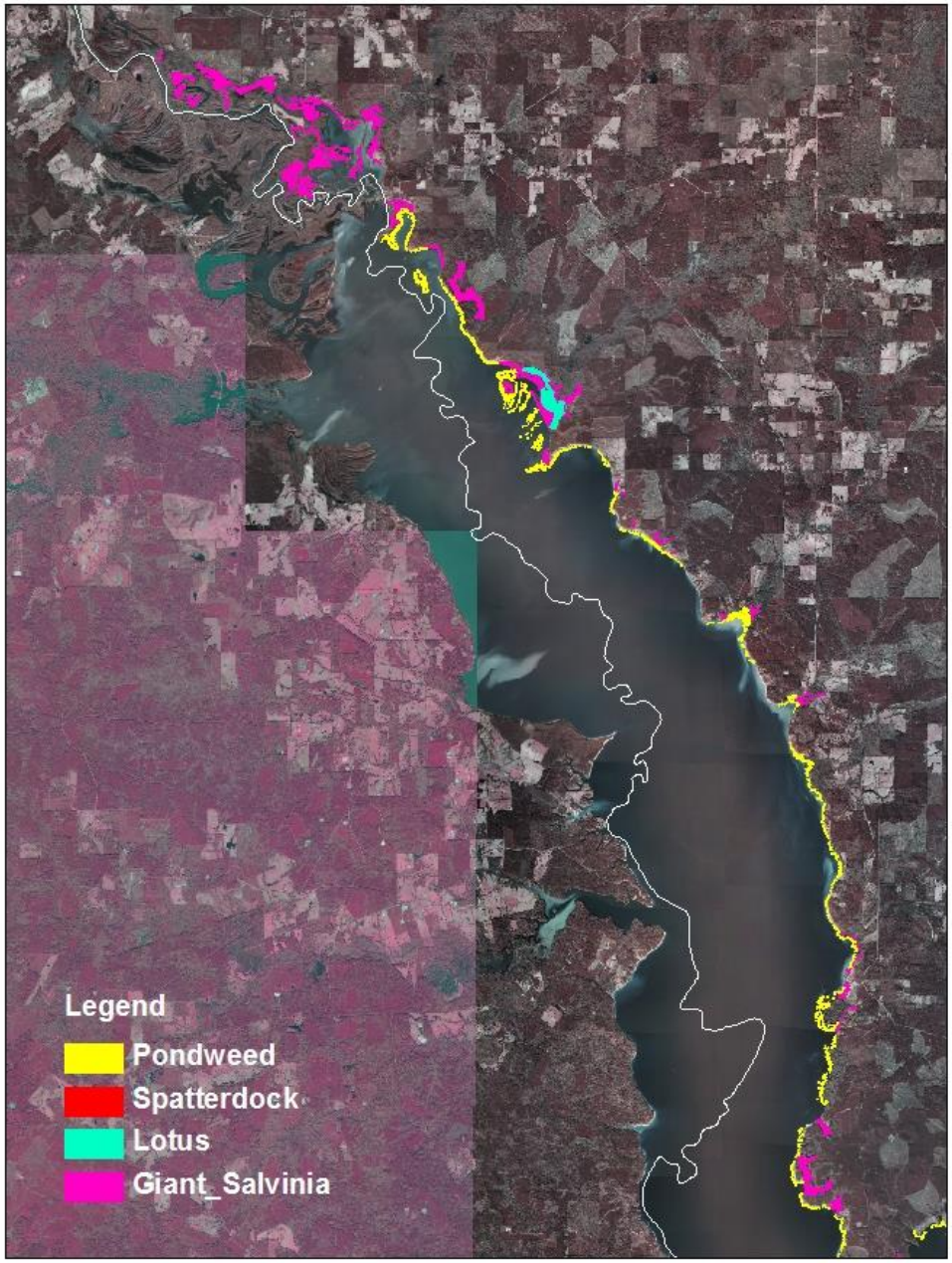
2013 Type Map of Floating and Emergent Vegetation between Pendleton Bridge and Converse on Toledo Bend Reservoir



Survey was conducted summer of 2013 by District 10 crew

N

2013 Type Map of Floating and Emergent Vegetation between Converse and Sabine River on Toledo Bend Reservoir



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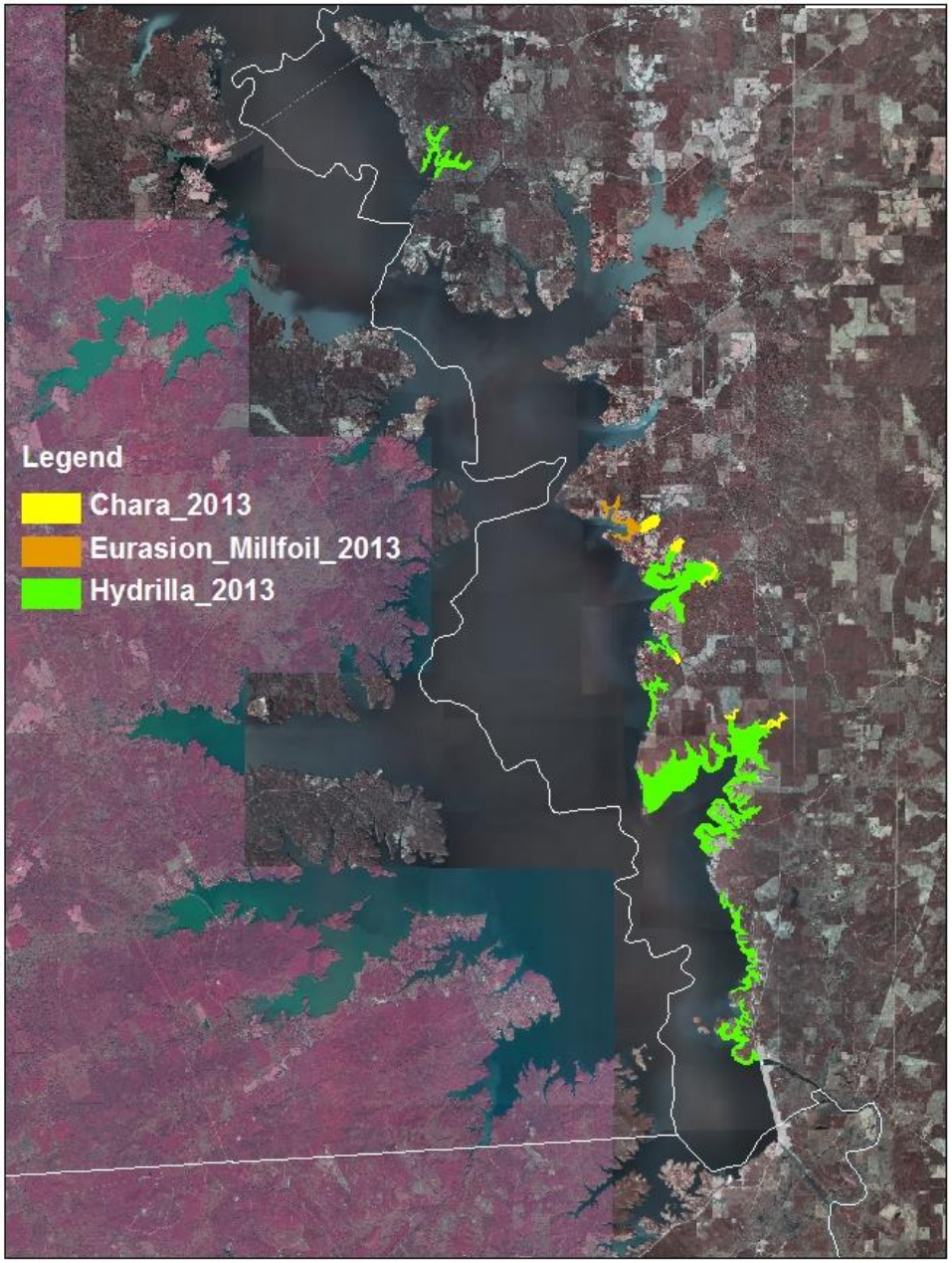
Survey was conducted summer of 2013 by District 10 crew

2013 Type Map of Submerged Vegetation between the Dam and Pendleton Bridge on Toledo Bend Reservoir



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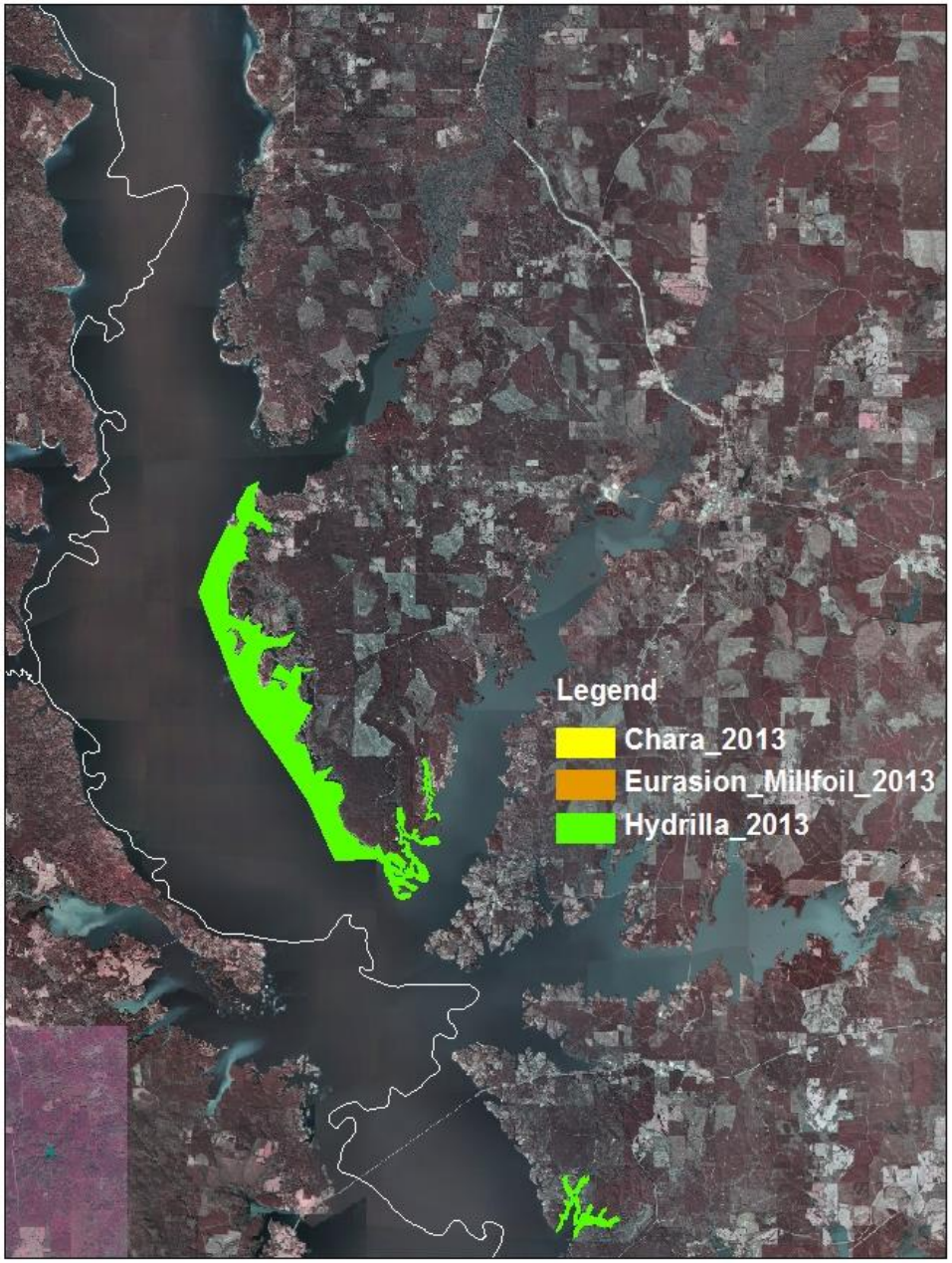
Survey was conducted summer of 2013 by District 10 crew

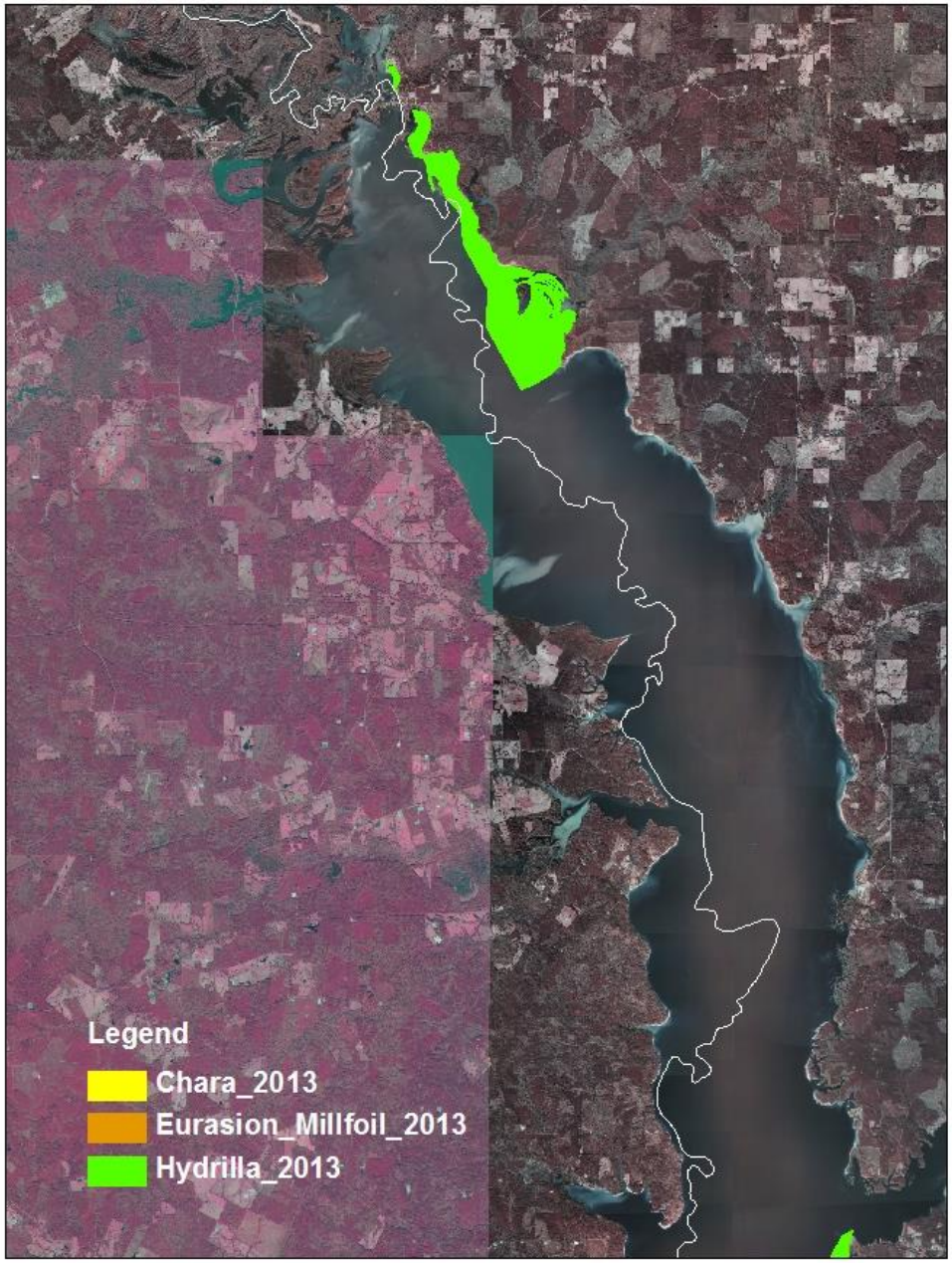
2013 Type Map of Submerged Vegetation between Pendleton Bridge and Converse on Toledo Bend Reservoir



Survey was conducted summer of 2013 by District 10 crew

N

2013 Type Map of Submerged Vegetation between Converse and Sabine River on Toledo Bend Reservoir



N

Survey was conducted summer of 2013 by District 10 crew

APPENDIX V

WEEVIL RELEASES

(back to Biological)

DATE	SOURCE LATITUDE	SOURCE LONGITUDE	RELEASE LATITUDE	RELEASE LONGITUDE	WEEVIL	HOST PLANT	Amount of Material
12/8/2005	UNKNOWN	UNKNOWN	N 31 20.312	W 93 35.194	Cyrtobagous salvinae	Salvinia molesta	4 cu. ft.
12/8/2005	UNKNOWN	UNKNOWN	N 31 21.376	W 93 36.487	Cyrtobagous salvinae	Salvinia molesta	4 cu. ft.
12/8/2005	UNKNOWN	UNKNOWN	N 31 21.220	W 93 36.434	Cyrtobagous salvinae	Salvinia molesta	4 cu. ft.
10/7/2008	N 29 40.880	W 90 27.641	N 31 20.285	W 93 36.289	Cyrtobagous salvinae	Salvinia molesta	4 cu. ft.
10/7/2008	N 29 40.880	W 90 27.641	N 31 21.271	W 93 36.372	Cyrtobagous salvinae	Salvinia molesta	12 cu. ft.
10/7/2008	N 29 40.880	W 90 27.641	N 31 37.960	W 93 40.282	Cyrtobagous salvinae	Salvinia molesta	4 cu. ft.
10/7/2008	N 29 40.880	W 90 27.641	N 31 37.855	W 93 39.592	Cyrtobagous salvinae	Salvinia molesta	4 cu. ft.
10/7/2008	N 29 40.880	W 90 27.641	N 31.636579	W 93.657507	Cyrtobagous salvinae	Salvinia molesta	12 cu. ft.
10/8/2008	N 29 40.880	W 90 27.641	N 31 41.047	W 93 43.321	Cyrtobagous salvinae	Salvinia molesta	12 cu. ft.
10/8/2008	N 29 40.880	W 90 27.641	N31 41.367	W 93 43.458	Cyrtobagous salvinae	Salvinia molesta	12 cu. ft.
10/8/2008	N 29 40.880	W 90 27.641	N 31 36.972	W 93 41.929	Cyrtobagous salvinae	Salvinia molesta	16 cu. ft.
10/8/2008	N 29 40.880	W 90 27.641	N 31 27.122	W 93 38.518	Cyrtobagous salvinae	Salvinia molesta	12 cu. ft.
10/8/2008	N 29 40.880	W 90 27.641	N 31 31.726	W 93 36.435	Cyrtobagous salvinae	Salvinia molesta	4 cu. ft.
10/8/2008	N 29 40.880	W 90 27.641	N 31 31.758	W 93 35.742	Cyrtobagous salvinae	Salvinia molesta	12 cu. ft.
10/8/2008	N 29 40.880	W 90 27.641	N 31 31.791	W 93 36.378	Cyrtobagous salvinae	Salvinia molesta	4 cu. ft.
10/8/2008	N 29 40.880	W 90 27.641	N 31 32.060	W 93 36.458	Cyrtobagous salvinae	Salvinia molesta	4 cu. ft.
10/8/2008	N 29 40.880	W 90 27.641	N 31 37.540	W 93 39.513	Cyrtobagous salvinae	Salvinia molesta	12 cu. ft.
10/8/2008	N 29 40.880	W 90 27.641	N 31.90911	W 93.92255	Cyrtobagous salvinae	Salvinia molesta	4 cu. ft.
10/8/2008	N 29 40.880	W 90 27.641	N 31.91902	W 93.93064	Cyrtobagous salvinae	Salvinia molesta	4 cu. ft.
10/8/2008	N 29 40.880	W 90 27.641	N 31.68531	W 93.72843	Cyrtobagous salvinae	Salvinia molesta	12 cu. ft.
10/8/2008	N 29 40.880	W 90 27.641	N 31.91660	W 93.92670	Cyrtobagous salvinae	Salvinia molesta	4 cu. ft.
10/8/2008	N 29 40.880	W 90 27.641	N 31.915563	W 93.92739	Cyrtobagous salvinae	Salvinia molesta	2 cu. ft.
UNKNOWN	SRA 1	UNKNOWN	N 31.914167	W 93.916389	Cyrtobagous salvinae	Salvinia molesta	UNKNOWN
UNKNOWN	SRA 2	UNKNOWN	N 31.908889	W 93.906944	Cyrtobagous salvinae	Salvinia molesta	UNKNOWN
UNKNOWN	SRA 3	UNKNOWN	N 31.902778	W 93.899722	Cyrtobagous salvinae	Salvinia molesta	UNKNOWN
UNKNOWN	SRA 4	UNKNOWN	N 31.845556	W 93.848056	Cyrtobagous salvinae	Salvinia molesta	UNKNOWN
UNKNOWN	SRA 5	UNKNOWN	N 31.796389	W 93.806944	Cyrtobagous salvinae	Salvinia molesta	UNKNOWN
UNKNOWN	SRA 6	UNKNOWN	N 31.800000	W 93.799444	Cyrtobagous salvinae	Salvinia molesta	UNKNOWN

APPENDIX V
WEEVIL RELEASES (cont.)

DATE	SOURCE LATITUDE	SOURCE LONGITUDE	RELEASE LATITUDE	RELEASE LONGITUDE	WEEVIL	HOST PLANT	Amount of Material
	SRA 7	UNKNOWN	N 31.799167	W 93.801111	Cyrtobagous salvinae	Salvinia molesta	UNKNOWN
UNKNOWN	SRA 8	UNKNOWN	N 31.782222	W 93.780278	Cyrtobagous salvinae	Salvinia molesta	UNKNOWN
UNKNOWN	SRA 9	UNKNOWN	N 31.779444	W 93.778889	Cyrtobagous salvinae	Salvinia molesta	UNKNOWN
UNKNOWN	SRA 10	UNKNOWN	N 31.662778	W 93.771667	Cyrtobagous salvinae	Salvinia molesta	UNKNOWN
UNKNOWN	SRA 11	UNKNOWN	N 31.645278	W 93.762222	Cyrtobagous salvinae	Salvinia molesta	UNKNOWN
UNKNOWN	SRA 12	UNKNOWN	N 31.654444	W 93.733333	Cyrtobagous salvinae	Salvinia molesta	UNKNOWN
UNKNOWN	SRA 13	UNKNOWN	N 31.594167	W 93.705833	Cyrtobagous salvinae	Salvinia molesta	UNKNOWN
UNKNOWN	SRA 14	UNKNOWN	N 31.615000	W 93.697222	Cyrtobagous salvinae	Salvinia molesta	UNKNOWN
UNKNOWN	SRA 15	UNKNOWN	N 31.633889	W 93.676667	Cyrtobagous salvinae	Salvinia molesta	UNKNOWN
UNKNOWN	SRA 16	UNKNOWN	N 31.630278	W 93.672500	Cyrtobagous salvinae	Salvinia molesta	UNKNOWN
UNKNOWN	SRA 17	UNKNOWN	N 31.626389	W 93.679722	Cyrtobagous salvinae	Salvinia molesta	UNKNOWN
UNKNOWN	SRA 18	UNKNOWN	N 31.632778	W 93.674722	Cyrtobagous salvinae	Salvinia molesta	UNKNOWN
UNKNOWN	SRA 19	UNKNOWN	N 31.629943	W 93.672686	Cyrtobagous salvinae	Salvinia molesta	UNKNOWN
UNKNOWN	SRA 20	UNKNOWN	N 31.634167	W 93.670833	Cyrtobagous salvinae	Salvinia molesta	UNKNOWN
UNKNOWN	SRA 21	UNKNOWN	N 31.631389	W 93.668056	Cyrtobagous salvinae	Salvinia molesta	UNKNOWN
UNKNOWN	SRA 22	UNKNOWN	N 31.630278	W 93.662778	Cyrtobagous salvinae	Salvinia molesta	UNKNOWN
UNKNOWN	SRA 23	UNKNOWN	N 31.572131	W 93.698500	Cyrtobagous salvinae	Salvinia molesta	UNKNOWN
UNKNOWN	SRA 24	UNKNOWN	N 31.629722	W 93.660000	Cyrtobagous salvinae	Salvinia molesta	UNKNOWN
UNKNOWN	SRA 25	UNKNOWN	N 31.618611	W 93.661667	Cyrtobagous salvinae	Salvinia molesta	UNKNOWN
UNKNOWN	SRA 26	UNKNOWN	N 31.571944	W 93.699444	Cyrtobagous salvinae	Salvinia molesta	UNKNOWN
UNKNOWN	SRA 27	UNKNOWN	N 31.573333	W 93.704167	Cyrtobagous salvinae	Salvinia molesta	UNKNOWN
UNKNOWN	SRA 28	UNKNOWN	N 31.531389	W 93.691944	Cyrtobagous salvinae	Salvinia molesta	UNKNOWN
UNKNOWN	SRA 29	UNKNOWN	N 31.542222	W 93.695278	Cyrtobagous salvinae	Salvinia molesta	UNKNOWN
UNKNOWN	SRA 30	UNKNOWN	N 31.542500	W 93.695833	Cyrtobagous salvinae	Salvinia molesta	UNKNOWN
UNKNOWN	SRA 31	UNKNOWN	N 31.433333	W 93.680278	Cyrtobagous salvinae	Salvinia molesta	UNKNOWN
UNKNOWN	SRA 32	UNKNOWN	N 31.415810	W 93.667672	Cyrtobagous salvinae	Salvinia molesta	UNKNOWN
UNKNOWN	SRA 33	UNKNOWN	N 31.417989	W 93.643238	Cyrtobagous salvinae	Salvinia molesta	UNKNOWN
UNKNOWN	SRA 34	UNKNOWN	N 31.453453	W 93.645659	Cyrtobagous salvinae	Salvinia molesta	UNKNOWN

APPENDIX V – WEEVIL RELEASES (cont.)

DATE	SOURCE LATITUDE	SOURCE LONGITUDE	RELEASE LATITUDE	RELEASE LONGITUDE	WEEVIL	HOST PLANT	Amount of Material
UNKNOWN	SRA 35	UNKNOWN	N 31.450556	W 93.643056	Cyrtobagous salvinae	Salvinia molesta	UNKNOWN
UNKNOWN	SRA 36	UNKNOWN	N 31.452121	W 93.642641	Cyrtobagous salvinae	Salvinia molesta	UNKNOWN
UNKNOWN	SRA 37	UNKNOWN	N 31.353864	W 93.612624	Cyrtobagous salvinae	Salvinia molesta	UNKNOWN
UNKNOWN	SRA 38	UNKNOWN	N 31.355833	W 93.607778	Cyrtobagous salvinae	Salvinia molesta	UNKNOWN
UNKNOWN	SRA 39	UNKNOWN	N 31.348333	W 93.618333	Cyrtobagous salvinae	Salvinia molesta	UNKNOWN
UNKNOWN	SRA 40	UNKNOWN	N 31.350278	W 93.613056	Cyrtobagous salvinae	Salvinia molesta	UNKNOWN
UNKNOWN	SRA 41	UNKNOWN	N 31.292279	W 93.610825	Cyrtobagous salvinae	Salvinia molesta	UNKNOWN
UNKNOWN	SRA 42	UNKNOWN	N 31.262222	W 93.588611	Cyrtobagous salvinae	Salvinia molesta	UNKNOWN
UNKNOWN	SRA 43	UNKNOWN	N 31.189167	W 93.565000	Cyrtobagous salvinae	Salvinia molesta	UNKNOWN

APPENDIX VI

TABLE OF TOLEDO BEND RECREATIONAL FISHING REGULATION HISTORY

(return to History of Regulations)

YEAR	SPECIES	REGULATION	REASON	METHOD
1968	Garfish (alligator gar. longnose gar, shortnose gar, spotted gar)	No daily limit. No size limit. Garfish may be taken by means of spears, guns, bows and arrows, or traps.	Existing regulation at time of impoundment.	
1968	Black Bass	15 fish daily limit in aggregate. Possession limit - 30.	Existing regulation at time of impoundment.	
1968	Black Crappie & White Crappie	50 fish daily in any combination. No minimum length. Possession limit - 100	Existing regulation at time of impoundment.	
1968	Lepomis (all bream species)	100 fish daily all species in aggregate. Possession limit – 200.	Existing regulation at time of impoundment.	
1968	Catfish	No limit.	Existing regulation at time of impoundment.	
1968	Buffalo Fish	No limit.	Existing regulation at time of impoundment.	
1968	Freshwater Drum	No limit.	Existing regulation at time of impoundment.	
1968	White Bass	25 fish daily limit. Possession limit – 50.	Existing regulation at time of impoundment.	
1968	Yellow Bass	25 fish daily limit. Possession limit - 50.	Existing regulation at time of impoundment.	
1968	Paddlefish	15 pound minimum.	Existing regulation at time of impoundment.	
1968	Bowfin	No limit.	Existing regulation at time of impoundment.	
1970	Striped Bass	2 fish daily limit. Possession limit - 4.		
1970	Yellow Bass	50 fish daily. Possession limit – 100.		
1976	Hybrid Striped Bass	2 fish daily. Possession limit – 4.		LWFC action, Title 76, Part VII, Chapter 1, 115.
1978	Hybrid Striped Bass	2 fish daily. Possession limit – 4.		1978 Act No. 448.
1980	Striped Bass	5 fish daily. Possession limit – 10.		
1980	Hybrid Striped Bass	5 fish daily. Possession limit – 10.		
1982	Striped Bass	5 fish daily in aggregate with hybrid striped bass of which no more than 2 may exceed 30 inches in length.		
1982	Hybrid Striped Bass	5 fish daily in aggregate with striped bass of which no more than 2 may exceed 30 inches in length.		
1982	Black Crappie & White Crappie	No limit.		
1982	Lepomis (all bream species)	No limit.		

APPENDIX VI - TABLE OF TOLEDO BEND RECREATIONAL FISHING REGULATION HISTORY (cont.)

YEAR	SPECIES	REGULATION	REASON	METHOD
1982	Catfish	Blue catfish under 14 inches total length, channel catfish under 11 inches total length, or flathead catfish under 14 inches total length or any combination thereof – 25 fish daily in aggregate with buffalo fish under 16 inches total length and freshwater drum under 12 inches total length. Possession limit – 50 in aggregate.		
1982	Buffalo Fish	Buffalo fish under 16 inches total length – 25 fish daily in aggregate with blue catfish under 14 inches total length, channel catfish under 11 inches total length, or flathead catfish under 14 inches total length or any combination thereof. Possession limit – 50 in aggregate.		
1982	Freshwater Drum	Freshwater drum under 12 inches total length – 25 fish daily in aggregate with blue catfish under 14 inches total length, channel catfish under 11 inches total length, or flathead catfish under 14 inches total length or any combination thereof. Possession limit – 50 in aggregate.		
1982	White Bass	50 fish daily. Possession limit – 100		
1983	Catfish	Blue catfish under 14 inches total length or flathead catfish under 14 inches total length or any combination thereof – 25 fish daily in aggregate with buffalo fish under 16 inches total length and freshwater drum under 12 inches. Possession limit – 50 in aggregate. Channel catfish – no daily limit.		
1983	Buffalo Fish	buffalo fish under 16 inches total length – 25 fish daily in aggregate with blue catfish under 14 inches total length or flathead catfish under 14 inches total length or any combination thereof. Possession limit – 50 in aggregate.		
1983	Freshwater Drum	Freshwater drum under 12 inches total length – 25 fish daily in aggregate with blue catfish under 14 inches total length or flathead catfish under 14 inches total length or any combination thereof. Possession limit – 50 in aggregate.		
1985, Jan. 1	Catfish	Channel catfish, no daily limit with 11 inch minimum length.		

APPENDIX VI - TABLE OF TOLEDO BEND RECREATIONAL FISHING REGULATION HISTORY (cont.)

YEAR	SPECIES	REGULATION	REASON	METHOD
1988	Black Crappie & White Crappie	50 fish daily.		1988 Act No. 86.
1988, September 1	Black Bass	10 fish daily limit in aggregate with 12 inch minimum.	This change was the result of joint discussions between LDWF & TP&WD. In November of 1987, LDWF proposed a 10 fish limit/ 10 inch minimum. Texas proposed a 5 fish limit/14 inch minimum. Compromise was reached at 10 fish/12 inch minimum. Possession limit – 20.	
1989	Paddlefish	All recreational fishing for paddlefish prohibited in Louisiana waters.		
1990	Catfish	Blue catfish under 12 inches total length, channel catfish under 11 inches total length, or flathead catfish under 14 inches total length or any combination thereof – 25 fish daily in aggregate with buffalo fish under 16 inches total length and freshwater drum under 12 inches total length. Possession limit – 50 in aggregate of undersized fish. No limit on catfish whose total lengths are equal to or exceed minimum length requirements. 1998: Possession limit reduced to one day's limit while on the water.		1989 Act No. 487.
1990	Buffalo Fish	Buffalo fish under 16 inches total length – 25 fish daily in aggregate with blue catfish under 12 inches total length, channel catfish under 11 inches total length, or flathead catfish under 14 inches total length or any combination thereof. Possession limit – 50 in aggregate of undersized fish. No limit on buffalo fish whose total lengths are equal to or exceed minimum length requirements		
1990	Freshwater Drum	Freshwater drum under 12 inches total length – 25 fish daily in aggregate with blue catfish under 12 inches total length, channel catfish under 11 inches total length, or flathead catfish under 14 inches total length or any combination thereof. Possession limit – 50 in aggregate of undersized fish. No limit on freshwater drum whose total lengths are equal to or exceed minimum length requirements		

APPENDIX VI - TABLE OF TOLEDO BEND RECREATIONAL FISHING REGULATION HISTORY (cont.)

YEAR	SPECIES	REGULATION	REASON	METHOD
1991, April 1	Black Bass	8 fish daily limit in aggregate with 14 inch minimum length. Possession limit – 16.	This regulation change resulted from joint discussions between LDWF & TP&WD. At this time, Louisiana was implementing the Louisiana Black Bass Management Plan. LDWF proposed a 14 inch– 17 inch slot with an 8 inch minimum. Texas proposed a 5 fish daily limit with a minimum length of 15 inches. Compromise was reached at 8 fish daily with a 14 inch minimum. Both states agreed that when appreciable numbers of LMB exceeded 14 inches that a 14 inch - 17 inch slot would be considered for future implementation.	
1993	Bowfin	Closed season – December, January, February		
1994	Bowfin	No limit.		
1996	Crawfish	All wiretraps prohibited for recreational take.		
1997, August	Black Bass	8 fish daily limit in aggregate with 14 inch minimum on largemouth bass and a 12 inch minimum on spotted bass.	This change was made in the interest of standardizing regulations and matched Texas statewide regulations.	
1997, August	ALL SPECIES OF FISH	Possession limit reduced to one day's limit while on the water.		LWFC action, Title 76, Part VII, Chapter 1, 110.
1997, August	White Bass	25 fish daily.		LWFC action, Title 76, Part VII, Chapter 1, 110.
1999	Crawfish	150 pounds daily		1999 Act No. 155.
1999: August 15	Catfish	100 fish daily in any combination of blue catfish, channel catfish or flathead catfish. Minimum total lengths for the three species are: blue catfish - 12 inches, channel catfish - 11 inches, and flathead catfish - 14 inches. 25 fish daily may be undersized. Possession limit – 100.		1999 Act No. 155.
1999	Buffalo Fish	16 inch minimum length. 25 fish per day.		1999 Act No. 155
1999	Freshwater Drum	12 inch minimum length. 25 fish per day.		1999 Act No. 155
1999	Shad	50 pounds daily		1999 Act No. 155
2003	Bowfin	16 inch minimum length.		

APPENDIX VI

TABLE OF TOLEDO BEND RECREATIONAL FISHING REGULATION HISTORY (cont.)

YEAR	SPECIES	REGULATION	REASON	METHOD
2004, July 1 - June 30, 2008	Catfish	125 fish of any combination of the three species with 50 undersized fish of any combination of the three species. Minimum total lengths for the three species are: blue catfish - 12 inches, channel catfish - 11 inches, and flathead catfish - 14 inches. Possession limit - 125.		This change resulted from passage of Act No. 237, Regular Session, 2004.
2005, April 1	Black Bass	8 fish daily limit in aggregate with a 14 inch minimum on largemouth bass and no minimum on spotted bass. Possession limit - 8 in aggregate.	This change was made in the interest of standardizing regulations for Toledo Bend Reservoir. LDWF & TP&WD agreed that reducing the minimum length for spotted bass would allow for increased utilization of spotted bass with no negative effect on largemouth bass populations. This changed matched Louisiana's older regulation which imposed no length limit on spotted bass.	LWFC action, Title 76, Part VII, Chapter 1, 110.
2005, April 1	Yellow Bass	No Limit.	This change was made in the interest of standardizing regulations for Toledo Bend Reservoir. LDWF & TP&WD agreed that removing the limit for yellow bass would allow for increased utilization of yellow bass with no negative effect on yellow bass populations.	LWFC action, Title 76, Part VII, Chapter 1, 110.
2007	Paddlefish	Recreational fishery re-established in Louisiana waters, except shared boundary waters with Texas where it remains closed to all paddlefish take as per special status in that state.		
2008, July 1	Catfish	100 fish daily in any combination of blue catfish, channel catfish or flathead catfish. Minimum total lengths for the three species are: blue catfish - 12 inches, channel catfish - 11 inches, and flathead catfish - 14 inches. 25 fish daily may be undersized. Possession limit – 100.		This change was a result of the expiration of Act No. 237, Regular Session, 2004.

APPENDIX VII

TABLE OF TOLEDO BEND COMMERCIAL FISHING REGULATION HISTORY

(return to Commercial Fishing Regulations)

YEAR	SPECIES	REGULATION	REASON	METHOD
1968	Buffalo fish	16 inch minimum length	Existing regulation at time of impoundment.	
1968	Freshwater drum	12 inch minimum length	Existing regulation at time of impoundment.	
1968	Paddlefish	Commercial status statewide, with a 15 lb. minimum size, no limit, however, no commercial nets allowed in impoundment	Existing regulation at time of impoundment.	
1968	Blue catfish	14 inch minimum length	Existing regulation at time of impoundment.	
1968	Flathead catfish	14 inch minimum	Existing regulation at time of impoundment.	
1968	Channel catfish	13 inch minimum length	Existing regulation at time of impoundment.	
1968	Bowfin	No regulation	Existing regulation at time of impoundment.	
1968	Shad	No regulation	Existing regulation at time of impoundment.	
1968:	Garfish (alligator gar. longnose gar, shortnose gar, spotted gar)	No limit	Existing regulation at time of impoundment.	
1972	Channel catfish	11 inch minimum length		
1982	Channel catfish	No limit		
1986	Paddlefish	All commercial fishing for paddlefish prohibited in Louisiana waters		

APPENDIX VII

TABLE OF TOLEDO BEND COMMERCIAL FISHING REGULATION HISTORY (cont.)

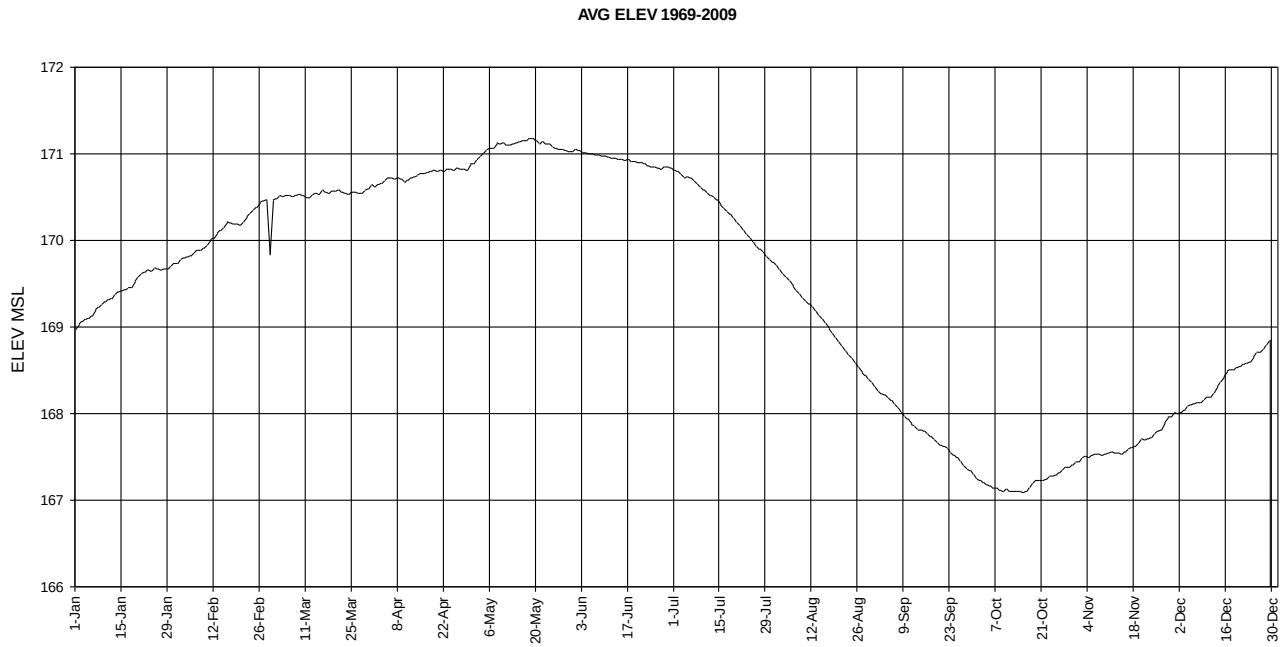
1986	Blue catfish	12 inch minimum length		
1993	Bowfin	22 inch minimum length. Fishermen are prohibited, while on the water, from possessing bowfin eggs (roe) that are not naturally connected to a whole fish. The taking of bowfin with nets or bowfin body parts including eggs (roe), is prohibited during the months of December, January, February.		
1999	Channel catfish	11 inches minimum total length, 9 inches collar-boned		
2000	Shad	50 pounds daily		
2000	Channel catfish	11 inches minimum total length, 8 inches collar-boned		
2009	Channel catfish	11 inches minimum total length		

APPENDIX VIII

WATER LEVELS

(back to Water Level)

Water level data from Toledo Bend Reservoir
Average water level 1969 to 2009



Appendix IX

Toledo Bend Standardized Samples

(back to Standardized Sampling)

YEAR	SAMPLE TYPE AND (NUMBER OF SAMPLES)
1976	**Rotenone**, (2) samples, one acre, two day pickup
1977	**Rotenone**, (2) samples, cove sample, two day pickup
1979	**Rotenone**, (2) samples, cove sample, two day pickup
1980	**Rotenone**, (2) samples, cove sample, two day pickup
1981	**Rotenone**, (2) samples, cove sample, two day pickup
1982	**Rotenone**, (2) samples, cove sample, two day pickup
1983	**Rotenone**, (2) samples, cove sample, two day pickup
1984	**Wiretrap**,(3) samples each of; 1 inch, no bonnet; 1 ½ inch, no bonnet; 1 inch, vertical bonnet; 1 ½ inch, vertical bonnet; 1 inch, horizontal bonnet; 1 ½ inch, horizontal bonnet, (1) sample, wire trap, 1 inch, fished as lost **Rotenone**, (2) samples, cove sample, two day pickup
1985	**Wiretrap**,(5) samples each of; 1 inch, no bonnet; 1 ½ inch, no bonnet; 1 inch, vertical bonnet; 1 ½ inch, vertical bonnet; 1 inch, horizontal bonnet; 1 ½ inch, horizontal bonnet, (4) samples wire trap, 1 inch, fished as lost **Rotenone**, (2) samples, cove sample, two day pickup
1986	**Wiretrap**,(5) samples each of; 1 inch, no bonnet; 1 ½ inch, no bonnet; 1 inch, vertical bonnet; 1 ½ inch, vertical bonnet; 1 inch, horizontal bonnet; 1 ½ inch, horizontal bonnet, (5) samples wire trap, 1 inch, fished as lost **Rotenone**, (2) samples, cove sample, two day pickup
1988	**Rotenone**, (6) samples, one acre, two day pickup **Rotenone**, (1) sample, one acre, one day pickup **Electrofishing**, (11) samples, DC, Prod, Night
1989	**Rotenone**, (11) samples, one acre, two day pickup (2) samples, one acre, three day pickup **Gillnet**, (8) samples 300 ft., 3 inch bar mono gill **Gillnet**, (8) samples 300 ft., 3.5 inch bar mono gill **Gillnet**, (8) samples 300 ft., 4 inch bar mono gill **Gillnet**, (2) samples 200 ft., 3 inch bar mono gill **Gillnet**, (2) samples 200 ft., 4 inch bar mono gill **Electrofishing**, (6) samples, DC, Prod, Night
1990	**Seine**, (15) samples, 25 ft., ¼ inch bar, 2 quadrants **Electrofishing**, (4) samples, DC, Prod, Night **Gillnet**, (8) samples 200 ft., 2.5 inch bar mono gill **Gillnet**, (8) samples 200 ft., 3 inch bar mono gill **Gillnet**, (8) samples 200 ft., 3.5 inch bar mono gill **Gillnet**, (8) samples 200 ft., 4 inch bar mono gill
1991	**Seine**, (16) samples, 25 ft., ¼ inch bar, 2 quadrants **Electrofishing**, (10) samples, DC, Prod, Night **Gillnet**, (9) samples 200 ft., 2.5 inch bar mono gill **Gillnet**, (9) samples 200 ft., 3 inch bar mono gill **Gillnet**, (9) samples 200 ft., 3.5 inch bar mono gill **Gillnet**, (9) samples 200 ft., 4 inch bar mono gill

Appendix IX – Toledo Bend Standardized Samples (cont.)

YEAR	SAMPLE TYPE AND (NUMBER OF SAMPLES)
1992	**Rotenone**, (8) samples, one acre, two day pickup **Rotenone**, (1) sample, one acre, one day pickup **Seine**, (7) samples, 25 ft., ¼ inch bar, 2 quadrants **Electrofishing**, (5) samples, DC, Prod, Night **Gillnet**, (6) samples 100 ft., 6 ft. deep, 2 ½ inch bar, mono gill **Gillnet**, (6) samples 100 ft., 6 ft. deep, 3 inch bar, mono gill **Gillnet**, (6) samples 100 ft., 6 ft. deep, 3 ½ inch bar, mono gill **Gillnet**, (6) samples 100 ft., 6 ft. deep, 4 inch bar, mono gill **Gillnet**, (3) samples 300 ft., 2.5 inch bar mono gill **Gillnet**, (3) samples 300 ft., 3 inch bar mono gill **Gillnet**, (3) samples 300 ft., 3.5 inch bar mono gill **Gillnet**, (3) samples 300 ft., 4 inch bar mono gill
1993	**Electrofishing**, (4) samples, DC, Prod, Night **Gillnet**, (3) samples 300 ft., 2.5 inch bar mono gill **Gillnet**, (3) samples 300 ft., 3 inch bar mono gill **Gillnet**, (3) samples 300 ft., 3.5 inch bar mono gill **Gillnet**, (3) samples 300 ft., 4 inch bar mono gill
1994	**Seine**, (20) samples, 25 ft., ¼ inch bar, 2 quadrants **Electrofishing**, (6) samples, DC, Prod, Night **Gillnet**, (8) samples 300 ft., 2.5 inch bar mono gill **Gillnet**, (8) samples 300 ft., 3 inch bar mono gill **Gillnet**, (8) samples 300 ft., 3.5 inch bar mono gill **Gillnet**, (8) samples 300 ft., 4 inch bar mono gill
1995	**Rotenone**, (1) sample, one acre, two day pickup **Rotenone**, (2) samples, cove sample, two day pickup **Seine**, (8) samples, 25 ft., ¼ inch bar, 2 quadrants **Electrofishing**, (6) samples, DC, Prod, Night **Gillnet**, (8) samples 300 ft., 2.5 inch bar mono gill **Gillnet**, (8) samples 300 ft., 3 inch bar mono gill **Gillnet**, (8) samples 300 ft., 3.5 inch bar mono gill **Gillnet**, (8) samples 300 ft., 4 inch bar mono gill
1996	**Electrofishing**, (5) samples, DC, Prod, Night **Electrofishing**, (3) samples, DC, Prod, Day **Gillnet**, (12) samples 300 ft., 2.5 inch bar mono gill **Gillnet**, (12) samples 300 ft., 3 inch bar mono gill **Gillnet**, (12) samples 300 ft., 3.5 inch bar mono gill **Gillnet**, (10) samples 300 ft., 4 inch bar mono gill
1997	**Seine**, (12) samples, 25 ft., ¼ inch bar, 1 quadrant **Electrofishing**, (3) samples, DC, Prod, Night **Gillnet**, (8) samples 300 ft., 2.5 inch bar mono gill **Gillnet**, (8) samples 300 ft., 3 inch bar mono gill **Gillnet**, (8) samples 300 ft., 3.5 inch bar mono gill **Gillnet**, (7) samples 300 ft., 4 inch bar mono gill
1998	**Seine**, (11) samples, 25 ft., ¼ inch bar, 1 quadrant **Rotenone**, (2) samples, cove sample, two day pickup **Electrofishing**, (60) samples, DC, Prod, Night **Gillnet**, (12) samples 300 ft., 2.5 inch bar mono gill **Gillnet**, (12) samples 300 ft., 3 inch bar mono gill **Gillnet**, (11) samples 300 ft., 3.5 inch bar mono gill **Gillnet**, (11) samples 300 ft., 4 inch bar mono gill **Frame net**, (2) samples, .5 in. bar, 3’ x 6 in. frame

Appendix IX – Toledo Bend Standardized Samples (cont.)

YEAR	SAMPLE TYPE AND (NUMBER OF SAMPLES)
1999	**Seine**, (15) samples, 25 ft., ¼ inch bar, 1 quadrant **Electrofishing**, (30) samples, DC, Prod, Night **Frame net**, (37) samples, .5 in. bar, 3' x 6 in. frame **Gillnet**, (18) samples 300 ft., 2.5 inch bar mono gill **Gillnet**, (18) samples 300 ft., 3 inch bar mono gill **Gillnet**, (17) samples 300 ft., 3.5 inch bar mono gill **Gillnet**, (17) samples 300 ft., 4 inch bar mono gill
2000	**Electrofishing**, (65) samples, DC, Prod, Night **Electrofishing**, (3) samples, forage **Seine**, (15) samples, 25 ft., ¼ inch bar, 1 quadrant **Gillnet**, (28) samples 300 ft., 2.5 inch bar mono gill **Gillnet**, (27) samples 300 ft., 3 inch bar mono gill **Gillnet**, (26) samples 300 ft., 3.5 inch bar mono gill **Gillnet**, (26) samples 300 ft., 4 inch bar mono gill
2001	**Electrofishing**, (27) samples, DC, Prod, Night **Electrofishing**, (11) samples, forage **Seine**, (17) samples, 25 ft., ¼ inch bar, 1 quadrant **Gillnet**, (17) samples 300 ft., 2.5 inch bar mono gill **Gillnet**, (17) samples 300 ft., 3 inch bar mono gill **Gillnet**, (17) samples 300 ft., 3.5 inch bar mono gill **Gillnet**, (17) samples 300 ft., 4 inch bar mono gill
2002	**Electrofishing**, (21) samples, DC, Prod, Night **Electrofishing**, (6) samples, forage **Frame net**, (7) samples, .5 in. bar, 3' x 6 in. frame **Seine**, (17) samples, 25 ft., ¼ inch bar, 1 quadrant **Gillnet**, (11) samples 300 ft., 2.5 inch bar mono gill **Gillnet**, (11) samples 300 ft., 3 inch bar mono gill **Gillnet**, (11) samples 300 ft., 3.5 inch bar mono gill **Gillnet**, (11) samples 300 ft., 4 inch bar mono gill
2003	**Electrofishing**, (33) samples, DC, Prod, Night **Electrofishing**, (4) samples, forage **Seine**, (17) samples, 25 ft., ¼ inch bar, 1 quadrant **Gillnet**, (11) samples 300 ft., 2.5 inch bar mono gill **Gillnet**, (11) samples 300 ft., 3 inch bar mono gill **Gillnet**, (11) samples 300 ft., 3.5 inch bar mono gill **Gillnet**, (11) samples 300 ft., 4 inch bar mono gill **Frame net**, (14) samples, .5 in. bar, 3' x 6 in. frame
2004	**Electrofishing**, (38) samples, DC, Prod, Night **Seine**, (17) samples, 25 ft., ¼ inch bar, 1 quadrant **Gillnet**, (15) samples 300 ft., 2.5 inch bar mono gill **Gillnet**, (15) samples 300 ft., 3 inch bar mono gill **Gillnet**, (15) samples 300 ft., 3.5 inch bar mono gill **Gillnet**, (15) samples 300 ft., 4 inch bar mono gill
2005	**Electrofishing**, (34) samples, DC, Prod, Night **Electrofishing**, (4) samples, forage **Seine**, (17) samples, 25 ft., ¼ inch bar, 1 quadrant **Gillnet**, (18) samples 300 ft., 2.5 inch bar mono gill **Gillnet**, (18) samples 300 ft., 3 inch bar mono gill **Gillnet**, (18) samples 300 ft., 3.5 inch bar mono gill **Gillnet**, (18) samples 300 ft., 4 inch bar mono gill

Appendix IX – Toledo Bend Standardized Samples (cont.)

YEAR	SAMPLE TYPE AND (NUMBER OF SAMPLES)
2006	**Electrofishing**, (27) samples, DC, Prod, Night **Electrofishing**, (3) samples, forage **Seine**, (15) samples, 25 ft., ¼ inch bar, 1 quadrant **Gillnet**, (22) samples 300 ft., 2.5 inch bar mono gill **Gillnet**, (22) samples 300 ft., 3 inch bar mono gill **Gillnet**, (22) samples 300 ft., 3.5 inch bar mono gill **Gillnet**, (22) samples 300 ft., 4 inch bar mono gill **Leadnet** (18) samples, (2 hoops(3.5ft) w/lead) 1 in. bar mesh
2007	**Electrofishing**, (42) samples, DC, Prod, Night **Electrofishing**, (3) samples, forage **Seine**, (19) samples, 25 ft., ¼ inch bar, 1 quadrant **Gillnet**, (15) samples 300 ft., 2.5 inch bar mono gill **Gillnet**, (15) samples 300 ft., 3 inch bar mono gill **Gillnet**, (15) samples 300 ft., 3.5 inch bar mono gill **Gillnet**, (15) samples 300 ft., 4 inch bar mono gill **Leadnet** (24) samples, (2 hoops(3.5ft) w/lead) 1 in. bar mesh
2008	**Electrofishing**, (39) samples, DC, Prod, Night **Electrofishing**, (3) samples, forage **Seine**, (22) samples, 25 ft., ¼ inch bar, 1 quadrant **Gillnet**, (23) samples 300 ft., 2.5 inch bar mono gill **Gillnet**, (23) samples 300 ft., 3 inch bar mono gill **Gillnet**, (23) samples 300 ft., 3.5 inch bar mono gill **Gillnet**, (23) samples 300 ft., 4 inch bar mono gill **Leadnet** (21) samples, (2 hoops(3.5ft) w/lead) 1 in. bar mesh
2009	**Electrofishing**, (40) samples, DC, Prod, Night **Electrofishing**, (3) samples, forage **Seine**, (20) samples, 25 ft., ¼ inch bar, 1 quadrant **Gillnet**, (14) samples 300 ft., 2.5 inch bar mono gill **Gillnet**, (14) samples 300 ft., 3 inch bar mono gill **Gillnet**, (14) samples 300 ft., 3.5 inch bar mono gill **Gillnet**, (14) samples 300 ft., 4 inch bar mono gill **Leadnet** (24) samples, (2 hoops(3.5ft) w/lead) 1 in. bar mesh
2010	**Electrofishing**, (48) samples, DC, Prod, Night **Electrofishing**, (3) samples, forage **Seine**, (23) samples, 25 ft., 3/16 inch bar, 1 quadrant **Gillnet**, (38) samples 300 ft., 2.5 inch bar mono gill **Gillnet**, (37) samples 300 ft., 3 inch bar mono gill **Gillnet**, (39) samples 300 ft., 3.5 inch bar mono gill **Gillnet**, (38) samples 300 ft., 4 inch bar mono gill **Leadnet** (46) samples, (2 hoops(3.5ft) w/lead) 1 in. bar mesh
2011	**Electrofishing**, (28) samples, DC, Prod, Night **Gillnet**, (6) samples 300 ft., 2.5 inch bar mono gill **Gillnet**, (6) samples 300 ft., 3 inch bar mono gill **Gillnet**, (6) samples 300 ft., 3.5 inch bar mono gill **Gillnet**, (6) samples 300 ft., 4 inch bar mono gill **Leadnet** (48) samples, (2 hoops(3.5ft) w/lead) 1 in. bar mesh
2012	**Electrofishing**, (31) samples, DC, Prod, Night **Gillnet**, (34) samples 300 ft., 2.5 inch bar mono gill **Gillnet**, (32) samples 300 ft., 3 inch bar mono gill **Gillnet**, (33) samples 300 ft., 3.5 inch bar mono gill **Gillnet**, (33) samples 300 ft., 4 inch bar mono gill
2013	**No fisheries samples taken.**
2014	**No fisheries samples scheduled.**
2015	**No fisheries samples scheduled.**
2016	**No fisheries samples scheduled.**

2017	**Electrofishing** – (39) samples, DC, Prod, Night **Leadnet –** (24) samples, (2 hoops (3.5 ft.) w/ lead) 1 in. bar mesh
2018	**Electrofishing**, (31) samples, DC, Prod, Night **Gillnet**, (34) samples 300 ft., 2.5 inch bar mono gill **Gillnet**, (32) samples 300 ft., 3 inch bar mono gill **Gillnet**, (33) samples 300 ft., 3.5 inch bar mono gill **Gillnet**, (33) samples 300 ft., 4 inch bar mono gill **Leadnet** (48) samples, (2 hoops(3.5ft) w/lead) 1 in. bar mesh

APPENDIX X
(return to Creel Sampling)

CREEL & OPINION SURVEY

Creel Survey forms used on Toledo Bend Reservoir 2005

Opinion Survey for Crappie Regulations on Toledo Bend

TEXAS PARKS AND WILDLIFE DEPARTMENT

Creel Survey Daily Data and Angler Count Form

Creel Clerk Name: _____

Water Body Code:_____ Date:_____(mm/dd/yyyy)

Survey Type: _____ Stratum: _____

Access / Section: _____ Time Period: _____ Period Hours: _____

Angler Counts

Bank Anglers: _____ Boat Anglers: _____

The area below this line can be used by the creel clerk to record (for creel clerk purposes only and not for data entry) the water body Access Point or Section to be sampled and any other notes that might assist in performing the creel survey work.

TEXAS PARKS AND WILDLIFE DEPARTMENT

Creel Survey Interview Form

Minimum Length Limit Reservoir

Water Body Name: Toledo Bend_____ Water Body Code: 0734___ Date:_____

Creel Clerk Name: _____ Access/Area:_____ Time Period:_____ Stratum: _A____

Time of Interview: _____ Number of Anglers : _____ Fishing From: (BK or BT)

Tournament (Yes or No) If yes, is angler releasing fish (Yes or No)

Hours Fished ____ : ____ Hours Until Finished ____ : ____(For any angler interviewed while fishing)

Species Sought: _____ Zip Code: _____

Economic Questions: The creel clerk says: "I would now like to ask you two questions about the value of your fishing trip."

1) How much money will you spend on today's fishing trip for things like gas, food, bait, lodging, entrance fees, and guides?
_____

If there is question from the angler, the creel clerk should explain, "We are trying to estimate the economic value of our fishery resources in Texas and we need to find out how much today's fishing trip is worth to you.

If the angler still does not understand, the clerk should thank the angler and move on to the remaining interview leaving any economic values not given by the angler blank on this form.

Fish Harvested						Fish Released		
Code	No	TL	Code	No	TL	Code	Below	Above

OPINION SURVEY – CRAPPIE 10 INCH SIZE LIMIT – TOLEDO BEND

The Department is surveying the opinion of fisherman's on setting a 10 inch size limit on the Louisiana side of the lake to be uniform with Texas regulations. Would you mind if I asked you a few questions?

☐ Refused **(END INTERVIEW)**

☐ Yes ☐ No	Have you been previously interviewed for your opinion on a 10 inch size limit on crappie in Toledo Bend? **(IF <u>YES</u>, END INTERVIEW)**
☐ Yes ☐ No	Do you fish for crappie in Toledo Bend? **(IF <u>NO</u>, END INTERVIEW)**

1) Are you a resident of: ☐ Louisiana ☐ Texas ☐ Other _____

2) On average how many time do you fish crappie on Toledo Bend each year: _____

STATEMENT:

THE CURRENT CRAPPIE REGULATIONS ON TOLEDO BEND ARE:

ON THE TEXAS SIDE OF THE LAKE THERE'S A 10 INCH SIZE LIMIT DURING THE MONTHS OF MARCH – NOVEMBER, AND NO SIZE LIMIT DURING THE MONTHS OF DECEMBER – FRBRUARY. ALL CRAPPIE CAUGHT DURING DECEMBER – FEBRUARY MUST BE KEPT.

ON THE LOUISIANA SIDE OF THE LAKE THERE'S NO SIZE LIMIT AND NO MANDATORY RETENTION.

☐ Yes ☐ No	Are you satisfied with the current regulations? **(IF <u>YES</u>, END INTERVIEW)**

If <u>No</u>:

What would you recommend?

_____

Why?

_____