PERFORMANCE REPORT

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INLAND FISHERIES DIVISION MONITORING AND MANAGEMENT PROGRAM

2016 Fisheries Management Survey Report

O.C. Fisher Reservoir

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SURVEY AND MANAGEMENT SUMMARY

Fish populations in O.C. Fisher Reservoir were surveyed in 2016 using electrofishing and trap netting and in 2017 using gill netting. 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:** O. C. Fisher Reservoir is a 5,440-acre reservoir at conservation pool elevation and is located on the west side of San Angelo, Texas. Access to the reservoir is controlled by San Angelo State Park which surrounds most of the lake basin. The reservoir has a history of severe water level fluctuations. It went completely dry in 2013 and then caught significant water in 2015.

- **Management History:** Important sport fishes have included Largemouth Bass, White Crappie, and catfishes. Sport fishes have been managed with statewide regulations.

- **Fish Community**
  - **Prey species:** Electrofishing catch of Gizzard Shad was very high with most available to predators based on their size. Electrofishing catch of Bluegills was high and provided an additional source of prey for predators.

  - **Catfishes:** Channel Catfish abundance was low. No Blue and Flathead Catfish were observed during sampling.

  - **White Bass:** White Bass were present in the reservoir, but population density was low.

  - **Largemouth Bass:** Largemouth Bass abundance was higher in 2016 compared to in the past. All but a few fish were <12 inches total length. Bass up to 16 inches were observed.

  - **White Crappie:** Abundance of White Crappie was markedly lower in 2016 compared to in the past. However, catch of a few 4-6 fish suggest some reproduction and survival.

Management Strategies: Continue to manage fish harvest with statewide regulations. Conduct electrofishing, trap netting, and hoop netting surveys in 2018-2019 and 2020-2021. Access and vegetation surveys will be conducted in 2020.

INTRODUCTION

This document is a summary of fisheries data collected from O.C. Fisher 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

O. C. Fisher Reservoir was constructed in 1953 on the North Concho River on the west side of San Angelo, Texas. The 5,440-acre impoundment is used for recreation, municipal water supply and irrigation. Access to the reservoir is controlled by San Angelo State Park which surrounds most of the lake basin. Historically, O. C. Fisher Reservoir has suffered from low and fluctuating water levels. At its lowest point the reservoir effectively went dry in 2013 and then caught significant water in 2015 (Figure 1). At the time of writing the reservoir was 14.1% full and had a surface area of 1,249. Other descriptive characteristics for O. C. Fisher Reservoir are presented in Table 1.

Angler Access

Angler access is controlled through the South Gate of San Angelo State Park (entry fee required). At conservation pool, the reservoir has two concrete boat ramps and ample shoreline access. The ramp nearest the dam is currently the only usable ramp (Table 2).

Management History

Previous management strategies and actions: Management strategies and actions from the previous survey report (Scott 2013) included:

1. Stay informed on local water issues and projects, write at least one article for the local newspaper on the importance of water conservation to the local fisheries.
   Action: Staff kept informed of local water issues, at least one article was written for the local newspaper.
2. If the reservoir catches a substantial amount of water, stock fingerling Bluegill, Largemouth Bass, Channel Catfish, adult White Crappie, and both Threadfin and Gizzard Shad.
   Action: The reservoir water level significantly increased in 2015, and all of the above named fishes except shad spp. were stocked.
3. Continue to work with San Angelo State Park to develop Javalina Draw fishing pond as an alternate fishing site within the park.
   Action: Javalina Draw was stocked with Channel Catfish and Rainbow Trout.
4. Cooperate with controlling authorities to post signage, educate the public about invasive species, and track existing and future inter-basin water transfers to facilitate potential invasive species responses.
   Action: Continued to work with controlling authorities to post signage and to educate the public on invasive species threats through media outlets.

Harvest regulation history: Sport fishes in O. C. Fisher Reservoir are managed with statewide harvest regulations (Table 3).

Stocking history: Species stocked have included Threadfin Shad, Blue Catfish, Channel Catfish, Flathead Catfish, Florida and Northern Largemouth Bass, and various sunfishes. Walleye were stocked in the past, with no success. The complete stocking history is in Table 4.

Vegetation/habitat management history: The reservoir has no habitat management history.

Water transfer: No interbasin water transfers are known to occur.

METHODS

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

Electrofishing – Largemouth Bass, Sunfishes, and Gizzard Shad were collected by electrofishing (1 hour at 12, 5-min stations). Catch per unit effort (CPUE) for electrofishing was recorded as the number of fish caught per hour (fish/h) of actual electrofishing.

Trap netting – Crappie were collected using trap nets (10 net nights at 10 stations). CPUE 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).

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 vegetation survey was conducted in 2016. Habitat was assessed with the digital shapefile method (TPWD, Inland Fisheries Division, unpublished manual revised 2015).

Water level – Source for water level data was the United States Geological Survey (USGS 2017).

RESULTS AND DISCUSSION

Habitat: Due to fluctuating water levels, limited amounts of native vegetation were present in 2016. One acre of coon-tail and one acre of water-primrose was observed in the reservoir. Additionally, bulrush was present, but coverage was less than one acre. Significant amounts of flooded terrestrial habitat were present and provides abundant fish habitat. Much of the lakebed was overgrown by salt cedar and willow during low water conditions. The previous vegetation survey in 2008 found no aquatic vegetation in O.C. Fisher Reservoir (Scott and Farooqi 2009).

Prey species: Electrofishing CPUE of Bluegill and Gizzard Shad in 2016 were 220.0/h and 617.0/h, respectively. These populations provide an excellent forage base for sportfish populations. Gizzard Shad IOV was high with 99% of fish available to existing predators based on their size (Figure 2). Total CPUE of Bluegill in 2016 was much higher than previous surveys in 2009 and 2008 (Figure 3). The bluegill population was mostly comprised of 3-4 inch fish. Other sunfish species observed included Warmouth, Green, Longear, and Redear Sunfish (Appendix A).

Channel Catfish: Channel Catfish were present in the reservoir, but at a low density. Gill net CPUE was 1.6 fish/nn in 2017, much lower than in 2009 and 2008, however, this was expected as the population is recovering from low water conditions. Channel Catfish from 11 to 16 inches were collected and fish condition was excellent with W_r ranging from 100 to 130 (Figure 4).

White Bass: White Bass CPUE was 2.6 fish/nn in 2017 (Figure 5). White Bass had not been collected in the reservoir since 2001. Although few fish were collected, they exceeded the minimum length limit. Relative weights were excellent with W_r over 110.

Largemouth Bass: The electrofishing CPUE of stock size Largemouth Bass was 38.0/h in 2016, which was similar to previous surveys in 2009 (39.0/h) and 2008 (22.0/h; Figure 6). Due to population recovery from low water levels, size structure was predictably poor as PSD and PSD-P was 8 and 5 respectively (Figure 6). The length frequency indicates good recruitment during spring 2016 with decent numbers of fish from 3 to 11 inches. Legal size fish were present and provide some angling opportunities. Relative weights (W_r) were above average and exceeded 100 most inch groups.

White Crappie: The trap net catch rate of White Crappie was 1.6/nn in 2016, which was much lower than 2008 (48.0/nn) and 2005 (22.3/nn; Figure 7). Low CPUE in 2016 was likely due to a combination of low population density and inefficient sampling due to flooded terrestrial habitat. In addition to a few legal size fish, 4 to 6 inch fish were collected confirming a successful spawn in spring 2016. Relative weights were above average for the larger white crappie (W_r > 100) while smaller crappie were only adequate (W_r ~ 80). Contingent upon the reservoir maintaining adequate water levels, the White Crappie population should continue to improve with abundant forage and good structural habitat.

Fisheries management plan for O.C. Fisher Reservoir, Texas

Prepared – July 2017.

ISSUE 1: Sportfish populations are recovering following a 5 year period of extreme low water level. Continued sampling is necessary to monitor for changes in sport and prey fish populations and additional stockings of some species may be warranted to help with recovery.

MANAGEMENT STRATEGY

1. Conduct electrofishing, hoop and trap netting in 2018 and 2020 to assess the Largemouth Bass, prey spp., Channel Catfish, and White Crappie populations.
2. Conduct additional trap net survey in fall 2017, if CPUE remains low, conduct management stocking of White Crappie.
3. Monitor Blue Catfish population with low-frequency electrofishing in spring 2021.
4. Request stockings of Florida Largemouth Bass and Channel Catfish in spring 2018.
5. Collect Largemouth Bass genetics sample in 2020.
6. Continue to manage sportfish with statewide regulations.

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 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.

Objective-Based Sampling Plan and Schedule

O.C. Fisher Reservoir 2017-2021

Sport fish, forage fish, and other important fishes

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

Low-density fisheries

Flathead Catfish: Flathead Catfish have historically been present in the reservoir, but at low density. Since 2000 only three individuals have been collected during gill net surveys and population density is likely to be low following drought conditions. Sampling this population is unnecessary during 2017-2021, however, length frequency data can be collected while sampling for Blue Catfish. If sufficient numbers are observed, we may develop specific Flathead Catfish survey objectives for the next reporting cycle.

White Bass: White Bass are present in the reservoir, but at a low density. White Bass were collected in 2017, but prior to this had not been observed in gill net surveys since 2001. Sampling this population is unnecessary during 2017-2021, however, presence/absence data can be collected during sampling for other species.

Survey objectives, fisheries metrics, and sampling objectives

Largemouth Bass: The Largemouth Bass population was negatively affected by severe low water in 2011-2015, but water levels sharply increased in spring 2015. Electrofishing data from fall 2016 indicates a combination of a successful spawn in spring 2016 and good survival of stocked Largemouth Bass. Collection of biennial trend data in this reservoir using electrofishing in the fall will allow for determination of any large-scale changes in the population that may spur further investigation. A minimum of 12 randomly selected 5-min electrofishing sites will be sampled in fall 2018 and 2020 (Table 6), but sampling will continue at random sites until 50 stock-size fish are collected and the RSE of CPUE-Stock is ≤25 (the anticipated effort to meet both sampling objectives is 12 stations with 80% confidence). Twelve random stations will be determined. Exclusive of the original 12 random stations, 6 additional random stations will be pre-determined in the event some extra sampling is necessary. A maximum of 18 stations will be sampled. Otoliths from 13 fish between 13.0 and 14.9 inches will be collected to determine mean age at 14 inches. A genetic sample of 30 fish will be collected during electrofishing in 2020.

Blue Catfish: Currently, Blue Catfish are not abundant in O.C. Fisher Reservoir. However, efforts to establish a population have been started through stockings 2016 and 2017. Low-frequency electrofishing (LFE) will be utilized to assess the stocking success and collect exploratory data on abundance, condition, and size structure of Blue Catfish in spring 2021 (Table 6). Previous LFE sampling at this reservoir in 2008 resulted in a catch rate of 13.3 fish/hr. Sampling will be exploratory in nature and based on our findings may spur further investigation. We will conduct at minimum 1 hour of LFE (12 randomly-selected 5-min electrofishing stations) in 2021 (Table 6). If the initial catch rates indicate we can improve the data precision with extra sampling we will sample additional stations.

Channel Catfish: Channel Catfish have been surveyed at O.C. Fisher Reservoir using 5 gill nets set at random locations since 1996. No survey since then has collected adequate numbers of Channel Catfish

to reliably assess size structure. We would like to explore the use of baited tandem hoop nets to survey the Channel Catfish population. Switching to baited hoop nets will reduce the by-catch and unnecessary mortality of non-target species. The estimated number of sets to achieve an RSE for CPUE-S ≤25 is 10 sets using the recommended 2-night soak duration. A target of 100 stock size fish should provide an adequate PSD estimate per the tandem hoop net procedures (PSD within 10% with 80% confidence, 75-140 fish are recommended). We will sample 10 randomly selected stations in 2018 and 2020 (Table 6). Ten additional random stations will be selected in the event extra sampling is necessary. A maximum of 20 tandem hoop net sets will be sampled. If sampling objectives are not achieved, then Channel Catfish will be listed as a low density population during the next reporting cycle.

White Crappie: Standard trap net surveys from 1999 to 2008 produced high catch rates of stock size crappie (5.2-36.0 fish/nn). Catch rates were low in 2016 due to recovery from drought, but expectations are that the crappie population will improve going forward. Our objectives are to monitor trends in abundance, size structure, condition, and growth. Analysis of historical trap net data from 1999-2008 indicates that a CPUE-Stock with an RSE ≤25 would be achieved most years with 10 net sets. A minimum of 10 randomly selected trap net sites will be sampled in 2018 and 2020 (Table 6), but sampling will continue at random sites until 50 stock-size fish are collected. Otoliths from 13 fish between 9.0 and 10.9 inches will be collected to determine mean age at 10 inches. The anticipated effort to meet both sampling objectives is 10-15 stations with 95% confidence. Beyond the original 10 random stations, 10 additional random stations will be pre-determined in the event some extra sampling is necessary. A maximum of 20 stations will be sampled.

Gizzard Shad and Bluegill: Gizzard Shad and Bluegill are the primary forage fish in O.C. Fisher Reservoir. Sampling effort based on sampling objectives for Largemouth Bass will be sufficient to determine IOV and CPUE-Total of Gizzard Shad and CPUE-Total and size structure of Bluegill. No additional sampling effort will be expended to achieve an RSE ≤25 for CPUE-Total for Gizzard Shad or Bluegill

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Water Level

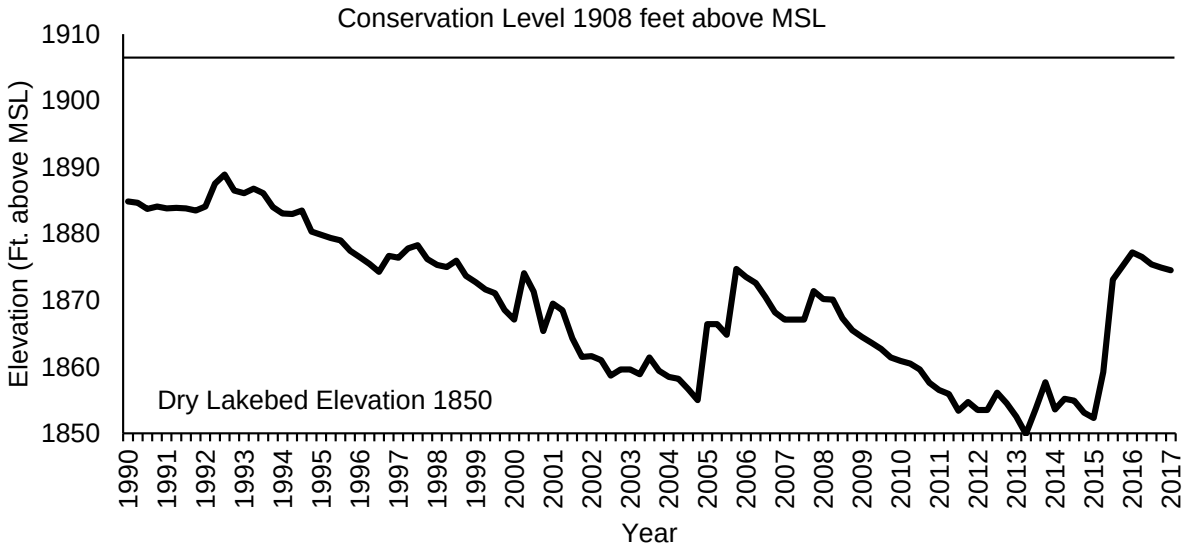


Figure 1. Quarterly water level elevations in feet above mean sea level (MSL) recorded for O.C. Fisher Reservoir, Texas.

Table 1. Characteristics of O.C. Fisher Reservoir, Texas.

Characteristic	Description
Year constructed	1953
Controlling authority	United States Army Corps of Engineers
County	Tom Green
Reservoir type	Main stem
Shoreline Development Index (SDI)	2.60
Conductivity	409 µS/cm

Table 2. Boat ramp characteristics for O.C. Fisher Reservoir, Texas, May, 2017. Reservoir elevation at time of survey was 1874 feet above mean sea level.

Boat ramp	Latitude Longitude (dd)	Public	Parking capacity (N)	Elevation at end of boat ramp (ft)	Condition
State Park South Ramp	31.47911 -100.4848	Y	15	1860	Excellent

Table 3. Harvest regulations for O.C. Fisher 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 O.C. Fisher Reservoir, Texas. FGL = fingerling; ADL = adults; UNK = unknown.

Species	Year	Number	Size
Threadfin Shad	1984	8,500	UNK
Gizzard Shad	2005	160	ADL
Blue Catfish	1971	1,500	UNK
	1974	24,600	UNK
	1980	39,132	UNK
	1981	30,004	UNK
	1982	30,427	UNK
	2005	75,000	FGL
	2006	112,596	FGL
	2016	71,032	FGL
	2017	66,576	FGL
		384,291	
Channel Catfish	1966	3,000	UNK
	1969	112,100	UNK
	1973	12,250	UNK
	1974	56,400	UNK
	1980	61,884	UNK
	1987	200,150	FGL
	1994	50,345	FGL
	2005	107,341	FGL
	2006	120,619	FGL
	2016	75,700	FGL
		799,789	
Flathead Catfish	1971	3,000	UNK
Warmouth	1969	38,000	UNK
Bluegill	2005	75,145	FGL
	2016	62,233	FGL
		137,378	
Redear Sunfish	1970	12,000	UNK
	1971	5,040	UNK
		17,040	
Largemouth Bass	1966	209,500	UNK
	1968	139,000	UNK
	1969	25,450	UNK
	1970	43,135	UNK
	1971	10,000	UNK
	1972	6,000	UNK
	1973	3,425	UNK
	2016	114	ADL
	Total	436,624	

Table 4. Stocking history continued.

Species	Year	Number	Size
White Crappie	1969	5,000	UNK
	1972	12,000	UNK
	2005	394	ADL
	2015	120	ADL
		17,514	
Florida Largemouth Bass	1987	145,249	FGL
	1996	107,803	FGL
	2003	71,426	FGL
	2005	76,191	FGL
	2016	153,269	FGL
	Total	553,938	
Walleye	1968	7,400	UNK
	1970	1,100,000	UNK
	1971	740,000	UNK
	1972	1,030,000	UNK
	1973	3,900,000	UNK
	1974	50,000	UNK
	1983	6,306,250	UNK
	1989	4,787,250	FRY
	1990	4,962,600	FRY
	Total	22,883,500	
Kemp's Largemouth Bass	1974	4,500	FGL
Green X Redear Sunfish	1969	40,000	UNK
	1974	100,000	UNK
		140,000	

Table 5. Objective-based sampling plan components for O.C. Fisher Reservoir, Texas 2016 – 2017.

Gear/target species	Survey objective	Metrics	Sampling objective
Electrofishing			
Largemouth Bass	Abundance	CPUE – stock	12 stations
	Size structure	PSD, length frequency	12 stations
	Condition	W_r	10 fish/inch group
Bluegill	Abundance	CPUE – Total	12 stations
	Size structure	PSD, length frequency	12 stations
Gizzard Shad	Abundance	CPUE – Total	12 stations
	Size structure	length frequency	12 stations
	Prey availability	IOV	12 stations
Trap netting			
Crappie	Abundance	CPUE – stock	10 stations
	Size structure	PSD, length frequency	10 stations
	Condition	W_r	10 fish/inch group
Gill netting			
Channel Catfish	Abundance	CPUE– stock	5 stations
	Size structure	PSD, length frequency	5 stations
	Condition	W_r	10 fish/inch group
White Bass	Abundance	CPUE– stock	5 stations
	Size structure	PSD, length frequency	5 stations
	Condition	W_r	10 fish/inch group

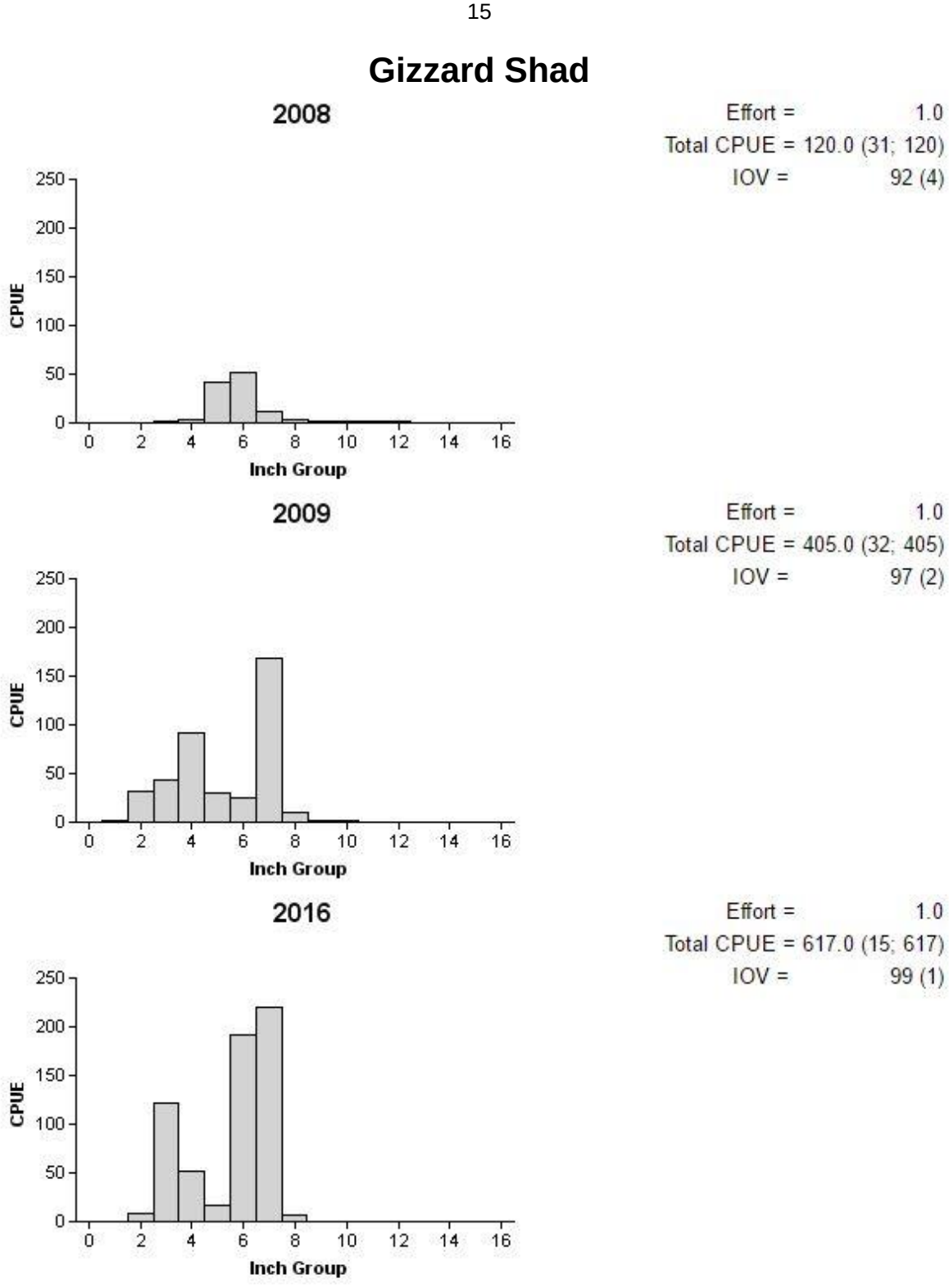


Figure 2. Number of Gizzard Shad caught per hour (CPUE) and population indices (RSE and N for CPUE and SE for IOV are in parentheses) for fall electrofishing surveys, O.C. Fisher Reservoir, Texas, 2008, 2009, and 2016.

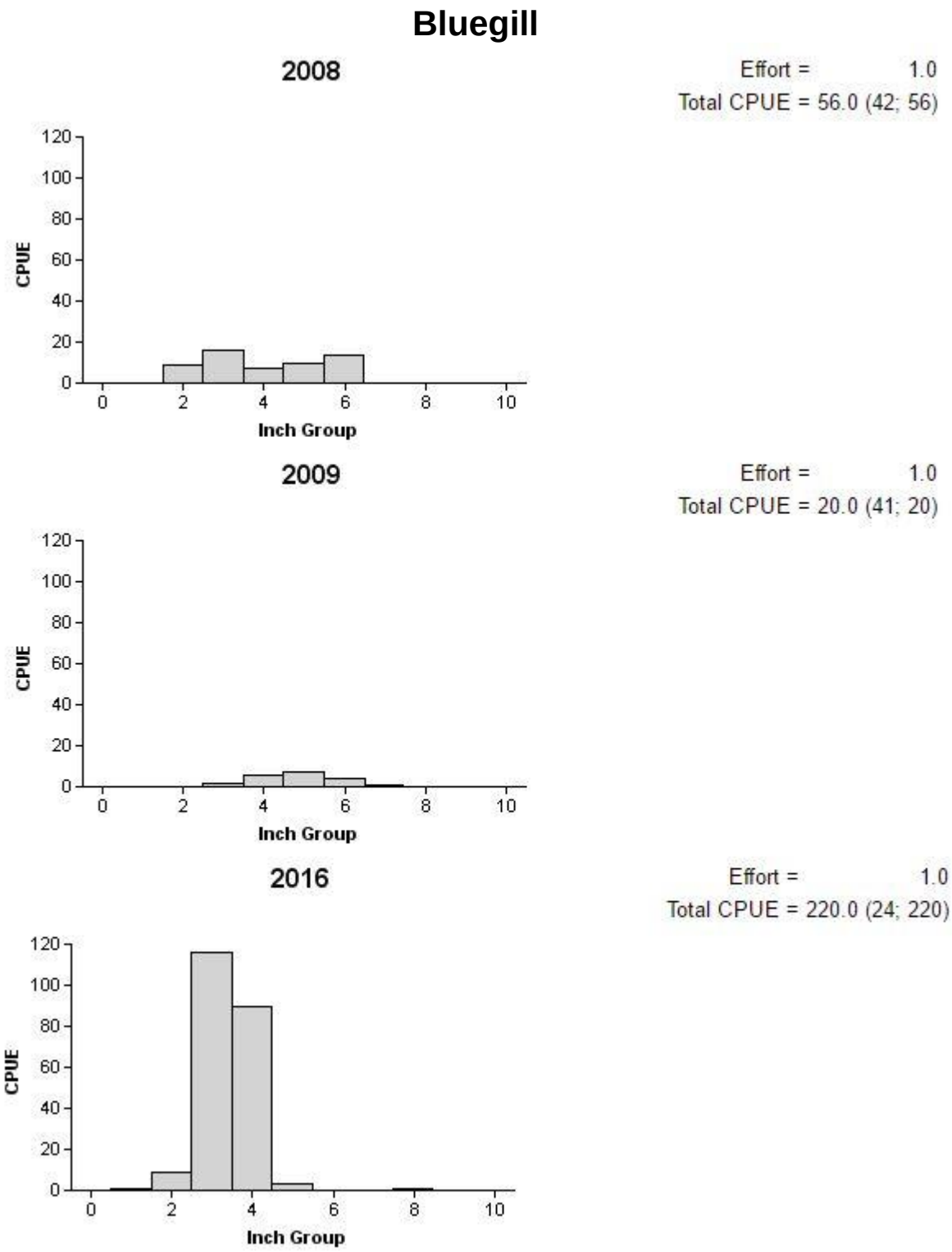


Figure 3. Number of Bluegill caught per hour (CPUE) and population indices (RSE and N for CPUE are in parentheses) for fall electrofishing surveys, O.C. Fisher Reservoir, Texas, 2008, 2009, and 2016.

Channel Catfish

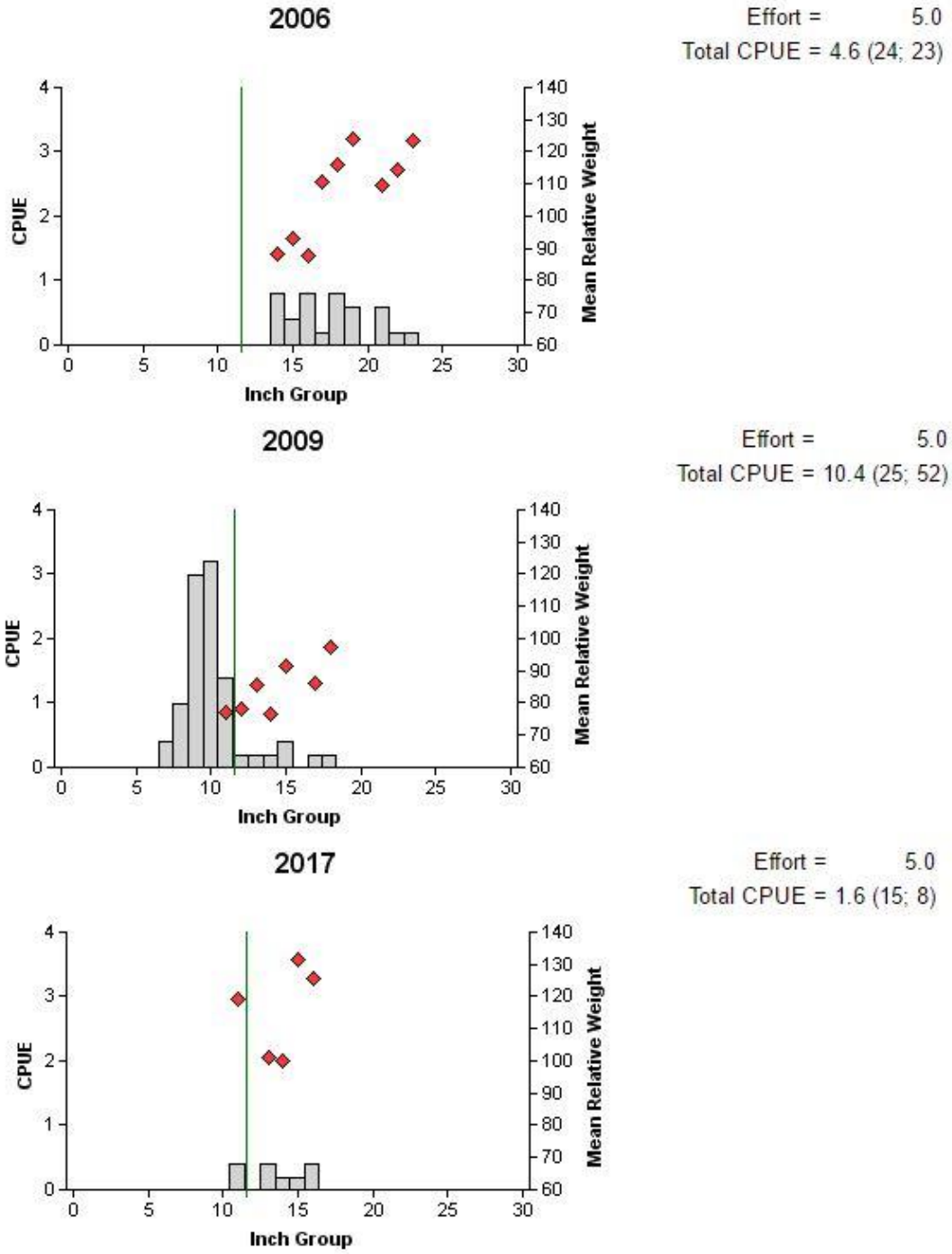


Figure 4. Number of Channel Catfish caught per net night (CPUE, bars), mean relative weight (diamonds), and population indices (RSE and N for CPUE are in parentheses) for spring gill net surveys, O.C. Fisher Reservoir, Texas, 2006, 2009, and 2017. Vertical line indicates minimum length limit.

White Bass

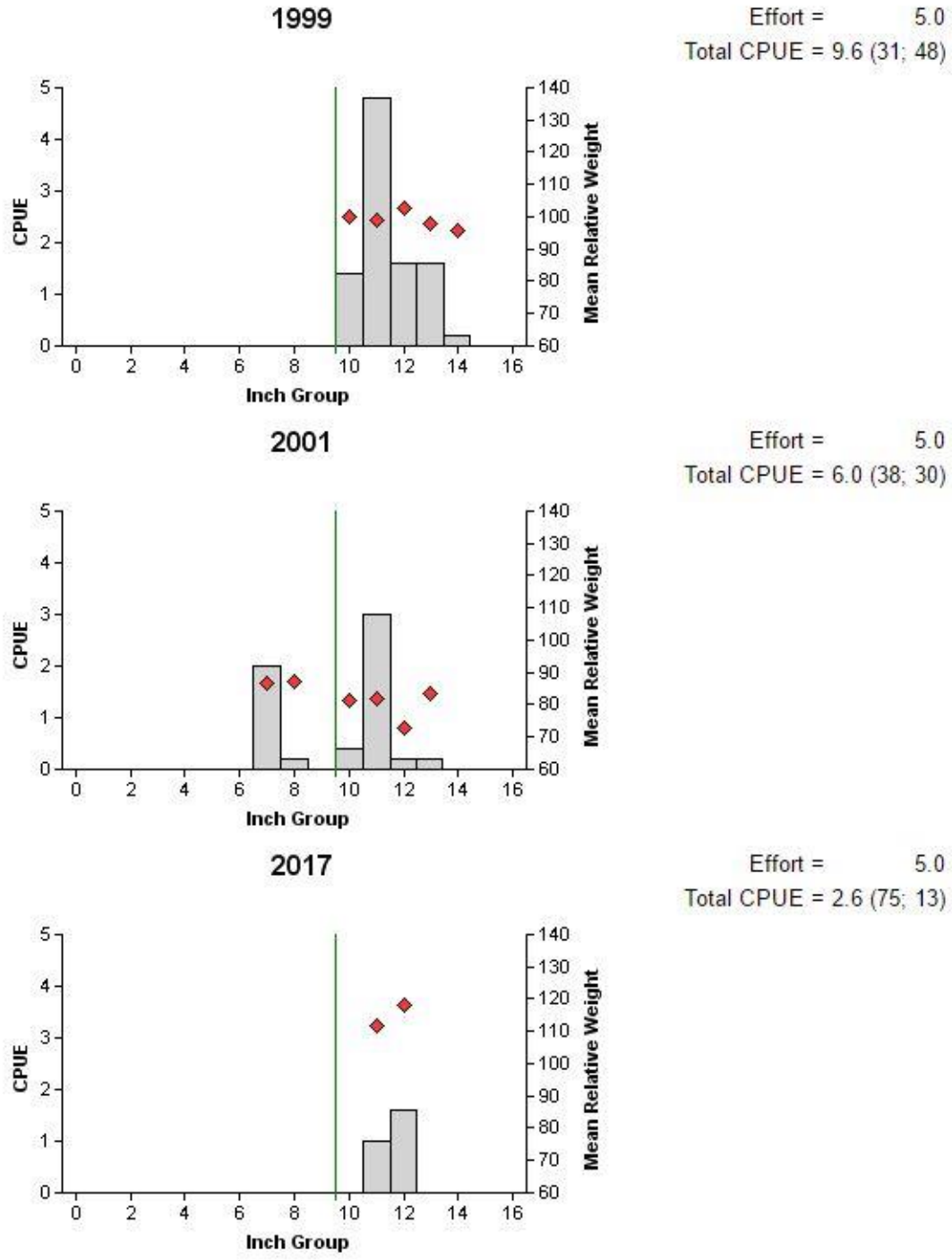


Figure 5. Number of White Bass caught per hour (CPUE, bars), mean relative weight (diamonds), and population indices (RSE and N for CPUE are in parentheses) for spring gill net surveys, O.C. Fisher Reservoir, Texas, 1999, 2001, and 2017. Vertical line indicates minimum length limit.

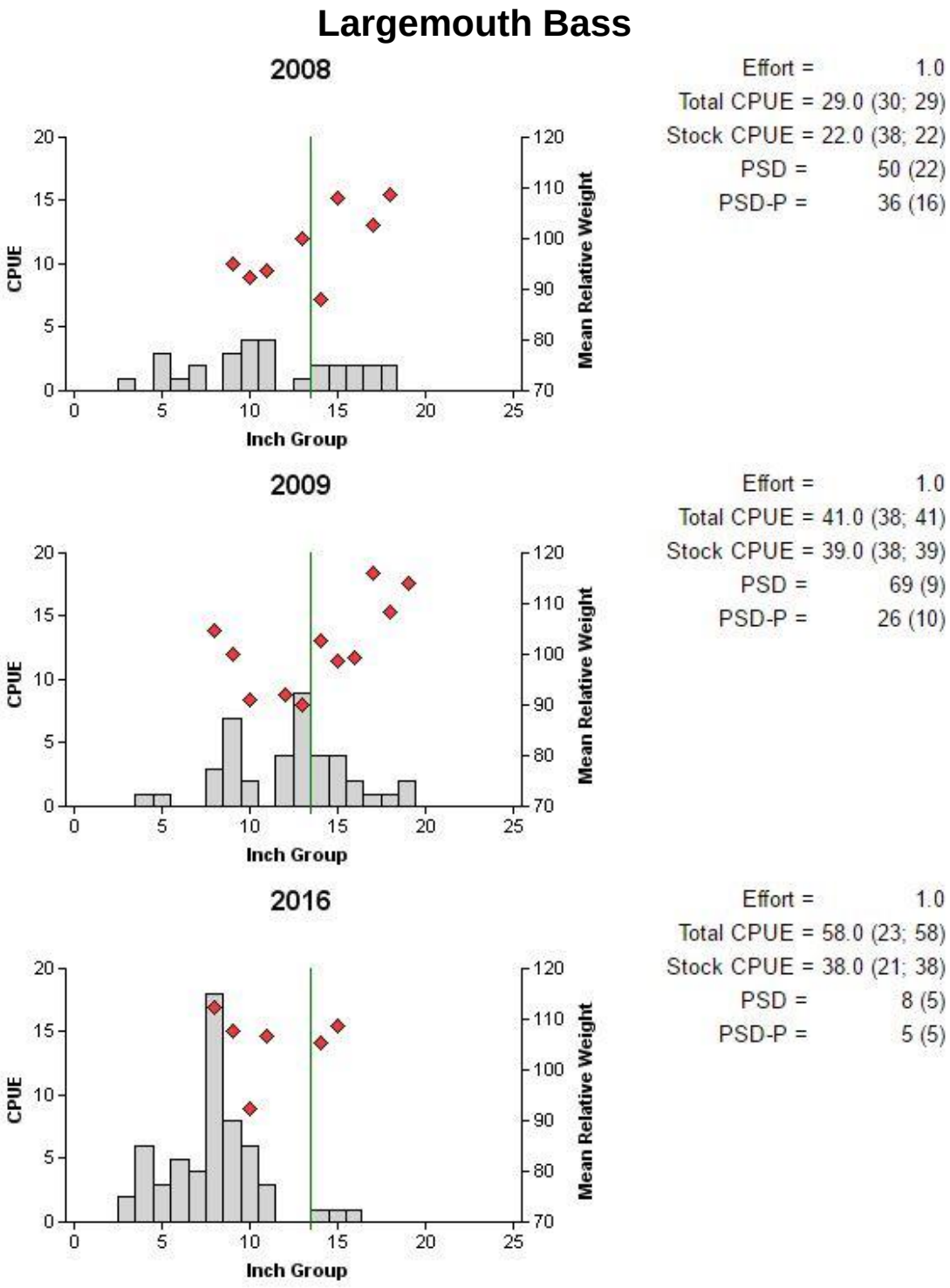


Figure 6. Number of Largemouth Bass caught per hour (CPUE, bars), mean relative weight (diamonds), and population indices (RSE and N for CPUE and SE for size structure are in parentheses) for fall electrofishing surveys, O.C. Fisher Reservoir, Texas, 2008, 2009, and 2016. Vertical line indicates minimum length limit.

White Crappie

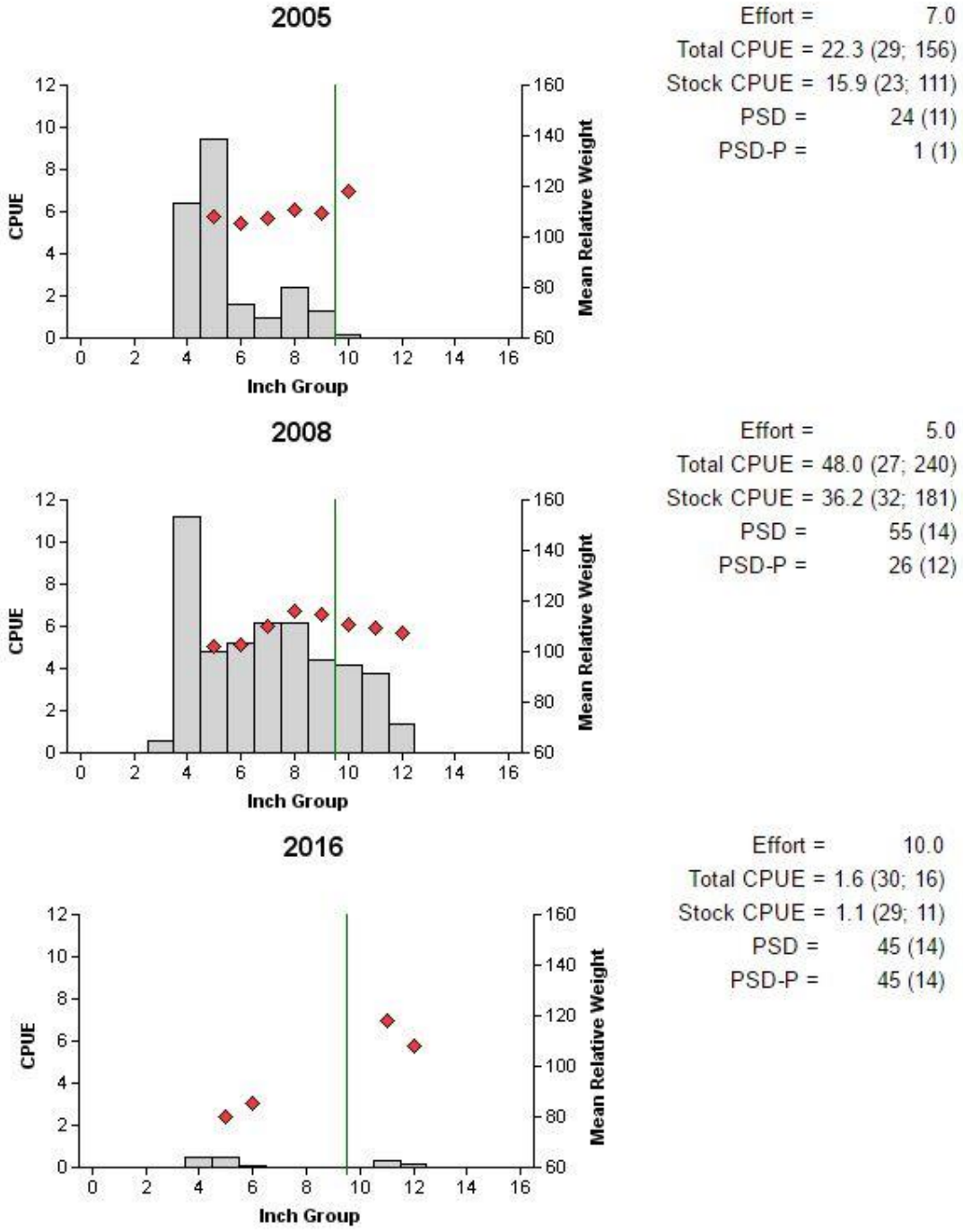


Figure 7. Number of White Crappie caught per net night (CPUE, bars), mean relative weight (diamonds), and population indices (RSE and N for CPUE and SE for size structure are in parentheses) for fall trap netting surveys, O.C. Fisher Reservoir, Texas, 2005,2008, and 2016. Vertical line indicates minimum length limit.

Table 6. Proposed sampling schedule for O.C. Fisher Reservoir, Texas. Survey period is June through May. Gill netting surveys are conducted in the spring, while electrofishing and trap netting surveys are conducted in the fall. Standard survey denoted by S and additional survey denoted by A.

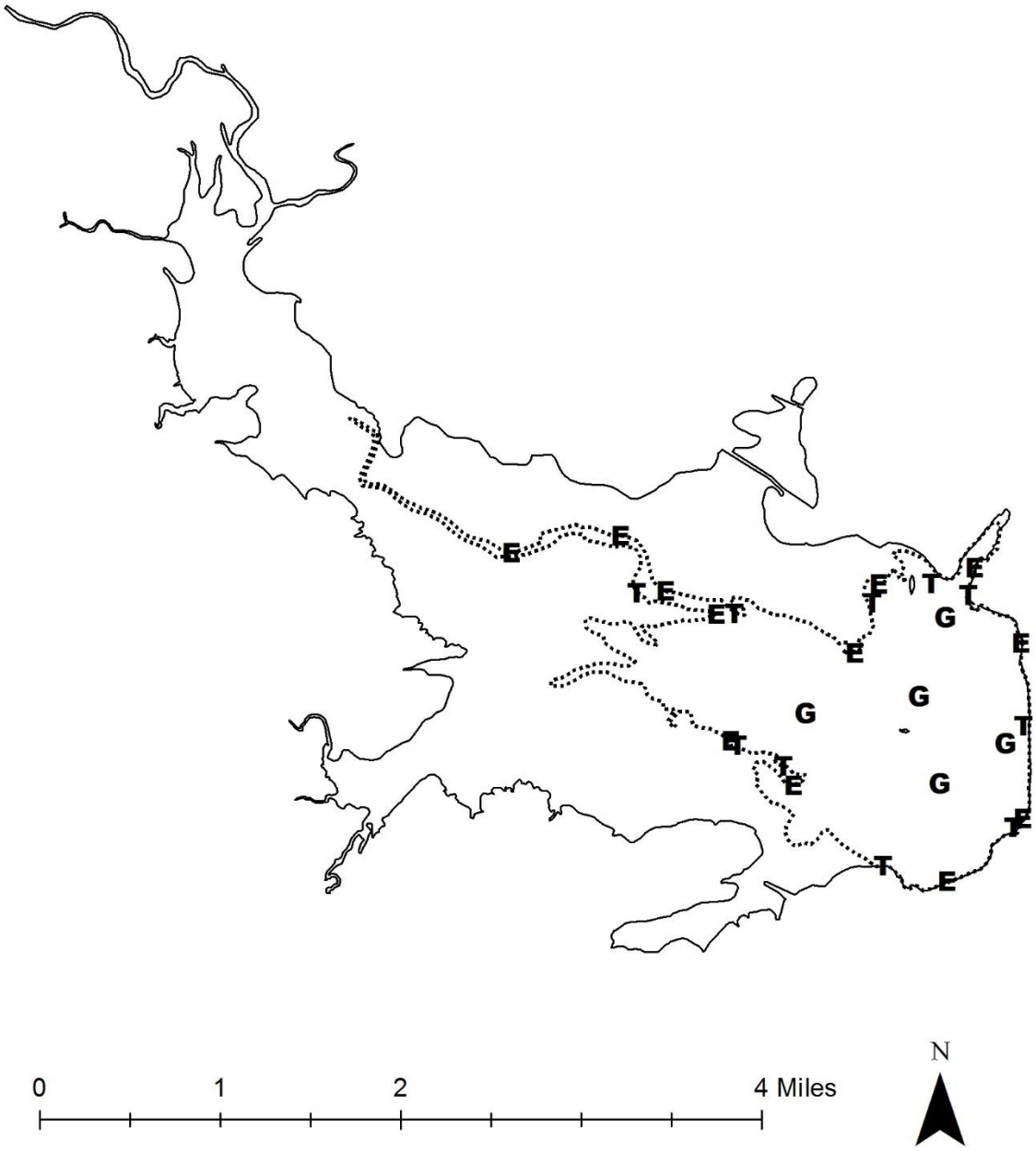
Survey year	Electrofish Fall(Spring)	Trap net	Hoop net	Low-Frequency Electrofishing	Habitat		
					Vegetation	Access	Report
2017-2018	A						
2018-2019	A	A	A				
2019-2020							
2020-2021	S	S	A	A	S	S	S

APPENDIX A

Number (N) and catch rate (CPUE) of all target species collected from all gear types from O.C. Fisher Reservoir, Texas, 2016-2017. Sampling effort was 5 net nights for gill netting, 10 net nights for trap netting, and 1 hour for electrofishing.

Species	Gill Netting		Trap Netting		Electrofishing	
	N	CPUE	N	CPUE	N	CPUE
Gizzard Shad					617	617.0
Channel Catfish	8	1.6				
White Bass	13	2.6				
Green Sunfish					31	31.0
Warmouth					31	31.0
Bluegill					220	220.0
Longear Sunfish					27	27.0
Redear Sunfish					2	2.0
Largemouth Bass					58	58.0
White Crappie	12	2.4	16	1.6		

APPENDIX B



Location of sampling sites, O.C. Fisher Reservoir, Texas, 2016-2017. Trap net, gill net, and electrofishing stations are indicated by T, G, and E, respectively. Water level was 34.2 feet below conservation pool at time of sampling. Dashed line indicates lake surface area at time of sampling.