Arlington Reservoir

2018 Fisheries Management Survey Report

PERFORMANCE REPORT

As Required by

FEDERAL AID IN SPORT FISH RESTORATION ACT

TEXAS

FEDERAL AID PROJECT F-221-M-3

INLAND FISHERIES DIVISION MONITORING AND MANAGEMENT PROGRAM

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Survey and Management Summary

Fish populations in Arlington Reservoir were surveyed in 2018 using electro fishing and trap nets and in 2019 using gill nets and hoop nets. This report summarizes the results of the surveys and contains a management plan for the reservoir based on those findings.

Reservoir Description: Arlington Reservoir is a 1,939-acre impoundment constructed on Village Creek (a tributary of West Fork Trinity River) by the City of Arlington in 1957 to provide flood control, water for municipal and industrial purposes, and recreation. Arlington Reservoir is surrounded by urban development and is almost directly in the center of the Dallas-Fort Worth metroplex. It is approximately 3.8 miles long, 1.6 miles wide (widest point), and has a 20-mile shoreline at 550 feet above mean-sea-level. In addition to run-off from the 143 square-mile watershed, an average of 30,426 acre-feet of water, purchased annually from the Tarrant Regional Water District (TRWD), is pumped from Cedar Creek and Richland-Chambers Reservoirs. Exelon operates a natural gas power plant on the reservoir, discharging hot water on the west side of the reservoir. It is classified as Eutrophic by the Texas Commission of Environmental Quality (TCEQ) (Texas Commission on Environmental Quality 2018). Angler and boat access were adequate. There are three handicap specific facilities and three boat ramps. Most bank access is at the parks associated with the boat ramps. Fishery habitat is primarily native emergent vegetation in the form of American Water-Willow (*Justicia Americana*) and Button Bush (*Cephalanthus occidentalis*) along with riprap and rocky shorelines.

Management History: Important sport fishes include Largemouth Bass, White Crappie, White Bass, and Channel Catfish. All species have been managed with statewide regulations.

Fish Community

- **Prey species:** Gizzard and Threadfin Shad were present in the reservoir. Catch rates of these species were lower than in previous samples but these species are of high enough abundance to support predators in the reservoir.
- **Catfishes:** Catch rate of Channel Catfish remained high with quality fish available for anglers. Flathead catfish are present but none were captured during the most recent survey.
- **White bass:** White Bass catch rates remained low. This could be the result of spawning activity during sampling or competitive interaction with yellow bass.
- **Largemouth Bass:** The Largemouth Bass catch rates increased from previous survey. The population had good size structure and fish were in good condition.
- **White Crappie:** White Crappie catch rates were higher than the previous survey. The catch rate of White Crappie ≥10 inches also increased.

Management Strategies: An additional electro fishing survey will be conducted in fall 2020. Additional hoop netting will be conducted annually from 2020 thru 2022. Hoop netting will be conducted to experiment with the gear to improve catch statistics. General monitoring with trap netting, hoop netting, and electro fishing will occur in 2022-2023.

Introduction

This document is a summary of fisheries data collected from Arlington Reservoir in 2015-2019. 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 2015-2019 data for comparison.

Reservoir Description

Arlington Reservoir is a 1,939-acre impoundment constructed on Village Creek (a tributary of West Fork Trinity River) by the City of Arlington in 1957 to provide flood control, water for municipal and industrial purposes, and recreation. Arlington Reservoir is surrounded by urban development and is almost directly in the center of the Dallas-Fort Worth metroplex. It is approximately 3.8 miles long, 1.6 miles wide (widest point), and has a 20-mile shoreline at 550 feet above mean-sea-level. In addition to run-off from the 143 square-mile watershed, an average of 30,426 acre-feet of water, purchased annually from the Tarrant Regional Water District (TRWD), is pumped from Cedar Creek and Richland-Chambers Reservoirs. Exelon operates a natural gas power plant on the reservoir, discharging hot water on the west side of the reservoir. It is classified as Eutrophic by the Texas Commission of Environmental Quality (TCEQ) (Texas Commission on Environmental Quality 2018). Fishery habitat is primarily native emergent vegetation in the form of American Water-Willow (*Justicia Americana*) and Button Bush (*Cephalanthus occidentalis*) along with riprap and rocky shore lines. Fish habitat can be limited by water level fluctuations (Figure 1). Other descriptive characteristics for Arlington Reservoir are in Table 1.

Angler Access

Angler and boat access on Arlington Reservoir were adequate. There are three handicap specific facilities and three boat ramps. Additional boat ramp characteristics are in Table 2. Shoreline access for bank anglers is limited to three parks that are associated with boat ramps that are around the reservoir.

Management History

Previous management strategies and actions: Management strategies and actions from the previous survey report (Brock and Hungerford 2015) included:

1. Adequate fish habitat is limited in Arlington Reservoir during periods of low water levels. The City of Arlington is willing to help improve the fish populations in the reservoir. The addition of offshore habitat could be beneficial to sport fish during periods of low water

   Action: Bamboo brush structures were deployed at three different locations in the Reservoir. A large habitat project supported by Conservation License Plate grant money was recently developed.

2. Cooperate with and contact the City of Arlington and the boating and fishing public about invasive species.

   Action: Any additional information regarding Zebra Mussels in Texas was shared with controlling authority**.** Water samples were also taken from the Reservoir and was monitored for the presence of zebra mussels.

3. Largemouth Bass are the most sought after species in Arlington Reservoir. The current lake record is 13.8 lbs. The last stocking for FLMB occurred in 2002.

   Action: A total of 196,197 and 197,880 Florida Largemouth Bass were requested and stocked in 2016 and 2017 respectively.

Harvest regulation history: Sport fish populations in Arlington Reservoir have been managed with statewide regulations (Table 3).

Stocking history: Arlington Reservoir was stocked in 2017 with Florida Largemouth Bass. The complete stocking history is in Table 4.

Vegetation/habitat management history: The last habitat survey was conducted in 2010 (Brock and Hungerford 2011). During sampling, littoral zone habitat consisted primarily of native emergent vegetation (water willow and button bush). along with riprap and rocky shore lines.

Zebra mussels: The exotic species Zebra Mussels has been found in several DFW area reservoirs. No adult zebra mussels or larva have been found in Arlington Reservoir. It has not tested positive for Zebra Mussel DNA as determined by PCR analysis.

Water transfer: In addition to run-off from the 143 square-mile watershed, an average of 30,426 acre-feet of water, purchased annually from the Tarrant Regional Water District (TRWD), is pumped from Cedar Creek and Richland-Chambers Reservoirs. Water transferred from Cedar Creek and Richland Chambers Reservoirs enters Arlington Reservoir via Village.

Methods

Surveys were conducted to achieve survey and sampling objectives in accordance with the objective-based sampling (OBS) plan for Arlington 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).

Electro fishing – Largemouth Bass, sunfishes, Gizzard Shad, and Threadfin Shad were collected by electro fishing (1.0 hour at 12, 5-min stations). Catch per unit effort (CPUE) for electro fishing was recorded as the number of fish caught per hour (fish/h) of actual electro fishing.

Trap netting – Crappie were collected using trap nets (5 net nights at 5 stations). Catch per unit of effort for trap netting was recorded as the number of fish caught per net night (fish/nn).

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

Hoop netting – Channel Catfish were collected by hoop netting (6 net nights at 6 stations). CPUE for hoop 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 through 2012 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 and creel statistics.

Habitat – A structural habitat survey was last conducted in 2010.

Water level – Source for water level data was the United States Geological Survey (USGS 2018).

Results and Discussion

Habitat: The last habitat survey was conducted in 2010 (Brock and Hungerford 2011)**.** Fishery habitat at time of sampling was primarily native emergent vegetation in the form of American Water-Willow (*Justicia Americana*) and Button Bush (*Cephalanthus occidentalis*) along with riprap and rocky shore lines**.**

Prey species: The 2018 electro fishing catch rate of Threadfin Shad (74.0/hr) was much lower than the previous sample (Appendix A and C). The Gizzard Shad electro fishing catch rate in 2018 (165.0/hr) was also lower than the previous sample (Figure 2). Index of vulnerability for Gizzard Shad (70) was higher when compared to the previous sample. This indicated that 70% of Gizzard Shad captured in 2018 were available as forage. The electro fishing catch rate of Bluegill in 2018 (344.0/hr) was much higher than the previous sample and higher than reservoir average (Figure 3; Appendix A and C). Past surveys have revealed some larger sunfish available for anglers. The most recent sample was no different with a CPUE-6 of Bluegill that was higher than the previous sample. The Longear Sunfish catch rate observed in 2018 (80.0/hr) was similar to the reservoir average (Appendix A and C). The OBS sampling objectives were achieved for Bluegill.

Channel Catfish: The gill net catch rate of Channel Catfish continues to be very high. The catch rate of 25.2/nn observed in 2019 was the second highest ever recorded (Figure 4; Appendix A and C). The 2019 catch rate was above the reservoir average and size structure remained excellent as indicated by a PSD

value of 43. The gill netting OBS objective for Channel Catfish was achieved. Supplemental hoop netting was also conducted in spring of 2019 to aid in determining if it could be used instead of gill netting surveys to improve district sampling efficiency. The catch rate for hoop netting was high (11.2/nn) but lower than the previous hoop netting survey (Figure 5). Hoop netting again appeared to be very effective at collecting Channel Catfish although precision was not as good when compared to gill netting (Appendix A).

White Bass: The gill netting catch rates of White Bass in Arlington have continued to be low during the past several samples. The 2019 gill net catch rate (0.6/nn) was also very low (Figure 6). It is possible the fish were in the upper portions of the reservoir spawning. Another complicating factor that could be affecting the population is the presence of Yellow Bass. No OBS objectives were set for sampling the White Bass population.

Largemouth Bass: The total electro fishing catch rate in 2018 (104.0/hr) was higher than the previous sample and just below the reservoir average (Figure 7; Appendix A and C). The PSD (53) and PSDP (38) were higher than the values observed in the previous sample. Catch of fish ≥ 14 inches (CPUE-14) also increased over the past couple of surveys (Figure 7). Body condition in 2018 was above 90 for most size classes of the fish. OBS objectives were achieved for Largemouth Bass. Florida Largemouth Bass (FLMB) influence was high (34%) but lower than the previous sample (Table 7). Genetic analysis also revealed more pure Northern Largemouth Bass than in previous years. The apparent decrease in FLMB genetic influence occurred despite the stocking of FLMB in 2016 and 2017.

White Crappie: The trap net catch rate of White Crappie was 18.0/nn in 2018 and was higher than the previous sample (Figure 8). The body condition of White Crappie was good with most size classes at or above 90. The size structure of the population is biased towards larger fish as indicated by a PSD value of 100. The catch rate of fish over 10 inches (8.2/nn) was slightly higher than the previous sample.

Fisheries Management Plan for Arlington Reservoir, Texas

Prepared – July 2019

ISSUE 1: Adequate fish habitat is limited in Arlington Reservoir during periods of low water levels. The City of Arlington is willing to help improve the fish populations in the reservoir. The addition of offshore habitat could be beneficial to sport fish during periods of low water.

MANAGEMENT STRATEGY

1. A habitat improvement plan was developed and funded by the Conservation License Plate Grant in 2019. The habitat improve plan involves the placement of Georgia PVC structures and bamboo brush piles along with a graduate level research project involving floating wetland rafts attached to Georgia PVC structures (Appendix D). We are currently working with partners to complete plan.

ISSUE 2: 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 the controlling authority to post appropriate signage at access points around the reservoir.
2. Contact and educate marina owners about invasive species, and provide them with posters, literature, etc.… so that they can, in turn, educate their customers.
3. Educate the public about invasive species using 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.

Objective-Based Sampling Plan and Schedule (2019–2023)

Sport fish, forage fish, and other important fishes

Important sport fishes in Arlington Reservoir include Largemouth Bass, Channel Catfish, and White Crappie. Known important forage species include Bluegill, Longear Sunfish, Threadfin and Gizzard Shad.

Low-density fisheries

Flathead Catfish: Flathead Catfish are present in Arlington Reservoir, however, they are rarely captured in gill nets.

White Bass: Previous creel survey data (Brock and Hungerford 2015) indicated only 1.0% of anglers targeted White Bass in Arlington Reservoir. No sampling objectives will be set for White Bass because of the low popularity of the species and variability in year class strength of the population

Survey objectives, fisheries metrics, and sampling objectives

Channel Catfish: Channel Catfish are the second most sought-after sport fish in Arlington Reservoir (24.5 % of total angling effort; creel conducted 2014-2015) (Brock and Hungerford 2015). Although gill net surveys provide good data on the Channel Catfish population, we will use 6 hoop net arrays to sample the Channel Catfish population. Based on past catch rates, this will not be adequate to obtain an RSE of CPUE-S $\leq$ 25 but should provide good estimates of size structure (PSD; 50 fish minimum at 6 stations with 80% confidence). No effort will be expended to achieve any RSE objectives. To determine if hoop net sampling precision can be improved, additional 6 hoop net arrays will be used to sample the population annually in the spring of 2020 thru 2022.

Largemouth Bass: According to the most recent creel survey conducted on Arlington Reservoir (2014-2015), 29 % of anglers target Largemouth Bass and they are the most popular sport fish in the reservoir (Brock and Hungerford 2015). The popularity of Largemouth Bass fishing at this reservoir warrants sampling time and effort. Trend data on CPUE, size structure, and body condition have been collected for years with fall nighttime electro fishing. To continue the monitoring of Largemouth bass, fall nighttime electro fishing will be conducted. A minimum of 12 randomly selected 5-min electro fishing sites will be sampled in fall of 2020 and 2022. Based on past catch rates, this should be adequate to obtain an RSE of CPUE-S $\leq$ 25 and size structure estimates (the anticipated effort to meet both sampling objectives is 12 stations with 80% confidence) (PSD; 50 fish minimum at 18 stations with 80% confidence). If the RSE objective is not met, additional electro fishing sampling will only continue if 50 stocked sized or larger fish are not captured in the 12 sample sites.

Bluegill, Longear Sunfish, Threadfin and Gizzard Shad: Bluegill, Longear Sunfish, and Threadfin and Gizzard Shad are the primary forage in Arlington Reservoir. Like Largemouth Bass, trend data on CPUE and size structure have been collected with fall nighttime electro fishing. The electro fishing for Largemouth Bass will allow for monitoring of large-scale changes in Bluegill, Longear Sunfish, and Threadfin and Gizzard Shad relative abundance and size structure. Sampling effort for Largemouth Bass should result in sufficient numbers of Bluegill, Longear Sunfish, and Threadfin and Gizzard Shad for size structure estimation (PSD and IOV; 50 fish minimum at 18 stations with 80% confidence).

White Crappie: Previous creel survey data indicate White Crappie angling comprised 9% of total angling effort (Brock and Hungerford 2015). A trap-netting survey consisting of 5 single-cod shoreline nets will be conducted in fall of 2022. This sampling effort should result is sufficient numbers of White Crappie to

provide sufficient information for monitoring of large-scale changes of population. No OBS objectives will be set for White Crappie.

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Tables and Figures

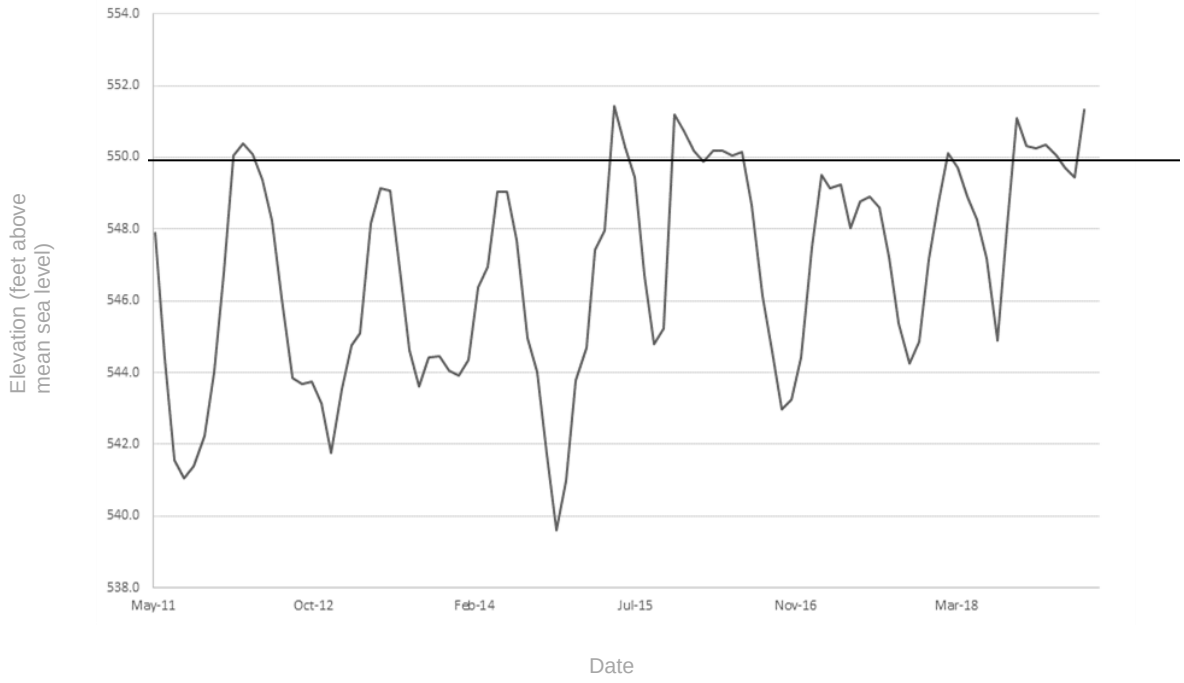


Figure 1. Water level elevations in feet above mean sea level (MSL) recorded for Arlington Reservoir, Texas, January 2011- May 2019. Conservation pool (500 MSL) is noted with solid black line.

Table 1. Characteristics of Arlington Reservoir, Texas.

Characteristic	Description
Year constructed	1957
Controlling authority	City of Arlington
County	Tarrant
Reservoir type	Tributary of Trinity River
Conductivity	219 umhos/cm

Table 2. Boat ramp characteristics for Arlington Reservoir, Texas, August 2017. Reservoir elevation at time of survey was 522 feet above mean sea level.

Boat ramp	Latitude Longitude (dd)	Public	Parking capacity (N)	Elevation at end of boat ramp (ft)	Condition
Bowman Springs Park	32.6897 -97.2178	Y	40	540.0	Good
Simpson Park	32.6271 -96.9823	Y	250	538.0	Good
Eugene McCray Park	32.7129 -97.2119	Y	50	540.0	Good

Table 3. Harvest regulations for Arlington Reservoir, Texas.

Species	Bag limit	Length limit
Catfish: Channel and Blue Catfish, 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	14-inch minimum
Crappie: White and Black crappie, their hybrids and subspecies	25 (in any combination)	10-inch minimum

Table 4. Stocking history of Arlington Reservoir, Texas. FRY= fry, FGL = fingerling; AFGL = advanced fingerling; ADL = adults. UNK=unknown.

Year	Number	Size
	Channel Catfish	
1970	13,450	AFGL
1972	5,026	AFGL
1997	1,000	AFGL
1998	1,500	AFGL
Species Total	20,976	
	Florida Largemouth Bass	
1978	9,900	FGL
1992	114,075	FGL
1997	115,321	FGL
2002	115,750	FGL
2016	196,197	FGL
2017	197,880	FGL
Species Total	749,123	
	Largemouth Bass	
1967	10,000	UNK
1971	75,000	UNK
Species Total	85,000	
	Palmetto-Bass (striped x white bass hybrid)	
1978	11,947	UNK
1980	22,500	UNK
1982	21,000	UNK
1984	46,605	FGL
1985	45,000	FGL
1986	44,000	FRY
1987	45,450	FRY
1989	49,700	FGL
1991	41,200	FRY
1992	21,800	FGL
1994	34,506	FGL
1995	38,400	FGL
1996	35,800	FGL
1997	30,000	FGL
1998	35,218	FGL
1999	11,526	FGL
2002	11,379	FGL
2003	19,390	FGL
Species Total	616,721	

Table 4. Stocking history continued

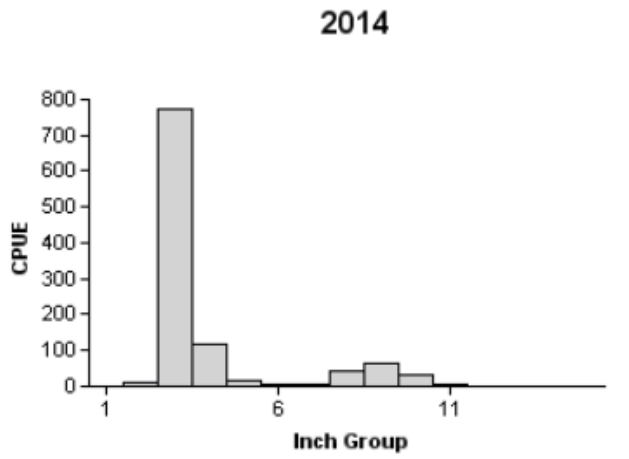
Year	Number	Size
	Walleye	
1975	50,000	FRY
1976	500,000	FRY
Species Total	550,000	

Table 5. Objective-based sampling plan components for Arlington Reservoir, Texas 2018–2019.

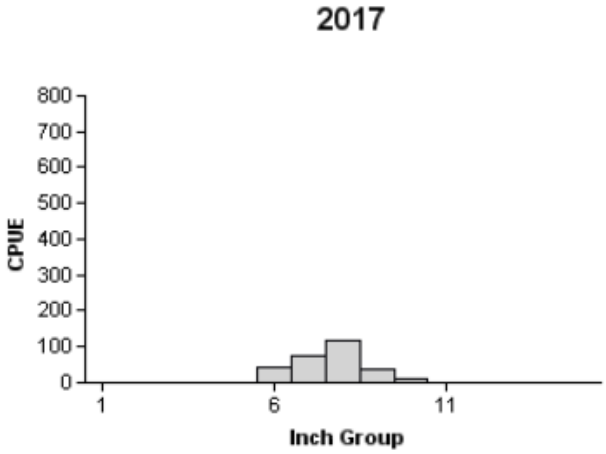
Gear/target species	Survey objective	Metrics	Sampling objective
Electro fishing			
Largemouth Bass	Abundance	CPUE–Stock	RSE-Stock ≤ 25
	Size structure	PSD, length frequency	N ≥ 50 stock
	Condition	W_r	N ≥ 50 stock
	Genetics	%FLMB	N = 30, all sizes
Bluegill [a]	Abundance	CPUE–Total	None
	Size structure	PSD, length frequency	N ≥ 50 stock
Gizzard Shad [a]	Abundance	CPUE–Total	None
	Size structure	PSD, length frequency	None
	Prey availability	IOV	None
Trap netting			
Crappie	Abundance	CPUE–Stock	RSE-Stock ≤ 25
	Size structure	PSD, length frequency	None
	Condition	W_r	N ≥ 50 stock
Gill netting			
Channel Catfish	Abundance	CPUE–Stock	RSE-Stock ≤ 25
	Size structure	PSD, length frequency	None
	Condition	W_r	N ≥ 50 stock
Hoop netting			
Channel Catfish	Abundance	CPUE–Stock	RSE-Stock ≤ 25

[a] No additional effort will be expended to achieve an RSE ≤ 25 for CPUE of Bluegill and Gizzard Shad if not reached from designated Largemouth Bass sampling effort. Instead, Largemouth Bass body condition can provide information on forage abundance, vulnerability, or both relative to predator density.

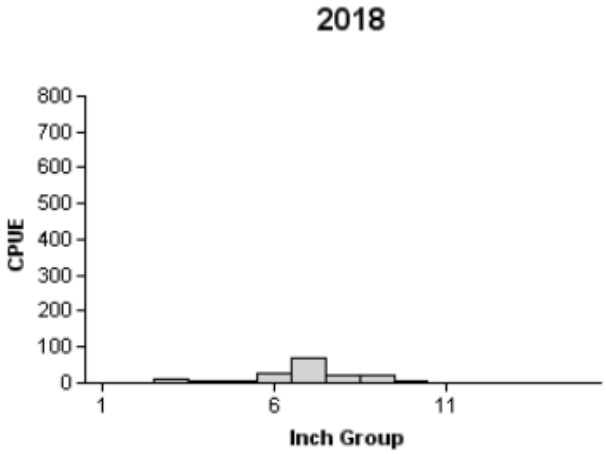
Gizzard Shad



Effort = 1.0
Total CPUE = 1,075.0 (24; 1075)
Stock CPUE = 150.0 (23; 150)
IOV = 86 (5)



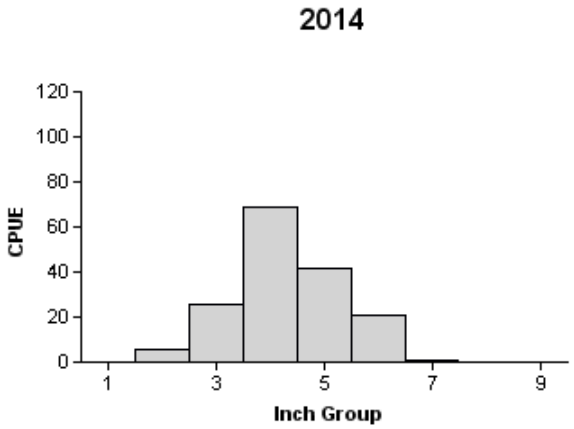
Effort = 1.0
Total CPUE = 282.0 (19; 282)
Stock CPUE = 235.0 (16; 235)
IOV = 43 (4)



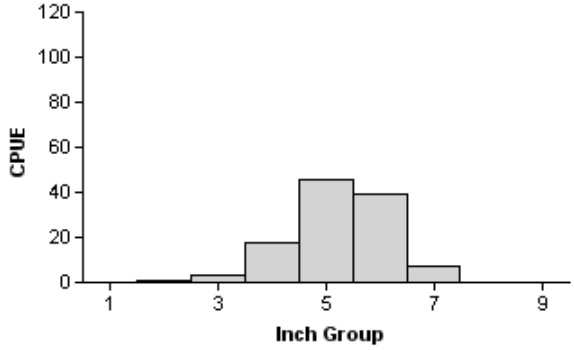
Effort = 1.0
Total CPUE = 165.0 (47; 165)
Stock CPUE = 119.0 (41; 119)
IOV = 70 (14)

Figure 2. Number of Gizzard Shad caught per hour (CPUE; bars) and population indices (RSE and N for CPUE and SE for IOV are in parentheses) for fall electro fishing surveys, Arlington Reservoir, Texas, 2014, 2017, and 2018.

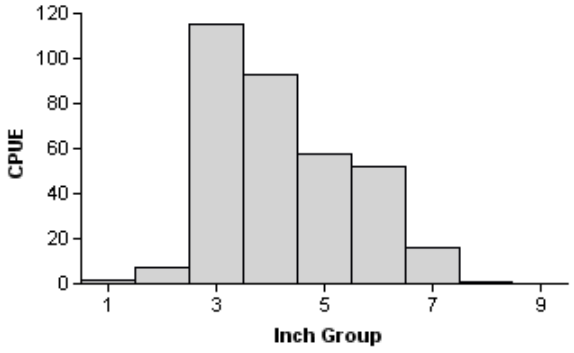
Bluegill



Effort = 1.0
Total CPUE = 165.0 (41; 165)
Stock CPUE = 159.0 (42; 159)
CPUE-6 = 22.0 (44; 22)
PSD = 14 (2)



Effort = 1.0
Total CPUE = 114.0 (32; 114)
Stock CPUE = 113.0 (32; 113)
CPUE-6 = 46.0 (50; 46)
PSD = 41 (9)



Effort = 1.0
Total CPUE = 344.0 (26; 344)
Stock CPUE = 335.0 (27; 335)
CPUE-6 = 69.0 (22; 69)
PSD = 21 (3)

Figure 3. Number of Bluegill caught per hour (CPUE; bars) and population indices (RSE and N for CPUE and SE for size structure are in parentheses) for fall electro fishing surveys, Arlington Reservoir, Texas, 2014, 2017, and 2018.

Channel Catfish

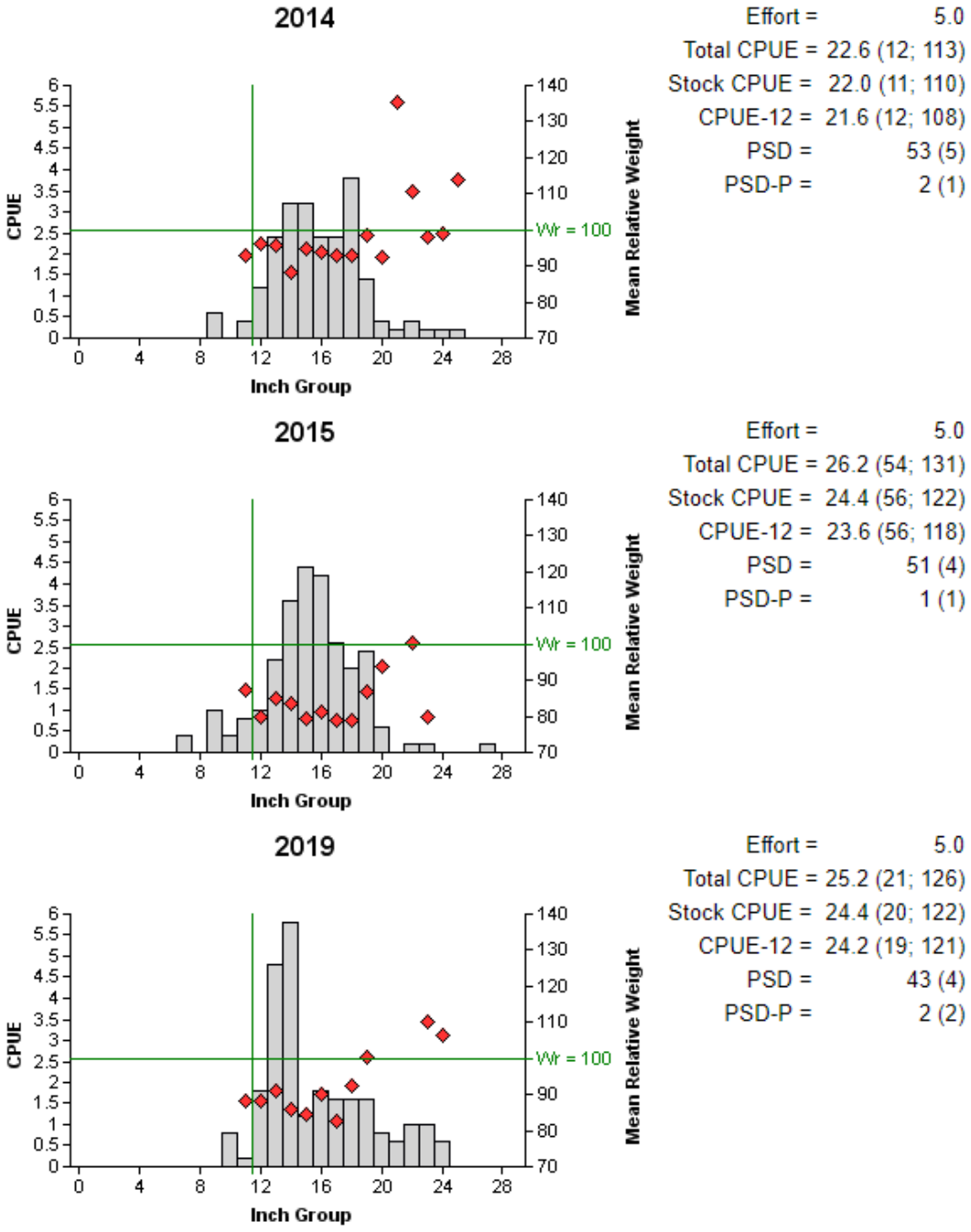


Figure 4. Number of Blue Catfish caught per net night (CPUE; bars), mean relative weight (diamonds), and population indices (RSE and N for CPUE and SE for size structure are in parentheses) for spring gill net surveys, Arlington Reservoir, Texas, 2014, 2015, 2019. Vertical line represents length limit at time of sampling.

Channel Catfish

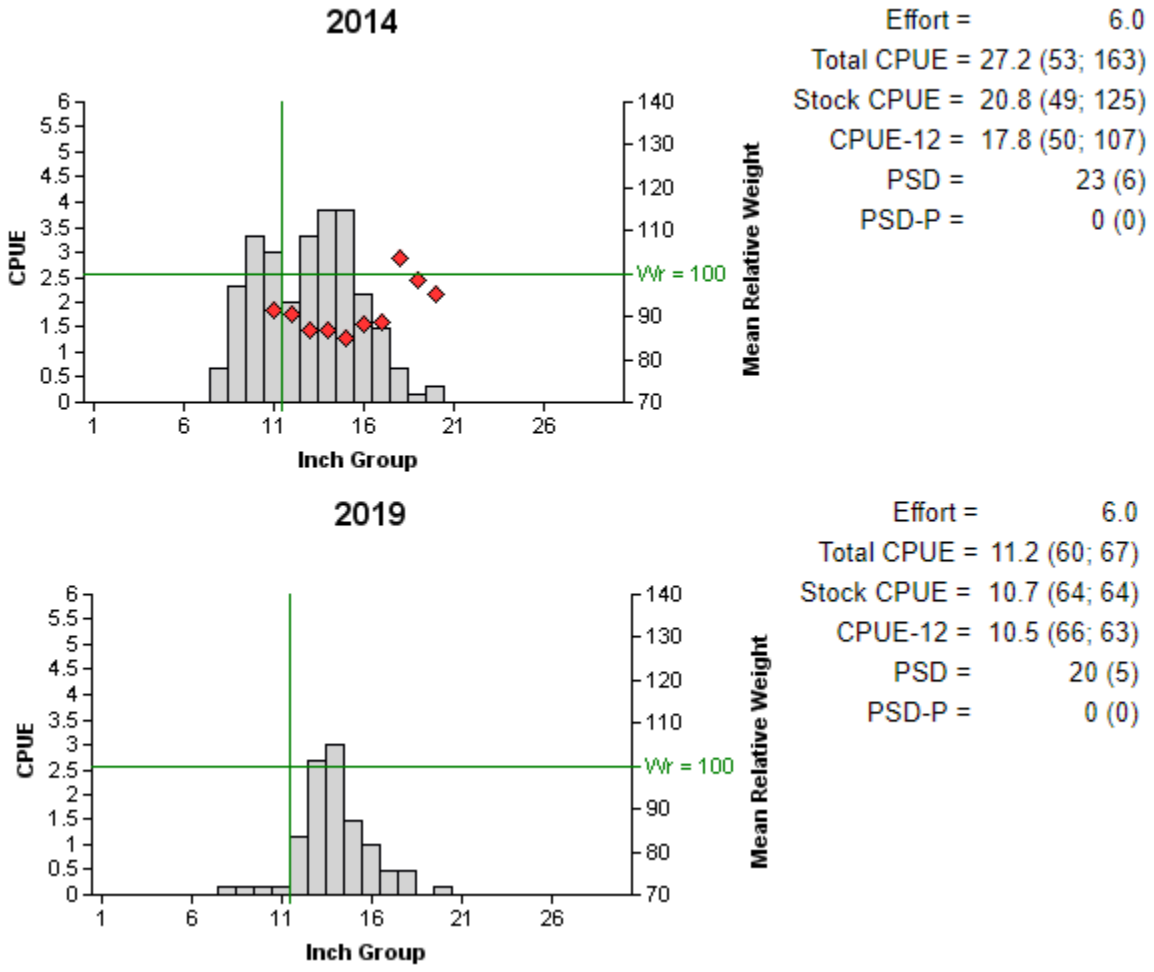


Figure 5. Number of Channel Catfish caught per net night (CPUE; bars), mean relative weight (diamonds), and population indices (RSE and N for CPUE and SE for size structure are in parentheses) for spring hoop net surveys, Arlington Reservoir, Texas, 2014 and 2019. Vertical line represents length limit at time of sampling. Fish collected in 2019 were not weighed because of high wind conditions and thus no mean relative weights were calculated.

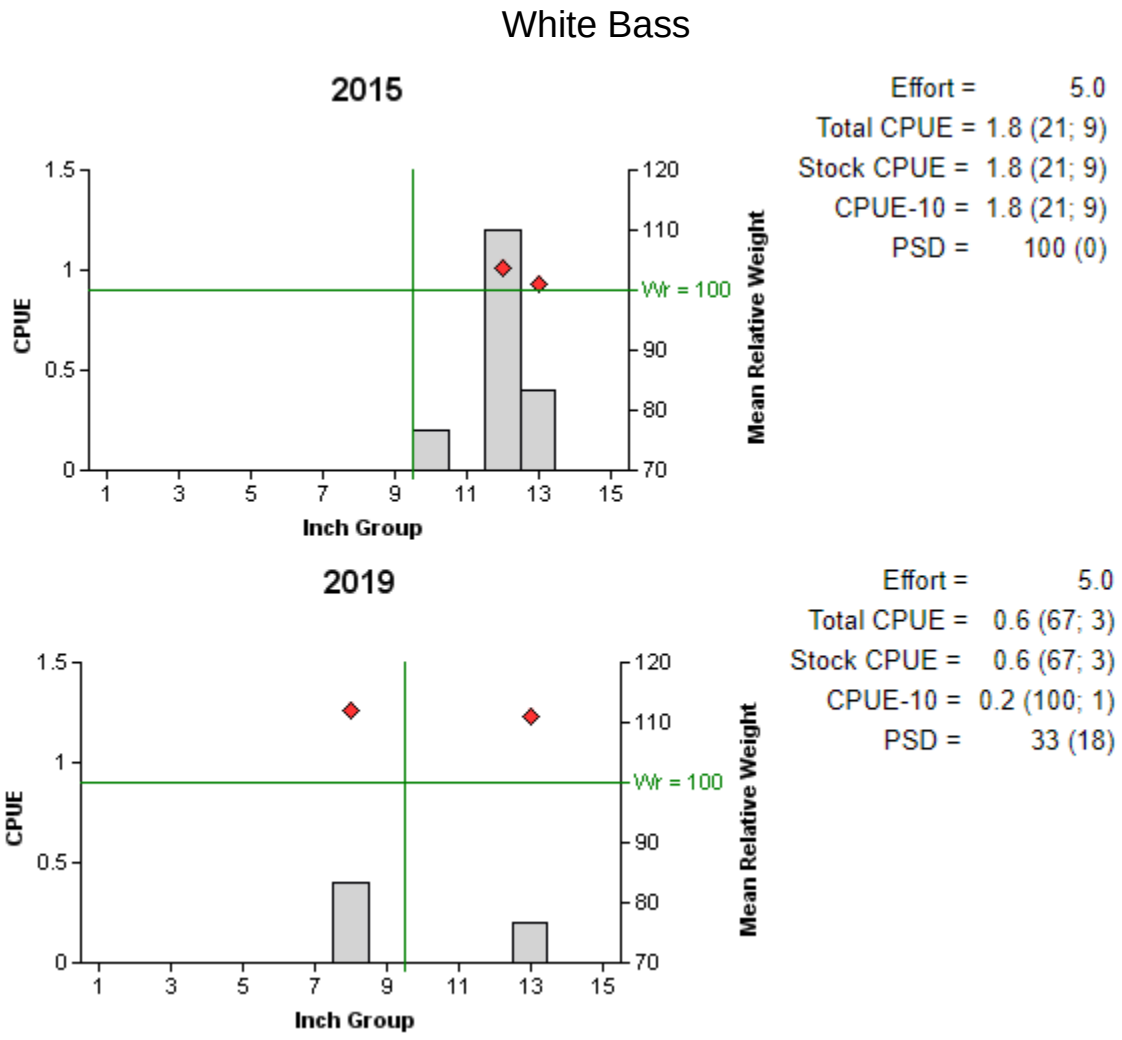


Figure 6. Number of White Bass caught per net night (CPUE, bars), mean relative weight (diamonds), and population indices (RSE and N for CPUE and SE for size structure are in parentheses) for spring gill net surveys, Arlington Reservoir, Texas, 2015 and 2019. A figure for 2014 is not presented because no White Bass were captured Vertical line represents length limit at time of sampling

Largemouth Bass

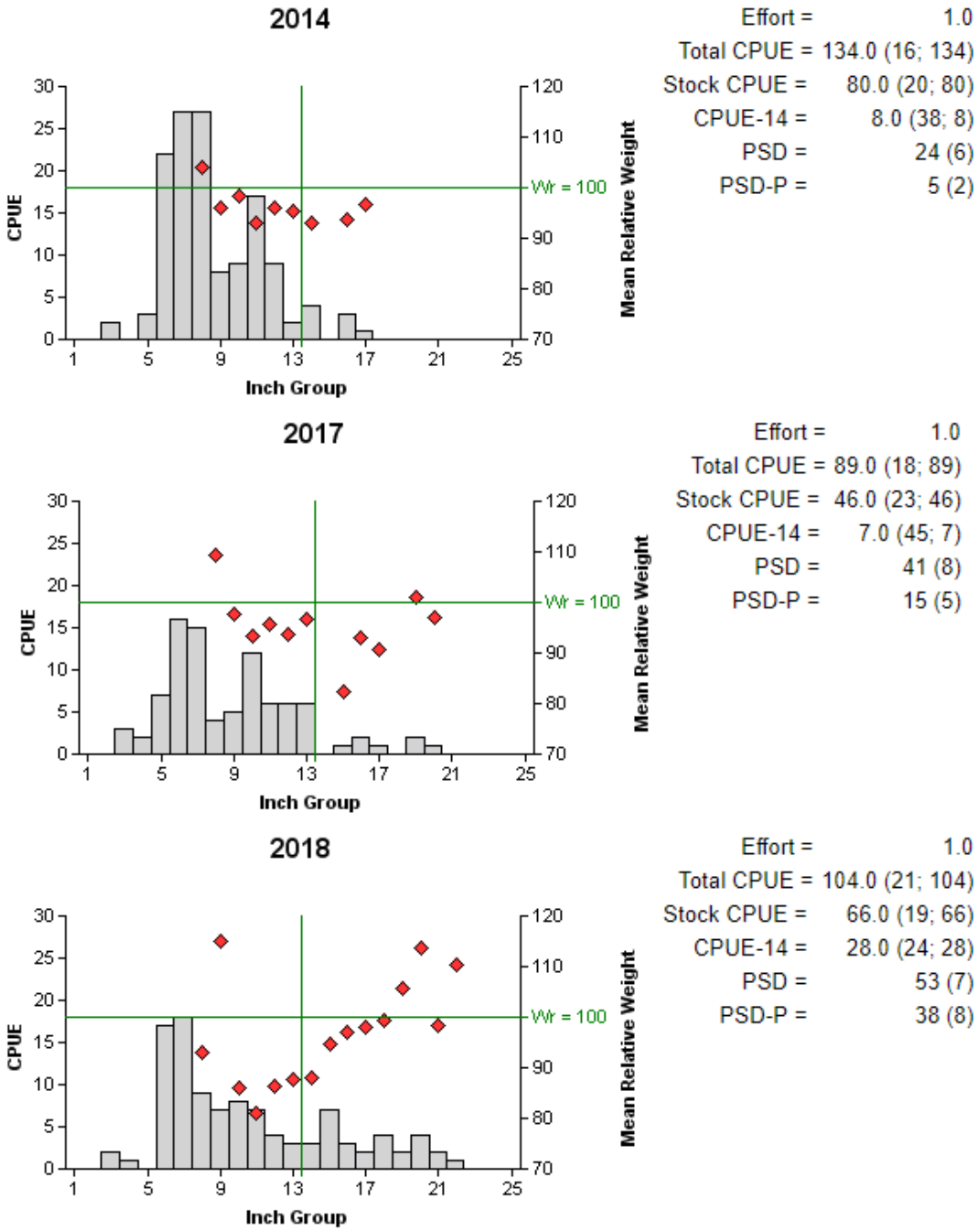


Figure 7. Number of Largemouth Bass caught per hour (CPUE, bars), mean relative weight (diamonds), and population indices (RSE and N for CPUE and SE for size structure are in parentheses) for fall electro fishing surveys, Arlington Reservoir, Texas, 2014, 2017, and 2019. Vertical line represents length limit at time of sampling.

Table 6. Results of genetic analysis of Largemouth Bass collected by fall electro fishing, Arlington Reservoir, Texas, 2004, 2008, and 2012. FLMB = Florida Largemouth Bass, NLMB = Northern Largemouth Bass, Intergrade = hybrid between a FLMB and a NLMB. Micro-satellite DNA analysis was used to determine genetic composition of individual fish from 2005 through 2012 and by electrophoresis for previous years.

		Number of fish				
Year	Sample size	FLMB	Intergrade	NLMB	% FLMB alleles	% FLMB
2010	30	0	30	0	58	0
2014	30	0	29	1	45	0
2018	30	0	20	10	34	0

White Crappie

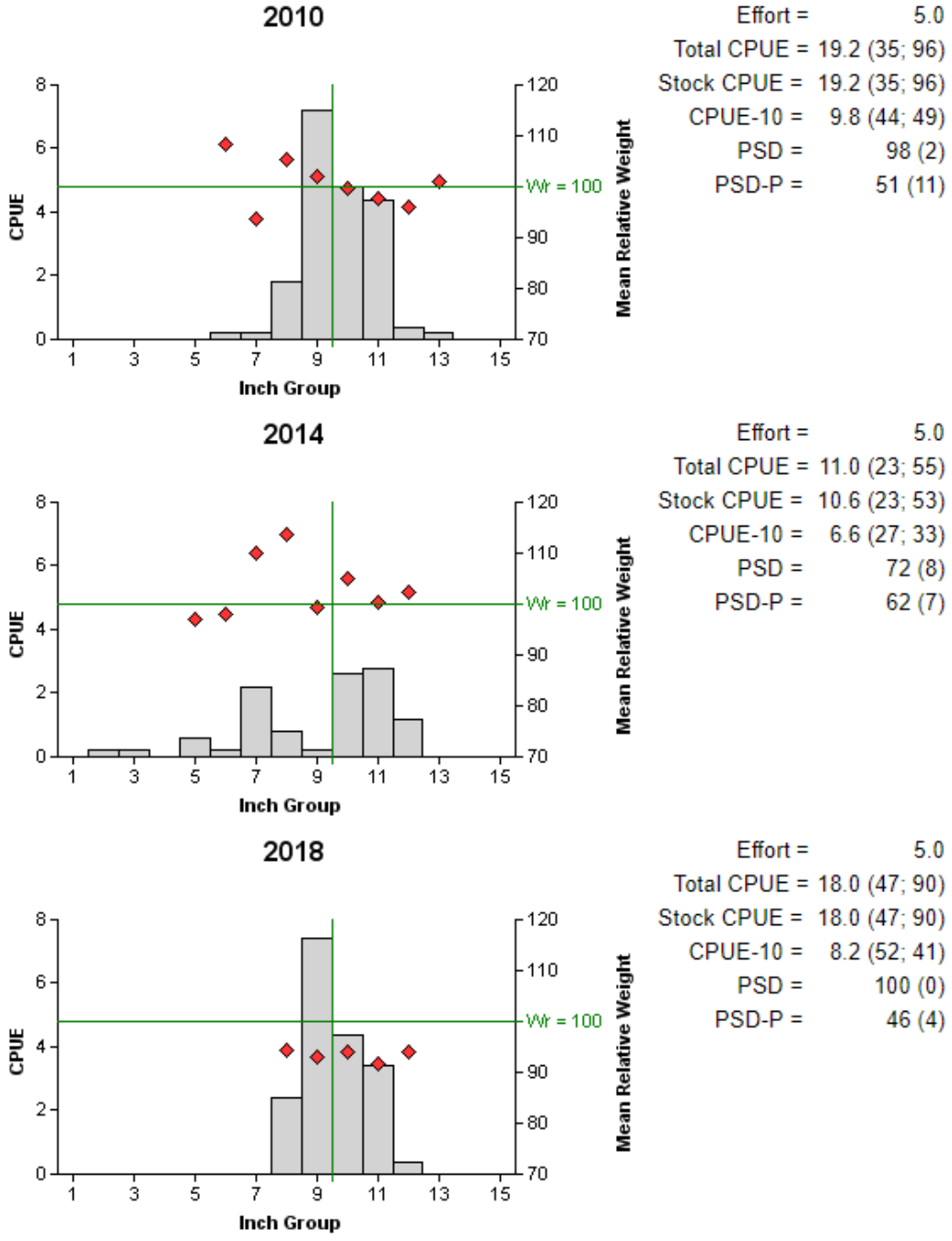


Figure 8. Number of White Crappie caught per net night (CPUE, bars), mean relative weight (diamonds), and population indices (RSE and N for CPUE and SE for size structure are in parentheses) for fall trap netting surveys, Arlington Reservoir, Texas, 2010, 2014, and 2018. Vertical line indicates minimum length limit.

Proposed Sampling Schedule

Table 7. Proposed sampling schedule for Arlington Reservoir, Texas. Survey period is June through May. Gill netting surveys are conducted in the spring, while electro fishing and trap netting surveys are conducted in the fall. Standard survey denoted by S and additional survey denoted by A.

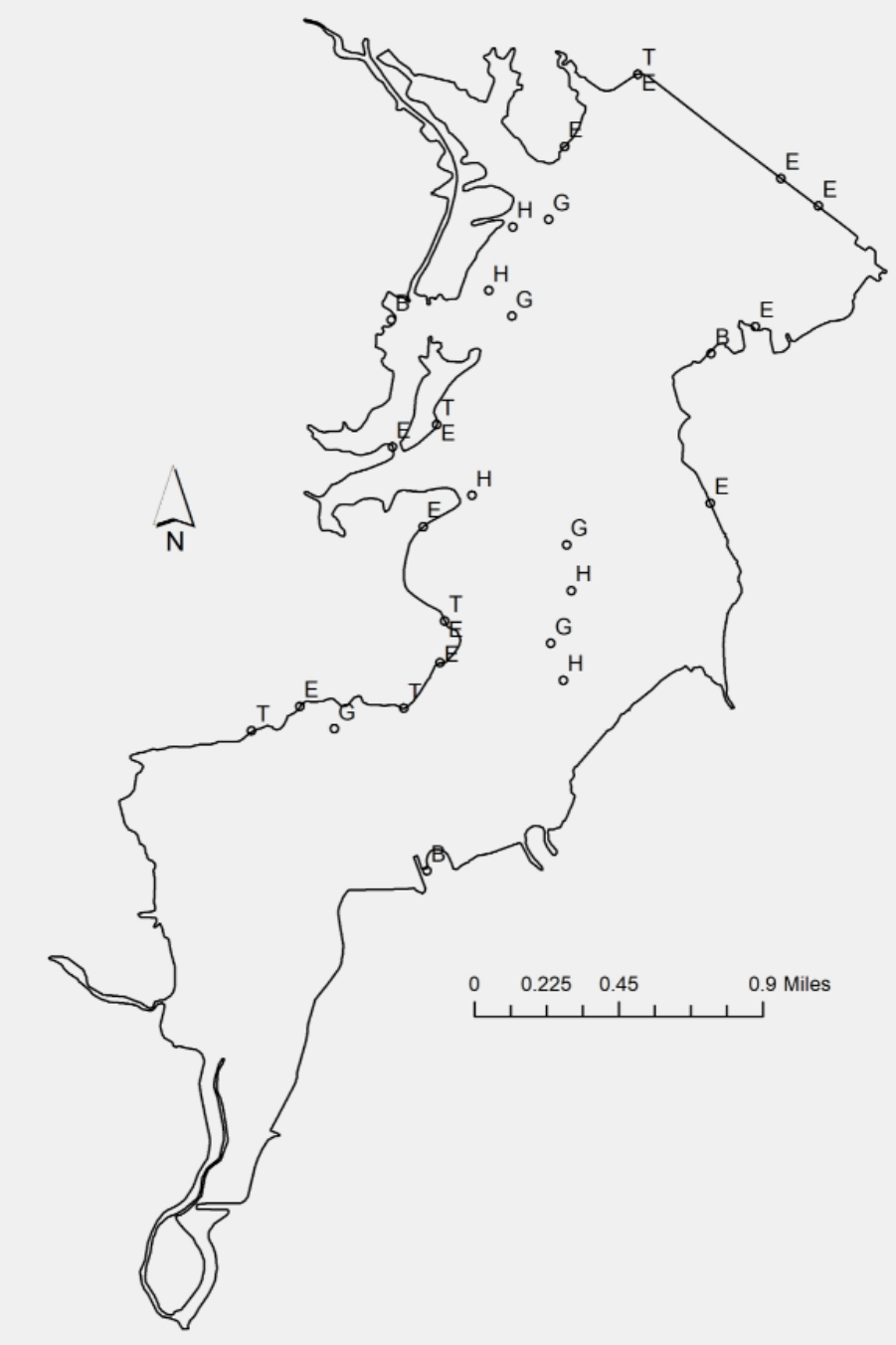
	Survey year			
	2019-2020	2020-2021	2021-2022	2022-2023
Angler Access				S
Vegetation				
Electro fishing – Fall		A		S
Trap netting				S
Gill netting				
Hoop netting	A	A	A	S
Report				S

APPENDIX A – Catch rates for all species from all gear types

Number (N) and catch rate (CPUE) (RSE in parentheses) of species collected from all gear types from Arlington Reservoir, Texas, 2017-2018. Sampling effort was 5 net nights for gill netting, trap netting, and hoop netting, and 1.0 hours for electro fishing.

Species	Gill Netting		Trap Netting		Electro fishing		Hoop Netting	
	N	CPUE	N	CPUE	N	CPUE	N	CPUE
Gizzard Shad	59	11.8 (26)			165	165.0 (47)		
Threadfin Shad					74	74.0 (40)		
Common Carp	17	3.40 (46)						
Channel Catfish	126	25.2 (21)					60	11.2 (67)
White Bass	3	0.6 (67)						
Yellow Bass	254	50.8 (23)						
Bluegill					344	344.0 (26)		
Longear Sunfish					80	80.0 (40)		
Redear Sunfish					9	9.0 (52)		
Largemouth Bass					104	104.0 (21)		
White Crappie			90	18.0 (47)				
Black Crappie			1	0.20 (100)				

APPENDIX B – Map of sampling locations



Location of sampling sites, Arlington Reservoir, Texas, 2017-2018. Trap net, gill net, and electro fishing stations are indicated by T, G, and E, respectively. Boat ramps are indicated by B. Water level was near full pool (550 MSL) at time of all surveys.

APPENDIX C – Historical catch rates of targeted species by gear type for Arlington Reservoir, Texas.

		Year														
Gear	Species	1992	1995	1998	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011
Gill Netting	Channel Catfish	17.0	9.4	7.8		17.4		8.6				15.0				23.6
(fish/net night)	White Bass	2.4	11.6	9.2		4.8		19.0				5.2				1.2
Electro fishing	Gizzard Shad	211.3	339.3	194.0	275.0		96.0		208.0	264.0	303.0		328.0	221.0	276.0	340.0
(fish/hour)	Threadfin Shad	12.7	164.0	195.0	476.0		416.0		154.0	1085.0	528.0		992.0	334.0	60.0	2342.0
	Bluegill	199.3	212.0	236.0	188.0		390.0		295.0	210.0	353.0		295.0	335.0	483.0	145.0
	Longear Sunfish		36.0	59.0	108.0		132.0		96.0	72.0	94.0		88.0	145.0	92.0	48.0
	Redear sunfish	2.7	2.7	1.0	6.0		1.0		0.0	0.0	0.0		9.0	3.0	0.0	0.0
	Largemouth Bass	164.0	174.7	144.0	126.0		81.0		86.0	147.0	94.0		159.0	121.0	122.0	85.0
Hoop Netting	Channel Catfish															
(fish/net night)																
Trap Netting (fish/net night)	White Crappie	8.6	2.8	4.0			15.6				19.0				19.2	

APPENDIX C – Continued

		Year					
Gear	Species	2014	2015	2017	2018	2019	**Ave.**
Gill Netting	Channel Catfish	22.6	26.2			25.2	17.3
(fish/net night)	White Bass	0.0	1.8			0.6	5.6
Electro fishing	Gizzard Shad	1,075.0		282.0	165.0		305.2
(fish/hour)	Threadfin Shad	514.0		345.0	74.0		512.8
	Bluegill	165.0		114.0	344.0		264.3
	Longear Sunfish	80.0		35.0	80.0		83.2
	Redear sunfish	0.0		1.0	9.0		2.4
	Largemouth Bass	134.0		89.0	104.0		122.0
Hoop Netting	Channel Catfish	27.2				11.2	19.2
(fish/net night)							
Trap Netting	White Crappie	11.0			3.0		10.4
(fish/net night)							

APPENDIX D – 2019 Habitat Improvement Plan for Arlington Reservoir

Introduction and Scope

Arlington Reservoir is a 1,939 acre impoundment located in Arlington, Texas. It is controlled by and is the primary water source for the City of Arlington. It is located in the central area of the DFW metroplex in Tarrant County. Arlington Reservoir contains populations of sunfish, largemouth bass, catfish, Crappie, White Bass, and various forage fish species. It is a popular fishery and receives high angler pressure.

The City of Arlington strongly promotes fishing and water recreation on the Reservoir. The City has hosted an annual Largemouth Bass Tournament the past several years, provides boat rentals, and allows private companies to rent kayaks and canoes to visitors. The City also has staff that provide lake patrol and along with Texas Parks and Wildlife, provide water safety enforcement.

Arlington Reservoir has fish habitat in the form of emergent shoreline vegetation in the form of Water Willow, *Justicia Americana,* and Button Bush, *Cephalanthus occidentalis,* and rock rip rap. Because Arlington Reservoir is used as a water source, it is subject to annual water level fluctuations. When water levels decrease, most fish habitat becomes un accessible to fish populations.

Project Description

History

In the summer of 2015, Texas Parks and Wildlife and the City of Arlington, created three habitat locations. These habitat areas were created by placing 8-10 bamboo condos at the different locations. All sites were marked with a plastic buoy and the coordinates of their location were published on social media and websites. After condos were placed, positive feedback from anglers was received by the City of Arlington and TPWD. Because of the positive feedback, the City of Arlington requested to partner with TPWD to expand and create an additional artificial habitat locations.

Floating Wetland Project

A graduate student at University of Texas at Arlington has designed a research project involving a floating wetland. The objectives of this projects are to measure public perception of floating wetlands and determine whether large scale implementation may increase lake attendance, to use the floating wetland as an interpretive tool for public talks focused on public water resources, water quality, habitat conservation and encourage positive meaningful action from the public, and to determine if floating wetlands provide any habitat quality benefits for fish stocks by measuring phosphates, nitrates, dissolved oxygen, temperature, pH and turbidity on Arlington Reservoir. The floating wetland will contain native emergent plants. The floating wetland project also involves attaching Georgia PVC structures (Figure 3) to the floating wetland to provide additional fish habitat. A location for the floating wetland has not yet been determined. The graduate research student is doing all the research on the floating wetland while TPWD is hoping to provide the material and labor to assist with construction and deployment of the floating wetland. Other In-Kind partners are University of Texas at Arlington, The City of Arlington, and the Trinity River Authority.

Lake Wide Habitat Project

To improve the three existing bamboo habitat locations, 10 Georgia PVC structures will be placed at each bamboo site (30 total Georgia structures). In addition to improving the three existing habitat sites, a new habitat location will also be developed. The new habitat location will contain 20 Georgia structures along with 20 bamboo condos.

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