

PERFORMANCE REPORT

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FEDERAL AID IN SPORT FISH RESTORATION ACT

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FEDERAL AID PROJECT F-221-M-2

INLAND FISHERIES DIVISION MONITORING AND MANAGEMENT PROGRAM

2016 Fisheries Management Survey Report

Tradinghouse Creek Reservoir

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SURVEY AND MANAGEMENT SUMMARY

Fish populations in Tradinghouse Creek Reservoir were surveyed in 2016 using electrofishing and in 2017 using gill nets. Historical data are presented with the 2016-2017 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:** Tradinghouse Creek is a 2,012-acre reservoir located 15 miles east of Waco in McLennan County, Texas. The reservoir was constructed in 1968 by Texas Utilities Generating Company (Luminant) to serve as a cooling-reservoir for electrical power Generation; however, the power plant is no longer in use. Bank and boat access are good, yet handicap facilities are absent. Habitat features consisted mainly of natural shoreline and emergent aquatic vegetation.
- **Management History:** Important sport fish include Largemouth Bass, Channel Catfish, White Bass and crappies. During 2009 and 2010 we confirmed the complete loss of the Red Drum fishery, caused by the dismantling of the power plant and loss of artificially warm winter water temperatures. Red Drum stockings were then discontinued and Red Drum regulations were removed. The management plan from the 2012 survey report included annual monitoring of hydrilla and giant reed. Both were monitored through 2014, yet never required control efforts. Since 2013, management efforts have focused on posting appropriate invasive species signage at access points to try and prevent the spread of zebra mussels into the reservoir, and supporting the statewide PR campaign “Clean, Drain, and Dry”. Approximately 20 bamboo crappie condos were placed into the reservoir to complete a habitat improvement project during 2015. Recent management efforts include full aquatic vegetation and boater access surveys conducted during summer 2016.
- **Fish Community**
 - **Prey species:** Threadfin and Gizzard Shad were present in the reservoir in record/average numbers respectively, and about one-third of Gizzard Shad were available as prey to sport fish. Other forage species included Bluegill, Longear Sunfish and Redear Sunfish.
 - **Catfishes:** Channel Catfish catch rates were below the historical average for the species. Body condition was good and improved with increasing length. No other species of catfish were observed.
 - **White Bass:** White Bass catch rates were below the historical average for the species. Body condition was good for all length classes.
 - **Black Basses:** Largemouth Bass catch rates were well below the historical average. Body condition was generally good. Few individuals approached or exceeded the memorable (20 inches) size class.
 - **Crappies:** White and Black Crappie were not sampled with trap nets (i.e., the standard gear) during 2016, but were collected in low numbers during 2017 gill netting. Body condition was good for both species.
- **Management Strategies:** The sport fishes in Tradinghouse Creek Reservoir will continue to be managed with statewide regulations. We will continue to maintain invasive species signage at access points and inform the public about the negative impacts of invasive species. Access and vegetation surveys will be conducted in summer 2020, and electrofishing and gill net surveys will be conducted in 2020 and 2021.

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INTRODUCTION

This document is a summary of fisheries data collected from Tradinghouse Creek Reservoir in 2016-2017. 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 fishes was collected, this report deals primarily with major sport fishes and important prey species. Historical data are presented with the 2016-2017 data for comparison.

Reservoir Description

Tradinghouse Creek is a 2,012-acre reservoir located 15 miles east of Waco, McLennan County, Texas. The reservoir was constructed in 1968 by Texas Utilities Generating Company (TXU) to serve as a cooling-reservoir for electrical power generation; however, the power plant is no longer in use. Other water uses include recreation. The reservoir is eutrophic, with water transparencies typically ranging from 2 to 3 feet. Habitat at time of sampling consisted mainly of natural shoreline and emergent aquatic vegetation. (e.g., cattail *Typha sp.* and bulrush *Scirpus sp.*). There are currently no sources for water level data for Tradinghouse Creek Reservoir. Other descriptive characteristics for Tradinghouse Creek Reservoir are in Table 1.

Angler Access

Bank and boat access on Tradinghouse Creek Reservoir is good. Boat access consists of four ramps on the eastern side of the reservoir which are controlled by McLennan County. All four boat ramps were useable during the recent 2016/2017 surveys, and there are currently no access issues when the reservoir is full (see below section about boat ramp extensions). Shoreline access is excellent along the eastern one-third of the reservoir. Additional boat ramp characteristics are in Table 2.

Management History

Previous management strategies and actions: Management strategies and actions from the previous survey report (Tibbs and Baird 2012) included:

1. Monitor the reservoir for noxious vegetation (e.g., hydrilla and giant reed) annually through 2017 and work with the City of Waco to control these species with appropriate means.
Action: Noxious vegetation was monitored annually through 2011 and drought prevented access during 2012. Since neither hydrilla nor giant reed infestations posed a threat to access, and control efforts were unnecessary and unlikely, the noxious vegetation presence on Tradinghouse Creek Reservoir was reclassified as a tier III infestation, requiring monitoring every four years only. Current data are included in this report.
2. Discontinue Red Drum stockings unless there is a change in the power plant operations, submit a regulation change proposal to remove Red Drum regulations listed for the reservoir, and update the fish and reservoir species information for the reservoir on the TPWD website.
Action: Red Drum stockings were permanently discontinued in 2010 once it was clear the power plant would no longer produce electricity. A regulation change was adopted in 2013 to remove Red Drum regulations listed for the reservoir, and the fish and reservoir information is in the process of being updated on the TPWD website.
3. Discuss extension of existing boat ramps, construction of new ramps, and options to increase shoreline access with the controlling authority, including funding options like the Boating Access Grant, to increase accessibility.
Action: During communications with McLennan County in 2014, it was determined that boat ramp extensions would not improve access during low water due to the shallow nature of the reservoir shoreline. However, the Boating Access Grant application and process was shared with the County staff at that time, to upgrade parking lots and build new restrooms and boat docks. The County resurfaced and upgraded some of the ramps at that time and also submitted a grant application. Waco District staff reviewed

the grant application by the end of 2014 and made it a high priority for the district. Grant F274B to McLennan County, Tradinghouse Creek Reservoir Lake Boat Ramp local agreement, was reviewed and signed on June 7, 2016, and is a current and active grant. However, to date no work from this grant has been performed. It will expire on June 30th, 2018.

4. Cooperate with McLennan County to post invasive species signage at access points, provide technical support/informational materials for the City's "Clean, Drain and Dry" campaign, and educate business owners about invasive species through verbal and written means, so that they can in turn educate their customers. Keep track of existing and future inter-basin water transfers to facilitate potential invasive spp. Responses.

Action: Invasive species signage was posted at Tradinghouse Creek Reservoir access points during summer 2013. District biologists have made a speaking point about invasive species, how to prevent their spread, and potential effects on Tradinghouse Creek Reservoir while speaking to business owners and constituent groups such as the Central Texas Flyrodders, Legacy Outfitters and Brazos River Sportsman's Club over the past several years. Inter-basin transfer is a permanent section in all formal reports now, and is part of this report.

Harvest regulation history: Sportfish in Tradinghouse Creek Reservoir, with the exception of Red Drum, have always been managed with statewide regulations. The current harvest regulations are in Table 3.

Stocking history: Tradinghouse Creek Reservoir was last stocked with Florida Largemouth Bass in spring, 2017. The complete stocking history is in Table 4.

Vegetation/habitat management history: Hydrilla first appeared in Tradinghouse Creek Reservoir in 1996, and quickly spread to 182 acres of coverage by 1999. In April 2000, 450 triploid grass carp (approximately 2.5 fish/vegetated acre) were stocked into the reservoir to address the hydrilla issue. The county purchased these fish, but TXU sponsored the permit application and arranged the stocking. It was further recommended that mechanical harvesting at access points be implemented if lake access was impeded. Chemical treatment was not recommended. At the end of summer 2000, hydrilla coverage was at *trace* levels (probably due to a rise in lake elevation and turbidity caused by heavy rains in June of that year), making mechanical harvesting unnecessary. An additional 250 grass carp were stocked into the reservoir in May 2001 to aid in future control of hydrilla. Noxious vegetation surveys were conducted annually through 2011 and drought prevented access during 2012. Since hydrilla infestations didn't pose a threat to access, and control efforts were unnecessary and unlikely, hydrilla presence on Tradinghouse Creek Reservoir was reclassified as a tier III infestation in 2013. In mid-January, 2017, a local fishing guide spotted another noxious species of vegetation on the reservoir. Upon investigation, water hyacinth was confirmed near the main boat ramp in the south end of the reservoir, and manually removed. A follow-up visit on March 16th, 2017 recovered a half-dozen or so smaller water hyacinth plants within the same vicinity of the reservoir. Management strategies in this report deal with the future management of water hyacinth and other noxious vegetation species in the reservoir.

Water transfer: There are no interbasin transfers within Tradinghouse Creek Reservoir.

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METHODS

Surveys were conducted to achieve survey and sampling objectives in accordance with the objective-based sampling (OBS) plan for Tradinghouse Creek Reservoir (TPWD unpublished). Primary components of the OBS plan are listed in Table 5. All survey sites were randomly selected and all surveys were conducted according to the Fishery Assessment Procedures (TPWD, Inland Fisheries Division, unpublished manual revised 2015).

Electrofishing – Largemouth Bass, sunfishes, Gizzard Shad and Threadfin Shad were collected by daytime electrofishing (1 hour at 12, 5-min stations). The 2016 survey is the first daytime electrofishing survey completed on Tradinghouse Creek Reservoir. Catch per unit effort (CPUE) for electrofishing was recorded as the number of fish caught per hour (fish/h) of actual electrofishing.

Gill netting – Channel Catfish, White Bass and crappies were collected by gill netting (5 net nights at 5 stations). Catch per unit effort for gill netting was recorded as the number of fish caught per net night (fish/nn).

Genetics – Genetic analysis of Largemouth Bass was conducted according to the Fishery Assessment Procedures (TPWD, Inland Fisheries Division, unpublished manual revised 2015). Micro-satellite DNA analysis was used to determine genetic composition of individual fish from 2005 to present, and by electrophoresis for previous years.

Statistics – 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.

Habitat – The 2010 structural habitat and 2011 vegetation surveys were conducted according to Tibbs and Baird (2010). Vegetation surveys were conducted using an adaptation of the point method during 2016 (TPWD, Inland Fisheries Division, unpublished manual revised 2015). Points were randomly generated on the shoreline and averaged a minimum of one point per shoreline mile. Aquatic vegetation has always been found close to the shore in Tradinghouse Creek Reservoir, so stratifying the random points to exclude deep-water areas increased precision and resulted in better data.

Water level – There is currently no source for water level data for Tradinghouse Creek Reservoir.

RESULTS AND DISCUSSION

Habitat: Tradinghouse Creek Reservoir is a moderately turbid reservoir with a secchi range from two to three feet. The most recent habitat survey results can be found in Table 6. A full vegetation survey conducted during summer 2016 found dominant shoreline vegetation to be cattail (*Typha spp.*), American pondweed (*Potamogeton nodosus*) and common buttonbush (*Cephalanthus occidentalis*; Table 7).

Creel: The last creel survey was conducted on Tradinghouse Creek Reservoir during summer 2010 and results can be found in Tibbs and Baird (2012).

Prey species: Threadfin Shad and Gizzard Shad were collected by electrofishing at 156.0/h and 218.0/h respectively in 2016 (Figure 1; Appendices A and B). The Threadfin Shad catch rate was the highest on record while the Gizzard Shad catch rate was similar to the historical average. The index of vulnerability (IOV) for Gizzard Shad was poor as only 31% of the population was available to existing predators as forage. Other important forage species collected were Bluegill (83.0/h) and Redear Sunfish (50.0/h) (Figures 2 and 3; Appendices A and B). The Bluegill catch rate was less than the historical average,

whereas the Redear catch rate was similar to the historical average.

Catfishes: Channel Catfish were collected with gill nets at 4.0/nn in 2017, which is less than one-half the 2013 catch rate, and less than one-third the 2009 catch rate (Figure 4; Appendices A and B). Body condition remained excellent and improved with increasing length, similar to previous surveys.

White Bass: White Bass were collected with gill nets at 1.6/nn in 2017, well-below the historical average for the species (Figure 5; Appendices A and B). Similar to the Channel Catfish trend, the current White Bass catch rate is one-half the 2013 catch rate, and less than one-third the 2009 catch rate. Body condition was good.

Black basses: Largemouth Bass were collected by daytime electrofishing at 98.0/h in 2016, below average for the species (Figure 6; Appendices A and B). The OBS goal for this species (obtaining a CPUE-stock RSE of 25 or less) was reached. The current PSD (i.e., 56) is similar to that of the previous survey, and is in the middle of the accepted range for balanced populations (Figure 6). The percentage of legal-sized fish (PSD-14; i.e., 14 inches) has more than doubled from the previous survey, largely due to a reduction in smaller stock-size fish. Body condition was fair to good, and increased with increasing length. Largemouth Bass genetics in 2016 showed much-improved Florida Largemouth Bass influence (67%) over the previous survey (33%) (Table 8).

Spotted Bass were not targeted during the 2016 electrofishing survey, but are still included in Appendix B.

Crappies: White Crappie were collected with gill nets at 1.6/nn in 2017, similar to the historical average with this sampling gear (Figure 7; Appendices A and B).

Black Crappie were collected with gill nets at 1.2/nn in 2017, similar to the historical average with this sampling gear (Figure 8; Appendices A and B).

Fisheries management plan for Tradinghouse Creek Reservoir, Texas

Prepared – July 2017

ISSUE 1: McLennan County was awarded a Boat Ramp Grant in June 2016, but they haven't broken ground on the project yet. The grant terminates on June 30th, 2018.

MANAGEMENT STRATEGY

1. Continue to communicate with the county and facilitate where possible.

ISSUE 2: Tradinghouse Creek Reservoir is shallow and lacks woody fish habitat.

MANAGEMENT STRATEGIES

1. Work with partners to build and deploy new fish habitat structures into Tradinghouse Creek Reservoir.
2. Utilize side scan sonar to monitor artificial fish habitat structure condition as needed.
3. Update fish attractor map and coordinates on the TPWD website as needed.
4. Release a news article describing the location(s) and benefits of the fish attractors to the fishery.
5. Investigate the use of spawning structures to increase Channel Catfish recruitment.

ISSUE 3: Water hyacinth was confirmed in the cove between the two most southern boat ramps in early 2017.

MANAGEMENT STRATEGIES

1. Monitor the area of infestation in summer 2017, after cattail senescence in winter 2017 and again in spring 2018 and manually remove propagules if observed. Determine future monitoring efforts based on the presence or absence of propagules.
2. Coordinate with the aquatic vegetation and habitat enhancement staff and controlling authority to develop a treatment plan if necessary.

ISSUE 4: 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 McLennan County to maintain appropriate signage at access points around the reservoir.
2. Provide technical support and informational materials for the City of Waco's "Clean, Drain, Dry" initiative.

Objective Based Sampling Plan and Schedule 2017 - 2021

Sport fish, forage fish and other important fishes

Survey data suggest important sport fishes in Tradinghouse Creek Reservoir include Largemouth Bass, Channel Catfish, White Bass and White and Black Crappie. Important forage fishes include Gizzard Shad, Threadfin Shad, Bluegill and Redear Sunfish. The proposed sampling schedule (Table 9) lists electrofishing and gill netting surveys planned for the next four years.

Low-density fisheries

Flathead Catfish and Spotted Bass occur in very low abundance in Tradinghouse Creek Reservoir and are generally caught incidentally to other targeted species. We will continue collecting and reporting data for these species, and upgrade their status if appropriate.

Survey objectives, fisheries metrics, and sampling objectives

Fall Electrofishing: This survey will be used to evaluate Largemouth Bass, and primary forage species (Gizzard Shad, Threadfin Shad, Bluegill, Redear Sunfish and Longear Sunfish). Largemouth Bass were the most sought-after species by anglers in Tradinghouse Creek Reservoir during the 2010 spring creel survey, and the popularity of bass fishing here, including local tournaments, justifies sampling time and effort. Daytime electrofishing was initially compared to nighttime electrofishing on Tradinghouse Creek Reservoir in 2008 and a recommendation was made to transition to daytime sampling. The 2016 electrofishing survey marked the first standard daytime survey for the reservoir. All future surveys will also be daytime surveys. The goal of the 2020 Largemouth Bass survey will be general monitoring to characterize the Largemouth Bass population (CPUE, size structure, W_r , genetics) and compare to historical and future data. The number of sampling sites will be determined based on achieving a CPUE-stock RSE of 25 or less as well as collecting a total of 50 stock-length fish. A minimum of 12 randomly selected stations will be sampled. If the goals are not attained, and catch rates indicate that achieving the desired precision and collecting the proposed number of fish is reasonable, sampling will continue at pre-determined random stations until the target is reached.

The goals of the forage species survey will be general monitoring to characterize forage species populations (CPUE, size structure) and compare to historical and future data. No minimum level of precision is assigned to this effort and sampling will only continue for 12 randomly selected stations.

Spring Gill Netting: This survey will be used to evaluate Channel Catfish, White Bass, White Crappie and Black Crappie. The goal of the 2021 spring gill net survey will be general monitoring to characterize the catfish, temperate bass and crappie populations and compare to historical and future data. The number of sampling sites will be determined based on achieving a Channel Catfish CPUE-stock RSE of 25 or less and collecting a total of 50 stock-length Channel Catfish. A minimum of five randomly selected gill net stations will be sampled in spring, 2021. If the goal isn't attained, and catch rates indicate that achieving the desired precision and collecting the proposed number of fish is reasonable, sampling will continue at pre-determined random stations until the target is reached. No minimum level of precision is assigned to White Bass and crappie sampling efforts.

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Table 1. Characteristics of Tradinghouse Creek Reservoir, Texas 2016 - 2017.

Characteristic	Description
Year Constructed	1965
Controlling authority	Luminant
County	McLennan
Reservoir type	Tributary of the Brazos River
Shoreline Development Index (SDI)	5.0
Conductivity	325 umhos/cm

Table 2. Boat ramp characteristics for Tradinghouse Creek Reservoir, Texas, 2016 - 2017. There is currently no source for water level data for Tradinghouse Creek Reservoir; elevations at the ends of boat ramps are unavailable.

Boat ramp	Latitude Longitude (dd)	Trailer Parking capacity (N)	Elevation at end of boat ramp	Condition
Number 1	31.5499/-96.9637	10	N/A	Short, steep
Number 2	31.5509/-96.9619	16	N/A	Fair, shallow
Number 3	31.5554/-96.9415	8	N/A	Fair, shallow
Number 4	31.5746/-96.9335	12	N/A	Fair, shallow

Table 3. Harvest regulations for Tradinghouse Creek Reservoir, 2016 - 2017.

Species	Bag Limit	Length limit (inches)
Catfish: Channel, Blue, their hybrids and subspecies	25 (in any combination)	12-inch minimum
Catfish, Flathead	5	18-inch minimum
Bass, White	25	10-inch minimum
Bass, Largemouth	5 ^a	14-inch minimum
Bass, Spotted	5 ^a	None
Crappie: White, Black, their hybrids and subspecies	25 (in any combination)	10-inch minimum

^a Daily bag for Largemouth Bass and Spotted Bass, = 5 fish in any combination.

Table 4. Stocking history for Tradinghouse Creek Reservoir, 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)
Black x White Crappie	1995	101,848	FRY	0.9
	1996	201,132	FRY	0.9
	Total	302,980		
Blue Catfish	1986	21,122	FGL	2.0
	Total	21,122		
Channel Catfish	1968	10,600	AFGL	7.9
	Total	10,600		
Florida Largemouth Bass	1985	59,294	FGL	2.0
	1985	98,338	FRY	1.0
	1986	100,566	FRY	1.0
	2017	100,214	FGL	40.4
	Total	358,412		
Largemouth Bass	1969	100,000	UNK	0.0
	Total	100,000		
Peacock Bass	1982	1,600		0.0
	Total	1,600		
Red Drum	1975	53,161	UNK	0.0
	1981	200,000	UNK	0.0
	1983	198,500	UNK	0.0
	1984	153,783	FRY	1.0
	1985	408,532	FRY	1.0
	1986	671	ADL	15.0
	1986	245,800	FRY	1.0
	1987	768,810	FRY	1.0
	1989	8,000	FGL	1.2
	1990	69	ADL	11.0
	1990	9,500	FGL	1.1
	1991	224,000	FGL	1.7
	1991	114,066	FRY	1.0
	1991	75,136	UNK	0.0
	1992	90	ADL	13.1
	1992	77,010	FGL	1.8
1992	125,466	FRY	1.0	
1993	206,434	FGL	1.2	

Table 4. Stocking history continued.

Species	Year	Number	Life Stage	Mean TL (in)
	1994	184,000	FGL	1.4
	1995	217,188	FRY	1.0
	1996	197,399	FGL	1.3
	1997	202,378	FGL	1.1
	1999	268,643	FGL	1.1
	2000	251,815	FGL	1.1
	2001	290,905	FGL	1.1
	2002	4,158	ADL	11.3
	2002	175,964	FGL	1.3
	2003	344,657	FGL	1.3
	2004	370,011	FGL	1.5
	2005	345,238	FGL	1.5
	2006	750	ADL	10.0
	2006	145,847	FGL	1.5
	2007	391,145	FGL	1.4
	2008	358,080	FGL	1.3
	2009	376,104	FGL	1.4
	2010	203,661	FGL	1.3
	Total	7,196,971		
Striped Bass	1980	240,700	UNK	0.0
	Total	240,700		
White Crappie	1992	2,224	FGL	1.4
	1992	10,494	FRY	0.7
	Total	12,718		

Table 5. Objective-based sampling plan components for Tradinghouse Creek Reservoir, Texas 2016 – 2017.

Gear/target species	Survey objective	Metrics	Sampling objective
<u>Electrofishing</u>			
Largemouth Bass	General monitoring	CPUE, size structure, Wr	RSE – Stock < 25
	Genetics	% FLMB	N = 30, any age
Bluegill ^a	General monitoring	CPUE, size structure	None
Redear Sunfish	General monitoring	CPUE, size structure	None
Longear Sunfish	General monitoring	CPUE, size structure	None
Gizzard Shad	General monitoring	CPUE, size structure	None
<u>Gill netting</u>			
Channel Catfish	General monitoring	CPUE, size structure, Wr	None
White Bass	General monitoring	CPUE, size structure, Wr	None
Crappie spp.	General monitoring	CPUE, size structure, Wr	None

Table 6. Survey of structural habitat types, Tradinghouse Creek Reservoir, Texas, 2010. Survey was conducted using 2010 NAIP, 1-meter resolution satellite imagery. Shoreline habitat type units are in miles. Eleven (11) boat docks and piers were observed during the survey.

Habitat Type	Estimate	% of Total
Gravel shoreline	1.88	9.7
Boulder/riprap shoreline	2.29	11.8
Natural shoreline	14.94	77.2

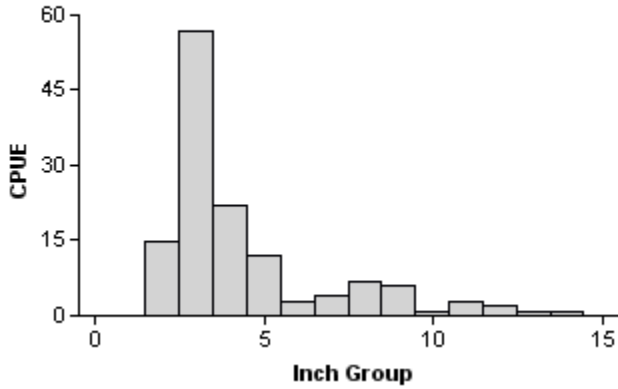
Table 7. Survey of aquatic vegetation, Tradinghouse Creek Reservoir, Texas, 2011 and 2016. Percent of total reservoir surface area is listed for 2011, while percent of randomly-selected points where species occurred, is listed for 2016. Although no gauging station exists near Tradinghouse Creek Reservoir, water level was near full pool during the surveys. Tier III is watch status.

Vegetation	2011	2016
Native submersed		
American pondweed (<i>Potamogeton nodosus</i>)		76% (19 of 25)
Southern naiad (<i>Najas guadalupensis</i>)		12% (3 of 25)
Muskgrass (<i>Chara spp.</i>)		4% (1 of 25)
Coontail (<i>Ceratophyllum demersum</i>)		8% (2 of 25)
Native floating-leaved		
American lotus (<i>Nelumbo lutea</i>)		8% (2 of 25)
White water lily (<i>Nymphaea odorata</i>)		4% (1 of 25)
Native emergent		
Bulrush (<i>Scirpus spp.</i>)		52% (13 of 25)
Common buttonbush (<i>Cephalanthus occidentalis</i>)		8% (2 of 25)
Cattail (<i>Typha spp.</i>)		80% (20 of 25)
Non-native		
Hydrilla (<i>Hydrilla verticillata</i>) (Tier III)	3.8 (0.2)	4% (1 of 25)
Giant reed (<i>Arundo donax</i>) (Tier III)	0.6 (.03)	4% (1 of 25)

Gizzard Shad

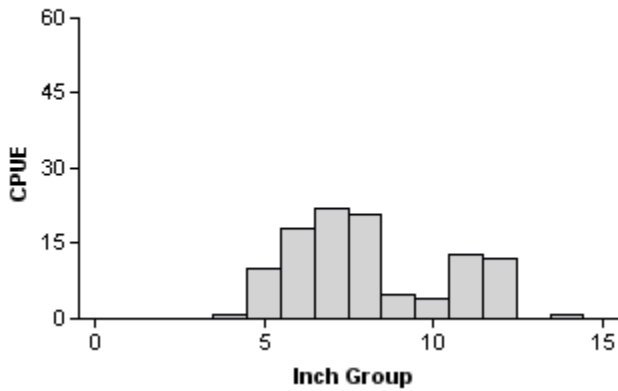
2008

Effort = 1.0
 Total CPUE = 134.0(28;134)
 Stock CPUE = 25.0 (20; 25)
 IOV = 84 (5)



2012

Effort = 1.0
 Total CPUE = 107.0(18;107)
 Stock CPUE = 78.0 (20; 78)
 IOV = 48 (10)



2016

Effort = 1.0
 Total CPUE = 218.0(17;218)
 Stock CPUE = 166.0(15;166)
 IOV = 31 (9)

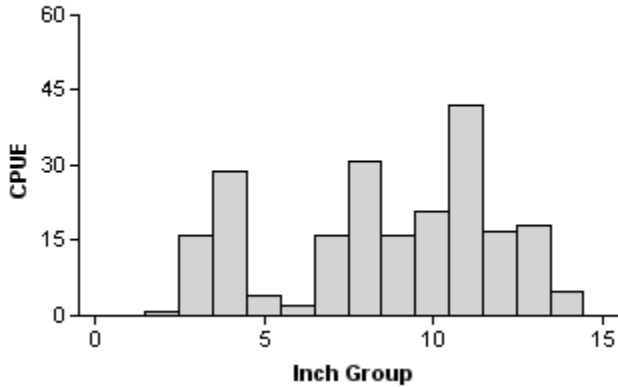
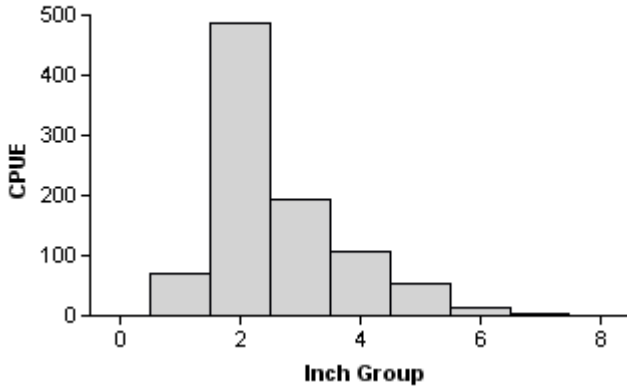


Figure 1. Number of Gizzard Shad caught per hour (CPUE) and population indices (RSE and N for CPUE and SE for IOV are in parentheses) for fall electrofishing surveys, Tradinghouse Creek Reservoir, Texas, 2008, 2012 and 2016 (daytime).

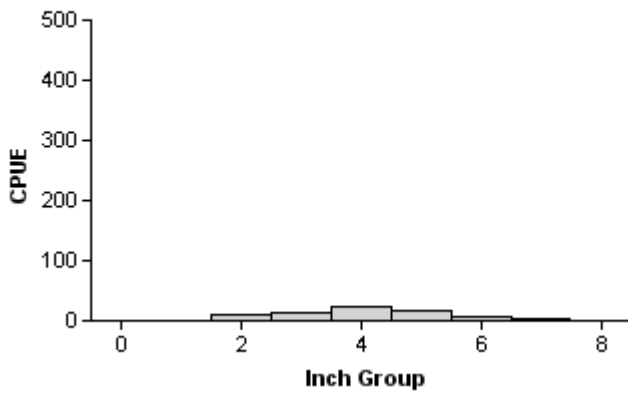
Bluegill

2008



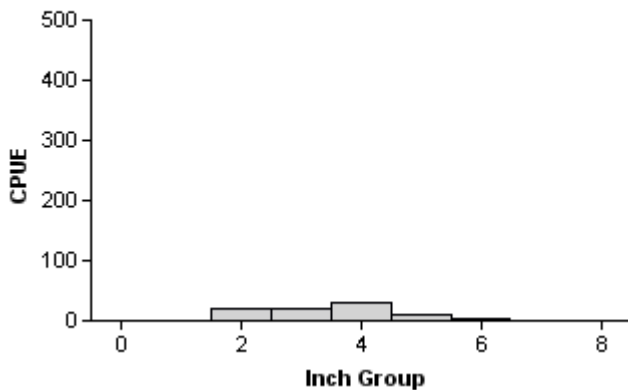
Effort = 1.0
 Total CPUE = 927.0(21;927)
 Stock CPUE = 370.0(24;370)
 PSD = 4 (1)

2012



Effort = 1.0
 Total CPUE = 73.0 (25;73)
 Stock CPUE = 62.0 (31;62)
 PSD = 16 (8)

2016



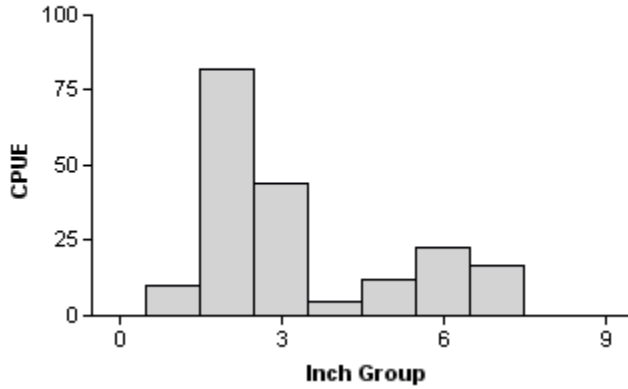
Effort = 1.0
 Total CPUE = 83.0 (25;83)
 Stock CPUE = 63.0 (29;63)
 PSD = 5 (4)

Figure 2. Number of Bluegill caught per hour (CPUE) and population indices (RSE and N for CPUE and SE for size structure are in parenthesis) for fall electrofishing surveys, Tradinghouse Creek Reservoir, Texas, 2008, 2012 and 2016 (daytime).

Redear Sunfish

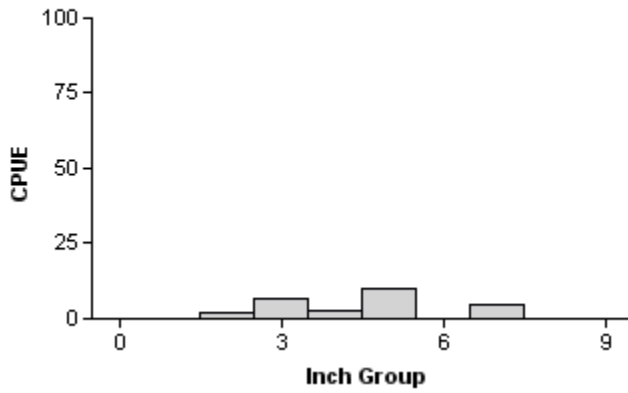
2008

Effort = 1.0
 Total CPUE = 193.0(12;193)
 Stock CPUE = 57.0 (23; 57)
 PSD = 30 (7)



2012

Effort = 1.0
 Total CPUE = 27.0 (37;27)
 Stock CPUE = 18.0 (37;18)
 PSD = 28 (15)



2016

Effort = 1.0
 Total CPUE = 50.0 (20;50)
 Stock CPUE = 48.0 (20;48)
 PSD = 33 (7)

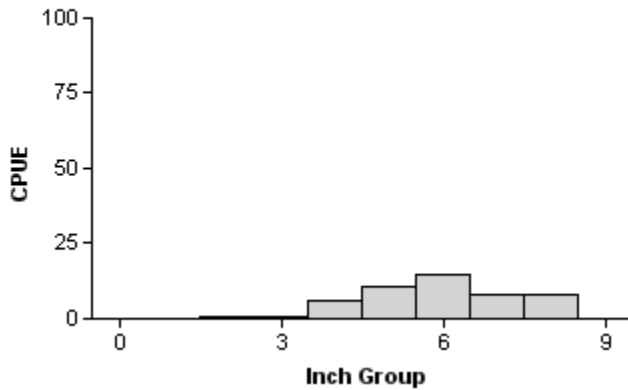
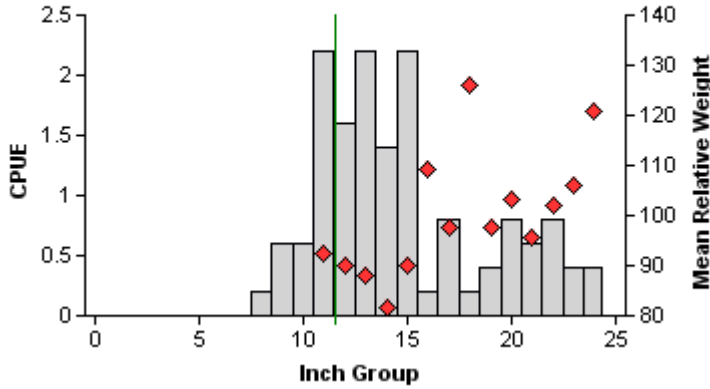


Figure 3. Number of Redear Sunfish caught per hour (CPUE) and population indices (RSE and N for CPUE and SE for size structure are in parenthesis) for fall electrofishing surveys, Tradinghouse Creek Reservoir, Texas, 2008, 2012 and 2016 (daytime).

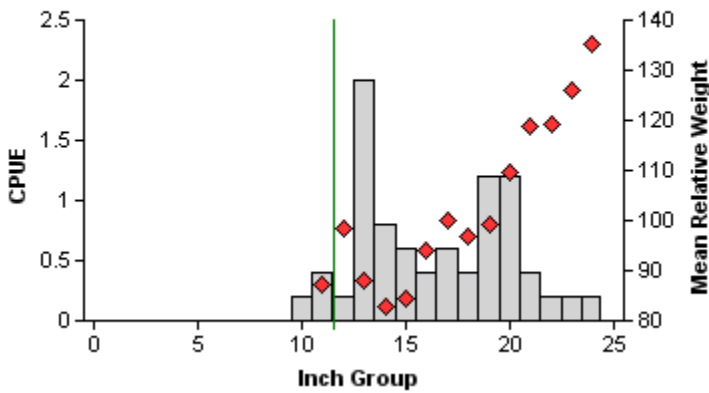
Channel Catfish

2009



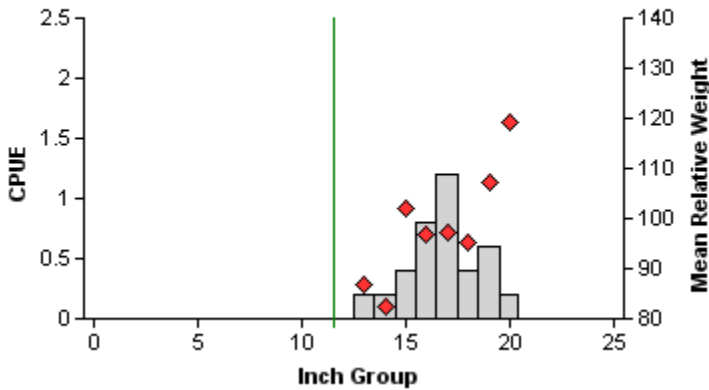
Effort = 5.0
 Total CPUE = 15.6 (36; 78)
 Stock CPUE = 14.2 (33; 71)
 PSD = 32 (17)
 PSD-12 = 85 (8)

2013



Effort = 5.0
 Total CPUE = 9.0 (19; 45)
 Stock CPUE = 8.8 (18; 44)
 PSD = 55 (7)
 PSD-12 = 95 (2)

2017



Effort = 5.0
 Total CPUE = 4.0 (22; 20)
 Stock CPUE = 4.0 (22; 20)
 PSD = 80 (7)
 PSD-12 = 100 (0)

Figure 4. Number of Channel Catfish caught per net night (CPUE), mean relative weight (diamonds), and population indices (RSE and N for CPUE and SE for size structure are in parentheses) for spring gill net surveys, Tradinghouse Creek Reservoir, Texas, 2009, 2013 and 2017. Vertical line indicates minimum length limit.

White Bass

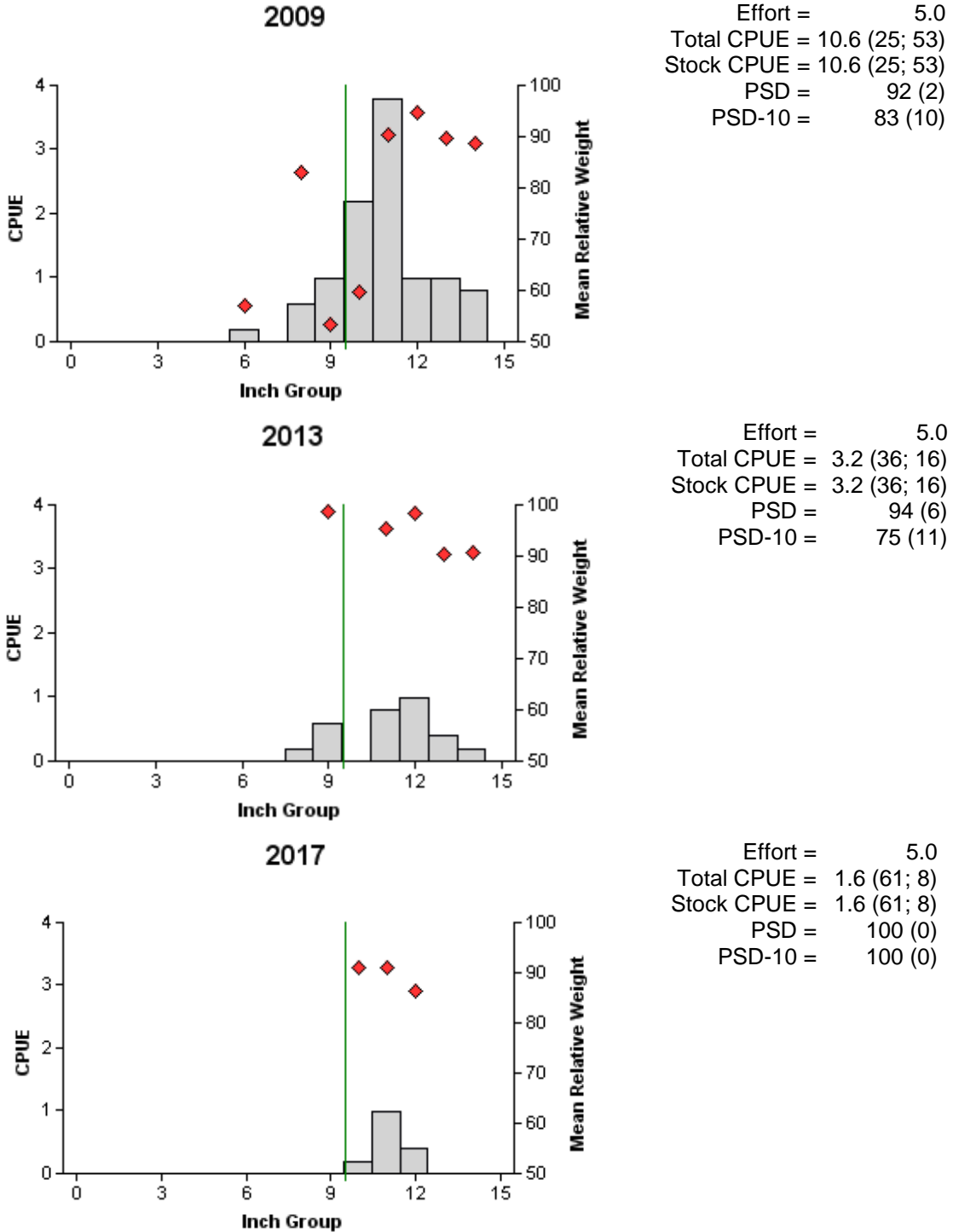


Figure 5. Number of White Bass caught per net night (CPUE), mean relative weight (diamonds), and population indices (RSE and N for CPUE and SE for size structure are in parentheses) for spring gill net surveys, Tradinghouse Creek Reservoir, Texas, 2009, 2013 and 2017. Vertical line indicates minimum length limit.

Largemouth Bass

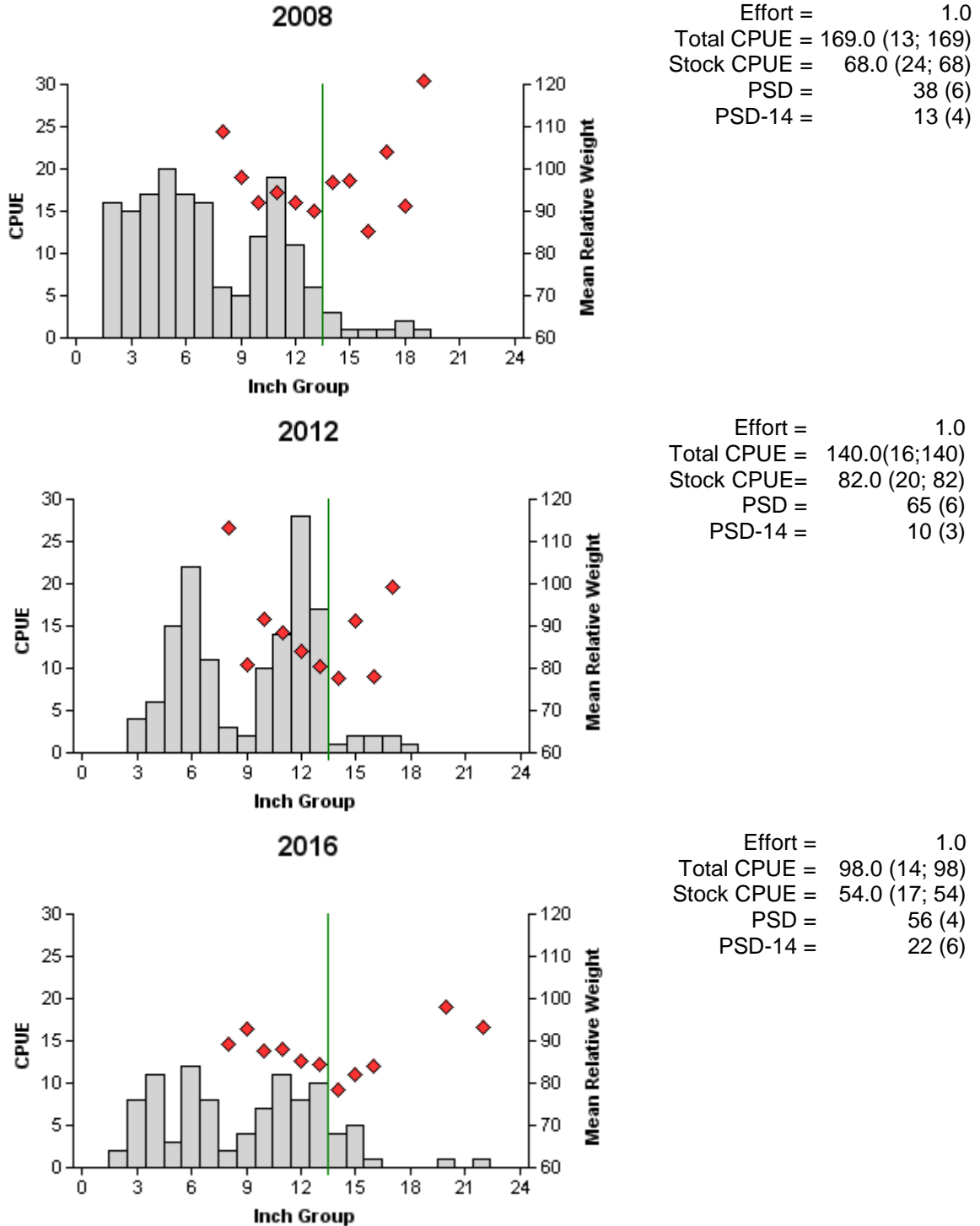


Figure 6. Number of Largemouth Bass caught per hour (CPUE), mean relative weight (diamonds), and population indices (RSE and N for CPUE and SE for size structure are in parentheses) for fall electrofishing surveys, Tradinghouse Creek Reservoir, Texas, 2008, 2012 and 2016 (daytime). Vertical line indicates minimum length limit.

Table 8. Results of genetic analysis of Largemouth Bass collected by fall electrofishing, Tradinghouse Creek Reservoir, Texas, 2008 and 2016. FLMB = Florida Largemouth Bass, NLMB = Northern Largemouth Bass, Intergrade = hybrid between a FLMB and a NLMB. Genetic composition was determined with micro-satellite DNA analysis.

Year	Sample size	Number of fish			% FLMB alleles	% FLMB
		FLMB	Hybrid	NLMB		
2008	15	0	13	2	33	0
2016	30	0	30	0	67	0

White Crappie

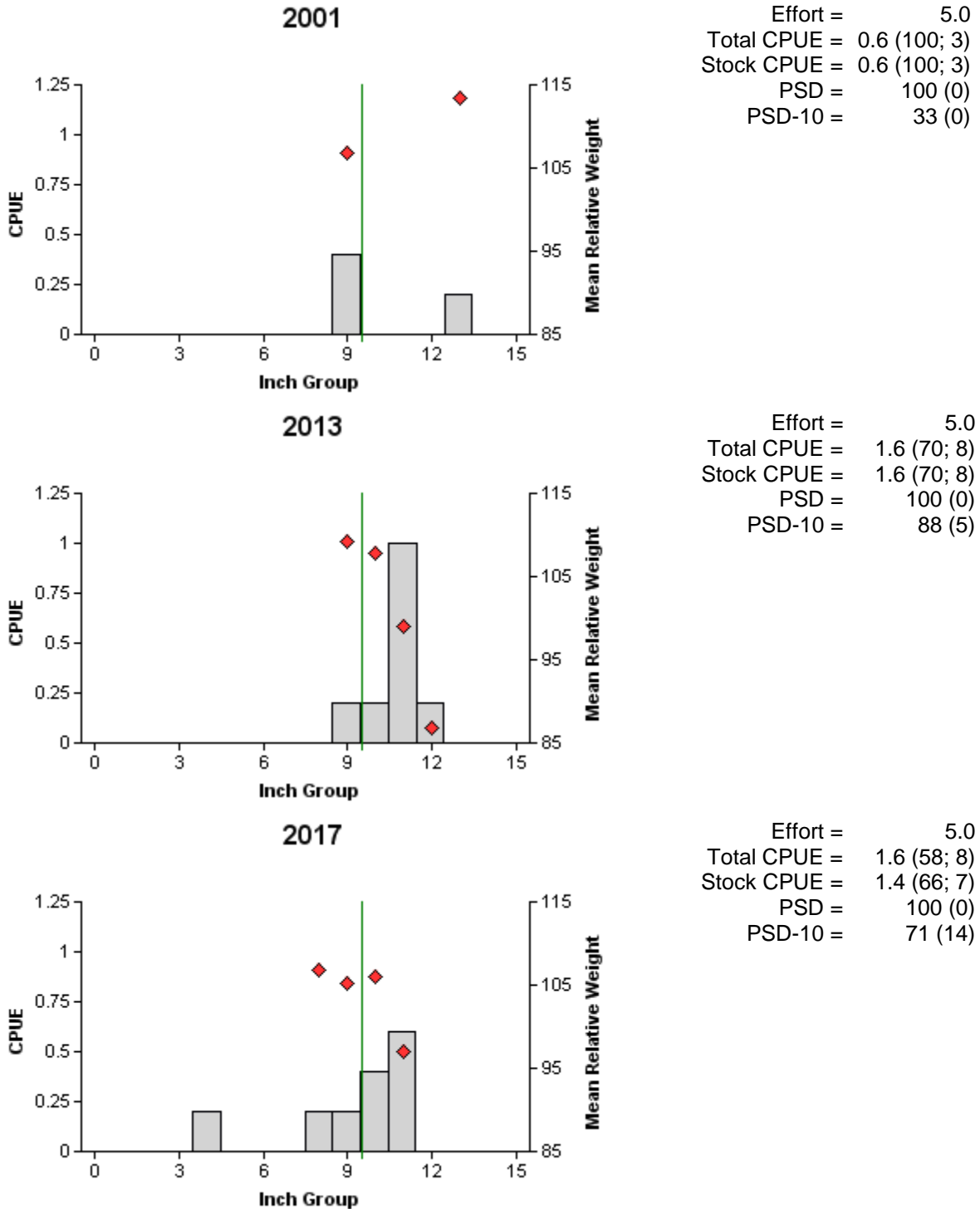
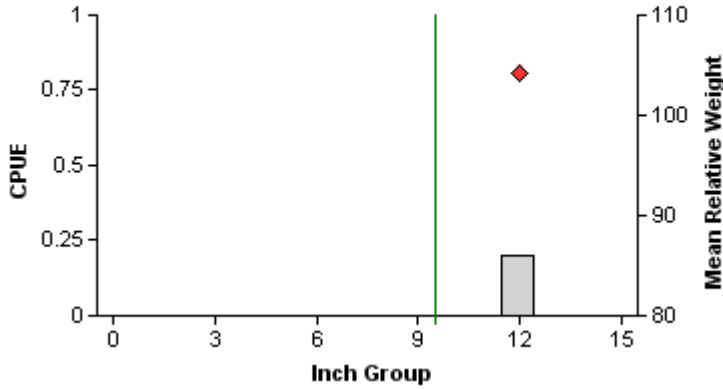


Figure 7. Number of White Crappie caught per net night (CPUE), mean relative weight (diamonds), and population indices (RSE and N for CPUE and SE for size structure are in parentheses) for spring gill net surveys, Tradinghouse Creek Reservoir, Texas, 2001, 2013 and 2017. Vertical line indicates minimum length limit.

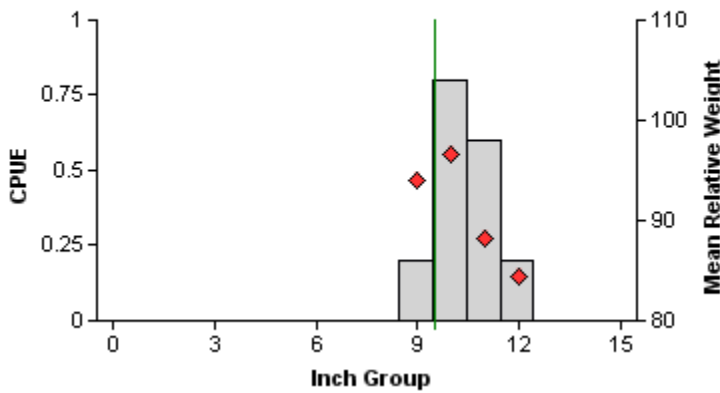
Black Crappie

2001



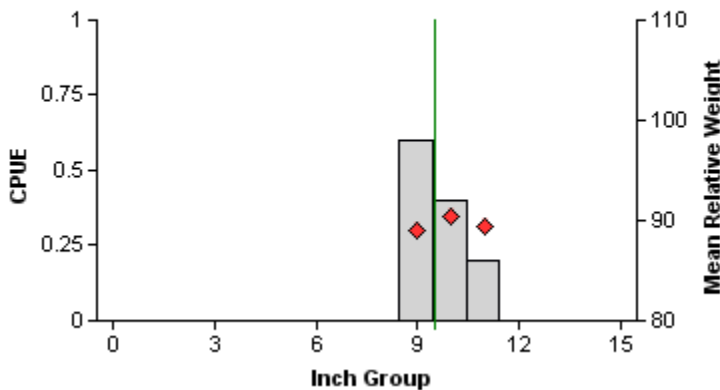
Effort = 5.0
 Total CPUE = 0.2 (100; 1)
 Stock CPUE = 0.2 (100; 1)
 PSD-10 = 100 (0)

2013



Effort = 5.0
 Total CPUE = 1.8 (41; 9)
 Stock CPUE = 1.8 (41; 9)
 PSD-10 = 89 (8)

2017



Effort = 5.0
 Total CPUE = 1.2 (81; 6)
 Stock CPUE = 1.2 (81; 6)
 PSD-10 = 50 (13)

Figure 8. Number of Black Crappie caught per net night (CPUE), mean relative weight (diamonds), and population indices (RSE and N for CPUE and SE for size structure are in parentheses) for spring gill net surveys, Tradinghouse Creek Reservoir, Texas, 2001, 2013 and 2017. Vertical line indicates minimum length limit.

Table 9. Proposed sampling schedule for Tradinghouse Creek 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 and winter. Standard survey denoted by S and additional survey denoted by A.

Survey year	Electrofishing Fall	Trap net	Gill net	Habitat			Creel survey	Report
				Structural	Vegetation	Access		
2017-2018					A			
2018-2019								
2019-2020								
2020-2021	S		S		S	S		S

APPENDIX A

Number (N), relative standard error (RSE) and catch rate (CPUE) of all target species collected from all gear types from Tradinghouse Creek Reservoir, Texas, 2016-2017. Asterisks represent data collection with a non-standard gear.

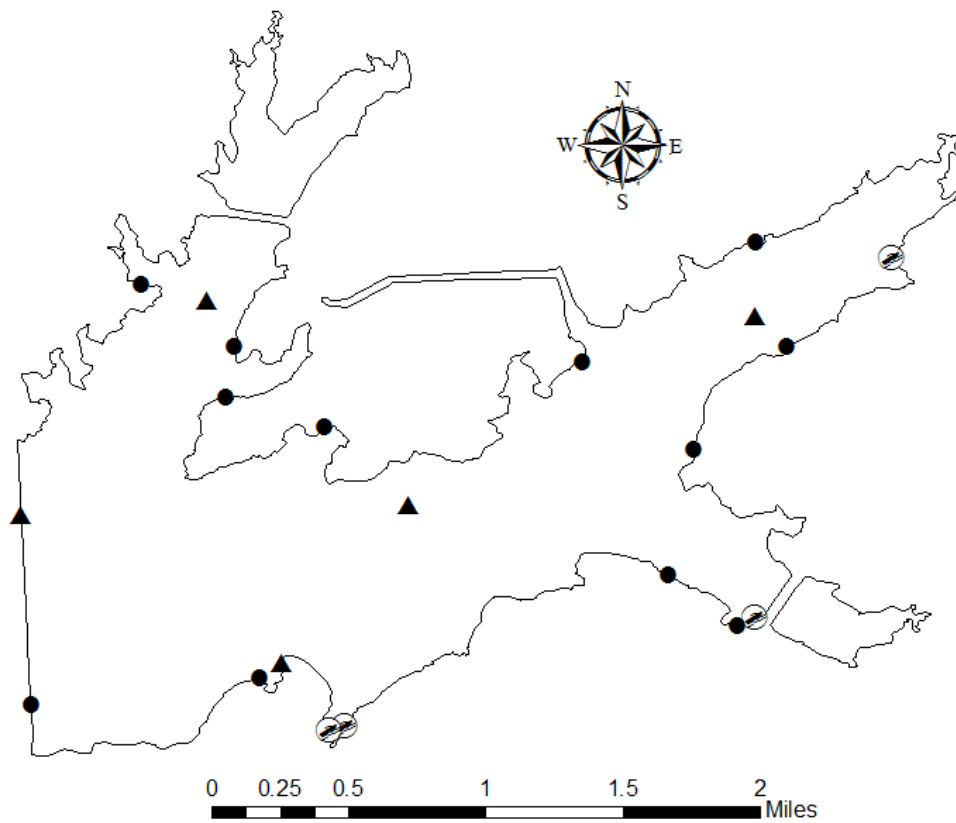
Species	Gill Netting		Electrofishing	
	N/RSE	CPUE	N/RSE	CPUE
Gizzard Shad			218/17	218.0
Threadfin Shad			156/52	156.0
Channel Catfish	20/22	4.0		
White Bass	8/61	1.6		
Bluegill			83/25	83.0
Longear Sunfish			15/86	15.0
Redear Sunfish			50/20	50.0
Largemouth Bass			98/14	98.0
White Crappie	*8/58	*1.6		
Black Crappie	*6/81	*1.2		

APPENDIX B

Catch rates (CPUE) of targeted species by gear type for standard surveys on Tradinghouse Creek Reservoir, Texas, 2000 to present. Electrofishing stations were shocked with a 5.0 Smith-Root GPP (Gas Powered Pulsator) until 2010, then a 7.5 Smith-Root GPP was used. Objective based sampling began in 2015. Species averages are in bold. Dashes represent no data collection; asterisks represent data collection with a non-standard gear, or a survey performed outside the normal time period for a gear.

Gear	Species	2000	2001	2002	2003	2004	2005	2008	2009	2012	2013	2016	2017	Avg.
Electrofisher	Largemouth Bass	227		117	177	289		169		140		98.0		174.0
	Spotted Bass	0		0	0	0		0		2		0		0.3
	Gizzard Shad	441		80	441	183		134		107		218.0		229.0
	Threadfin Shad	3		5	8	7		52		144		156.0		54.0
	Bluegill Sunfish	528		421	292	176		927		73		83.0		357.0
	Redear Sunfish	37		20	39	5		193		27		50.0		53.0
	Longear Sunfish	41		65	60	57		80		8		15.0		47.0
	Green Sunfish	0		4	0	0		3		0		0		1.0
Warmouth	0		0	0	0		3		0		0		0.4	
Gill nets	Channel Catfish	3	4.8		7		3		15.6		9		4.0	6.6
	White Bass	0.9	1		2.2		9.8		10.6		3.2		1.6	4.2
	White Crappie	-	*0.6	-	-	-	-	-	-	-	*1.6	-	*1.6	*1.3
	Black Crappie	-	*0.2	-	-	-	-	-	-	-	*1.8	-	*1.2	*1.1
Trap nets	White Crappie	1.8		0.2	0.6	0.2				0.8		-		0.7
	Black Crappie	9.8		0	0	0.1				0		-		2.0

APPENDIX C



Location of electrofishing (circles) and gill netting (triangles) sites, Tradinghouse Creek Reservoir, Texas, 2016 and 2017. Boat ramps are also marked.