

# Casa Blanca Reservoir

## 2018 Fisheries Management Survey Report

PERFORMANCE REPORT

As Required by

FEDERAL AID IN SPORT FISH RESTORATION ACT

TEXAS

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INLAND FISHERIES DIVISION MONITORING AND MANAGEMENT PROGRAM

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## Contents

Survey and Management Summary .....	1
Introduction .....	2
Reservoir Description .....	2
Angler Access .....	2
Management History .....	2
Methods .....	3
Results and Discussion .....	4
Fisheries Management Plan for Casa Blanca Reservoir, Texas .....	5
Objective-Based Sampling Plan and Schedule (2019-2023) .....	6
Literature Cited .....	8
Tables and Figures .....	9
Reservoir Characteristics .....	9
Boat Ramp Characteristics .....	9
Harvest Regulations .....	9
Harvest Regulations .....	9
Stocking History .....	10
Objective-Based Sampling Plan for 2015-2019 .....	11
Aquatic Vegetation Survey .....	12
Gizzard Shad .....	13
Bluegill .....	14
Blue Catfish .....	15
Channel Catfish .....	16
Hybrid Striped Bass .....	17
Largemouth Bass .....	18
Appendix A – Map of Sampling Locations .....	21
Appendix B – Catch Rates for All Species and Gear Types .....	22

## Survey and Management Summary

Fish populations in Casa Blanca Reservoir were surveyed in 2018-2019 using electrofishing and gill netting since the last report (2014). Historical data are presented for comparison. This report summarizes the results of the surveys and contains a management plan for the reservoir based on those findings.

**Reservoir Description:** Casa Blanca is a 1,055 acre reservoir located near Laredo, Texas, in the Rio Grande River watershed. In 1990, the county park located on the lower end of the reservoir was acquired by Texas Parks and Wildlife Department and opened in March of 1991 as Lake Casa Blanca International State Park. Major uses include recreation and irrigation for a golf course. Water level in the reservoir fluctuates, however water level is not recorded. Angler and boat access is very good. Native emergent vegetation occupied 24% of the reservoir in 2018.

**Management History:** Important sport fishes include Largemouth Bass, catfishes, and Hybrid Striped Bass. Harvest of all sport fish species, except Largemouth Bass, has been regulated according to statewide size and daily bag limits. Largemouth Bass harvest is currently regulated with an 18-inch minimum size limit (implemented in 1994). Palmetto Bass have been stocked regularly with stockings occurring in seven years since 2004. In 2014, Sunshine Bass were stocked instead of Palmetto Bass. Florida Largemouth Bass fingerlings were last stocked in 2011. ShareLunker fingerlings were stocked in 2006, 2008, and 2010.

### Fish Community

- **Prey species:** Gizzard Shad and Bluegill were the primary prey species, and their combined abundance was lower in 2018 than in 2014. Despite lower prey abundance, body condition of predator species (Largemouth Bass, Hybrid Striped Bass, and Blue Catfish) remained consistent since 2010 suggesting that lower prey availability in 2018 was not having a negative impact on predator species.
- **Catfishes:** Relative abundance of Blue and Channel Catfishes was lower in 2019 than in 2015. However, relative abundance of legal-harvestable size Blue Catfish in 2019 was similar to past years. The Channel Catfish population continued to be comprised of mostly sub-legal size individuals.
- **Hybrid Striped Basses:** Relative abundance of Hybrid Striped Bass was lower in 2019 than in 2015, and legal-harvestable fish comprised 19% of the population. This species grows to legal harvestable size in 3-4 years.
- **Largemouth Bass:** Relative abundance of Largemouth Bass was lower in 2018 than in 2014. Similarly, relative abundance of legal-harvestable size fish was lower in 2018 than 2014. This species continues to experience rapid early-life growth attaining 14 inches in 2.5 years on average. Florida Largemouth Bass introgression remains very high (>80% Florida Largemouth Bass alleles) indicating fish possess high potential genetically to attain trophy size (>10 lbs).

**Management Strategies:** Continue to manage fisheries with current regulations. Stock Hybrid Striped Bass annually at the rate of 15 fingerlings per acre. Assess for presence of invasive species concurrent with fisheries and habitat sampling. Fishes will be sampled every four years according to the objective based sampling plan.

## Introduction

This document is a summary of fisheries data collected from Casa Blanca Reservoir in 2018-2019. 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 2018-2019 data for comparison.

## Reservoir Description

Casa Blanca is a 1,055 acre reservoir located near Laredo, Texas, in the Rio Grande River watershed. In 1990, the county park located on the lower end of the reservoir was acquired by Texas Parks and Wildlife Department and opened in March of 1991 as Lake Casa Blanca International State Park (LCBISP). Major uses include recreation and irrigation for a golf course. The reservoir, fed by a 117 square mile drainage area of Chacon and San Ygnacio Creeks, has a history of substantial water level fluctuation; however water level records have not been recorded for this reservoir. Cattails and bulrush are present along the shoreline and no submerged vegetation is present. Other descriptive characteristics for Casa Blanca Reservoir are in Table 1.

## Angler Access

Considerable shoreline access exists for bank angling including a handicapped-accessible fishing pier. There is one public boat ramp at the LCBISP and details about this site are found in Table 2.

## Management History

**Previous management strategies and actions:** Management strategies and actions from the previous survey report (Myers and Dennis 2015) included:

1. Work with the LCBISP staff to develop a protocol to collect data on angler use at the reservoir.
 

**Action:** A questionnaire concerning fishing was drafted in English with Spanish translation for hand-out to users entering LCBISP. Support from LCBISP for the idea was limited, so the effort was dropped.
2. Stock Palmetto Bass fingerlings annually at a rate of 15 fish/acre.
 

**Action:** Sunshine Bass were stocked in 2014 (12.5 fish/acre) and Palmetto Bass were stocked in 2015 and 2016 (average 24.7 fish/acre) and requested for stocking in 2018.
3. Monitor for the presence of aquatic invasive species and cooperate with the controlling authority to inform users about such and measures to take to reduce risk of introductions.
 

**Action:** A habitat/vegetation survey was conducted in 2018 and no invasive aquatic plants were found. "Clean, Drain, and Dry" signs were posted at the public boat ramp.

**Harvest regulation history:** All sport fishes, except Largemouth Bass, are currently managed with statewide regulations (Table 3). In 1994, 18-inch minimum length (MLL) and 3-fish daily bag limits (DBL) were enacted for Largemouth Bass. The DBL was changed to 5 fish in 1995.

**Stocking history:** Palmetto Bass were first stocked in 1977 and have been stocked regularly since 1984. Sunshine Bass were stocked for the first time in 2014. Florida Largemouth Bass were stocked periodically from 1978 to 2011. ShareLunker Largemouth Bass fingerlings were stocked in 2006, 2008, and 2010. The complete stocking history is in Table 4.

**Vegetation/habitat management history:** No habitat or vegetation management activities have been conducted on this reservoir.

**Water transfer:** No interbasin transfers are known to exist.

## Methods

Surveys were conducted to achieve survey and sampling objectives in accordance with the 2015-2019 objective-based sampling (OBS) plan for Casa Blanca Reservoir (Myers and Dennis 2015). Primary components of the OBS plan are listed in Table 5. All survey sites were randomly selected and all surveys were conducted according to the Fishery Assessment Procedures (TPWD, Inland Fisheries Division, unpublished manual revised 2015).

**Electrofishing** – Largemouth Bass, sunfishes, and Gizzard Shad were collected using electrofishing (1.0 hour at 12, 5-minute daytime stations). Catch per unit effort (CPUE) for electrofishing was recorded as the number of fish caught per hour (fish/h) of actual electrofishing. The 2015-2019 OBS plan called for 18 electrofishing stations and collection of  $\geq 50$  stock-size Largemouth Bass. Only 12 stations were sampled as this amount of sampling effort yielded sufficiently precise estimates of Largemouth Bass total CPUE (RSE = 21) and PSD (SE = 7). Thirteen Largemouth Bass ranging from 13-15 inches were targeted for ageing. Fish were aged using otoliths in accordance to the Fishery Assessment Procedures (TPWD, Inland Fisheries Division, unpublished manual revised 2015).

**Gill netting** – Channel Catfish, Blue Catfish, and Hybrid Striped Bass were collected with gill nets (10 net-nights at 10 stations). Catch per unit effort (CPUE) for gill netting was recorded as the number of fish per net night (fish/nn). Thirteen Hybrid Striped Bass ranging from 17-19 inches were targeted for ageing. Fish were aged using otoliths in accordance to the Fishery Assessment Procedures (TPWD, Inland Fisheries Division, unpublished manual revised 2015).

**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.

**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) and Dumont and Neely (2011). 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 estimates.

**Habitat** - Surveys were conducted by using the random point sampling method in September 2018 (TPWD Inland Fisheries Division, unpublished manual, revised 2015).

**Water level** – No water level data is available for this reservoir.

## Results and Discussion

**Habitat:** In 2018 the primary habitat was native emergent vegetation (cattails and bulrush), with percent occurrence of this habitat type estimated at 24% (Table 6). While percent occurrence of native emergent vegetation in 2018 was similar to estimates made in previous years (18-22% in 2013-2014), percent occurrence of flooded terrestrial vegetation was less in 2018 (11%) than in previous years (25-30%). This difference is likely a product of fluctuating water levels and timing of vegetation surveys.

**Prey species:** Daytime electrofishing CPUE of Gizzard Shad in 2018 (61.0 fish/h) was lower than in 2014 (202.3 fish/h) and lower than in 2010 when night-time electrofishing was used (103.0 fish/h; Figure 1). Although IOV was >60 for all three years, the relative abundance of Gizzard Shad vulnerable as prey (<8 inches) was less in 2018 (38.0 fish/h) than in previous years (67.0-153.7 fish/h). Daytime electrofishing CPUE of Bluegill was slightly greater in 2018 (70.0 fish/h) than in 2014 (51.4 fish/h) and lower than in 2010 when night-time electrofishing was used (111.0 fish/h; Figure 2). Size structure of the Bluegill population differed in 2018 compared to previous years. Bluegill PSD was 52 in 2018, whereas in previous years Bluegill PSD was 6-17, with fish  $\geq 6$  comprising a greater fraction of the population in 2018. Electrofishing CPUE of Gizzard Shad and Bluegill combined was about 50% lower in 2018 (131.0 fish/h) than in 2014 (253.7 fish/h), which suggests abundance of these important prey species has declined recently. However, this lower prey availability has not manifested in reduced condition of Largemouth Bass as  $W_r$  values remained >80 for all but one size class in one year for this species (see below).

**Catfishes:** Gill net CPUE of Blue Catfish in 2019 (4.0 fish/nn) was lower than in 2015 (9.4 fish/nn) and slightly higher than in 2011 (2.4 fish/nn; Figure 3). The lower relative abundance in 2019 compared to 2015 was attributable to lower catch of sub-12 inch fish in 2019. Gill net CPUE of Blue Catfish  $\geq 12$  inches was similar for all three survey years (2.4-3.2 fish/nn). Blue Catfish population size structure has worsened slightly over the past three survey years (PSD was 42 in 2011 and 28 in 2019); however, large Blue Catfish ( $\geq 20$  inches) continued to comprise a substantial portion of the population (23% in 2019). Gill net CPUE of Channel Catfish in 2019 (5.4 fish/h) was lower than in 2015 (21.0 fish/nn) and 2011 (11.4 fish/nn; Figure 4). The population continued to be dominated by sub-legal size fish. Gill net CPUE of Channel Catfish  $\geq 12$  inches ranged from 0.4 to 0.6 fish/nn across survey years. The few Channel Catfish  $\geq 12$  inches had good body condition ( $W_r > 90$ ).

**Hybrid Striped Bass:** Gill net CPUE of Hybrid Striped Bass in 2019 (8.4 fish/nn) was less than in 2015 (15.6 fish/nn) and similar to in 2011 (6.4 fish/nn; Figure 5). Although relative abundance was 46% less in 2019 compared to 2015, legal-harvestable size fish continued to exist and comprised 19% of the gill net catch in 2019. Body condition of sublegal size fish remained poor, with  $W_r < 75$  for most sublegal size classes. Body condition improved with fish length for legal-size fish, with  $W_r$  values ranging from 75 to 92. Two year classes (2015 and 2016) were represented in age sample of twelve Hybrid Striped Bass having a length of 17-19 inches. As such, this species grows to legal-harvestable size in 3-4 years.

**Largemouth Bass:** Daytime electrofishing CPUE of Largemouth Bass was lower in 2018 (58.0 fish/h) than in 2014 (110.3 fish/h) and in 2010 when night-time electrofishing was used (73.0 fish/h; Figure 6). Catch of legal harvestable size fish in 2018 (2.0 fish/h) was likewise lower than in 2014 (6.3 fish/h), but the same as in 2010 (2.0 fish/h). Population size structure remained similar across survey years with PSD ranging from 33 to 54. Body condition was good for small fish in 2018, with  $W_r > 80$  for all sublegal length classes, and excellent for legal-size fish, with  $W_r \geq 100$  for fish of this size collected during the survey years. Three year classes (2015, 2016, and 2017) were represented in the age sample of six Largemouth Bass having a length of 13-15 inches. Average age of 14-inch fish was 2.5 years, indicating Largemouth Bass exhibit rapid early-life growth in Casa Blanca Reservoir. Florida Largemouth Bass (FLMB) introgression remained high (>80% FLMB alleles) and was 85 in 2018 (Table 7). Percent of fish that were FLMB genotype was substantial in 2018 (20%). The reservoir has produced six ShareLunker Largemouth Bass ( $\geq 13$  lbs), but none since 2010. Given the high FLMB introgression and occurrence of FLMB genotype fish in 2018, Largemouth Bass in Casa Blanca Reservoir continue to possess high potential genetically to attain trophy size ( $\geq 10$  lbs).

# Fisheries Management Plan for Casa Blanca Reservoir, Texas

Prepared - July 31, 2019

**ISSUE 1:** Hybrid Striped Bass are an important sport fish in Casa Blanca Reservoir. Natural reproduction of this species does not occur in the reservoir, thus stocking is necessary to support this fishery.

## MANAGEMENT STRATEGIES

1. Stock Hybrid Striped Bass fingerlings annually at 15 fish/acre.

**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 LCBISP 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 (2019-2023)

### Sport fish, forage fish, and other important fishes

Sport fishes in Casa Blanca Reservoir include Largemouth Bass and Hybrid Striped Bass. Blue Catfish are also a recreationally important fish. Known important forage species include Bluegill and Gizzard Shad.

### Survey objectives, fisheries metrics, and sampling objectives

**Largemouth Bass:** Largemouth Bass in Casa Blanca Reservoir are an important sport fish and have been managed with an 18-inch minimum length limit since 1994. Additionally, six Sharelunkers have been donated from Casa Blanca since 1994. Our objective is to monitor large-scale changes in size structure, relative abundance, body condition, and growth. Electrofishing will be conducted to collect at least 50 fish to monitor size structure and relative abundance. Also, 13 fish between 13 and 15 inches will be targeted for age and growth analysis. Electrofishing will consist of a minimum of 12 randomly selected daytime stations, which should provide an RSE <25 for CPUE-total based on historical electrofishing results. No additional sampling will be conducted should numbers of fish collected be less than targeted. Sampling will occur once every four years. The next sampling will be fall 2022.

**Hybrid Striped Bass:** Hybrid Striped Bass have been stocked in this reservoir on a near annual basis since 2000. Our objective is to monitor for large-scale population changes in size structure, relative abundance, body condition and determine general stocking success. Sampling to collect 50 Hybrid Striped Bass will consist of 5 gill nets set at random sites. If that target is not reached, an additional five nets will be set at randomly selected stations. Sampling will cease after 10 nets. Sampling will occur once every four years and the next gill net survey will be conducted in spring 2023.

**Catfishes:** The reservoir supports moderate density populations of Blue and Channel Catfishes. The Channel Catfish population is dominated by sub-legal size fish, whereas Blue Catfish more readily grow to legal-harvestable size. Our objective is to monitor for large-scale population changes in size structure, body condition, and relative abundance of both species. No fish sample size and estimate precision targets are set for catfishes. No minimum sample size and Standard overnight gill netting as described above for Hybrid Striped Bass will be used to estimate relative abundance and size structure indices.

**Bluegill and Gizzard Shad:** Bluegill and Gizzard Shad are the primary forage fishes at Casa Blanca Reservoir. While CPUE of both species is variable, major changes in their relative abundances can be indicated in CPUE trend data. Sampling of these species concurrently with Largemouth Bass sampling should provide adequate CPUE precision (RSE<25) of Bluegill and Gizzard Shad to detect major changes in relative abundance. No additional effort will be expended to increase the number of Bluegill or Gizzard Shad collected.

**Black and White Crappies:** Very few Black Crappie have been captured in sampling gear historically and White Crappie have predominated catch in spring gill net and historic trap net surveys. Trap net catch of White Crappie ranged 25-58 fish from 2002 to 2006 (5 net-nights of effort), and catch in spring gill nets ranged from 28-45 fish from 2006 to 2018 (5-10 net nights of sampling effort). Our objective is to monitor for large-scale changes in size structure and relative abundance of White Crappie using spring gill net surveys as described above. No fish sample size and estimate precision targets are set for crappies. No additional effort will be expended to increase the number of White Crappie collected.



## Low-density fisheries

**Flathead catfishes:** Based on low catch in historic gill net surveys, Flathead Catfish may only support a minimal fishery. As such, sampling for presence/absence is all that is required. Sampling for Flathead Catfishes will be done as a corollary to our Hybrid Striped Bass sampling every four years.

## Literature Cited

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- Dennis, J. A., and R. Myers. 2015. Statewide freshwater fisheries monitoring and management program survey report for Casa Blanca Reservoir, 2015. Texas Parks and Wildlife Department, Federal Aid Report F-221-M-1, Austin.
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- Dumont, S. C. and B. C. Neely. 2011. A proposed change to palmetto bass proportional size distribution length categories. North American Journal of Fisheries Management 31: 722-725
- Guy, C. S., R. M. Neuman, D. W. Willis, and R. O. Anderson. 2007. Proportional size distribution (PSD): a further refinement of population size structure index terminology. Fisheries 32(7): 348.

## Tables and Figures

Table 1. Characteristics of Casa Blanca Reservoir, Texas

Characteristic	Description
Year constructed	1951
Controlling authority	Webb County and TPWD
Counties	Webb
Reservoir type	Off stream
Shoreline Development Index (SDI)	2.3
Conductivity	593 umhos/cm

Table 2. Boat ramp characteristics for Casa Blanca Reservoir, Texas, August 2018. Water level is not recorded for this reservoir.

Boat ramp	Latitude Longitude (dd)	Public	Parking capacity (N)	Elevation at end of boat ramp (ft)	Condition
Casa Blanca State Park	27.533271 -99.43964	Y	25	Unknown	Good

Table 3. Harvest regulations for Casa Blanca Reservoir, Texas.

Species	Bag Limit	Minimum length limit (inches)
Gar, Alligator	1	None
Catfish: Channel, Blue, their hybrids and subspecies	25*	12
Catfish, Flathead	5	18
Bass, Hybrid Striped	5	18
Bass, Largemouth	5	18
Crappie, White, Black, their hybrids and subspecies	25*	10

\*In any combination

Table 4. Stocking history of Casa Blanca Reservoir, Texas. Size categories are FRY = <1 inch, FGL = 1-3 inches, ADL = adults, and UNK = unknown.

Species	Year(s) Stocked	Number of Years	Number Stocked	Size
Blue Catfish	1966	1	10,000	FGL
	1988	1	15	ADL
Channel Catfish	1966–1972	2	39,900	UNK
	2003-2018 <sup>a</sup>	12	7,544	ADL
Flathead Catfish	1966	1	12	UNK
Bluegill	2003	1	105,072	FGL
Black Crappie	1966	1	23,000	UNK
White Crappie	1966	1	2,050	UNK
	1994	1	94	ADL
	1994	1	80,165	FRY
Red Drum	1963	1	490	FGL
Green x Redear Sunfish	1966	1	3,000	UNK
Walleye	1973	1	30,000	UNK
Florida Largemouth Bass	1966	1	68,430	UNK
Largemouth Bass	1978-2011	9	877,830	FGL
ShareLunker Largemouth Bass	2006-2010	3	9,390	FGL
Striped Bass	1996	1	24,840	FGL
Sunshine Bass	2014	1	13,190	FGL
Palmetto Bass	1977-1982	4	239,525	UNK
	1994-2016	14	312,943	FGL

<sup>a</sup>fish were used for an annual kids fishing event at Casa Blanca State Park then released into the reservoir

Table 5. Objective-based sampling plan components for Casa Blanca Reservoir, Texas, 2015-2019.

Gear/target species	Survey objective	Metrics	Sampling objective
<i>Electrofishing</i>			
Gizzard Shad	Abundance	CPUE-total	RSE $\leq 25$
	Prey availability	IOV	Practical effort
Bluegill	Abundance	CPUE-total	RSE $\leq 25$
	Size structure	Length frequency	Practical effort
Largemouth Bass	Abundance	CPUE-stock	$\geq 50$ fish
	Size structure	PSD, length frequency	$\geq 50$ fish
	Age and Growth	Average age at 14 inches	$\geq 13$ fish between 13-15 inches
<i>Gill nets</i>			
Blue Catfish	Abundance	CPUE-stock	None
	Size structure	Length frequency	Practical effort
Channel Catfish	Abundance	CPUE-stock	None
	Size structure	Length frequency	Practical effort
Hybrid Striped Bass <sup>a</sup>	Abundance	CPUE-total	$\geq 50$ fish
	Size structure	PSD, length frequency	$\geq 50$ fish
	Age and growth	Length at age	$\geq 13$ fish between 17-19 inches

<sup>a</sup>Five additional net-nights of sampling effort will be used to achieve sampling objective target of  $\geq 50$  Hybrid Striped Bass.

Table 6. Results of random point sampling habitat surveys conducted at Casa Blanca Reservoir (Texas-side only) in August 2013, August 2014, and September 2018. Percent occurrence is shown for predominate habitat types along with lower and upper 95% confidence interval (in parentheses). Number of random points sampled are provided for reference.

Habitat type/survey metric	2013	2014	2018
Open water	56 (47-65)	55 (45-66)	67 (54-79)
Flooded terrestrial vegetation	30 (21-38)	25 (16-34)	11 (3-19)
Standing timber/stumps	7 (2-11)	6 (1-10)	11 (2-19)
Native Emergent	18 (11-25)	22 (14-32)	24 (13-35)
Bulrush	17 (11-24)	22 (13-31)	24 (13-35)
Cattails	1 (0-2)	1 (0-3)	6 (0-12)
Number of random points	122	87	54

## Gizzard Shad

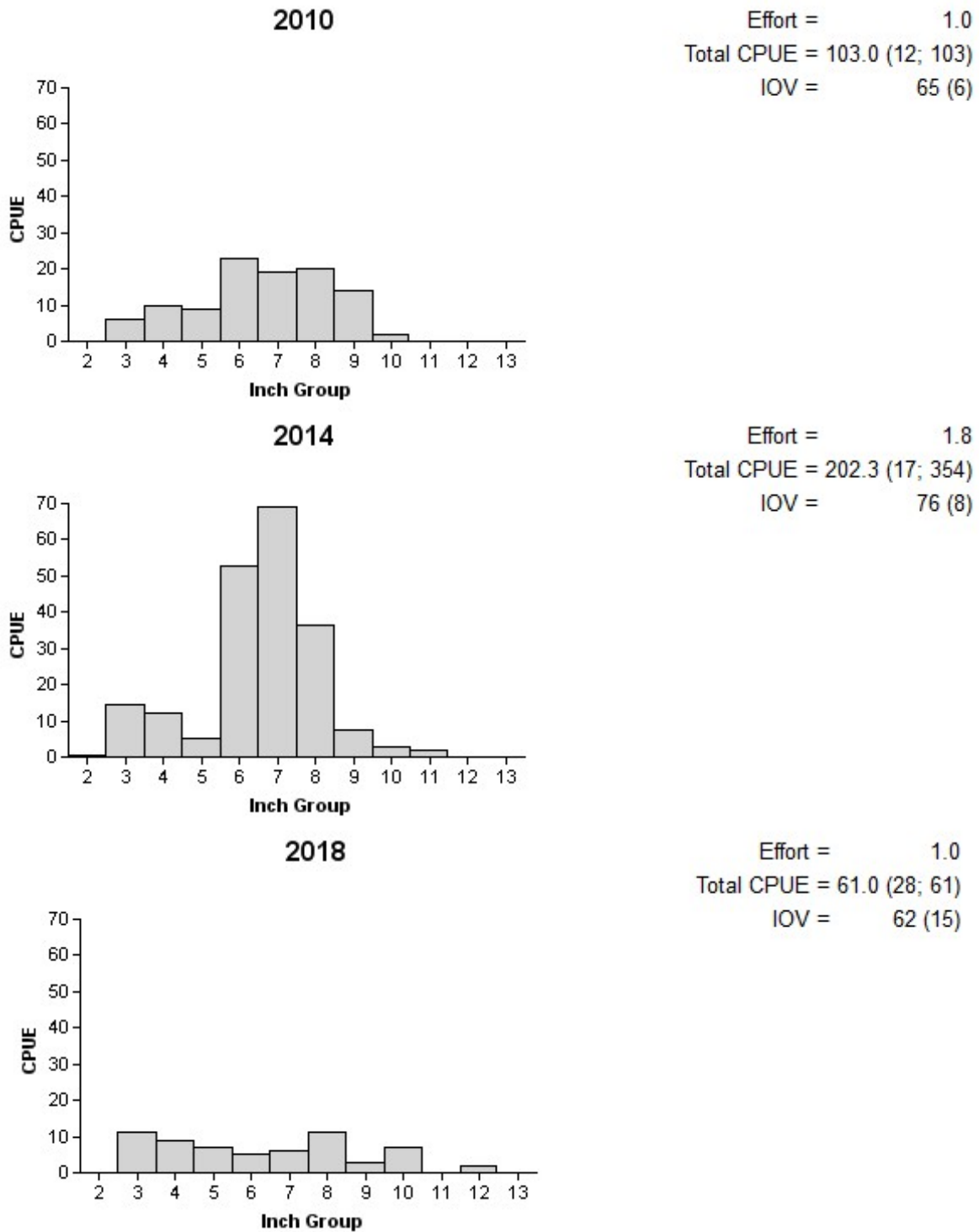


Figure 1. Number of Gizzard Shad caught per hour (CPUE) and population indices (RSE and N for CPUE and SE for IOV are in parentheses) for fall night time (2010) and fall daytime (2014 and 2018) electrofishing surveys, Casa Blanca Reservoir, Texas.

Bluegill

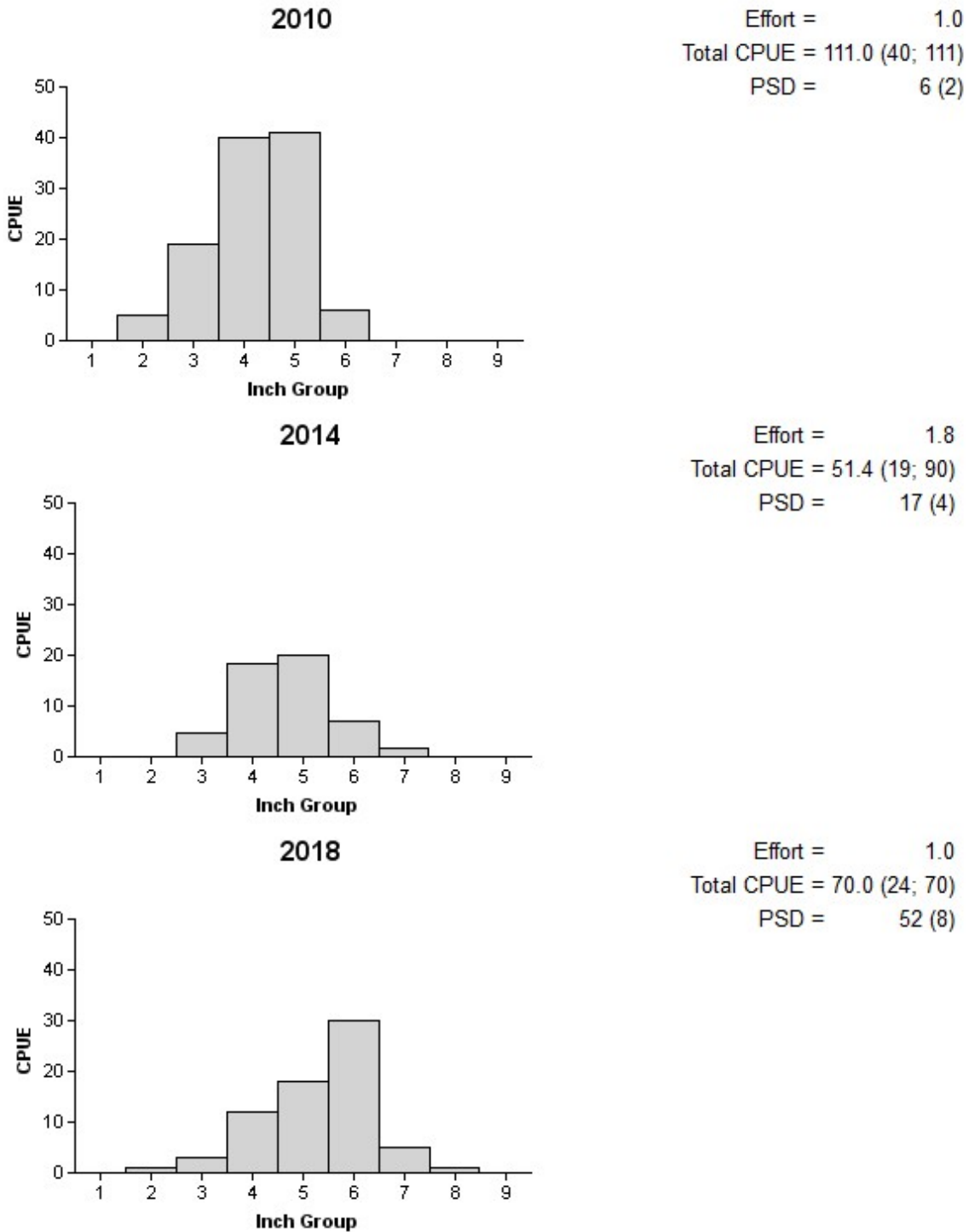


Figure 2. Number of Bluegill caught per hour (CPUE) and population indices (RSE and N for CPUE and SE for size structure are in parentheses) for fall night-time (2010) and fall daytime (2014 and 2018) electrofishing surveys, Casa Blanca Reservoir, Texas.



## Blue Catfish

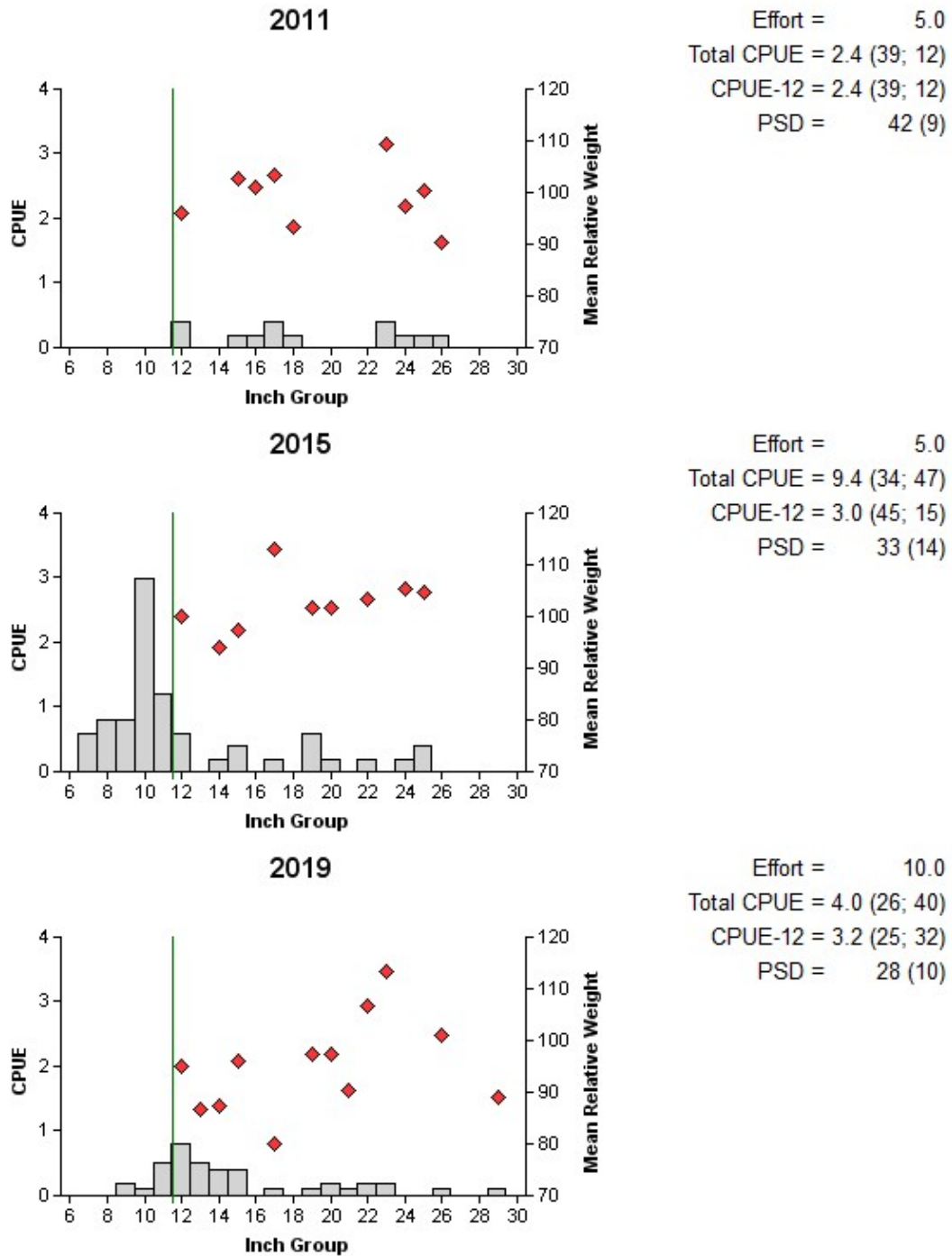


Figure 3. Number of Blue Catfish caught per net night (CPUE, bars), mean relative weight (diamonds), and population indices (RSE and N for CPUE and SE for size structure are in parentheses) for spring gill net surveys, Casa Blanca Reservoir, Texas, 2011, 2015, and 2019. Vertical line denotes the minimum length limit.

## Channel Catfish

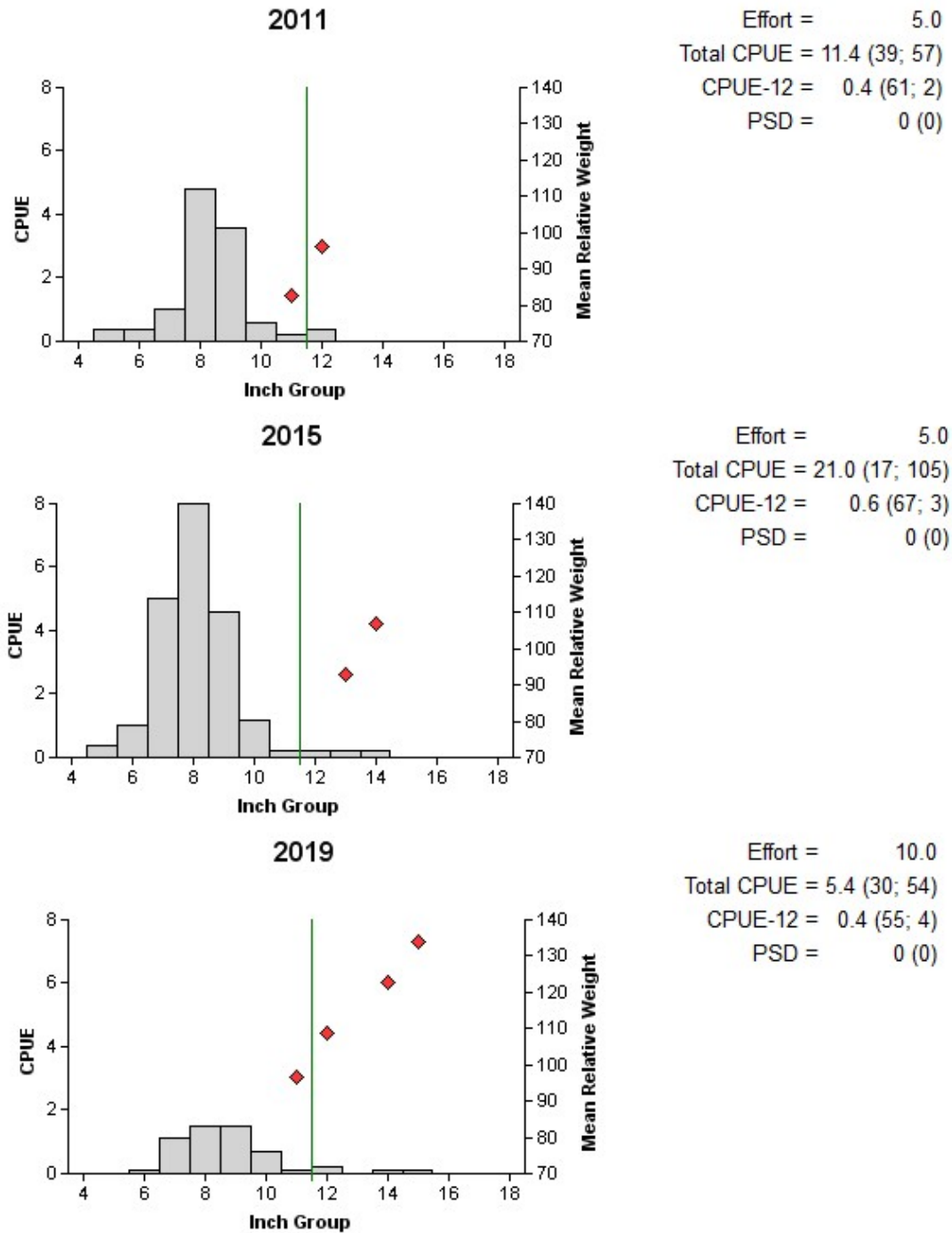


Figure 4. Number of Channel Catfish caught per net night (CPUE, bars), mean relative weight (diamonds), and population indices (RSE and N for CPUE and SE for size structure are in parentheses) for spring gill net surveys, Casa Blanca Reservoir, Texas, 2011, 2015, and 2019. Vertical line denotes the minimum length limit.

### Hybrid Striped Bass

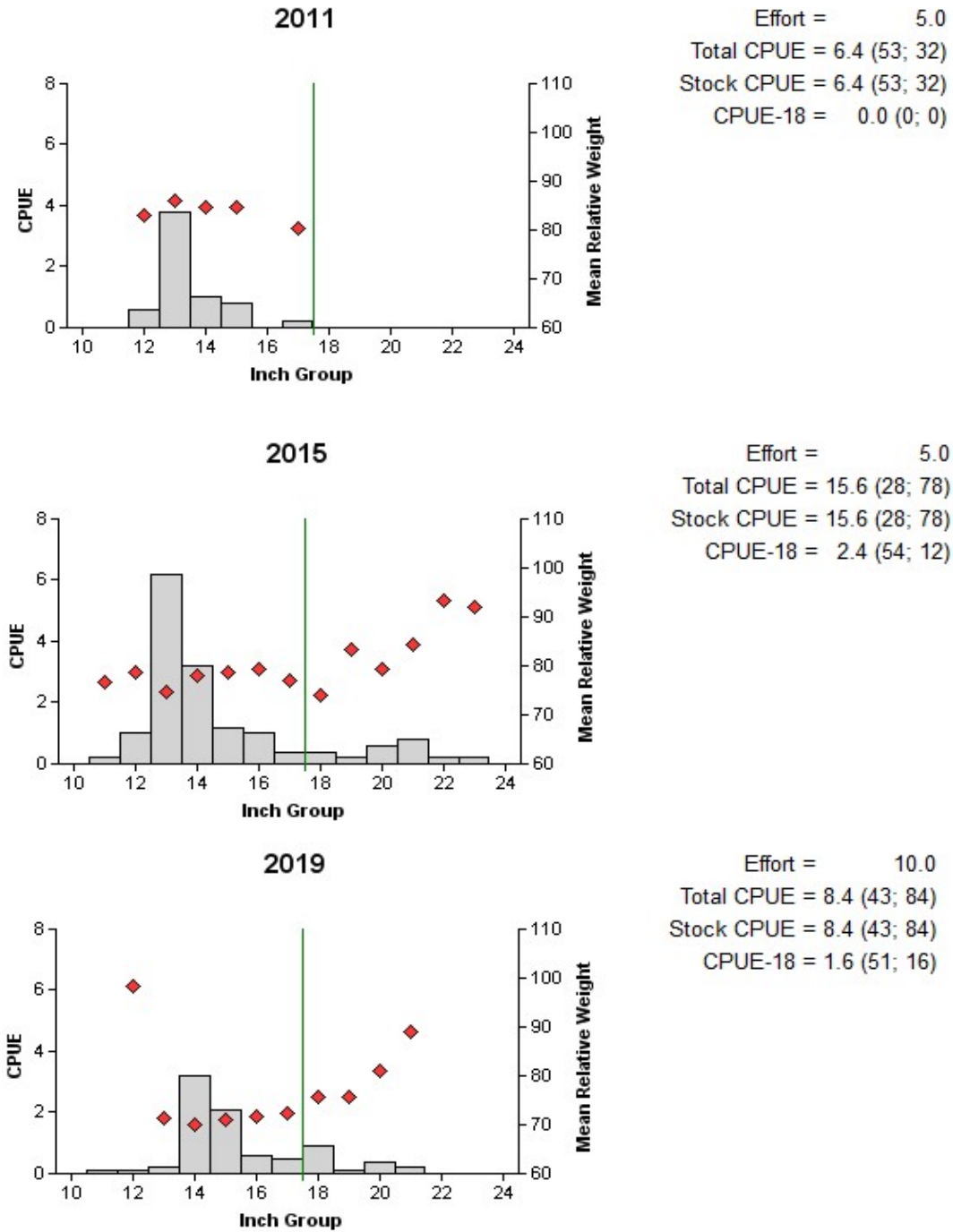


Figure 5. Number of Hybrid Striped Bass caught per net night (CPUE, bars; RSE and N for CPUE are in parentheses) and mean relative weight (diamonds) for spring gill net surveys, Casa Blanca Reservoir, Texas, 2011, 2015, and 2019. Vertical line denotes the minimum length limit.

## Largemouth Bass

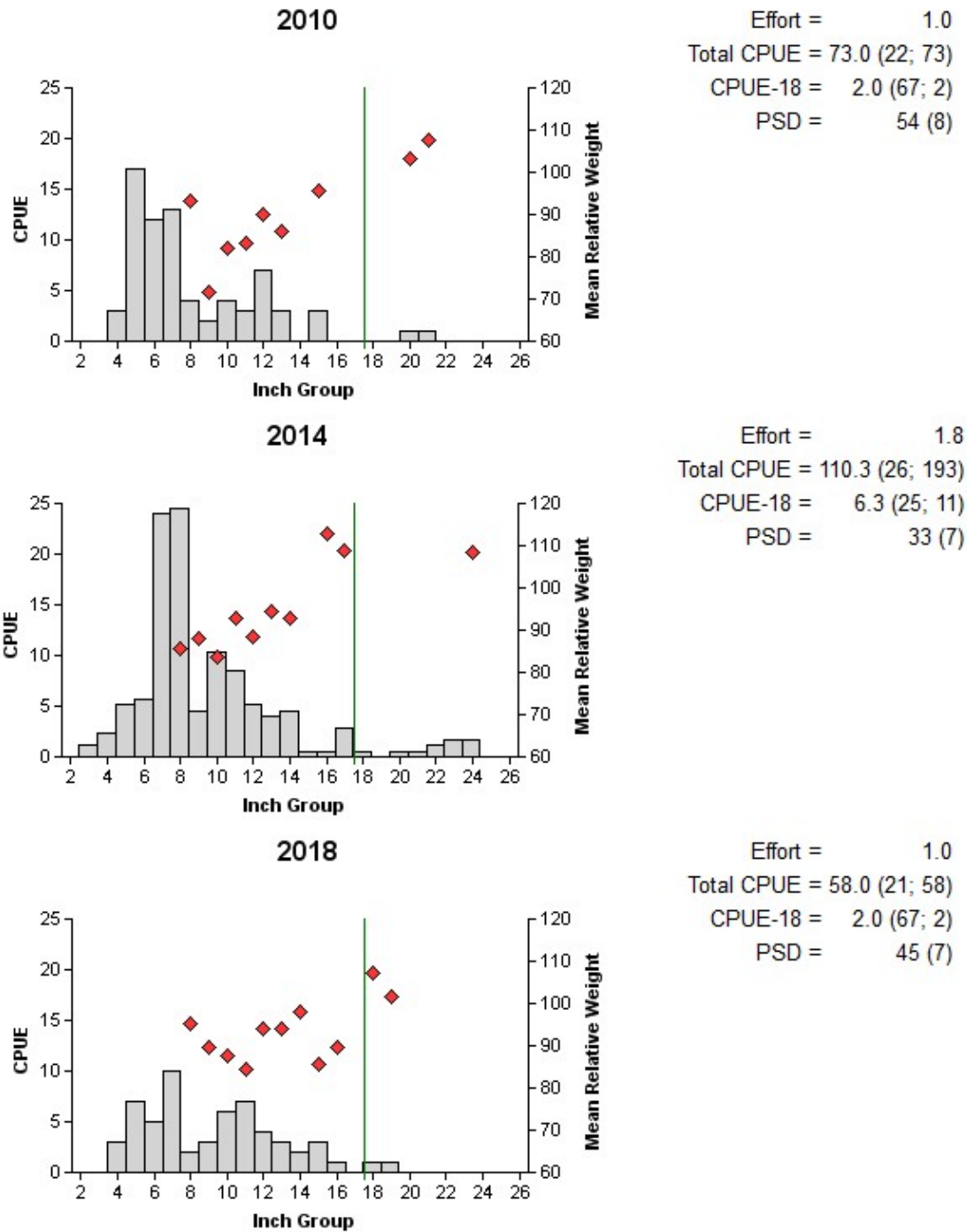


Figure 6. Number of Largemouth Bass caught per hour (CPUE, bars), mean relative weight (diamonds), and population indices (RSE and N for CPUE and SE for size structure are in parentheses) for fall night time (2006 and 2010) and fall daytime (2014) electrofishing surveys, Casa Blanca Reservoir, Texas. Green line denotes 18-inch minimum length limit.

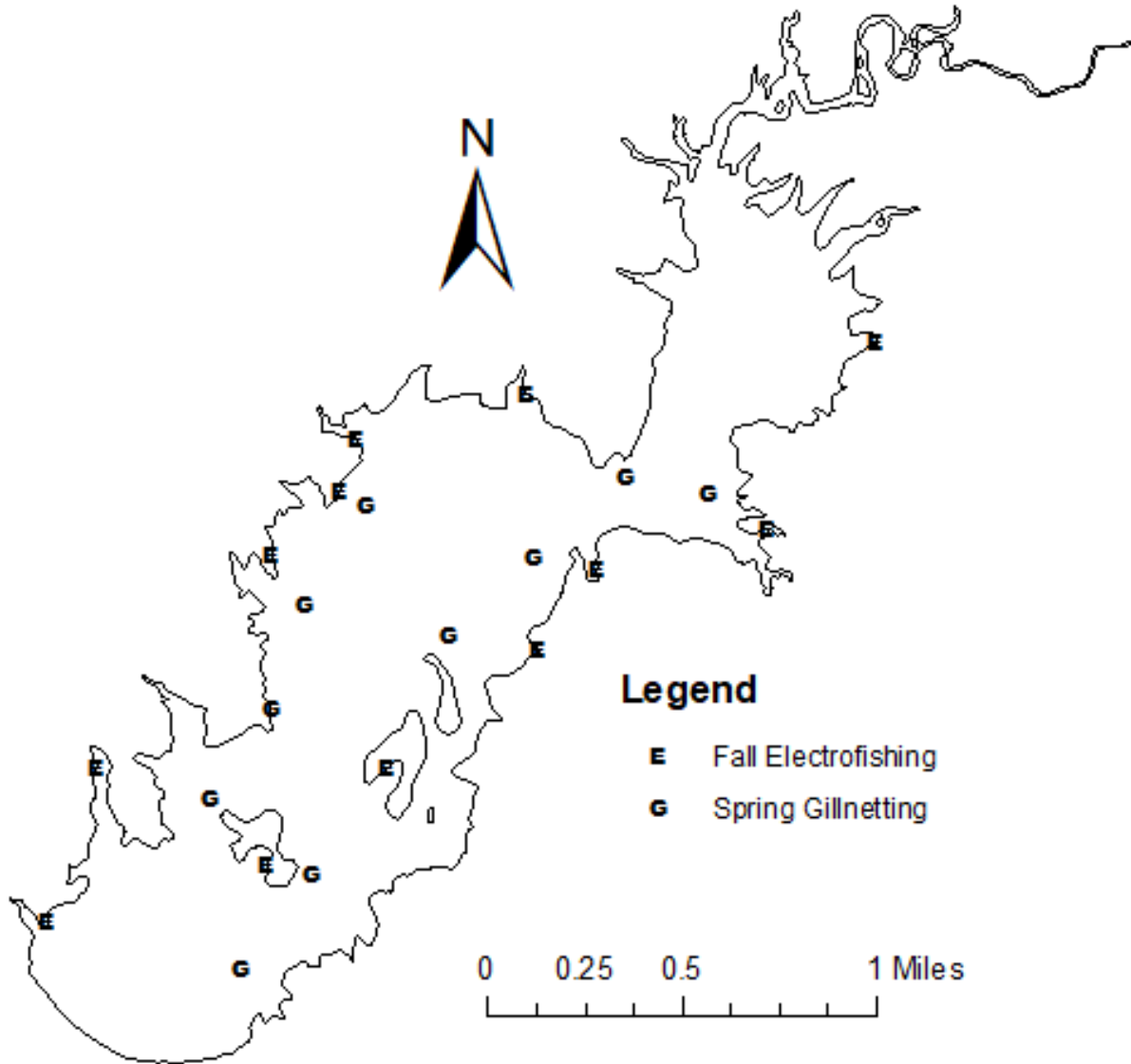
Table 7. Results of genetic analysis of Largemouth Bass collected by fall electrofishing, Casa Blanca Reservoir, Texas, 2000-2018. FLMB = Florida Largemouth Bass, NLMB = Northern Largemouth Bass, Intergrade = hybrid between a FLMB and a NLMB. Genetic composition was determined using electrophoresis prior to 2005 and using micro-satellite DNA analysis since 2005.

Year	Sample size	Number of fish			% FLMB alleles	% FLMB
		FLMB	Intergrade	NLMB		
2000	21	13	8	0	85	62
2002	25	17	8	0	87	68
2006	30	15	15	0	88	50
2010	30	4	26	0	81	13
2018	30	6	24	0	85	20

Table 8. Proposed sampling schedule for Casa Blanca Reservoir, Texas. Survey period is June through May. Standard survey denoted by S.

	Survey year			
	2019-2020	2020-2021	2021-2022	2022-2023
Angler Access				S
Vegetation				S
Electrofishing – Fall				S
Gill netting				S
Report				S

## Appendix A – Map of Sampling Locations



Location of electrofishing and gill net sampling sites, Casa Blanca Reservoir, Texas, 2018 – 2019. Fall electrofishing and spring gill net sample sites are indicated by “E” and “G” respectively.

## Appendix B – Catch Rates for All Species and Gear Types

Number (N) and catch rate (CPUE) (RSE in parentheses) of all target species collected from all gear types from Casa Blanca Reservoir, Texas, 2018-2019. Sampling effort was 1. hour for fall daytime electrofishing, and 10 net- nights for gill netting.

Species	Spring Gill Netting		Fall electrofishing	
	N	CPUE	N	CPUE
Gizzard Shad	609	60.9 (11)	61	61.0 (21)
Threadfin Shad			10	10.0 (30)
Common Carp	65	6.5 (34)		
Blue Catfish	40	4.0 (26)		
Channel Catfish	54	5.4 (30)		
Flathead Catfish			1	1.0 (100)
Suckermouth Catfish	3	0.3 (100)		
Bluegill	9	0.9 (39)	70	70.0 (22)
Redear Sunfish			1	1.0 (100)
Largemouth Bass	5	0.5 (45)	58	58.0 (18)
White Crappie	45	4.5 (39)		
Freshwater Drum	29	2.9 (82)		
Hybrid Striped Bass	84	8.4 (43)		





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