

PERFORMANCE REPORT

As Required by

FEDERAL AID IN SPORT FISH RESTORATION ACT

TEXAS

FEDERAL AID PROJECT F-221-M-5

INLAND FISHERIES DIVISION MONITORING AND MANAGEMENT PROGRAM

2014 Fisheries Management Survey Report

Arlington Reservoir

Prepared by:

Raphael Brock, District Management Supervisor
and
Thomas Hungerford, Assistant District Management Supervisor

Inland Fisheries Division
Dallas/ Fort Worth, District
Fort Worth, Texas



Carter Smith
Executive Director

Craig Bonds
Director, Inland Fisheries

July 31, 2015

TABLE OF CONTENTS

Survey and Management Summary.....	1
Introduction.....	2
Reservoir Description.....	2
Angler Access.....	2
Management History.....	2
Methods.....	3
Results and Discussion.....	3
Fisheries Management Plan.....	5
Literature Cited.....	7
Figures and Tables.....	8-24
Water Level (Figure 1).....	8
Reservoir Characteristics (Table 1).....	8
Boat Ramp Characteristics (Table 2).....	8
Harvest Regulations (Table 3).....	9
Stocking History (Table 4).....	10
Percent Directed Effort (Table 5).....	11
Angler Total Hours and Direct Expenditures (Table 6).....	11
Gizzard Shad (Figure 2).....	12
Bluegill (Figure 3).....	13
Channel Catfish (Figures 4 and 5; Tables 7 and 8).....	14
White Bass (Figures 6 and 7; Table 9).....	17
Largemouth Bass (Figures 8 and 9; Tables 10 and 11).....	19
White Crappie (Figures 10 and 11; Table 12).....	22
Proposed Sampling Schedule (Table 13).....	24
Appendix A	
Catch Rates for all Species from all Gear Types.....	25
Appendix B	
Map of 2014-2015 Sampling Locations.....	26
Appendix C	
Historical Catch Rates for Target Species by Gear Type.....	27
Appendix D	
Supplemental Hoop Net Sampling Catch Results.....	29
Appendix E	
2014-2015 Objective-Based Sampling Plan.....	30

SURVEY AND MANAGEMENT SUMMARY

Fish populations in Arlington Reservoir were surveyed in 2014 using an electrofisher and trap nets, and in 2015 using gill 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. Angler and boat access was adequate. There are three handicap specific facilities, three boat ramps, and several bank areas accessible to anglers. Fishery habitat is primarily native emergent vegetation (water willow and button bush) 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 in great abundance in the reservoir. Bluegill were also abundant as prey and there were some larger fish (≥ 6 inches) available for anglers. Longear Sunfish were moderately abundant as well.
 - **Catfishes:** Arlington continues to be the best Channel Catfish reservoir in the district. The catch rate of Channel Catfish was an all-time high. An abundance of quality fish is available for anglers. Flathead Catfish are present but none were sampled.
 - **White Bass:** White Bass catch rates continue to be low. This could be caused by minimal flow entering the reservoir during the spring or the proliferation of the yellow Bass population.
 - **Largemouth Bass:** Largemouth Bass is the most sought after species by anglers. The Largemouth Bass population has fluctuated slightly in abundance over the past three surveys. The catch rate decreased when compared to the previous survey.
 - **White Crappie:** The White Crappie population continued to be high in abundance with quality fish available for anglers. Relative weights for crappie averaged over 100.
- **Management Strategies:** Standard monitoring with electrofishing, trap netting, and hoop netting surveys will be conducted in 2018-2019. Request the stocking of Florida Largemouth Bass in 2016 and 2017 to increase trophy potential of Largemouth population. Work with the City of Arlington and local angler groups to establish more artificial habitat in the reservoir. Monitor the reservoir for the spread of invasive species, specifically zebra mussels that may be introduced via recreation boats and/or a pipeline from other reservoirs within the Trinity River watershed.

INTRODUCTION

This document is a summary of fisheries data collected from Arlington 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

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, is pumped from Cedar Creek Reservoir and Richland Chambers Reservoir. Fishery habitat was primarily native emergent vegetation (water willow and button bush) and along with rocky shoreline and boat docks. Other descriptive characteristics for Arlington Reservoir are in Table 1.

Angler Access

Arlington Reservoir has three public boat ramps. Two of these are Simpson Park and Bowman Springs Park which are managed by the City of Arlington. Eugene McCray Park located on the East side of the reservoir is managed by the City of Fort Worth. All the ramps are adequate. During the past survey year only one ramp was available for use when water levels decreased to 10ft below conservation pool.

Shoreline access is limited to the three parks mentioned above. Fishing docks are available for bank anglers at all three parks.

Management History

Previous management strategies and actions: Management strategies and actions from the previous survey report (Hungerford and Brock 2011) included:

1. Assist the city with habitat improvements to mitigate future retaining walls and bulk heading along the shores of the reservoir.
Action: A total of 23 bamboo "crappie condo" structures were built at the City of Arlington Lake Office and sank along the lakeside of the discharge canal.
2. Invasive organisms such as Giant Salvinia (*Salvinia molesta*) and zebra mussels (*Dreissena polymorpha*) have been spreading around aquatic environments in Texas.
Action: The controlling authority, City of Arlington, was contacted regarding the zebra mussel issue. Signs were erected at public ramps. Samplers were also placed at Simpson Park boat ramp. Several presentations and updates were given to City of Arlington Master Plan committee and water department regarding the zebra mussel issue.

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

Stocking history: The last stocking of Arlington Reservoir occurred in 2003 and consisted of 19,390 palmetto Bass. The complete stocking history is in Table 4.

Zebra mussels: The exotic zebra mussel has been found in several DFW area Reservoirs. The City of Arlington has posted signs and information on its website informing users of the zebra mussel threat. No DNA, larva, or adults have been found in Arlington Reservoir.

Water transfer: There is currently one permanent pumping station on the reservoir which connects to a raw water treatment plant for municipal use. There is also an outfall from a pipeline operated by TRWD that transfers water to Arlington Reservoir from Richland Chambers and Cedar Creek Reservoirs in East Texas.

METHODS

Fishes were collected by electrofishing (1.0 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/hr) of actual electrofishing and, for gill and trap nets, as the number of fish per net night (fish/nn). Supplemental hoop netting was conducted in spring of 2014 to aid in collecting additional Channel Catfish to conduct a tier 3 age and growth sample. Surveys were conducted to achieve survey and sampling objectives in accordance with objective-based sampling plan (OBS) (Appendix E). 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).

An annual access point creel survey was conducted from June 2014 through May 2015. Angler interviews were conducted on 5 weekend days and 4 weekdays per quarter to assess angler use and fish catch/harvest statistics in accordance with the Fishery Assessment Procedures (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 and creel statistics. All procedures were conducted according to the Fishery Assessment Procedures (TPWD, Inland Fisheries Division, unpublished manual revised 2014).

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 2012 and by electrophoresis for previous years.

Source for water level data was the United States Geological Survey (USGS 2014).

RESULTS AND DISCUSSION

Habitat: 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).

Creel: Most anglers fishing Arlington Reservoir were seeking to catch any species of fish. Largemouth Bass were the most sought after species followed by Channel Catfish (Table 5). Anglers spent a total of \$392,452 on their fishing trips (Table 6). Angler catch rate information is included in species results below.

Prey species: The 2014 electrofishing catch rate of Threadfin Shad (514.0/hr) was lower than the previous sample but near the reservoir average of 559.4/hr (Appendix A and C). The Gizzard Shad electrofishing catch rate in 2014 (1,075) was much higher than the previous sample (Figure 2). Index of vulnerability for Gizzard Shad (86) also was higher when compared to the previous sample. This indicated that 86% of Gizzard Shad captured in 2014 were available as forage. The electrofishing catch rate of Bluegill in 2014 of 165.0/hr was slightly higher than the previous sample and lower than reservoir average (Figure 3; Appendix A and C). Past surveys have revealed some larger sunfish available for anglers. However the CPUE-6 of Bluegill was lower than the previous sample. The OBS objectives were achieved for Gizzard Shad catch rates. The Longear Sunfish catch rate observed in 2014 (80.0/hr) was similar to the rate observed in 2011 and below the reservoir average of 97.3/hr (Appendix A and C). The OBS sampling objectives were not achieved for Bluegill or Longear Sunfish. Enough prey species are present to support predator populations in Arlington Reservoir thus no additional sampling was deemed necessary.

Channel Catfish: The gill net catch rate of Channel Catfish continues to be very high. The catch rate of 26.2/n observed in 2015 was the highest ever recorded (Figure 4; Appendix A and C). The 2015 catch rate was well above the reservoir average of 5.8/n and size structure remained excellent as indicated by a PSD value of 51. Supplemental hoop netting was conducted in spring of 2014 to aid in collecting additional Channel Catfish to conduct a tier 3 age and growth sample. Catch rate for hoop netting was high and appeared to be very effective at collecting Channel Catfish (Appendix D). A total of 213 Channel Catfish were aged with 197 being used in calculating length at age after concert read agreement. Channel Catfish reached 12 inches by age 3 (Table 7). Channel Catfish were the second most sought after species by anglers (Table 5). Angler catch rate of Channel Catfish was 0.23/hr with an estimated 6,151 Channel Catfish being harvested (Table 8; Figure 5). The OBS sampling objectives were not met for the 2015 sample but were for the 2014 sample. Target numbers of Channel Catfish for age and growth objectives had been met and thus no other sampling was deemed warranted.

White Bass: The gill netting catch rates of White Bass in Arlington have continued to be low during the past several samples. The 2015 gill net catch rate was 1.8/n (Figure 6). No White Bass were captured during gill net surveys in 2014 (Appendix C). OBS objectives were achieved for White Bass catch rates. White Bass were not a highly sought after species by anglers (Table 5). Recent drought has likely reduced spawning success. This could be attributed to the poor catch rates observed during sampling. However, angler catch rate of White Bass was high (1.7/hr; Figure 7; Table 9).

Largemouth Bass: The total electrofishing catch rate in 2014 (134.0/hr) was higher than the previous sample (Figure 8). The PSD (24) was lower than the PSD observed in the previous sample. Body condition in 2014 was above 90 for all size classes of fish sample. OBS objectives were achieved for Largemouth Bass. Largemouth Bass showed fast growth and reached 14 inches after 2 years (Figure 9). Florida Largemouth Bass (FLMB) influence was high (45%) but lower than the previous sample (Table 9). Genetic analysis also revealed only one pure Northern Largemouth Bass was sampled and all other fish collected were intergrades of FLMB. No FLMB genotypes were collected. Largemouth Bass were the most sought after species by anglers (Table 5). Angler catch rate of Largemouth Bass was 0.28/hr (Table 11).

White Crappie: The trap net catch rate of White Crappie was 11.0/n in 2014, and was lower than the previous sample (Figure 10). The body condition of White Crappie was good with most size classes at or above 100. The size structure of the population is biased towards larger fish as indicated by a PSD value of 72. The catch rate of fish over 10 inches (6.6/n) was slightly lower than the previous sample. The OBS objectives were achieved for White Crappie catch rates. White Crappie is the third most sought after species by anglers (Table 5). Angler catch rate of crappie was 0.24/hr (Table 12).

Fisheries management plan for Arlington Reservoir, Texas

Prepared – July 2015.

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 STRATEGIES

1. Cooperate with the City of Arlington and angler groups to improve fish habitat. Habitat will be in the form of bamboo “crappie condo” brush piles and pvc fish attractors.
2. Place some fish attractors near public fishing areas.

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. Arlington is especially susceptible through pipelines from Cedar Creek and Richland-Chambers Reservoirs.

MANAGEMENT STRATEGIES

1. Cooperate with the controlling authority to maintain 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 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 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.

MANAGEMENT STRATEGIES

1. Request the stocking of FLMB in 2016 and 2017. Conduct genetic analysis to monitor Largemouth Bass population genetics in 2018.

Objective-Based Sampling Plan and Schedule

2015 - 2019

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.

Negligible fisheries

White Bass are considered a negligible fishery. Low White Bass catch rates combined with minimal directed angler effort warrant this designation. The population spawning success relies on spring flows entering into the reservoir. The last several years this has not occurred and the population has decreased in abundance. Also the Yellow Bass catch rates have increased in the last several samples. With spring rains the population should hopefully bounce back. However no management strategy can overcome the prime factor in white bass population success.

Survey objectives, fisheries metrics, and sampling objectives

Largemouth Bass: Largemouth Bass are the most popular sport fish in Arlington Reservoir. The popularity and reputation for quality Largemouth Bass fishing at this reservoir warrant sampling time and effort. Largemouth Bass have always been managed with the statewide 14-in MLL regulation. Trend data on CPUE, size structure, and body condition have been collected annually from 2004-2011 with fall nighttime electrofishing. Fall nighttime electrofishing sampling of the Largemouth Bass will be conducted in 2018. This should allow for determination of any large-scale changes in the Largemouth Bass population that may spur further investigation. A minimum of 12 randomly selected 5-min electrofishing sites will be sampled in 2018 to obtain RSE of CPUE-S ≤ 25 and 50 stock-size fish. If RSE of CPUE-S ≤ 25 is not achieved, additional sampling sites will be selected and sampled until both objectives are met. A tier 2 age and growth survey will also be conducted on Largemouth Bass to determine age at 14 inches for comparison to past estimates. If adequate numbers are not collected during sampling, non-standard sampling will be conducted to collect the number needed to conduct age and growth analysis.

Channel Catfish: Channel Catfish are the second most sought after sport fish in Arlington Reservoir. The popularity and reputation for quality Channel Catfish fishing at this reservoir warrant sampling time and effort. A minimum of 3 tandem hoop net surveys will be conducted in spring of 2019 to determine CPUE and also collect 50 individuals greater than stock size to estimate population structure indices. If less than 50 stock sized individuals have been collected, additional tandem hoop net sets will be conducted until this is obtained. There is confidence that 3 surveys will provide trend data to make sound inferences about Channel Catfish population.

Bluegill, Threadfin and Gizzard Shad: Bluegill, Threadfin and Gizzard Shad are the primary forage in Arlington Reservoir. Continuation of sampling, as per Largemouth Bass above, will allow for monitoring of large-scale changes in Bluegill and Gizzard Shad relative abundance and size structure. Sampling effort based on achieving sampling objectives for Largemouth Bass will result in sufficient numbers of Bluegill and Gizzard Shad for size structure estimation (PSD and IOV; 50 fish minimum at 12 stations with 80% confidence). If this does not occur, additional sampling sites will be selected and sampled until 50 stocked sized fish are collected.

White Crappie: Catch rates have improved in recent surveys. A 5 single-cod shoreline trap netting survey will be conducted in fall of 2018. This should collect at least 50 stocked sized or larger individuals to estimate size structure indices. If 5 single-cod shoreline trap netting surveys do not collect the desired target number of stocked sized fish, additional single-cod shoreline trap netting surveys will be conducted until this is achieved. This should give us an idea of the population status when compared to past surveys.

LITERATURE CITED

- Anderson, R. O., and R. M. Neumann. 1996. Length, weight, and associated structural indices. Pages 447-482 in B. R. Murphy and D. W. Willis, editors. Fisheries techniques, 2nd edition. American Fisheries Society, Bethesda, Maryland.
- DiCenzo, V. J., M. J. Maceina, and M. R. Stimpert. 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. Neumann, 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.
- Hungerford, T and R. Brock. 2011. Statewide freshwater fisheries monitoring and management program survey report for Arlington Reservoir, 2010. Texas Parks and Wildlife Department, Federal Aid Report F-30-R, Austin.
- Texas Commission on Environmental Quality. 2011. Trophic classification of Texas reservoirs. 2010. Texas Water Quality Inventory and 303 (d) List, Austin. 18 pp.
- United States Geological Society (USGS). 2015. National water information system: Web interface. Available: <http://waterdata.usgs.gov/tx/nwis> (July 2015).

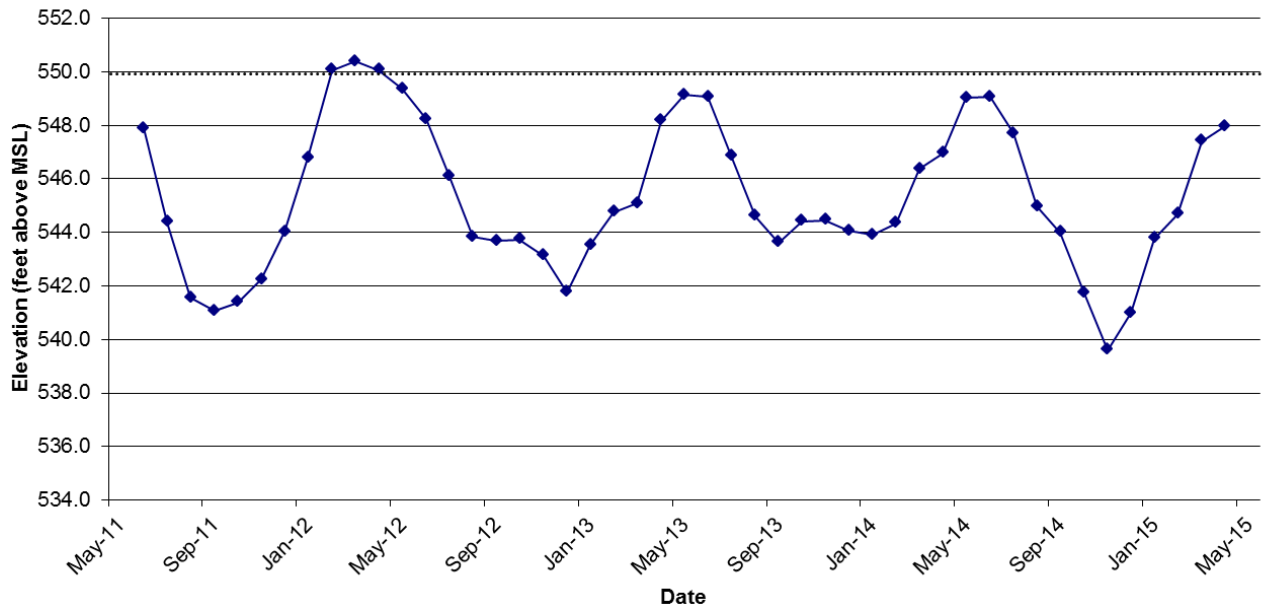


Figure 1. Mean monthly water level elevations in feet above mean sea level (MSL) recorded for Arlington Reservoir, Texas from May 2011 – April 2015. Conservation pool is 550 feet above MSL and is indicated by the dashed line. Data provided by United States Geological Survey in cooperation with the city of Arlington.

Table 1. Characteristics of Arlington Reservoir, Texas.

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

Table 2. Boat ramp characteristics for Arlington Reservoir, Texas, September, 2014. Reservoir elevation at time of survey was 544.0 feet above mean sea level.

Boat ramp	Latitude	Longitude	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.

Species	Bag Limit	Length Limit (inches)
Catfish: Channel and Blue catfish, their hybrids and subspecies	25 (in any combination)	12 minimum
Catfish, Flathead	5	18 minimum
Bass, White	25	10 minimum
Bass, Largemouth	5	14 minimum
Crappie: White and Black Crappie, their hybrids and subspecies	25 (in any combination)	10 minimum

Table 4. Stocking history of Arlington 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)
Channel Catfish	1970	13,450	AFGL	7.9
	1972	5,026	AFGL	7.9
	1997	1,000	ADL	16.1
	1998	1,500	ADL	13.1
	Total	20,976		
Florida Largemouth Bass	1978	9,900	FGL	2.0
	1992	114,078	FGL	1.2
	1997	115,321	FGL	1.2
	2002	115,750	FGL	1.6
	Total	355,049		
Largemouth Bass	1967	10,000	UNK	UNK
	1971	75,000	UNK	UNK
	Total	85,000		
Palmetto Bass (striped X White Bass hybrid)	1978	11,947	UNK	UNK
	1980	22,500	UNK	UNK
	1982	21,000	UNK	UNK
	1984	46,605	FGL	2.0
	1985	45,000	FGL	2.0
	1986	44,000	FRY	1.0
	1987	45,450	FRY	1.0
	1988	51,300	FRY	1.0
	1989	49,700	FGL	1.6
	1991	41,200	FRY	1.0
	1992	21,800	FGL	1.3
	1994	34,506	FGL	1.3
	1995	38,400	FGL	1.2
	1996	35,800	FGL	1.4
	1997	30,000	FGL	1.8
	1998	35,218	FGL	1.1
	1999	11,526	FGL	1.5
	2002	11,379	FGL	1.5
	2003	19,390	FGL	1.5
	Total	616,721		
Walleye	1975	50,000	FRY	0.2
	1976	500,000	FRY	0.2
	Total	550,000		

Table 5. Percent directed angler effort by species for Arlington Reservoir, Texas, 2014 – 2015. Survey periods were from 1 June 2014 through 31 May 2015.

Species	2014/2015
Catfishes	24.5
White Bass	0.5
Sunfishes	0.8
Largemouth Bass	28.9
Crappies	9.1
Anything	32.5

Table 6. Total fishing effort (h) for all species and total directed expenditures at Arlington Reservoir, Texas, 2014- 2015. Survey periods were from 1 June 2014 through 31 May 2015. Relative standard error is in parentheses.

Creel statistic	2014/2015
Total fishing effort (hrs)	118,664 (12)
Total directed expenditures	\$392,452 (24)

Gizzard Shad

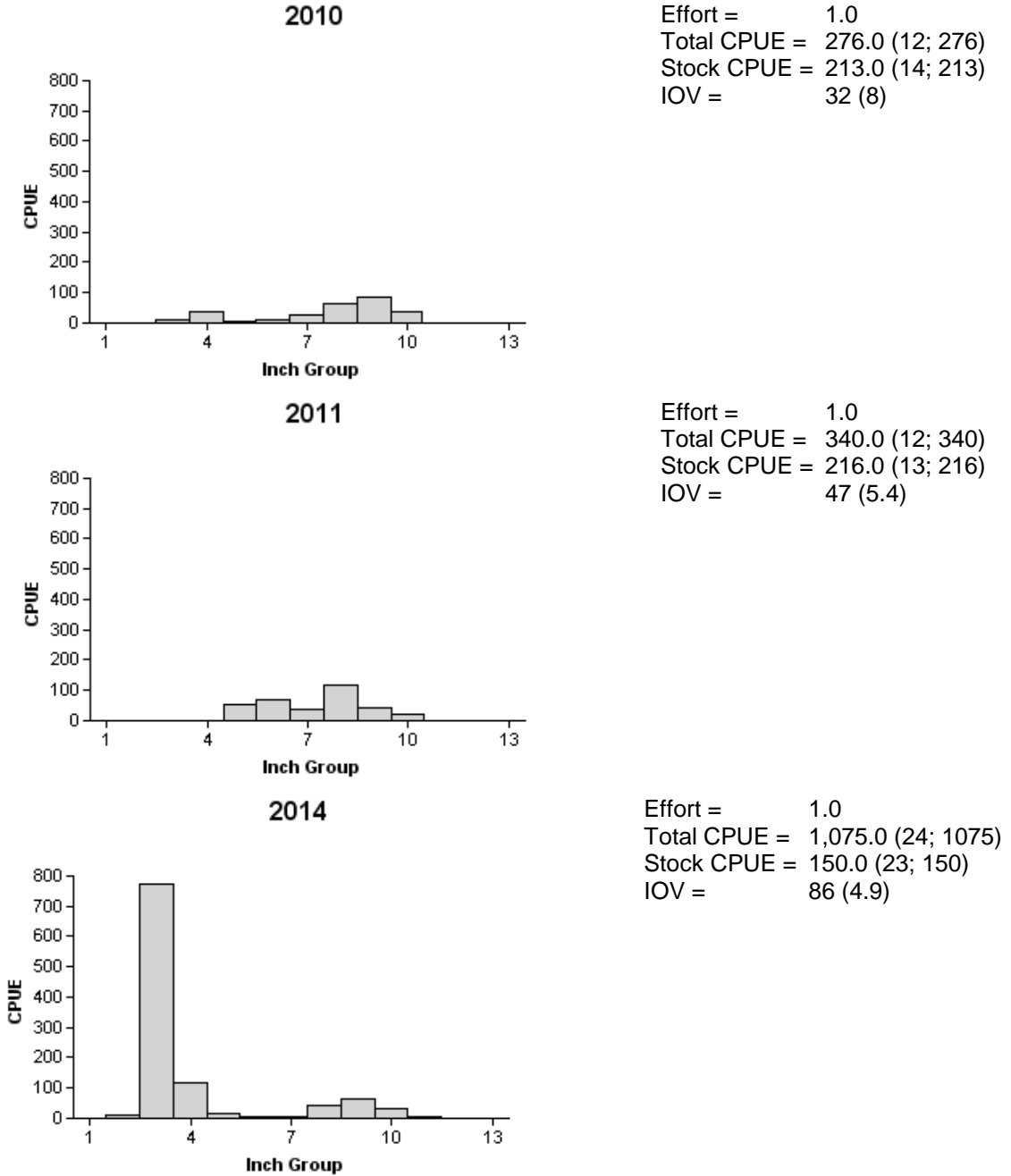


Figure 2. Number of Gizzard Shad caught per hour (CPUE; bars) and population indices (RSE and N for CPUE and SE for IOV are in parentheses) for fall electrofishing surveys, Arlington Reservoir, Texas, 2010, 2011, and 2014.

Bluegill

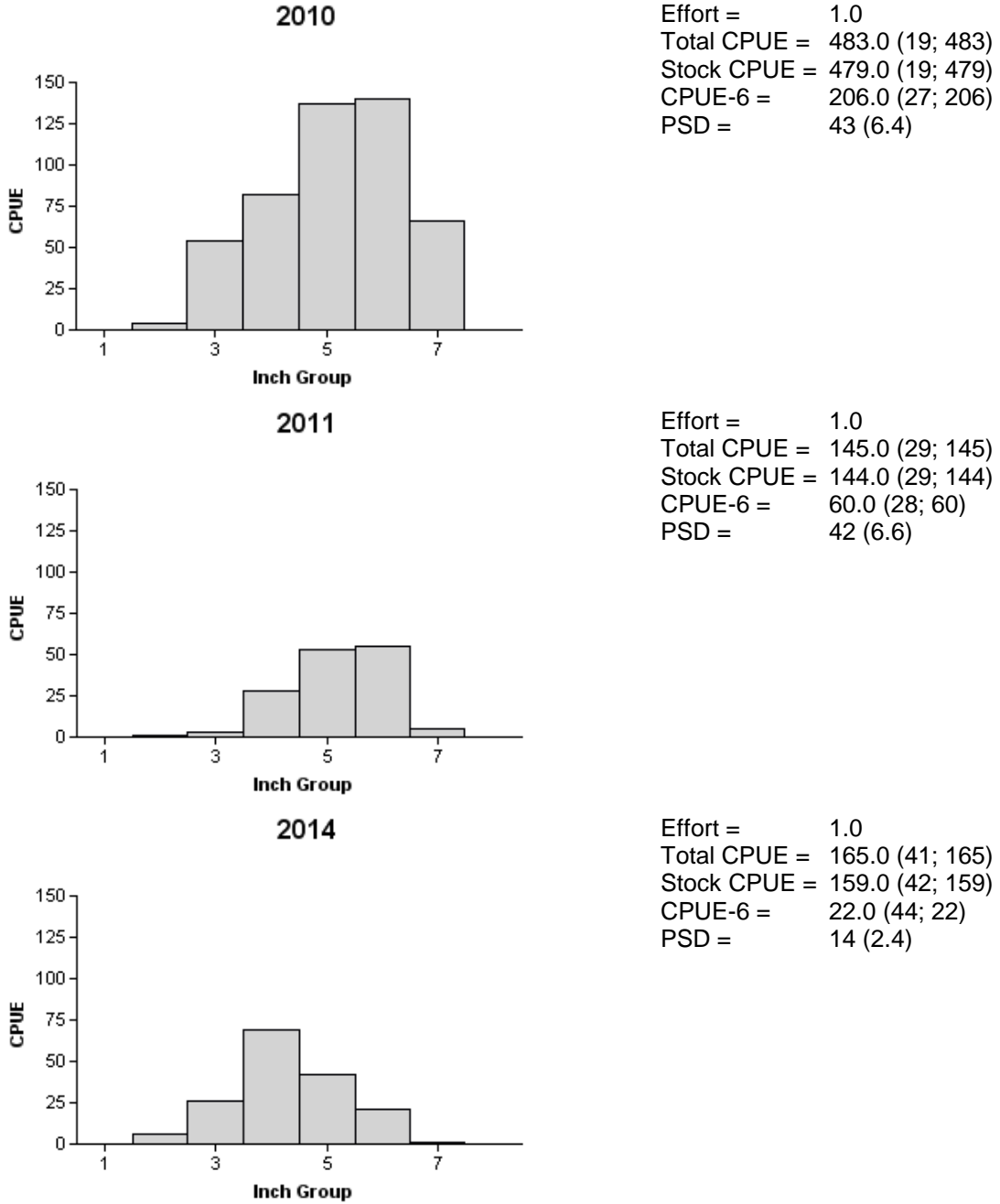


Figure 3. Number of Bluegill caught per hour (CPUE; bars) and population indices (RSE and N for CPUE and SE for size structure are in parentheses) for fall electrofishing surveys, Arlington Reservoir, Texas, 2010, 2011, and 2014.

Channel Catfish

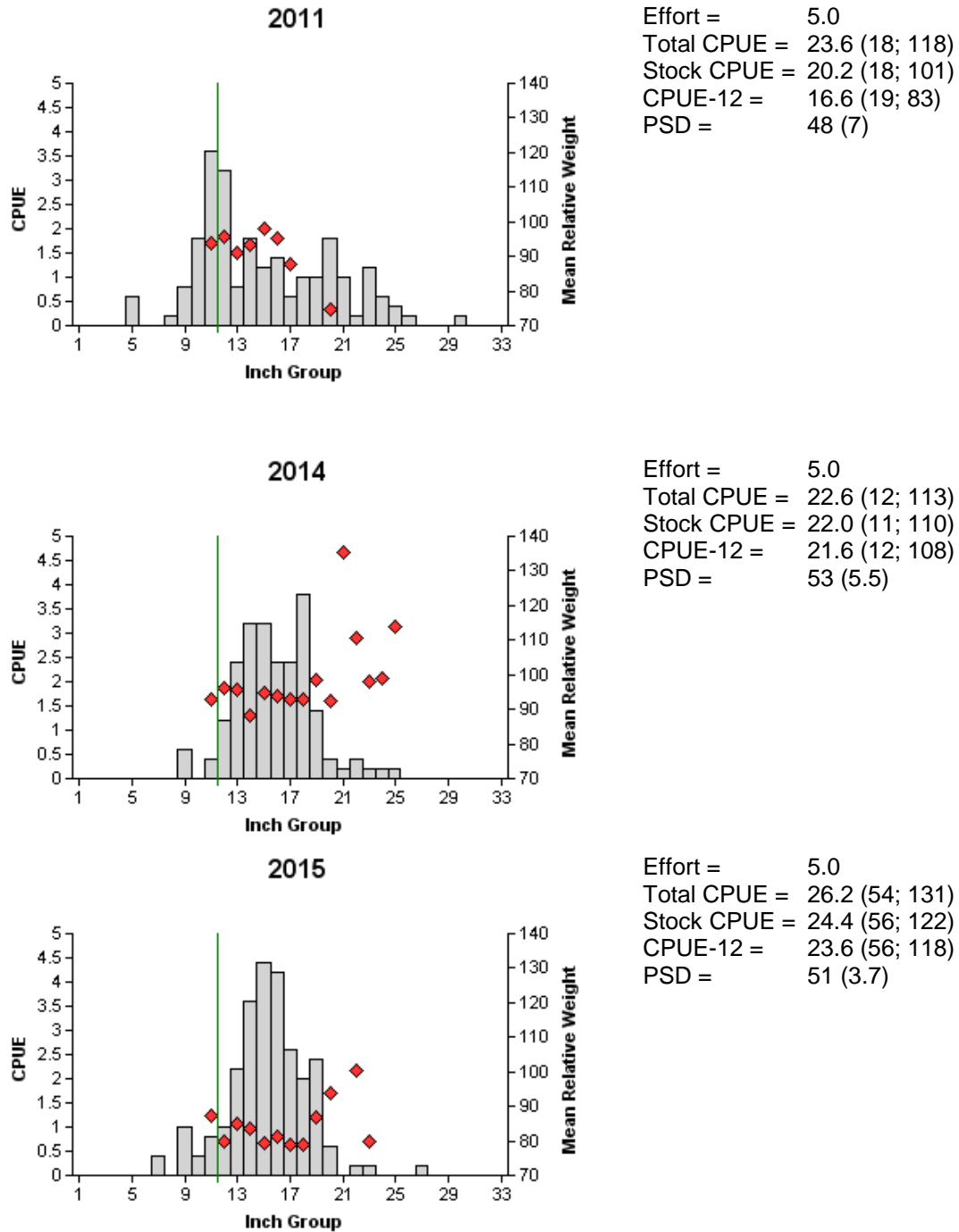


Figure 4. Number of Channel Catfish caught per net night (CPUE; bars), mean relative weight (diamonds), and population indices (RSE and N for CPUE and SE for size structure are in parentheses) for spring gill net surveys, Arlington Reservoir, Texas, 2011, 2014, and 2015. Vertical line represents length limit at time of sampling.

Table 7. Average length at capture for Channel Catfish ages 1 – 6 and 8, 9, and 11, collected in gill netting and hoop netting surveys, Arlington Reservoir, Texas, 2014. Lengths are followed by the sample size and relative standard error in parenthesis (RSE; N).

Sampling date	Length (inches) at capture for age									
	1	2	3	4	5	6	7	9	10	12
04/2014	11.0 (10)	10.5 (37)	13.3 (34)	15.3 (42)	17.0 (21)	17.7 (48)	16.2 (2)	19.7 (1)	14.9 (1)	13.5 (1)

Table 8. Creel survey statistics for Channel Catfish at Arlington Reservoir from June 2014 through May 2015, where effort statistics is for anglers targeting Catfish and harvest statistics and percent legal released is the estimated number of Channel Catfish harvested by all anglers. Relative standard errors (RSE) are in parentheses.

Creel Survey Statistic	Year
	June 2014-May 2015
Percent directed effort	24.5 (18)
Directed effort (h)	29,041.63 (18)
Directed effort/acre	15
Total catch per hour	0.23 (52.6)
Total harvest	6,151 (51.3)
Harvest/acre	3.2
Percent legal released	21

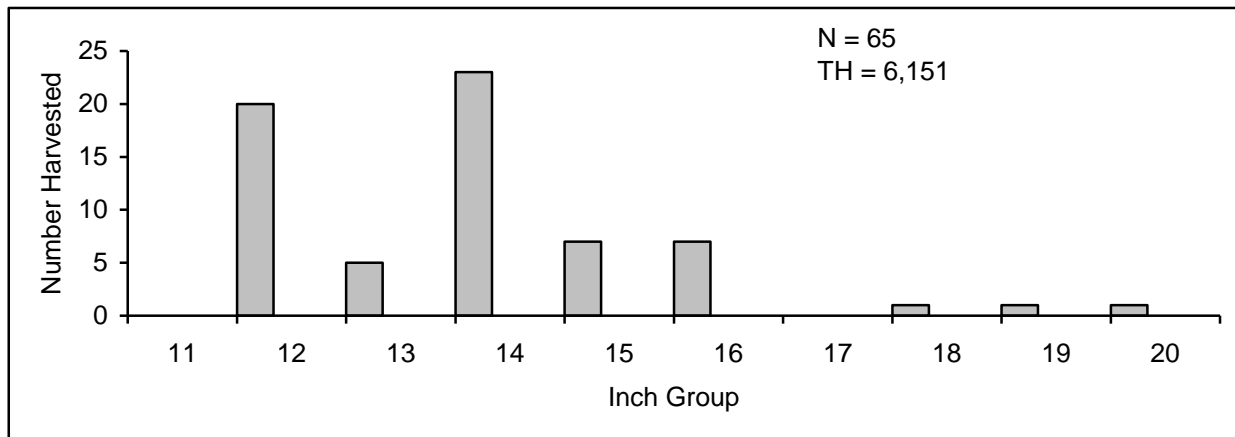


Figure 5. Length frequency of harvested Channel Catfish observed during creel surveys at Arlington Reservoir from June 2014 through May 2015 all anglers combined. N is the number of harvested Channel Catfish observed during creel surveys, and TH is the total estimated harvest for the creel period

White Bass

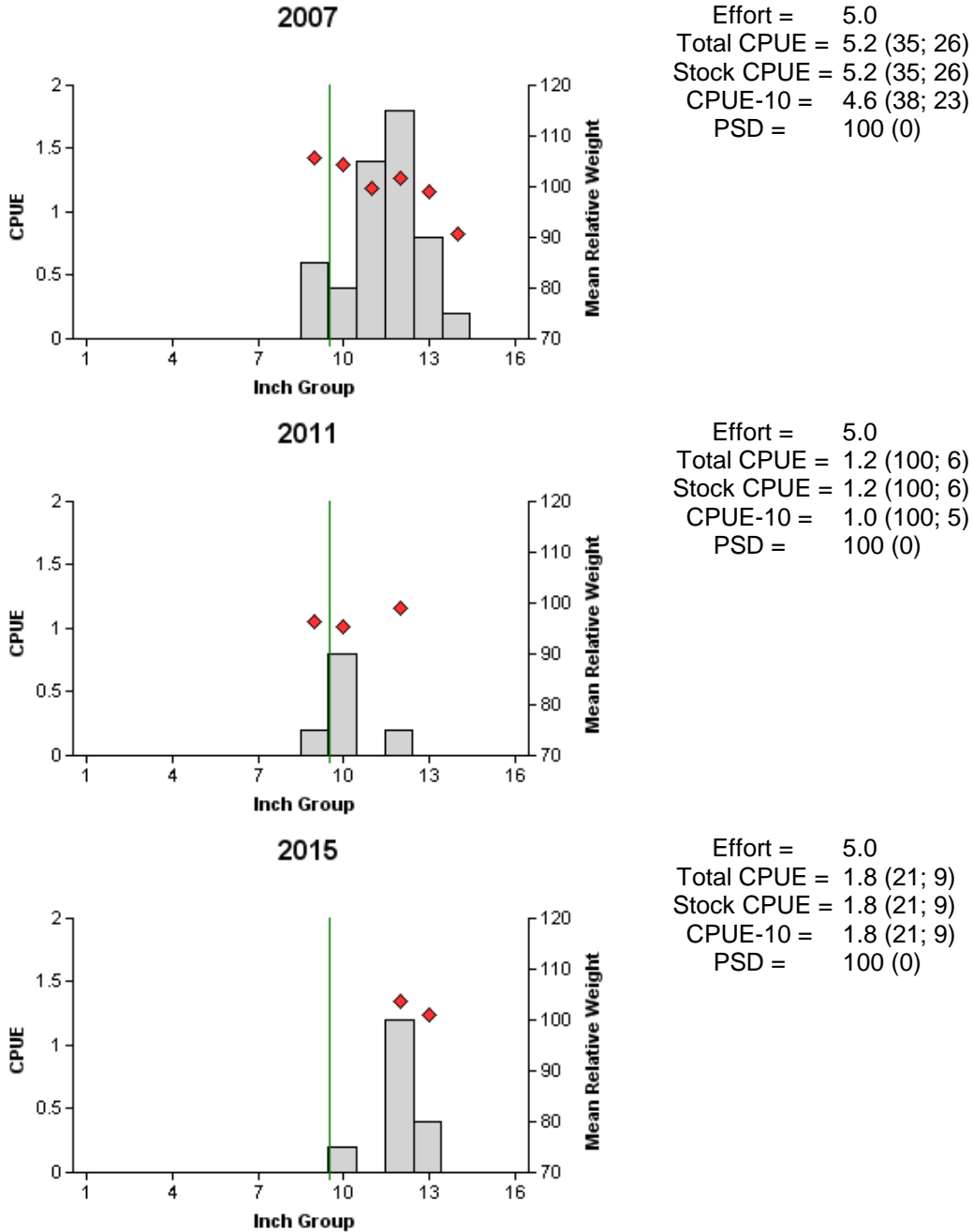


Figure 6. Number of White Bass caught per net night (CPUE; bars), mean relative weight (diamonds), and population indices (RSE and N are in parentheses) for spring gill net surveys, Arlington Reservoir, Texas, 2007, 2011, and 2015. Vertical line represents length limit at time of sampling.

Table 9. Creel survey statistics for White Bass at Arlington Reservoir from June 2014 through May 2015, where total catch per hour is for anglers targeting White Bass and total harvest is the estimated number of White Bass harvested by all anglers. Relative standard errors (RSE) are in parentheses.

Creel Survey Statistic	Year
	June 2014-May 2015
Percent directed effort	0.5 (76.6)
Directed effort (h)	615 (76.6)
Directed effort/acre	0.32
Total catch per hour	1.7 (38.5)
Total harvest	285 (82.5)
Harvest/acre	0.15
Percent legal released	91

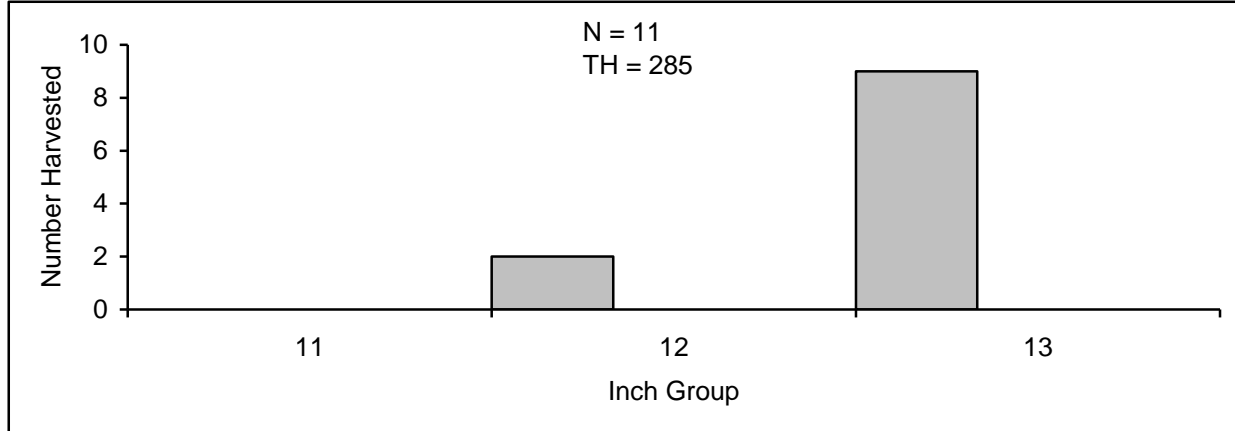


Figure 7. Length frequency of harvested White Bass observed during creel surveys at Arlington Reservoir from June 2014 through May 2015, all anglers combined. N is the number of harvested White Bass observed during creel surveys, and TH is the total estimated harvest for the creel period.

Largemouth Bass

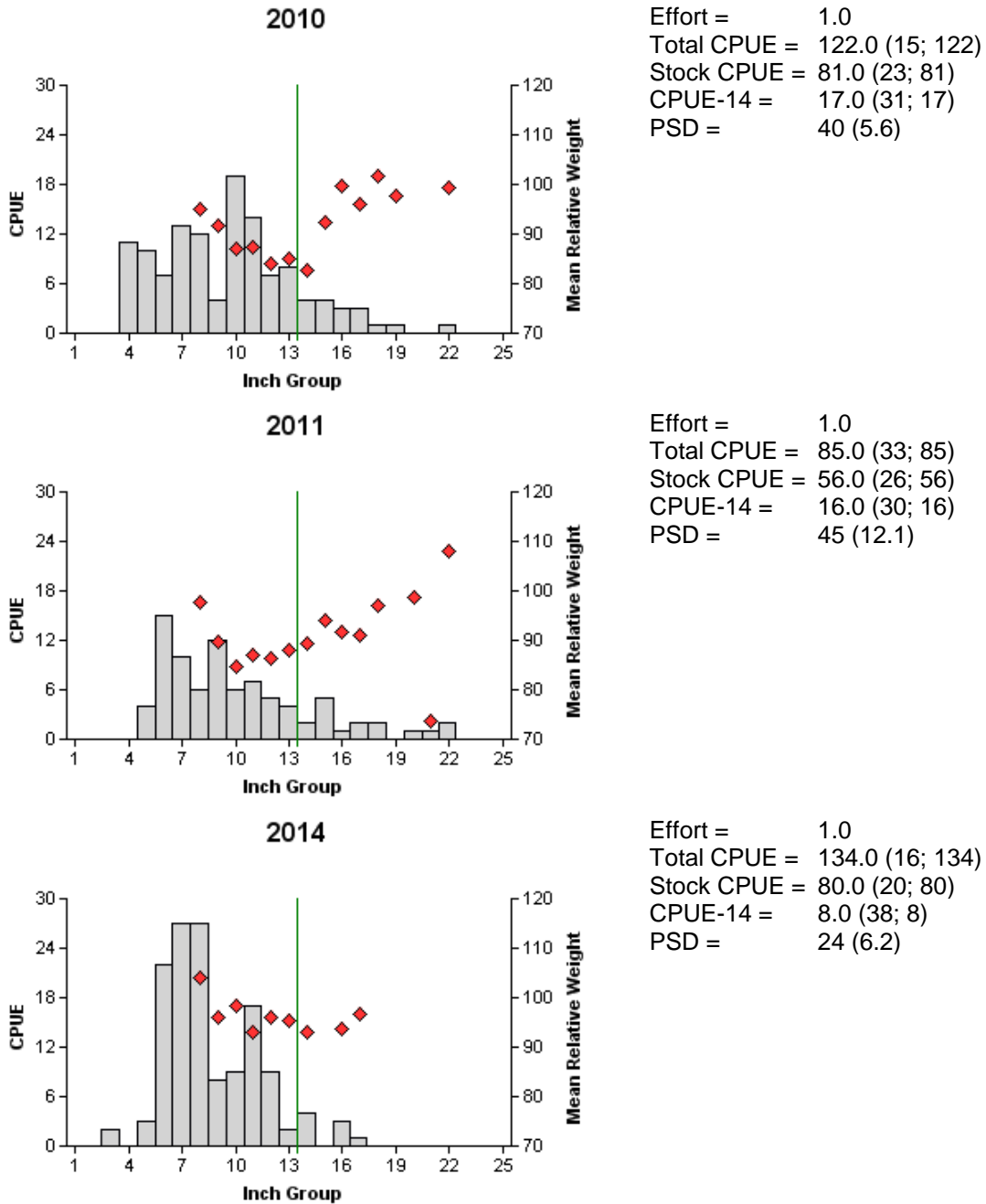


Figure 8. Number of Largemouth Bass caught per hour (CPUE, bars), mean relative weight (diamonds), and population indices (RSE and N for CPUE and SE for size structure are in parentheses) for fall electrofishing surveys, Arlington Reservoir, Texas, 2010, 2011, and 2014. Vertical lines represent length limit at time of sampling.

Table 10. Results of genetic analysis of Largemouth Bass collected by fall electrofishing, Arlington Reservoir, Texas, 2004, 2009, and 2014. FLMB = Florida Largemouth Bass, NLMB = Northern Largemouth Bass, Intergrade = hybrid between a FLMB and a NLMB. Genetic composition was determined by with micro-satellite DNA analysis since 2005.

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

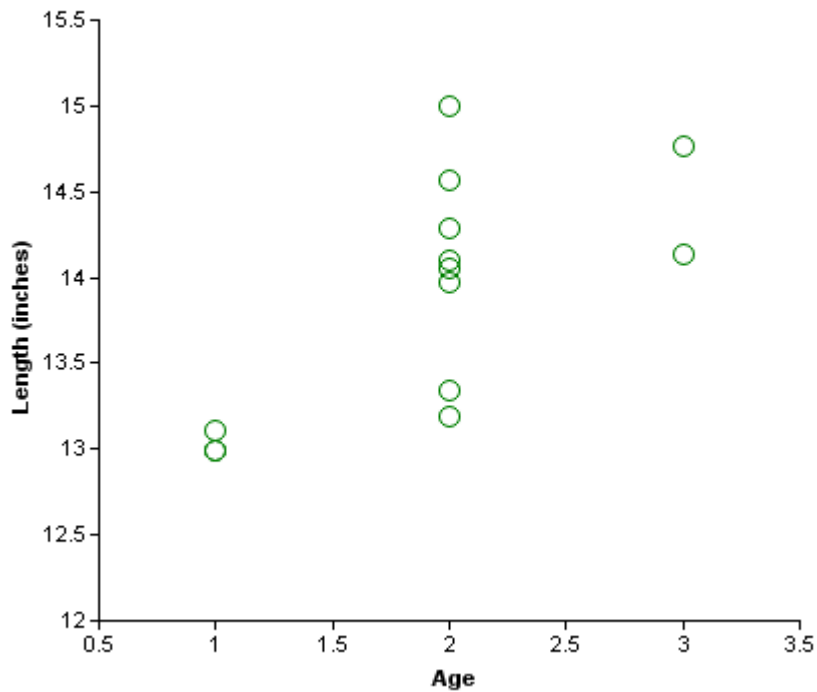


Figure 9. Length at age for Largemouth Bass (sexes combined) collected from electrofishing at Arlington Reservoir, Texas, for fall 2014 (N=13).

Table 11. Creel survey statistics for Largemouth Bass at Arlington Reservoir from June 2014 through May 2015, where total catch per hour is for anglers targeting Largemouth Bass and total harvest is the estimated number of Largemouth Bass harvested by all anglers. Relative standard errors (RSE) are in parentheses.

Creel Survey Statistic	Year
	June 2014-May 2015
Percent directed effort	28.9 (20.9)
Directed effort (h)	34,246 (20.9)
Directed effort/acre	17.7
Total catch per hour	0.28 (31.5)
Total harvest	0 (103.0)
Harvest/acre	0
Percent legal released	100

White Crappie

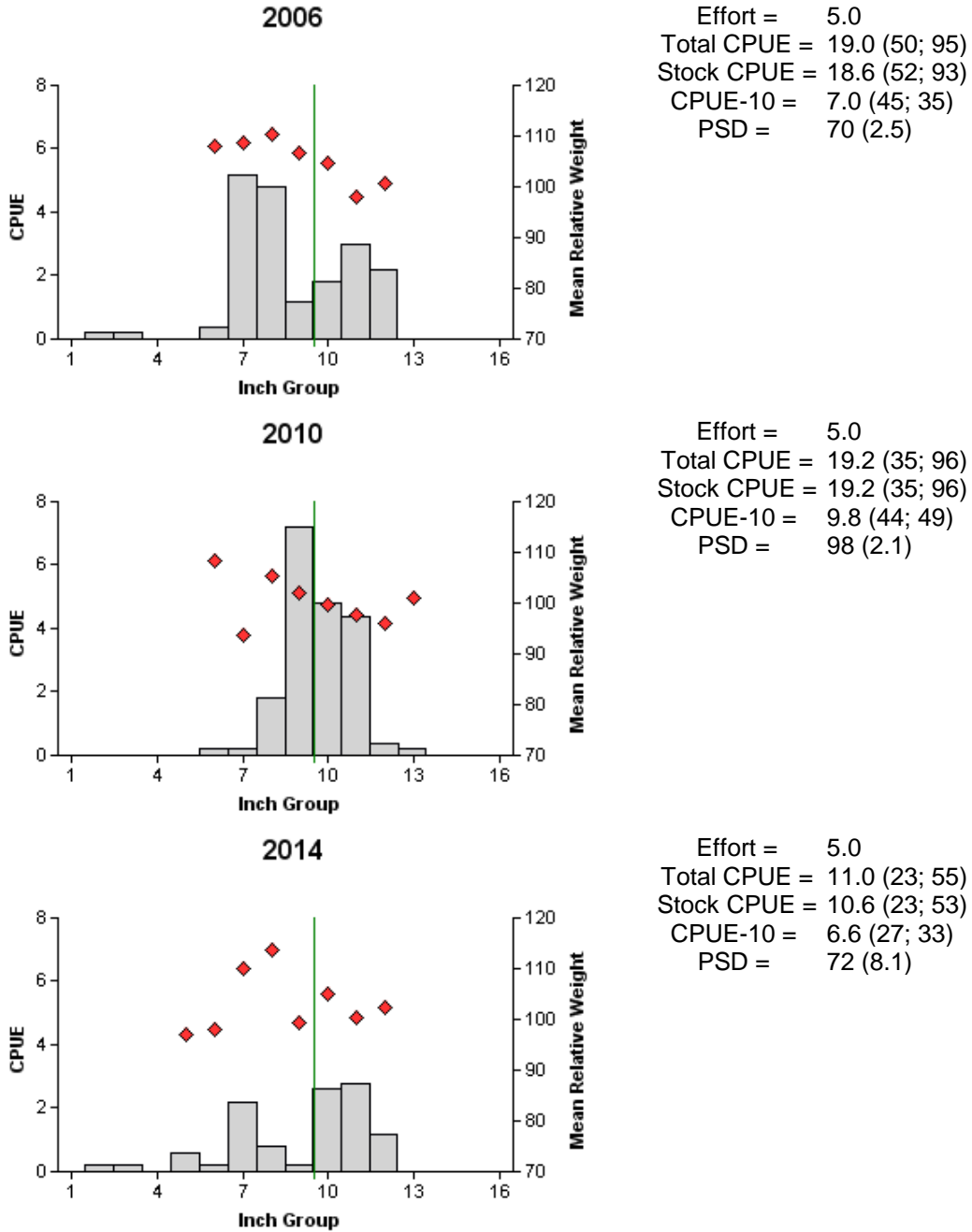


Figure 10. Number of White Crappie caught per net night (CPUE, bars), mean relative weight (diamonds), and population indices (RSE and N for CPUE and SE for size structure are in parentheses) for fall trap net surveys, Arlington Reservoir, Texas, 2006, 2010, and 2014. Vertical line represents length limit at time of sampling.

Table 12. Creel survey statistics for White Crappie at Arlington Reservoir from June 2014 through May 2015, where total catch per hour is for anglers targeting White Crappie and total harvest is the estimated number of White Crappie harvested by all anglers. Relative standard errors (RSE) are in parentheses.

Creel Survey Statistic	Year
	June 2014-May 2015
Percent directed effort	9.1
Directed effort (h)	10,770.5 (22.4)
Directed effort/acre	5.6
Total catch per hour	0.24 (68.5)
Total harvest	1,330 (49.4)
Harvest/acre	0.69
Percent legal released	11

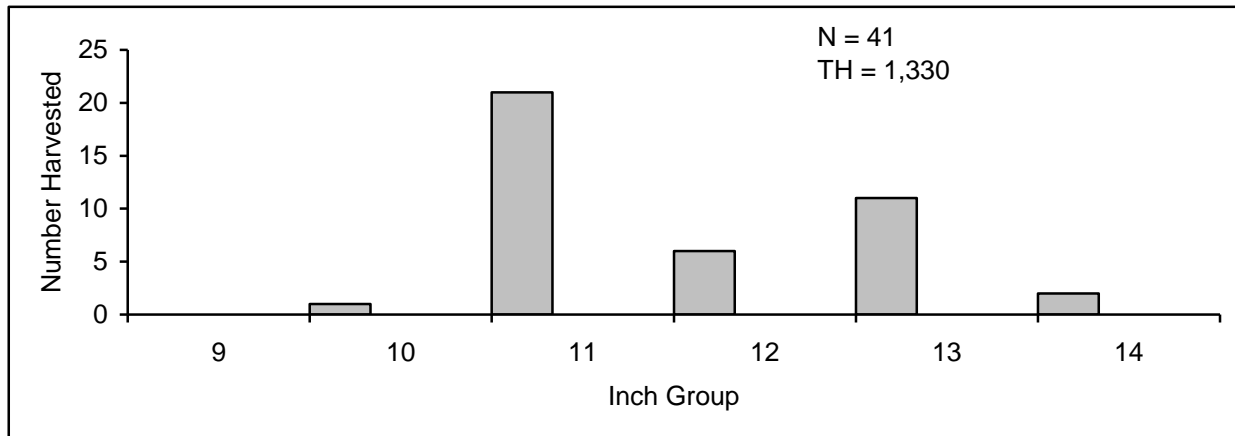


Figure 11. Length frequency of harvested White Crappie observed during creel surveys at Joe Pool Reservoir from June 2014 through May 2015, all anglers combined. N is the number of harvested White Crappie observed during creel surveys, and TH is the total estimated harvest for the creel period.

Table 13. Proposed sampling schedule for Arlington Reservoir, Texas. Gill netting surveys are conducted in the spring, while electrofishing and trap netting surveys are conducted in the fall. Standard surveys are denoted by S and additional surveys denoted by A.

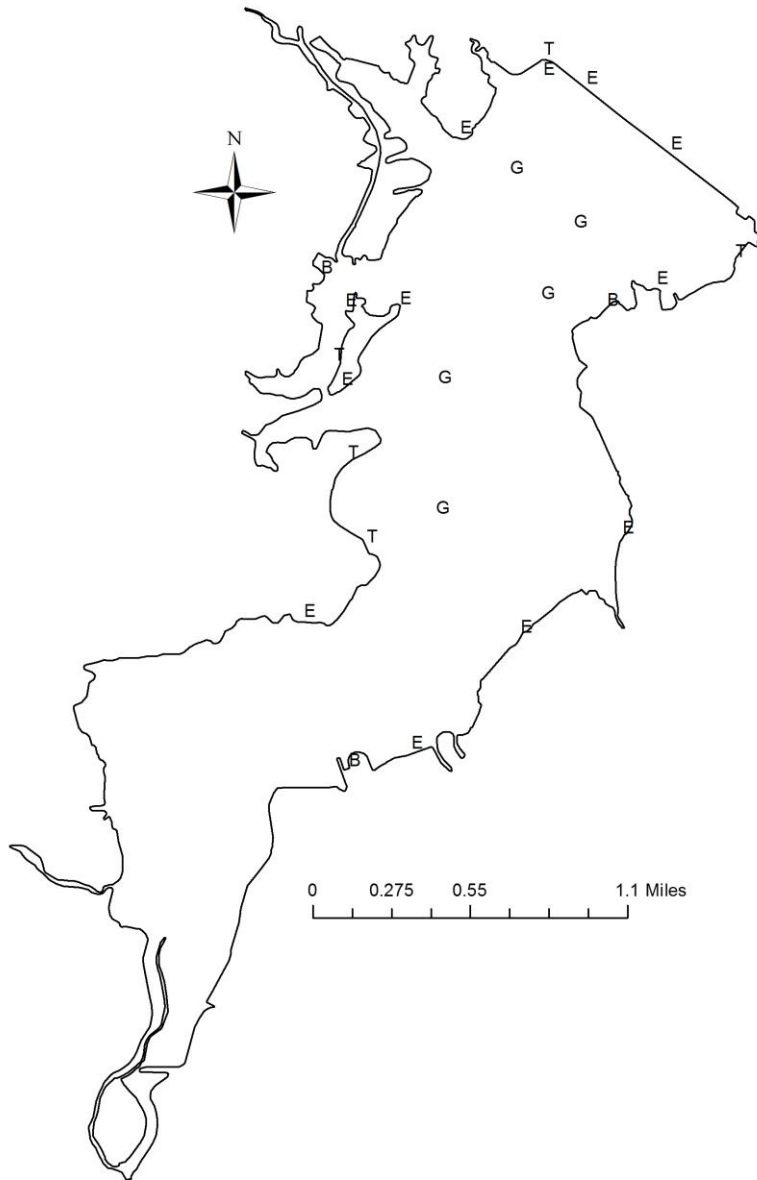
Survey year	Electrofishing Fall(Spring)	Trap net	Hoop net	Habitat			Creel survey	Report
				Structural	Vegetation	Access		
2015-2016								
2016-2017	A							
2017-2018								
2018-2019	S	S	A		S	S		S

APPENDIX A

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

Species	Gill Netting		Trap Netting		Electrofishing	
	N	CPUE	N	CPUE	N	CPUE
Gizzard Shad	28	5.6			1075	1075.0
Threadfin Shad					514	514.0
Common Carp	13	2.6				
Channel Catfish	131	26.2				
White Bass	9	1.8				
Yellow Bass	148	29.6				
Bluegill					165	165.0
Longear Sunfish					80	80.0
Largemouth Bass	1	0.2			134	134.0
White Crappie	1	0.2	55	11.0		
Freshwater Drum	11	2.2				

APPENDIX B



Location of sampling sites, Arlington Reservoir, Texas, 2014-2015. Trap net, gill net, and electrofishing stations are indicated by T, G, and E, respectively. Boat ramps are indicated with a B.

APPENDIX C

Historical catch rates for targeted species by gear type for Arlington Reservoir, Texas. Surveys prior to 1996 utilized biologist-selected stations while those after 1996 utilized randomly-selected stations. Species averages are in bold.

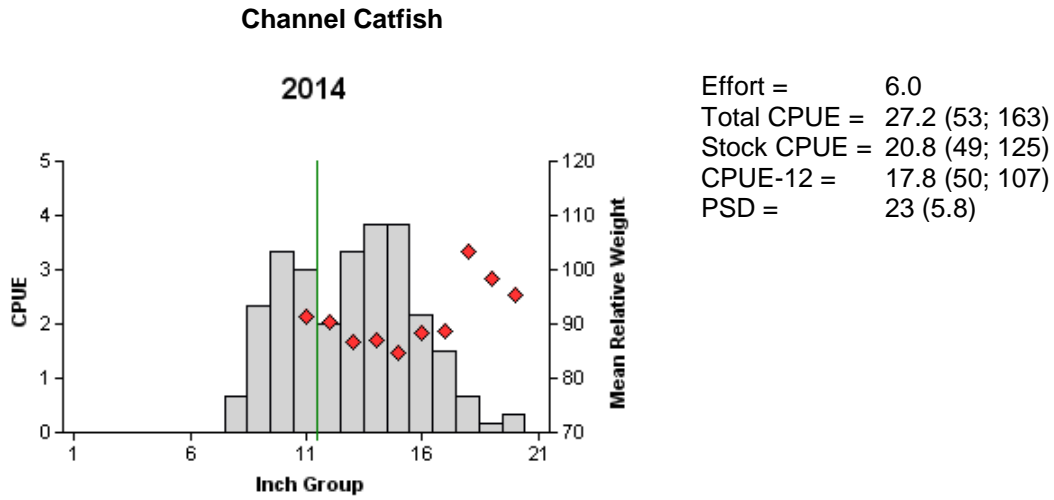
Gear	Species	Year														
		1992	1995	1998	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011
Gill Netting (fish/net night)	Channel Catfish	17.0	9.4	7.8		17.4		8.6				15.0				23.6
	White Bass	2.4	11.6	9.2		4.8		19.0				5.2				1.2
Electrofishing (fish/hour)	Gizzard Shad	211.3	339.3	194.0	275.0		96.0		208.0	264.0	303.0		328.0	221.0	276.0	340.0
	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 (fish/net night)	Channel Catfish															
Trap Netting (fish/net night)	White Crappie	8.6	2.8	4.0			15.6				19.0				19.2	

APPENDIX C continued.

Gear	Species	Year		Ave.
		2014	2015	
Gill Netting (fish/net night)	Channel Catfish	22.6	26.2	16.4
	White Bass	0.0	1.8	6.1
Electrofishing (fish/hour)	Gizzard Shad	1,075.0		317.7
	Threadfin Shad	514.0		559.4
	Bluegill	165.0		269.7
	Longear Sunfish	80.0		87.5
	Redear sunfish	0.0		2.0
	Largemouth Bass	134.0		126.0
Hoop Netting (fish/net night)	Channel Catfish	27.2		27.2
Trap Netting (fish/net night)	White Crappie	11.0		11.5

APPENDIX D

Spring 2014 Supplemental Hoop Net Sampling Channel Catfish Length Frequency Histogram and Catch Statistics, Arlington Reservoir, Texas.



APPENDIX E

Objective-Based Sampling Plan for Arlington Reservoir

2014 - 2015

Sport fish, forage fish, and other important fishes

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

Negligible fisheries

Negligible fisheries are non-existent at Arlington Reservoir

Survey objectives, fisheries metrics, and sampling objectives

Largemouth Bass: Largemouth Bass are the most popular sport fish in Arlington Reservoir. The popularity and reputation for quality Largemouth Bass fishing at this reservoir warrant sampling time and effort. The last creel survey was conducted in 2002-2003. A creel to confirm past angler effort information is currently being conducted. Largemouth Bass have always been managed with the statewide 14-in MLL regulation. Trend data on CPUE, size structure, and body condition have been collected annually from 2004-2011 with fall nighttime electrofishing. No Largemouth sampling has been conducted since. Continuation of annual trend data in this reservoir with night electrofishing in the fall was determined not to be justified after last sample plan. Depending on catch, biannual sampling of the Largemouth Bass will be conducted in the future. This should allow for determination of any large-scale changes in the Largemouth Bass population that may spur further investigation. A minimum of 12 randomly selected 5-min electrofishing sites will be sampled in 2014. Based on past catch rates, this should be adequate to obtain an RSE of $CPUE-S \leq 25$ (the anticipated effort to meet both sampling objectives is 12 stations with 80% confidence). A tier 2 age and growth survey will also be conducted on Largemouth Bass to determine age at 14 inches.

Channel Catfish: Channel Catfish are the second most sought after sport fish in Arlington Reservoir. The popularity and reputation for quality Channel Catfish fishing at this reservoir warrant sampling time and effort. The last creel survey was conducted in 2002-2003. A creel to confirm past angler effort information is currently being conducted. A total of 5 gill net surveys were conducted in spring of 2014 to determine CPUE and also collect 200 individuals greater than 150 mm for a tier 3 age and growth analysis. Since not enough individuals were collected to obtain adequate sample size, triple cod hoop nets were used to collect more individuals. Triple cod hoop net surveys were recommended by research staff instead of experimental gill netting surveys. A total of 6 triple cod hoop net surveys were conducted to obtain adequate sample size. Collecting 200 individuals should give an 80% confidence in the mean length at age. An additional 5 gill net survey will be conducted in the spring of 2015 and this should allow RSE of 25.

Bluegill, Threadfin and Gizzard Shad: Bluegill, Threadfin and Gizzard Shad are the primary forage in Arlington Reservoir. Like Largemouth Bass, trend data on CPUE and size structure have been collected

annually from 2004-2011 with fall nighttime electrofishing. No forage sampling has been conducted since. Sampling, as with Largemouth Bass above, will allow for monitoring of large-scale changes in Bluegill, Threadfin and Gizzard Shad relative abundance and size structure. Sampling effort based on achieving sampling objectives for Largemouth Bass will result in sufficient numbers of Bluegill, Threadfin and Gizzard Shad for size structure estimation (PSD and IOV; 50 fish minimum at 12 stations with 80% confidence) and for relative abundance estimates ($RSE \leq 25$ of CPUE-Total).

White Crappie: Previous creel survey data indicate White Crappie angling comprised only 4.5% of total angling effort. Catch rates have improved in recent surveys. However because of low past directed effort only a 5 single-cod shoreline trap netting survey will be conducted. This should give us an idea of the population status when compared to past surveys. If current creel reveals increased effort, more intense sampling with quantifiable objectives will be developed.

White Bass: Previous creel survey data indicated 6.7% of anglers targeted White Bass. Catch rates have declined in recent samples. A creel survey is currently being conducted to update angler effort information. The decrease in the White Bass population may be the result of minimal tributary flow during spawning. Data on White Bass will be collected when the 5 gill net survey for Channel Catfish is conducted in the spring of 2015. This should give an idea of the population status when compared to past surveys. If catch rates are still low and angler effort is minimal, White Bass may be deemed a negligible fishery in the reservoir.