PERFORMANCE REPORT

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FEDERAL AID PROJECT F-221-M-5

INLAND FISHERIES DIVISION MONITORING AND MANAGEMENT PROGRAM

2014 Fisheries Management Survey Report

Fort Parker Reservoir

Prepared by:

John Tibbs, District Management Supervisor
and
Michael S. Baird, Assistant District Management Supervisor

Inland Fisheries Division
Waco District
Waco, Texas

Carter Smith
Executive Director

Craig Bonds
Director, Inland Fisheries

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SURVEY AND MANAGEMENT SUMMARY

Fish populations in Fort Parker Reservoir were surveyed in 2014 using electrofishing and trap netting and in 2015 using gill netting. Historical data are presented with the 2014-2015 data for comparison. This report summarizes the results of the surveys and contains a management plan for the reservoir based on those findings.

- **Reservoir Description:** Fort Parker Reservoir is a 750-acre impoundment located within Fort Parker State Park in Limestone County, Texas. Water level has fluctuated moderately since January 2011, yet is not formally gauged. Mean and maximum water depths are four and eight feet respectively, and the reservoir is moderately productive due to Navasota River inflows. Habitat features consisted mainly of natural shoreline

- **Management history:** Important sport fish include White Bass, Largemouth Bass, White Crappie, and Catfishes. Recent sport fish stockings have included Largemouth Bass and Channel Catfish in 2004 and Blue Catfish in 2009. Sport fish are managed with statewide regulations, except that there is no minimum length limit on catfishes, and the daily bag limit is five (in any combination). Numerous conversations were conducted with park staff regarding the removal of cutgrass and other types of shoreline vegetation, to improve bank fishing access within the park, yet little to no vegetation clearing has been performed. Recent invasive species efforts have included posting zebra mussel signage at boat ramps and distributing fliers, etc. to park staff in order to better educate visitors about invasive species and how to prevent their spread.

- **Fish Community**
  - **Prey species:** Gizzard Shad were collected at rates well above historical averages while Threadfin Shad were collected in low numbers. Other forage species included Bluegill, Longear Sunfish and Green Sunfish. Larger-sized sunfishes were not observed.

  - **Catfishes:** The Blue Catfish catch rate was higher than the historical average while the Channel Catfish catch rate was below the historical average. The Blue Catfish population size structure was much-improved from previous surveys. Flathead Catfish were not collected.

  - **White Bass:** A single White Bass was collected during this survey. Although the species exists in the reservoir in low density, White Bass are popular among anglers in the Navasota River both above and below Fort Parker Reservoir and park.

  - **Largemouth Bass:** The Largemouth Bass catch rate was similar to the historical average, and body condition was good. Genetic analysis showed poor Florida Largemouth Bass influence.

  - **White Crappie:** The White Crappie catch rate was similar to the historical average, and body condition was good.

- **Management Strategies:** Manage sport fishes at Fort Parker Reservoir with existing regulations. Maintain invasive species signage at the boat ramp and inform the public about the negative impacts of aquatic invasive species when presenting to Fort Parker Reservoir user groups. Conduct access and vegetation surveys during summer 2018, and general monitoring surveys with trap netting, gill netting, and electrofishing in 2018-2019.

INTRODUCTION

This document is a summary of fisheries data collected from Fort Parker Reservoir in 2014-2015. The purpose of the document is to provide fisheries information and make management recommendations to protect and improve the sport fishery. While information on other species of fishes was collected, this report deals primarily with major sport fishes and important prey species. Historical data are presented with the 2014-2015 data for comparison.

Reservoir Description

Fort Parker Reservoir is a Texas Parks and Wildlife Department (TPWD) owned 750-acre reservoir located within Fort Parker State Park in Limestone County, Texas. The reservoir was constructed in 1935 by the Civilian Conservation Corps, and serves the dual purpose of flood control and municipal water supply for the town of Groesbeck, Texas (Table 1). The reservoir is in the Blackland Prairie Ecological Area and land use around the reservoir is primarily agricultural. Fort Parker Reservoir has a shoreline length of approximately 19 miles, mean and maximum water depths are four and eight feet respectively, and the reservoir is moderately productive due to Navasota River inflows. Water level has fluctuated moderately since January 2011, yet is not formally gauged. Fish habitat at time of sampling consisted almost exclusively of natural shoreline and native vegetation, including rocky substrate and overhanging brush (Tables 5 and 6).

Angler Access

Fort Parker Reservoir has two public boat ramps which consist of the State Park Ramp on the main lake and the Navasota River Ramp. There are no private ramps available. The ramps are available to anglers during periods of normal water elevations (Table 2). Although the entire reservoir lies within the boundaries of the state park, much of the preferred bank access (areas near day-use and camp sites) remains limited due to large stands of cutgrass and bulrush spp. (Table 6).

Management History

Previous management strategies and actions: Management strategies and actions from the previous survey report (Tibbs and Baird 2010) included:

1. Cooperate with the park staff to post appropriate invasive species signage at access points throughout Fort Parker State Park. Educate the public about invasive species through the use of media and the internet. Make a speaking point about invasive species when presenting to constituent and user groups. Keep track of (i.e., map) all existing and future inter-basin water transfer routes to facilitate potential invasive species responses.
   Action: Invasive species signage was posted at Fort Parker State Park access points during summer 2013. District biologists have made a speaking point about invasive species, how to prevent their spread, and potential effects on Fort Parker Reservoir, while speaking to constituent groups such as the Central Texas Flyrodders, Legacy Outfitters, and Brazos River Sportsman's Club over the past several years. Inter-basin water transfers are a permanent fixture in this report now, and will be updated appropriately.
2. Share information on Fort Parker Reservoir with the TPWD watershed coordinator, Southeastern Aquatic Resources partnership (SARP) and Reservoir Fisheries Habitat Partnership (RFHP); propose funding from SARP and RFHP to perform best management practice (BMP) work within the watershed.
   Action: A short document was drafted to: 1) describe the status of Fort Parker Reservoir and its fishery, 2) present the information to the Habitat Branch of the Inland Fisheries

Division for their review and consideration, and 3) request their expertise in retaining grant funding to accomplish the needed work. Funding from organizations such as the (SARP) and (RFHP) could then be used to promote best management practices or other work to reverse the effects of erosion and sedimentation within this watershed. The document is included in this report as Appendix D.

Harvest Regulation History: Sportfishes in Fort Parker Reservoir are managed with statewide regulations, except that there is no minimum length limit on catfishes, and that the daily bag limit of catfishes is five (in any combination)consistent with other TPWD owned State Park reservoirs (Table 3).

Stocking History: Blue Catfish were stocked at a rate of 50 fish/acre in both 2008 and 2009. Largemouth Bass and Channel Catfish were stocked in 2004. The complete stocking history is in Table 4.

Vegetation/Habitat Management History: Shoreline habitat at Fort Parker consists mainly of common species such as cattail, bulrush, and cutgrass. This habitat impedes bank angler access in several critical areas. Mechanical options have been used in small areas (i.e., around fishing piers) by park staff with modest success. Additionally, American lotus has been problematic in the past and at its peak in 2005 covered 500 acres or over two-thirds of the upper reservoir due to extremely shallow water caused by sedimentation. The fact that the reservoir serves as a drinking water source for the town of Groesbeck complicates the potential for chemical treatment of these problematic native species. Currently, no noxious vegetation exists in Fort Parker Reservoir, so vegetation issues are not monitored annually (Table 6).

Water Transfer: Fort Parker Reservoir is used primarily for municipal water supply, flood control, and recreation. The town of Groesbeck has rights to all but 0.5-acre foot of the water in the reservoir and the state park has rights to the ½-acre foot. The town of Groesbeck utilizes a siphon tube at the dam to pump make-up water from Fort Parker Reservoir into their drinking water supply reservoir as needed. Groesbeck's water rights supersede those of the town of Mexia for Mexia Reservoir, yet there are currently no plans to utilize those water rights. The state park's water rights are used mainly for irrigation purposes within the park.

Reservoir capacity: Fort Parker Reservoir loses volume annually to sedimentation by erosion within its watershed. Studies of Mexia and Limestone Reservoirs, upstream and downstream of Fort Parker, have also shown significant losses in volume since impoundment. Although the loss of Fort Parker Reservoir capacity is unknown at this time, dredging operations initiated by the town of Groesbeck in 1994 were begun to remove 930 acre feet of deposited silt in and adjacent to the Navasota River channel within the reservoir. Those efforts were abandoned in 2002 with limited success. See Appendix D for additional information.

METHODS

Fishes were collected by electrofishing (1 hour at 12, 5-min stations), gill netting (5 net nights at 5 stations), and trap netting (5 net nights at 5 stations). Catch per unit effort (CPUE) for electrofishing was recorded as the number of fish caught per hour (fish/h) of actual electrofishing and, for gill and trap nets, as the number of fish per net night (fish/nn). All survey sites were randomly selected and all surveys were conducted according to the Fishery Assessment Procedures (TPWD, Inland Fisheries Division, unpublished manual revised 2014).

No annual access-point or roving creel surveys have been conducted.

A structural habitat survey was conducted in 2010. A vegetation survey was conducted in 2014. Habitat

was assessed with the digital shape file method (TPWD, Inland Fisheries Division, unpublished manual revised 2014).

Sampling statistics (CPUE for various length categories), structural indices [Proportional Size Distribution (PSD), terminology modified by Guy et al. 2007], and condition indices [relative weight (W_r)] were calculated for target fishes according to Anderson and Neumann (1996). Index of vulnerability (IOV) was calculated for Gizzard Shad (DiCenzo et al. 1996). Standard error (SE) was calculated for structural indices and IOV. Relative standard error (RSE = 100 X SE of the estimate/estimate) was calculated for all CPUE statistics. Age and growth data were not collected in 2014 or 2015.

Genetic analysis of Largemouth Bass was conducted according to the Fishery Assessment Procedures (TPWD, Inland Fisheries Division, unpublished manual revised 2014). Micro-satellite DNA analysis was used to determine genetic composition of individual fish from 2005 through 2014 and by electrophoresis for previous years.

There is currently no source of water level data for Fort Parker Reservoir.

RESULTS AND DISCUSSION

Habitat: A habitat survey was last conducted in 2010 (Tibbs and Baird 2010).

Creel: No creels were conducted during this survey period.

Prey species: Threadfin and Gizzard Shad were collected by electrofisher at a catch rate of 48/h and 1,810/h respectively in 2014; these catch rates were above the historical average for Gizzard Shad and below the historical average for Threadfin Shad (Figure 1; Appendices A and B). The Index of vulnerability (IOV) for Gizzard Shad was excellent and 98% of Gizzard Shad were available to existing predators as forage (Figure 1). Other important forage species collected were Bluegill (24/h), Longear Sunfish (8/h), and Green Sunfish (4/h; Figure 2; Appendices A and B). Panfish seldom reach preferred size classes in Fort Parker Reservoir, and few anglers actively seek them.

Catfishes: Blue Catfish were collected from gill nets at 2.2/nn in 2015; this catch rate equates to 11 collected individuals, and is higher than the historical average (Figure 3; Appendices A and B). The Proportional size distribution (PSD) for Blue Catfish is defined as the percentage of 12-inch and longer individuals which are also 20-inches and longer. Proportional size distribution was high (i.e., 82), indicating an imbalanced population, perhaps caused by low recruitment (Figure 3). In fact, it is likely an artifact of the large number of blues stocked in 2007 and 2008 that are now adults. Body condition, expressed as relative weight (*Wr*), was good across most size classes but dropped in the two largest size classes sampled (Figure 3).

Channel Catfish were collected from gill nets at 1.4/nn in 2015; this catch rate equates to 7 collected individuals, and is below the historical average (Figure 4; Appendices A and B). The PSD for Channel Catfish is defined as the percentage of 11-inch and longer individuals which are also 16-inches and longer. Proportional size distribution was high (i.e., 86), indicating an imbalanced population, perhaps caused by low recruitment and/or high harvest/mortality of smaller, legal-sized fish (Figure 4). Body condition improved with increasing size classes (Figure 4).

Flathead Catfish exist in low density in Fort Parker Reservoir but were not collected in 2015.

White bass: White Bass were collected from gill nets at 0.2/nn in 2015; this catch rate equates to only one individual (Appendices A and B). A low-density population of White Bass typically exists in Fort

Parker and the species has provided good fishing opportunities both above and below the reservoir during the springtime runs.

Largemouth bass: Largemouth Bass were collected by electrofisher at 25/h in 2014; this catch rate equates to 25 collected individuals, and was similar to the historical average (Figure 5; Appendices A and B). The proportional size distribution (PSD) for Largemouth Bass is defined as the proportion of 8-inch and longer individuals which are also 12-inches and longer within the population. Proportional size distribution was high (i.e., 78), indicating an imbalanced population, perhaps caused by low recruitment and/or high harvest/mortality of smaller, legal-sized fish (Figure 5). The proportion of individuals 14-inches and larger was 57, indicating good numbers of harvestable bass for anglers. Body condition was also excellent; with relative weights (*Wr*) of over 100 for most size classes (Figure 5). Largemouth Bass genetics were analyzed in 2014 and continued to show minimal Florida influence (Table 7).

White Crappie: White Crappie were collected from trap nets at 106.8/nn in 2014; this catch rate equates to 534 individuals and is similar to the historical average for the reservoir (Figure 6; Appendices A and B). The proportional size distribution (PSD) for White Crappie is defined as the proportion of 5-inch and longer individuals which are also 8-inches and longer within the population. Proportional size distribution was good, indicative of a population with balanced recruitment, growth, and mortality rates (Figure 6). The PSD-10 was 47; and this, coupled with high trap net catch rates indicated good numbers of harvestable crappie for anglers. Several fish exceeded the memorable size category of 12 inches or more. Body conditions, expressed as relative weight (*Wr*), were excellent and tended to increase with size (Figure 6).

Fisheries management plan for Fort Parker Reservoir, Texas

Prepared – July 2015

ISSUE 1: Many invasive species threaten aquatic habitats and organisms in Texas and can adversely affect the state ecologically, environmentally, and economically. For example, zebra mussels (*Dreissena polymorpha*) can multiply rapidly and attach themselves to any available hard structure, restricting water flow in pipes, fouling swimming beaches and plugging engine cooling systems. Giant Salvinia (*Salvinia molesta*) and other invasive vegetation species can form dense mats, interfering with recreational activities like fishing, boating, skiing and swimming. The financial costs of controlling and/or eradicating these types of invasive species are significant. Additionally, the potential for invasive species to spread to other river drainages and reservoirs via watercraft and other means is a serious threat to all public waters of the state.

MANAGEMENT STRATEGIES

1. Cooperate with park staff to maintain appropriate signage at access points around the reservoir.
2. Contact and educate park staff about invasive species, and provide them with posters and literature so that they can in turn educate park users.
3. Educate the public about invasive species through the use of media and the internet.
4. Make a speaking point about invasive species when presenting to constituent and user groups.
5. Keep track of (i.e., map) existing and future inter-basin water transfers to facilitate potential invasive species responses.

ISSUE 2: Genetic analyses of Largemouth Bass were conducted in 2006 and 2014, and both showed minimal Florida influence, 14 and 11% respectively. Electrofishing catch rates of Largemouth Bass are very low relative to other district reservoirs.

MANAGEMENT STRATEGY

1. Stock Florida Largemouth Bass at an appropriate rate for the lower 250 acres of reservoir in 2016.

ISSUE 3: Fort Parker Reservoir is plagued with sedimentation issues (Appendix D) and as a result, only has approximately 250 acres of fishable water in the lower end. The habitat that is available is limited to shoreline vegetation.

MANAGEMENT STRATEGIES

1. Construct and deploy crappie condo fish attractors in appropriate depths within the lower end of the reservoir.
2. Update the Fort Parker Reservoir link of the TPWD website with fish attractor icons so that

anglers and park users know their location(s).

SAMPLING SCHEDULE JUSTIFICATION:

The proposed sampling schedule consists of mandatory monitoring in 2018/2019 (Table 8), which consists of electrofishing, gill netting, and trap netting. Access and vegetation surveys will be conducted in summer 2018.

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DiCenzo, V. J., M. J. Maceina, and M. R. Stimert. 1996. Relations between reservoir trophic state and Gizzard Shad population characteristics in Alabama reservoirs. North American Journal of Fisheries Management 16:888-895.

Guy, C. S., R. M. Neuman, D. W. Willis, and R. O. Anderson. 2007. Proportional size distribution (PSD): a further refinement of population size structure index terminology. Fisheries 32(7): 348.

Tibbs, J. and M. Baird. 2007. Statewide freshwater fisheries monitoring and management program survey report for Fort Parker Reservoir, 2006. Texas Parks and Wildlife Department, Federal Aid Report F-30-R, Austin.

Tibbs, J. and M. Baird. 2011. Statewide freshwater fisheries monitoring and management program survey report for Fort Parker Reservoir, 2010. Texas Parks and Wildlife Department, Federal Aid Report F-221-M-1, Austin.

Table 1. Characteristics of Fort Parker Reservoir, Texas.

Characteristic	Description
Year Constructed	1935
Controlling authority	Texas Parks and Wildlife Department
Counties	Limestone
Reservoir type	Main Stream
Shoreline Development Index (SDI)	4.80
Conductivity	310 umhos/cm

Table 2. Boat ramp characteristics for Fort Parker Reservoir, Texas, October 2014. There is no gauging station on Fort Parker Reservoir so elevation at time of survey is unknown.

Boat ramp	Latitude Longitude (dd)	Public	Parking capacity (N)	Elevation at end of boat ramp (ft)	Condition
State Park Ramp	31.596192 - 96.535520	Y	6	N/A	Concrete, fair
Navasota River Ramp	31.606785 - 96.551867	Y	4	N/A	Concrete, fair

Table 3. Harvest regulations for Fort Parker Reservoir.

Species	Bag Limit	Minimum-Maximum Length (inches)
Catfish: Channel and Blue Catfish, their hybrids and subspecies	5 (in any combination)	No Limit
Catfish, Flathead	5	18 - No Limit
Bass, White	25	10 - No Limit
Bass: Largemouth and Spotted	5	14 - No Limit
Crappie: White and Black Crappie, their hybrids and subspecies	25 (in any combination)	10 - No Limit

Table 4. Stocking history of Fort Parker State Park, Texas. Life stages are fry (FRY), fingerlings (FGL), advanced fingerlings (AFGL), adults (ADL) and unknown (UNK). Life stages for each species are defined as having a mean length that falls within the given length range. For each year and life stage the species mean total length (Mean TL; in) is given. For years where there were multiple stocking events for a particular species and life stage the mean TL is an average for all stocking events combined.

Species	Year	Number	Life Stage	Mean TL (in)
Blue Catfish	2003	7,089	AFGL	9.6
	2008	36,138	FGL	2.0
	2009	36,250	FGL	2.0
	Total	79,477		
Channel Catfish	1966	8,000	AFGL	7.9
	1982	35,000	AFGL	7.9
	1991	283	AFGL	5.2
	2004	4,597	AFGL	8.9
	Total	47,880		
Coppernose Bluegill	1982	30,000	UNK	UNK
	Total	30,000		
Florida Largemouth Bass	1982	34,900	FRY	1.0
	Total	34,900		
Largemouth Bass	1966	3,000	UNK	UNK
	1970	2,000	UNK	UNK
	1974	33,000	UNK	UNK
	1975	35,000	UNK	UNK
	2004	93,331	FGL	1.6
	Total	166,331		

Table 5. Survey of structural habitat types, Fort Parker Reservoir, Texas, 2010. Linear shoreline distance (miles) and percent of linear shoreline distance was recorded for each habitat type greater than one percent; otherwise noted as trace. Percent of total shoreline distance is blank for boat docks/piers because they were dually coded with adjacent habitat; counts are given instead. Survey was conducted using 2010 NAIP, 1-meter resolution satellite imagery.

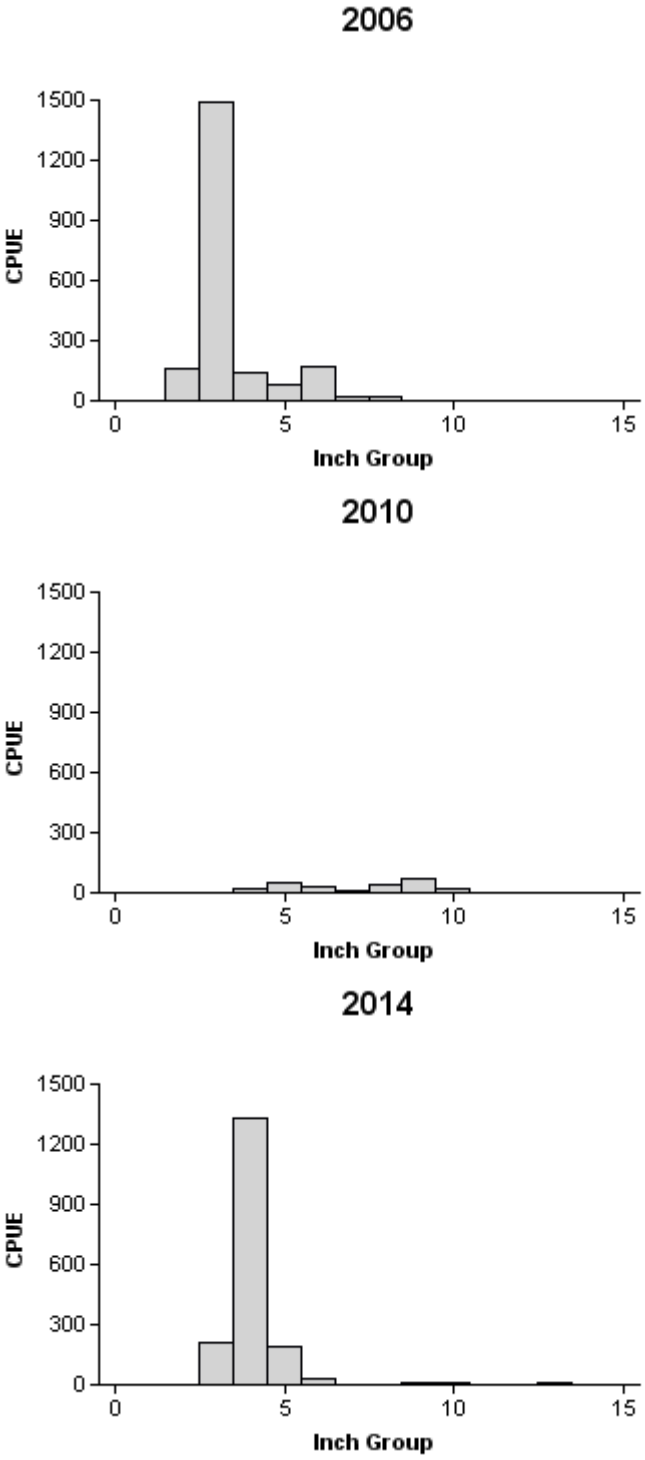
Habitat type	Estimate	% of total
Bulkhead	0.2	2.0
Natural	12.3	98.0
Piers/boat docks	N = 2	

Table 6. Survey of aquatic vegetation, Fort Parker Reservoir, Texas, 2014. Linear shoreline distance

(miles) and percent of linear shoreline distance was recorded for each habitat type greater than one percent; otherwise noted as trace.

Vegetation	2014
Clear shoreline	0.8 (9.1)
Cutgrass	7.1 (82.6)
Bulrush	0.7 (8.3)
Arrowhead	Trace

Gizzard Shad



Effort =	1.0
Total CPUE =	2,114.0 (24;2114)
Stock CPUE =	68.0 (24; 68)
IOV =	98 (0.7)

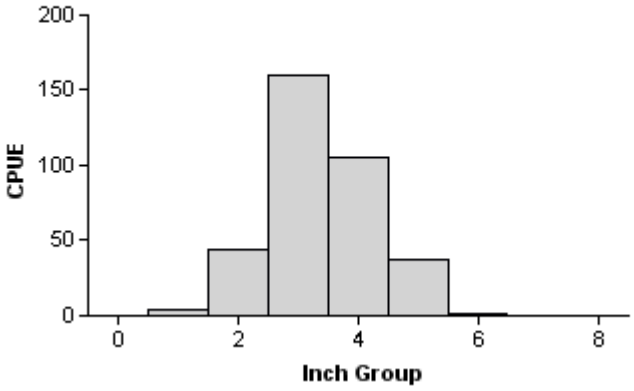
Effort =	1.0
Total CPUE =	252.0 (22; 252)
Stock CPUE =	145.0 (24; 145)
IOV =	45 (3.3)

Effort =	1.0
Total CPUE =	1,810.0 (20;1810)
Stock CPUE =	42.0 (33; 42)
IOV =	98 (0.6)

Figure 1. Number of Gizzard Shad caught per hour (CPUE) and population indices (RSE and N for CPUE and SE for IOV are in parentheses) for fall electrofishing surveys, Fort Parker Reservoir, Texas, 2006, 2010, and 2014.

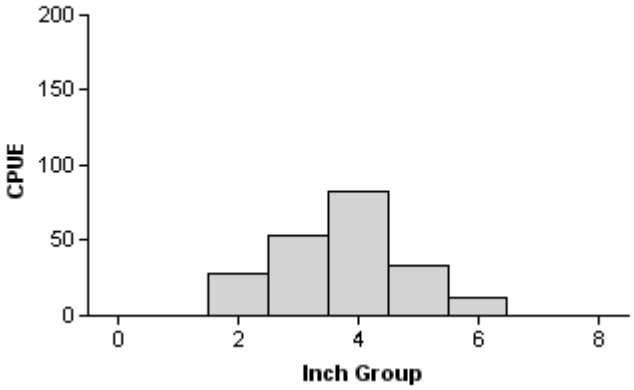
Bluegill

2006



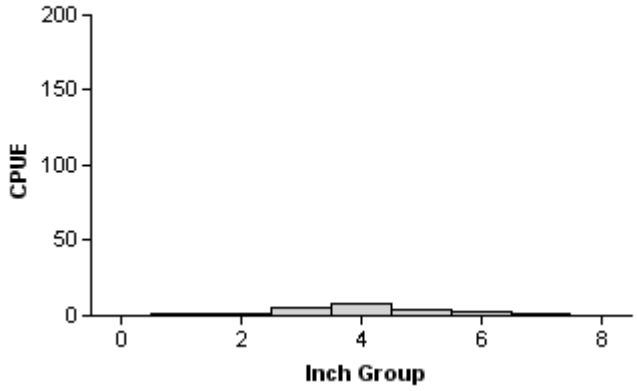
Effort = 1.0
Total CPUE = 352.0 (26; 352)
Stock CPUE = 304.0 (25; 304)
PSD = 0 (0.3)

2010



Effort = 1.0
Total CPUE = 209.0 (21; 209)
Stock CPUE = 181.0 (22; 181)
PSD = 7 (2.3)

2014



Effort = 1.0
Total CPUE = 24.0 (40; 24)
Stock CPUE = 21.0 (43; 21)
PSD = 19 (4.9)

Figure 2. Number of Bluegill caught per hour (CPUE) and population indices (RSE and N for CPUE and SE for size structure are in parentheses) for fall electrofishing surveys, Fort Parker Reservoir, Texas, 2006, 2010, and 2014.

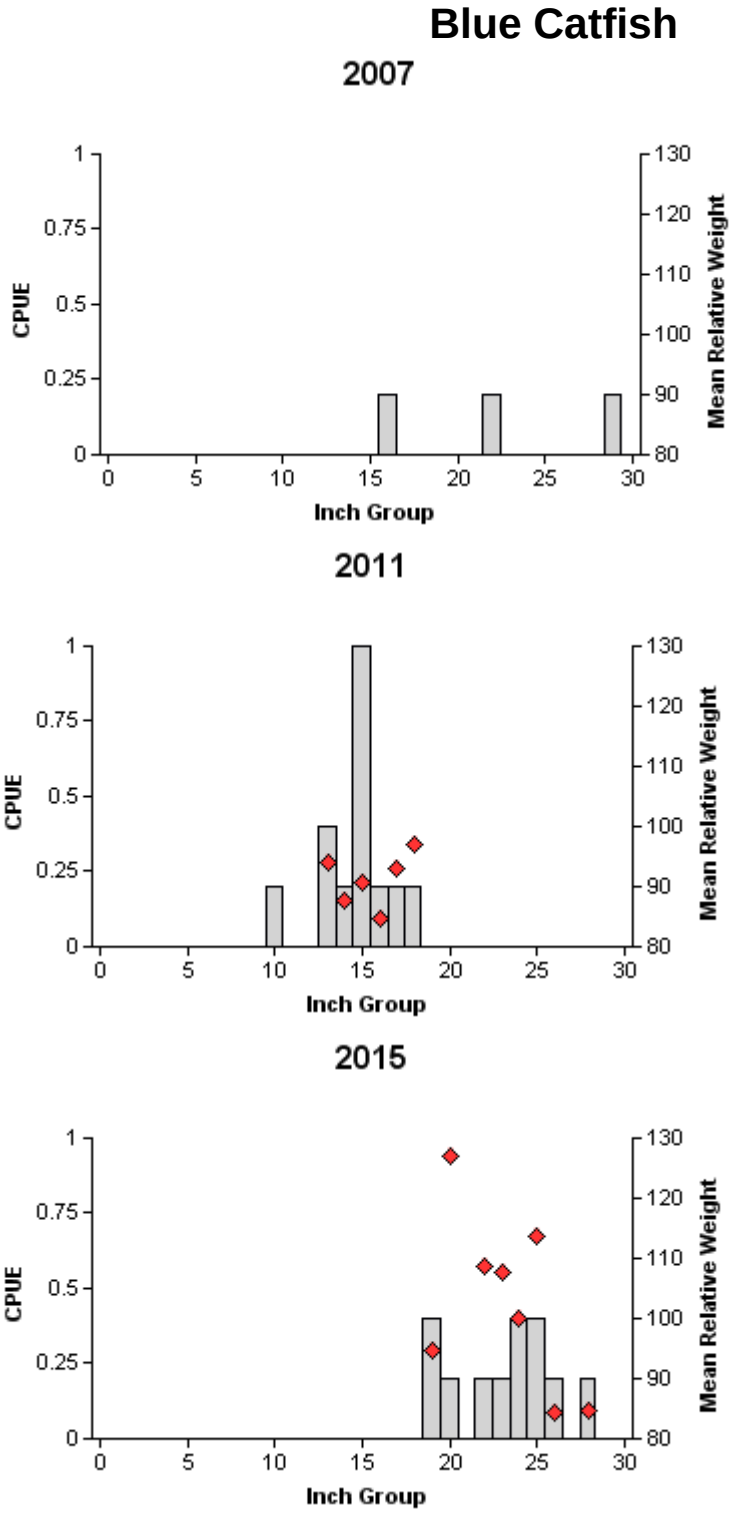


Figure 3. Number of Blue Catfish caught per net night (CPUE) and population indices (RSE and N for CPUE and SE for size structure are in parentheses) for spring gill net surveys, Fort Parker Reservoir, Texas, 2007, 2011, and 2015.

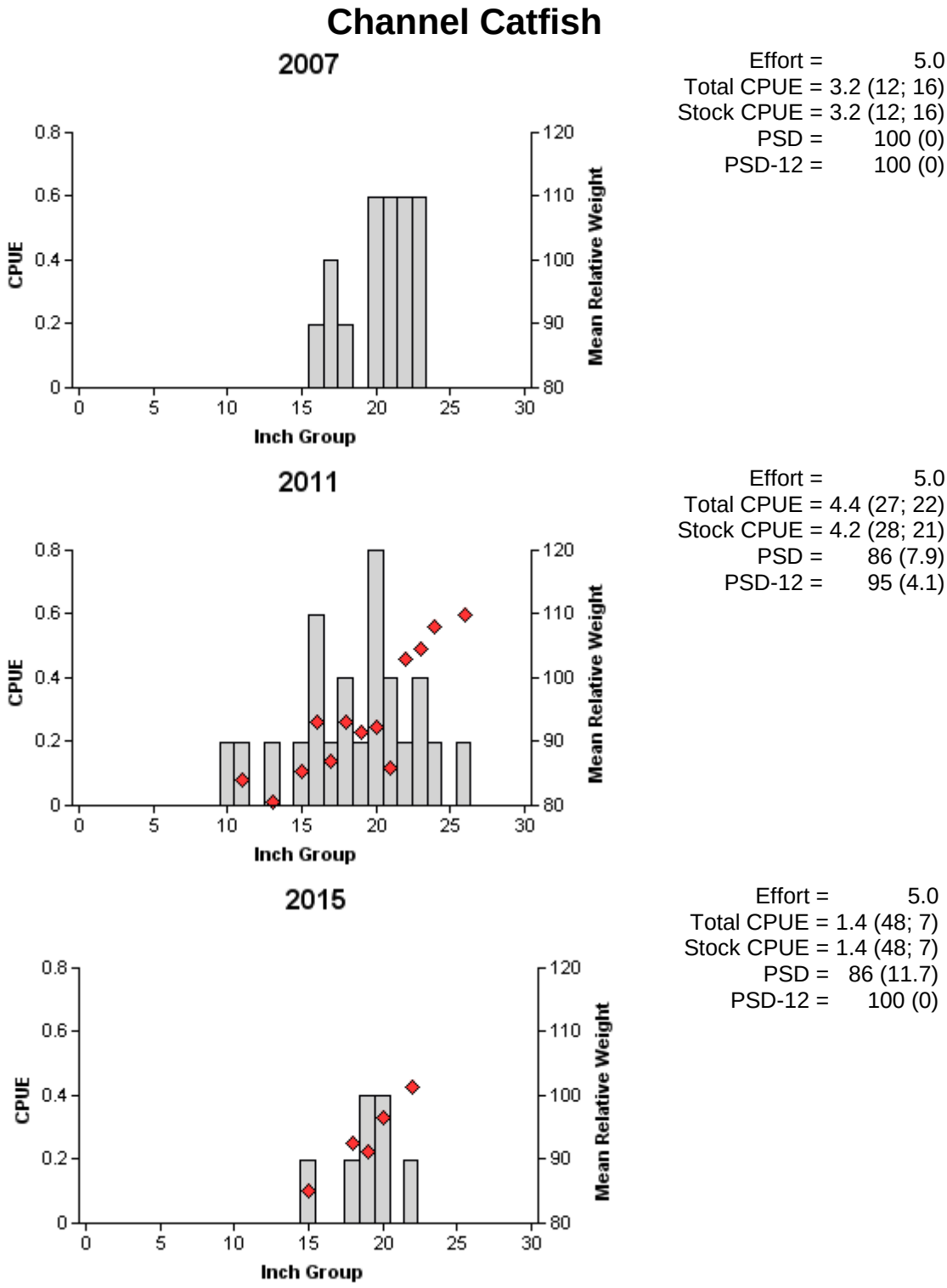


Figure 4. Number of Channel Catfish caught per net night (CPUE) and population indices (RSE and N for CPUE and SE for size structure are in parentheses) for spring gill net surveys, Fort Parker Reservoir, Texas, 2007, 2011, and 2015.

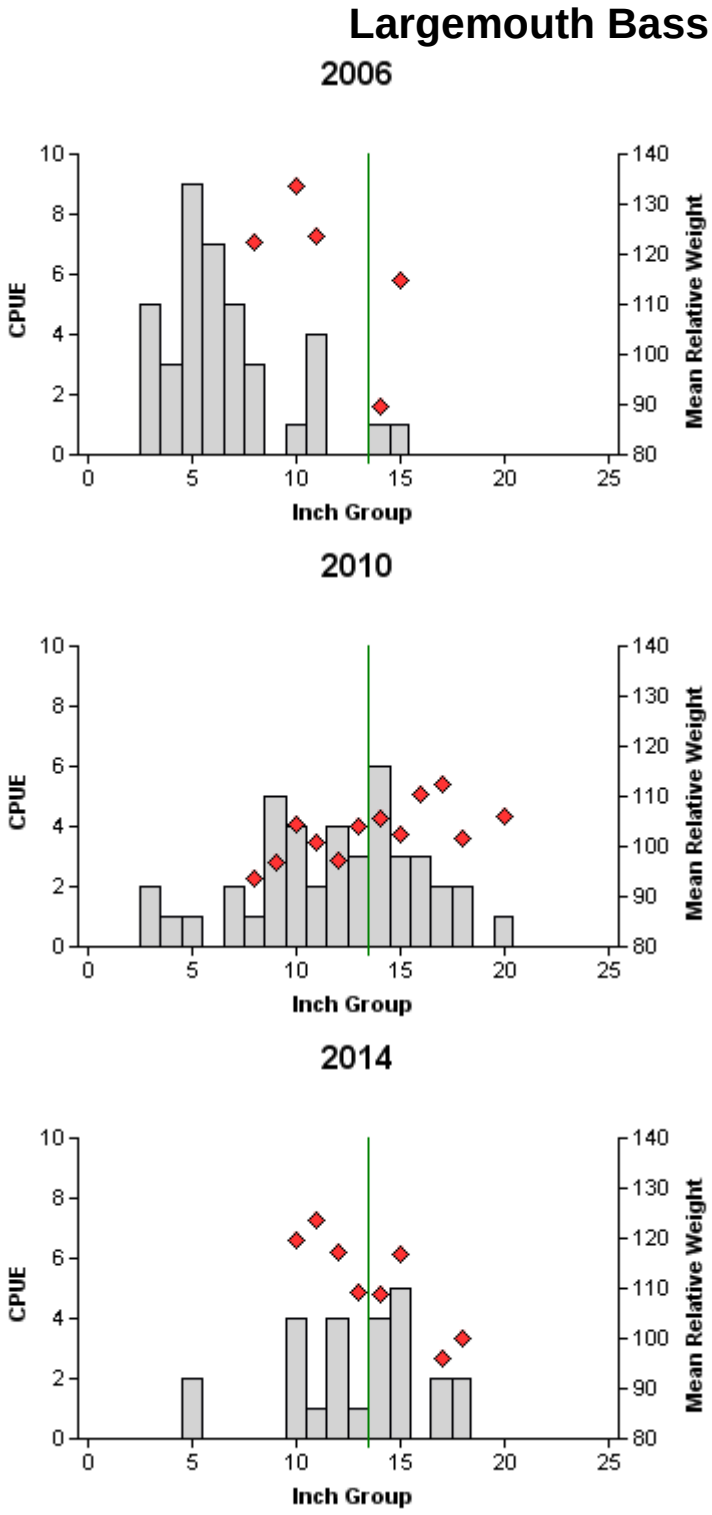


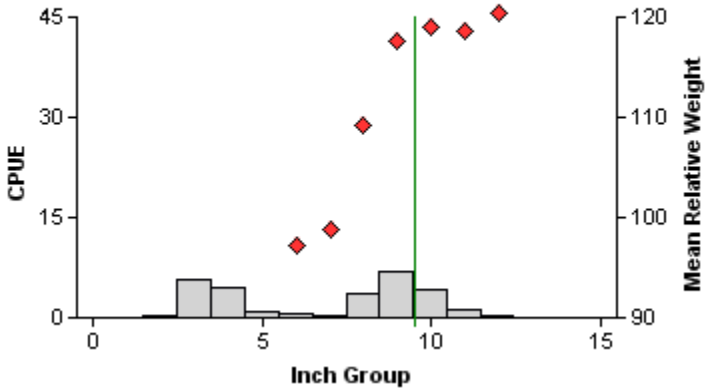
Figure 5. Number of Largemouth Bass caught per hour (CPUE) and population indices (RSE and N for CPUE and SE for size structure are in parentheses) for fall electrofishing surveys, Fort Parker Reservoir, Texas, 2006, 2010, and 2014.

Table 7. Results of genetic analysis of Largemouth Bass collected by fall electrofishing, Fort Parker Reservoir, Texas, 2002, 2006, and 2014. FLMB = Florida Largemouth Bass, NLMB = Northern Largemouth Bass, Intergrade = hybrid between a FLMB and a NLMB. Genetic composition was determined by electrophoresis prior to 2005 and with micro-satellite DNA analysis since 2005.

		Genotype				
Year	Sample size	%FLMB	%Hybrid	%NLMB	% FLMB alleles	% Northern alleles
2002	23	4	39	57	15	85
2006	30	0	60	40	14	86
2014	23	0	74	26	11	89

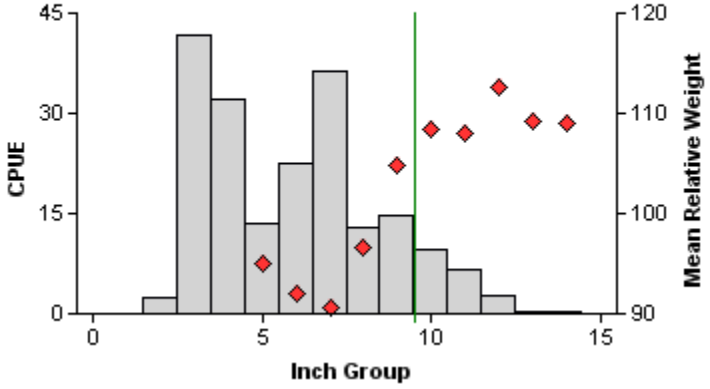
White Crappie

2006



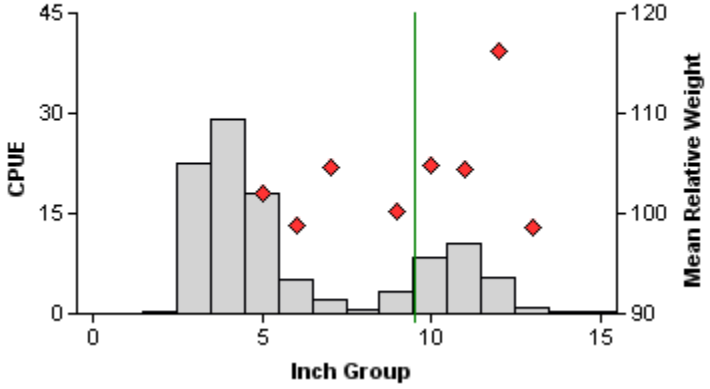
Effort = 5.0
Total CPUE = 28.6 (26; 143)
Stock CPUE = 18.0 (28; 90)
PSD = 90 (3.3)
PSD-10 = 31 (5.6)

2010



Effort = 5.0
Total CPUE = 195.0 (23; 975)
Stock CPUE = 119.0 (24; 595)
PSD = 39 (8.4)
PSD-10 = 16 (6.2)

2014



Effort = 5.0
Total CPUE = 106.8 (20; 534)
Stock CPUE = 55.0 (18; 275)
PSD = 54 (7.6)
PSD-10 = 47 (6.8)

Figure 6. Number of White Crappie caught per net night (CPUE) and population indices (RSE and N for CPUE and SE for size structure are in parentheses) for fall trap net surveys, Fort Parker Reservoir, Texas, 2006, 2010, and 2014.

Table 8. Proposed sampling schedule for Fort Parker Reservoir, Texas. Survey period is June through May. Gill netting surveys are conducted in the spring, while electrofishing and trap netting surveys are conducted in the fall. Standard survey denoted by S and additional survey denoted by A. Structural habitat surveys are required only if large changes in structural habitat are suspected, i.e. increases in bulkhead, loss of standing timber, etc.

				Habitat				
Survey year	Electrofish Fall	Trap net	Gill net	Structural	Vegetation	Access	Creel survey	Report
2015-2016								
2016-2017								
2017-2018								
2018-2019	S	S	S		S	S		S

APPENDIX A

Number (N) and catch rate (CPUE) of all target species collected from all gear types from Fort Parker Reservoir, Texas, 2014-2015.

Species	Gill Netting		Trap Netting		Electrofishing	
	N	CPUE	N	CPUE	N	CPUE
Gizzard Shad					1,810	1,810.0
Threadfin Shad					48	48.0
Blue Catfish	11	2.2				
Channel Catfish	7	1.4				
White Bass	1	0.2				
Green Sunfish					4	4.0
Bluegill					24	24.0
Longear Sunfish					8	8.0
Largemouth Bass					25	25.0
White Crappie			534	106.8		

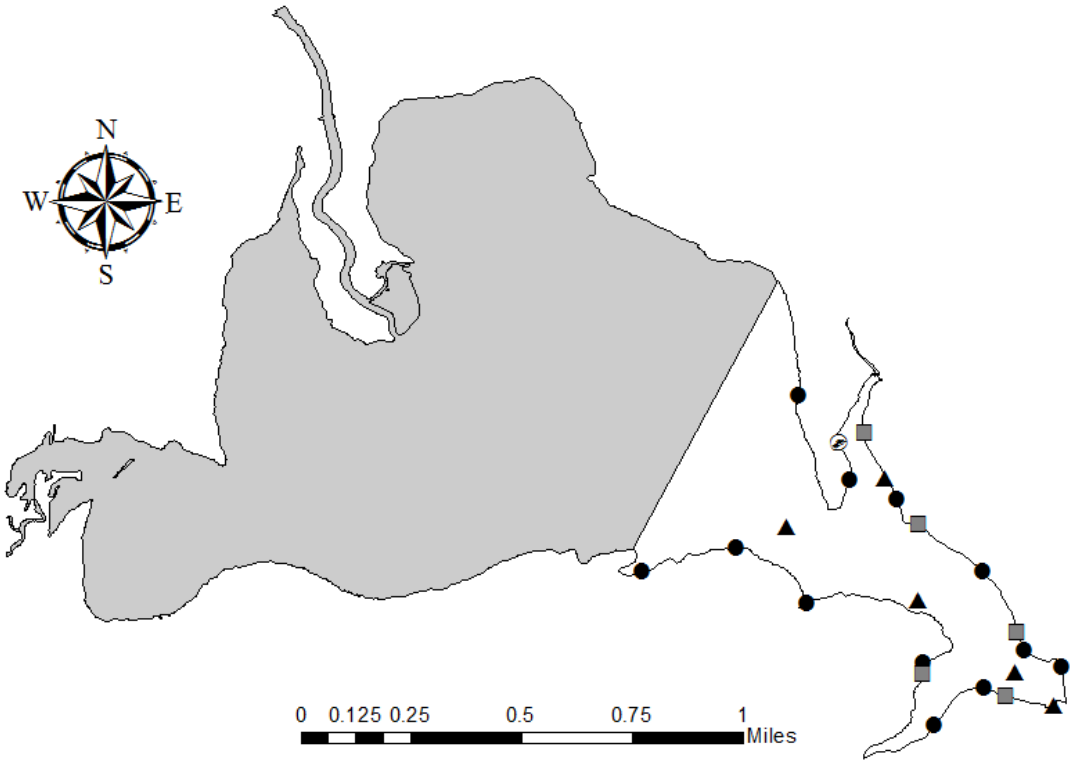
APPENDIX B

Catch rates (CPUE) of targeted species by gear type for standard surveys on Fort Parker Reservoir, Texas, 1991 to present. Surveys prior to 1996 used biologist-selected stations while those after 1996 used random stations. Electrofishing stations were shocked with a 5.0 Smith-Root GPP (Gas Powered Pulsator) until 2010, when a 7.5 Smith-Root GPP was used. Species averages are in bold. Asterisk denotes collection by a non-standard gear.

	Electrofisher							
	Bass	Shad		Sunfish				
Year	Largemouth	Gizzard	Threadfin	Bluegill	Longear	Green	Redear	Warmouth
1991	4.0	746.0	401.0	37.0	7.0	0.0	0.0	0.0
1993	-	-	-	-	-	-	-	-
1994	22	636.0	448.0	177.0	51.0	0.0	8.0	3.0
1997	2.0	267.0	155.0	57.0	1.0	-	-	-
2002	42.0	544.0	94.0	196.0	43.0	6.0	0.0	13.0
2003	-	-	-	-	-	-	-	-
2006	39.0	2114.0	243.0	352.0	55.0	4.0	1.0	4.0
2007	-	-	-	-	-	-	-	-
2010	42.0	252.0	231.0	209.0	25.0	3.0	0.0	5.0
2011	-	-	-	-	-	-	-	-
2014	25.0	1,810	48.0	24.0	8.0	4.0	0.0	0.0
Avg.	**25.1**	**1284.9**	**155.0**	**97.7**	**19.2**	**3.3**	**0.9**	**2.5**

	Gill nets			Trap nets
	Catfish		Bass	Crappie
Year	Blue	Channel	White	White
1991	0.2	4.6	5.2	29.4
1993	0.0	4.4	1.0	-
1994	0.0	6.0	4.4	32.4
1997	1.0	3.2	0.2	350.0
2002	-	-	-	11.8
2003	0.8	1.0	1.4	-
2006	-	-	-	28.6
2007	0.6	3.2	0.4	-
2010	-	-	-	195.0
2011	2.4	4.4	0.0	-
2014				106.8
2015	2.2	1.4	0.2	-
Avg.	**1.5**	**2.6**	**1.0**	**107.4**

APPENDIX C



Location of sampling sites, Fort Parker Reservoir, Texas, 2014-2015. Standard electrofishing, trap netting, and gill netting stations are indicated by circles, squares and triangles respectively. There is no gauging station on Fort Parker Reservoir so elevation at time of surveys is unknown. The upper two-thirds of the reservoir (shaded area) isn't navigable due to shallow water.

APPENDIX D

Introduction

The Waco Inland Fisheries Management District encompasses a 12 county area of north central Texas. The district is responsible for fourteen major reservoirs, thirty small impoundments, and at least eight important, navigable rivers – all flowing into the Brazos River, whose drainage bisects the district from north-west to south-east. The district also contains two major ecoregions: Cross Timbers and Blackland Prarie. The Cross Timbers ecoregion dominates the western two-thirds of the district, while Blackland Prarie covers an eastern-most sliver of district including the eastern portions of Hill, McLennan, and Bell Counties, the western portion of Limestone County, and most of Falls County. Due to changes in native ground cover from agricultural and farming practices, these Blackland Prarie areas are highly susceptible to erosion by wind and especially water. As such, Aquilla, Mexia, Fort Parker, and Limestone Reservoirs have lost substantial amounts of volume since impoundment from erosion and sedimentation within their watersheds. The objective of this appendix is to describe the status of Fort Parker Reservoir and its fishery, and to provide the information to the Habitat Branch of the Inland Fisheries Division for their review and consideration of this regional problem – and for their expertise in securing grant funding opportunities with any future statewide watershed proposals.

Geographical Area

The Texas Blackland Prarie ecoregion is a 50,501 km^2 area which runs in a south-west to north-east direction, from San Antonio to the Oklahoma border. Historically, land cover within this ecoregion was dominated by rolling topography and tallgrass prairie species such as big bluestem, indiangrass, and switchgrass, with occasional forest and wetland areas near riparian bottomlands. Early settlers were drawn to the region by its black, fertile soils, and the majority of the land was soon converted to farmland. A recent estimate suggests as few as 5,000 acres remain in their natural condition in terms of land cover, plant species, etc. Today, land use is dominated by pastureland, supporting livestock such as beef cattle, and cropland, including hay, corn, wheat, sorghum, cotton, milo, soybeans and pecans. Clear cutting of the native trees and grasses, along with repeated plowing from heavy farming and agricultural practices, has led to severe soil loss by wind erosion and surface runoff. The development of agricultural best management practices (BMPs) have helped farmers and other landowners reduce soil loss in recent decades, however BMPs have not been implemented in many important areas of watershed, some existing BMPs are outdated, and much of the damage to streams and reservoirs has already occurred.

Reservoir Specifics

Fort Parker Reservoir is a 750-acre reservoir located within the boundaries of Fort Parker State Park in Limestone County, Texas. Land use around the reservoir is primarily agricultural. The reservoir was constructed in 1935 by the Civilian Conservation Corps for the purpose of flood control, municipal water and recreation. The town of Groesbeck has rights to all but ½-acre foot of the water in the reservoir and the state park has rights to the 0.5-acre foot. The town of Groesbeck utilizes a siphon tube at the dam to pump make-up water from Fort Parker Reservoir into their drinking water supply reservoir as needed. Interestingly, Groesbeck's water rights supersede those of the town of Mexia for Mexia Reservoir, yet there are currently no plans to utilize those water rights. The state park's water rights are used mainly for irrigation purposes within the park. The reservoir has mean and maximum depths of 4 and 8 feet respectively. Fort Parker is moderately productive, with water clarity ranging from 2 to 4 feet. Structural habitat consists almost exclusively of natural shoreline and overhanging trees and brush. Aquatic vegetation is dominated by native shoreline species like Cattail, Bulrush, and Cutgrass, with some Buttonbush, Black willow, and Water willow. American lotus has been problematic in the upper 2/3 of reservoir due to extremely shallow water; over 500 acres of American lotus was estimated in 2005. No noxious vegetation exists in Fort Parker.

Loss of Volume and Impacts to the Fishery

Fort Parker Reservoir was constructed in 1935 by the Civilian Conservation Corps to cover an

area of approximately 750 acres and hold 3,100 acre-feet of water. This makes it the oldest of the three reservoirs on the Navasota mainstem, predating its upstream neighbor, Mexia reservoir (constructed in 1961) as well as Limestone reservoir downstream (constructed in 1978). It is also older than Aquilla reservoir, which was completed in 1982 within the Blackland Prairie Ecosystem area. All four reservoirs lose volume annually to sedimentation by erosion within their watersheds. Although the loss of Fort Parker Reservoir capacity is unknown at this time, dredging operations initiated by the town of Groesbeck in 1994 were begun to remove 930 acre-feet of deposited silt in and adjacent to the Navasota River channel within the reservoir. Those efforts were abandoned in 2002 with little success. Studies of the other three reservoirs have also shown significant losses in volume since impoundment. For example, according to recent Texas Water Development Board surveys, Mexia looses 22 acre-feet of reservoir volume annually while Limestone has lost an estimated 9,652 acre-feet since impoundment. The rate of loss within Aquilla could be as much as 218 acre-feet of volume annually. This relatively rapid loss of habitat is the single most important issue facing these reservoirs. Due to Fort Parker Reservoir's age and small size relative to its watershed, its loss of volume (and habitat for fishes) is much more obvious. Currently, the upper two-thirds of the reservoir are too shallow to access by boat, and fisheries management activities have been restricted to 250 acres of reservoir for over a decade. This provides a glimpse into what the future might hold for Mexia, Limestone and Aquilla reservoirs. Without action in the next couple of decades, it is likely that impacts to the fishery due to sedimentation in these four reservoirs will only become more severe.

Summary

Although Inland Fisheries Management staff can identify symptoms of larger, watershed-wide issues with the limnological, habitat and fisheries data we collect, we are not equipped logistically or financially to remedy problems on this scale. The objective of this appendix is to describe the status of Fort Parker Reservoir and its fishery, to provide the information to the Habitat Branch of the Inland Fisheries Division for their review and consideration, and to request their expertise in securing grant funding from organizations such as the Southeastern Aquatic Resources partnership (SARP) and Reservoir Fisheries Habitat Partnership (RFHP) to promote best management practices or other work to reduce or reverse the effects of erosion and sedimentation within this watershed.