PERFORMANCE REPORT

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FEDERAL AID PROJECT F-221-M-1

INLAND FISHERIES DIVISION MONITORING AND MANAGEMENT PROGRAM

2010 Survey Report

Lake Corpus Christi

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SURVEY AND MANAGEMENT SUMMARY

Fish populations were surveyed using electrofishing and trap nets (2006, 2008 and 2010) and gill nets (2009, 2010 and 2011). This report summarizes the results of the surveys and contains a management plan for the reservoir based on those findings.

- **Reservoir Description:** Lake Corpus Christi is an 18,256 acre impoundment located on the Nueces River approximately 20 miles northwest of Corpus Christi, Texas. The reservoir was built by the Lower Nueces Water Supply District in 1958 to provide water for Corpus Christi and other coastal bend communities. Boat access is correlated with water level. Shoreline and handicap access are limited to a few public areas around the lake. Water is typically turbid, but clears during summer in the lower reservoir and small creek arms. The substrate is composed primarily of silt, sand, clay, and some gravel/rock. Littoral habitat consists of native aquatic vegetation, periodically flooded live and dead terrestrial vegetation, standing timber, and seasonally abundant water hyacinth and alligatorweed.

- **Management History:** Important sport fishes include blue catfish, white bass, largemouth bass and white and black crappie. Recent management efforts have focused on control of nuisance aquatic vegetation, creating additional habitat, and supplementing the naturally occurring largemouth bass population through recent stockings in 2008 and 2009. The district has worked with the City of Corpus Christi to develop and implement a water hyacinth control program. Angler harvest of all sport fishes has been regulated according to statewide size and bag limits.

- **Fish Community**
  - **Prey species:** Gizzard and threadfin shad were the predominant prey in the reservoir. Most gizzard shad collected were of size available to predators. Bluegill relative abundance remained high and the majority collected was available as forage to the predator assemblage.

  - **Catfishes:** Although channel catfish were present, the catfish community is dominated by blue catfish. Several quality-sized blue catfish were collected.

  - **White bass:** White bass relative abundance increased substantially since previous surveys in 2006 and 2008.

  - **Largemouth bass:** Largemouth bass abundance has steadily increased since 2006. However, few fish above legal size limit were collected during the 2010 electrofishing survey. Overall body condition was good with relative weights exceeding 90. Largemouth bass attained legal size (14 inches) at 2.7 years.

  - **Crappie:** Trap net catch rates of white and black crappie increased substantially over the survey period, however, the majority of fish collected were sub-legal. White crappie body condition was excellent.

- **Management Strategies:** Continue to assist the City of Corpus Christi on the water hyacinth control program. Monitor for expansion of native aquatic vegetation. Request Florida largemouth bass stocking to enhance production of large fish (≥ 8 pounds) in the population. Conduct creel to collect fisheries dependent data (i.e., angler effort, catch, and harvest). Evaluate use of baited hoop nets for collection of channel catfish.

INTRODUCTION

This document is a summary of fisheries data collected from Lake Corpus Christi in 2006-2011. 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. Management strategies are included to address existing problems and/or opportunities. Historical data are presented with the 2010-2011 data for comparison.

Reservoir Description

Lake Corpus Christi is an 18,256-acre reservoir located on the Nueces River approximately 20 miles northwest of Corpus Christi, Texas. The reservoir was built by the Lower Nueces Water Supply District in 1958 to provide water for Corpus Christi and other coastal bend communities. Water level in the reservoir can fluctuate 1-10 feet annually (Figure 1). Water levels were the lowest in twenty years between 2009 and 2010. The lake level rose in the spring and summer of 2010 reaching approximately one foot below conservation pool. Boat access is dependent on water level, and shoreline and handicap access were limited to a few public areas around the lake. Water is typically turbid, but clears during summer in the lower reservoir and small creek arms. The substrate is composed primarily of silt, sand, clay, and some gravel/rock. Littoral habitat consists primarily of native aquatic vegetation, periodically flooded live and dead terrestrial vegetation, standing timber, and seasonally abundant water hyacinth and alligatorweed. Water hyacinth often becomes so abundant that it inhibits boating, fishing and shoreline access. Water lettuce is also present in the reservoir but has yet to restrict recreational use. Other descriptive characteristics for Lake Corpus Christi are in Table 1.

Management History

Previous management strategies and actions: Management strategies and actions from the previous survey report (Neahr and Findeisen 2006) included:

1. Largemouth bass catch rates in Lake Corpus Christi have decreased significantly during the survey period. The lake rose in the spring of 2007 and is currently at conservation pool. This rise in water has restored old habitat and created new habitat.

   Action: Florida largemouth bass were stocked at a rate of 25/fish-acre in 2008 and 2009 in response to water level rise in efforts to supplement the existing largemouth bass population.

2. Catch rates and size structure of blue catfish in Lake Corpus Christi have improved during the survey period.

   Action: District staff distributed press releases and promoted blue catfish angling opportunities among catfish anglers.

3. Native aquatic vegetation was scarce before water levels dropped in 2006 and native vegetation was not observed during the most recent vegetation survey.

   Action: Native aquatic vegetation plantings were not conducted during the survey period due to water level fluctuations.

4. Nuisance vegetation such as water hyacinth and water lettuce has historically been a severe problem in the reservoir restricting recreational use and impacting the quality of fish and wildlife habitat by outcompeting native aquatic vegetation.

   Action: Vegetation surveys were conducted in 2008 and 2010 to monitor presence and

expansion of water hyacinth and other nuisance vegetation. District staff consulted the City of Corpus Christi on vegetation control measures and assisted in the design and schematics of a spray rig to be used for spray operations on the reservoir. The City of Corpus Christi has their own vegetation control crew and has been treating water hyacinth, water lettuce, and alligatorweed with herbicides.

Harvest regulation history: Sport fishes in Lake Corpus Christi have always been managed with statewide regulations (Table 2).

Stocking history: Florida largemouth bass fingerlings (920,000) were stocked in the reservoir over a two-year period in 2008 and 2009. Prior to 2008, the most recent stocking of Florida largemouth bass occurred in 2002. Palmetto and striped bass have been stocked at Lake Corpus Christi in the past; the most recent occurring in 1995 and 1990, respectively. The complete stocking history can be found in Table 3.

Vegetation/habitat history: Shoreline habitat in Lake Corpus Christi is predominantly natural (clay, sand, silts) shoreline and rocky gravel banks. The upper portion of the lake is characterized by large stands of flooded timber and seasonally abundant water hyacinth and alligatorweed. The lake also supports limited stands of emergent (cattail), floating (white water lily), and submersed native aquatic vegetation (water stargrass). Results of the 2006 habitat and 2010 vegetation surveys can be found in Table 4.

Water hyacinth, a non-native floating plant, has historically been a problem in the upper end of the reservoir, reducing access and negatively impacting fish and wildlife habitat. Water lettuce, another non-native floating plant, is also present in the reservoir but has yet to restrict recreational use. Alligator weed has recently become established in the reservoir. The City of Corpus Christi, coupled with assistance from district staff, has initiated vegetation control measures in problematic areas of the reservoir.

Water Transfer: Lake Corpus Christi is primarily used for municipal/industrial water supply, recreation, and to a lesser extent, flood control. There are three water diversion categories managed by the City of Corpus Christi which include; municipal, industrial and irrigation/livestock. There are currently three permanent pumping stations on the reservoir transferring water to other locations. Untreated water is diverted to the cities of Beeville, Alice, and Mathis for use as municipal water supply and the pumps are operated by each respective municipality. Lake Corpus Christi also periodically receives auxiliary water from upstream Choke Canyon Reservoir when the dam gates are opened by the City of Corpus Christi. There are currently no proposals to install additional pumping stations on the reservoir.

METHODS

Fishes were collected by electrofishing (2.0 hours at 24 5-minute stations), trap nets (15 net nights at 15 stations), and gill nets (15 net nights at 15 stations). Standard electrofishing surveys were conducted during night time and sample station selection was random for all gear types as prescribed by the Fishery Assessment Procedures (TPWD, Inland Fisheries Division, unpublished manual revised 2009). Catch per unit effort (CPUE) for electrofishing was recorded as the number of fish caught per hour of actual electrofishing (fish/h) and for gill and trap nets as the number of fish caught in one net set overnight (fish/nn). An aquatic vegetation survey was conducted in 2010. A shoreline habitat survey was conducted in August 2006. Habitat/vegetation mapping was conducted by circumnavigating the lake and habitat features were geo-referenced with a trimble unit. Ages for largemouth bass were determined using 15 fish between 13 - 15 inches total length in 2010. Ages for white crappie were determined using 11 fish between 9 - 11 inches total length in 2010. All fish collected for age and growth analysis were aged using otoliths.

Genetic analysis of largemouth bass was conducted according to the Fishery Assessment Procedures (TPWD, Inland Fisheries Division, unpublished manual revised 2009). Micro-satellite analysis was used to determine genotype of individual fish in 2008 and 2010 and by electrophoresis for previous years.

Micro-satellite DNA analysis was not conducted in 2006 due to low sample size.

Sampling statistics (CPUE for various length categories) and structural indices [Proportional Size Distribution (PSD) for various length categories, as defined by Guy et el. (2007)], and condition indices [relative weight (W_r)] were calculated for target fishes according to Anderson and Neumann (1996). Historical mean relative weight values were calculated using historical data from samples prior to surveys conducted in 2010/2011. Ninety-five percent confidence intervals were calculated for historical relative weight values and plotted with the 2010/2011 relative weights for comparison. Index of vulnerability (IOV) was calculated for gizzard shad according to DiCenzo et al. (1996). Relative standard error (RSE = 100 X SE of the estimate/estimate) was calculated for all catch statistics and standard error (SE) was calculated for structural indices and IOV. Source for water level data was the United States Geological Survey website (http://waterdata.usgs.gov/tx).

RESULTS AND DISCUSSION

Habitat: Littoral zone habitat consisted primarily of natural shoreline, rocky gravel banks, standing timber and non-native submersed and floating vegetation (Table 4). In 2010, 2,186 of the 18,256 acres (12%) of the reservoir contained non-native aquatic vegetation. The lake also supports limited stands of native emergent and floating leaved vegetation (125 acres; <1% coverage). Cattail (110.8 acres) and white water lily (9.5 acres) were the most abundant native vegetation types (Table 4).

Prey species: In 2010, electrofishing catch rates of gizzard and threadfin shad were 210.0/h and 306.0/h, respectively. The electrofishing catch rate for gizzard shad in 2010 was lower than catches in 2006 (284.5/h) but greater than 2008 (167.5/h) (Figure 2). Index of vulnerability values have been consistent over the last three surveys and remained in the 90's, suggesting the majority of the gizzard shad population was less than 8 inches in length and available as prey to existing predators. Bluegill catch rates were 212.5/h in 2010 (Figure 3). The 2010 bluegill size structure was dominated by smaller individuals as indicated by a low PSD value (PSD = 5). Taken as a whole, survey results indicated ample prey base for sport fishes. Availability of prey should not be a limiting factor to the growth and condition of sport fishes in the reservoir.

Blue catfish: The 2011 blue catfish gill net catch rate was 20.2/nn, lower than previous surveys in 2009 (29.3/nn) and 2010 (35.3/nn) (Figure 4). PSD was low (PSD = 5), but values remained consistent with previous surveys. Roughly half (56%) of the fish sampled were of stock size (≥ 12 inches) as indicated by CPUE-stock (11.4/nn) and available to anglers for harvest. A few (n = 8) quality-sized (≥ 20 inches) individuals were collected and CPUE-20 was similar to prior surveys. Body condition of stock-size (12 inches) and larger blue catfish was below average historical values for the reservoir for most inch groups (Figure 5).

Channel catfish: The gill net catch rate for channel catfish in 2011 was 1.9/nn, similar to the rates in 2009 (1.2/nn) and 2010 (0.8/nn) (Figure 6). The channel catfish sample was dominated by smaller individuals and only 10% of the catch was ≥ 12 inches in length and available to anglers.

White bass: The 2011 gill net catch rate for white bass was 28.4/nn, substantially higher (12-fold increase) than rates in 2009 (2.2/nn) and 2010 (0.5/nn) (Figure 7). The increase in relative abundance observed may be explained by sampling during the spring spawning run. Relative abundance of legal-size (10 inches) white bass also increased as indicated by CPUE-10 (5.1/nn) compared to 2009 (0.3/nn) and 2010 (0.2/nn). Relative weight values exceeded 90 for all size classes and increased with increasing length (Figure 6).

Largemouth bass: The largemouth bass electrofishing catch rate in 2010 was 114.0/h, higher than both 2006 (26.5/h) and 2008 (50.0/h) (Figure 8). CPUE-14 also increased in 2010 (7.0/h) compared with 2006 (0.5/h) and 2008 (2.5/h). Size structure indices in 2010 (PSD = 25, PSD-14 = 20) indicate a more

balanced population than prior years, but one that is still dominated by smaller individuals. Body condition of 2010 stock-size (≥ 8 inches) fish was excellent as relative weight values exceeded average historical values for the reservoir with mean relative weights per inch group at or above 93 (Figure 9). Growth was slightly slower than largemouth bass growth rates for populations in South Texas. Mean age at 14 inches (13 – 15 in) was 2.7 years (N = 15; range = 1 – 3). Introgression of FLMB genetics in the population remained high and was consistent with previous years; FLMB alleles averaged 73% in 2010 and 13% of the genetics sample were pure FLMB (Table 5).

White crappie: The trap net catch rate for white crappie in 2010 was 10.5/nn, considerably higher than prior surveys in 2006 (2.9/nn) and 2008 (7.2/nn) (Figure 10). CPUE-10 was similar (< 1.0/nn) in all surveys throughout the survey period. Proportional size distribution values have remained consistent and indicate a stable, balanced population (2010; PSD = 39). Body condition of stock size (5 inches) or larger white crappie was excellent as 2010 relative weight values exceeded average historical values for the reservoir with mean relative weight values per inch group at or above 100 (Figure 11). Mean age at 10 inches (9 – 11 in) was 1.5 years (N = 11; range = 1 – 3 years), indicating good growth rates.

Black crappie: Black crappie relative abundance also increased with a catch rate of 2.9/nn in 2010, compared to 2006 (0.5/nn) and 2008 (0.8/nn) (Figure 12). The sample was dominated by smaller individuals as indicated by PSD = 11. Only one legal size (10 inches) black crappie was collected.

Fisheries management plan for Lake Corpus Christi, Texas

Prepared – July 2011.

ISSUE 1: The reservoir is capable of producing trophy-sized (≥ 8 pounds) largemouth bass. Catch records (water body record = 13.5 pounds) and anecdotal reports indicate the reservoir does produce large fish. Abundant forage populations exist to support the growth and production of these larger fishes.

MANAGEMENT STRATEGIES

1. Request Florida largemouth bass for stockings in 2012 and 2013 at a rate of 25/acre.

ISSUE 2: Fisheries dependent data such as angler effort, catch, and harvest of sport fishes do not exist for Lake Corpus Christi.

MANAGEMENT STRATEGIES

1. Conduct a roving creel survey beginning 1 September 2011 through 31 May 2012.

ISSUE 3: Historical and recent gill net catch data have indicated low relative abundance of channel catfish suggesting a minimal channel catfish population and/or poor sampling gear efficiency.

MANAGEMENT STRATEGIES

1. Determine the utility of baited hoop nets deployed during summer for use as an alternative collection gear for channel catfish.

ISSUE 4: Many invasive species threaten aquatic habitats and organisms in Texas and can adversely affect the state ecologically, environmentally, and economically. For example, 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. Exotic plants such as water hyacinth, water lettuce and alligatorweed have historically been a severe problem in the upper end and tributaries of the reservoir. These exotic plants restrict recreational use and negatively impact the quality of fish and wildlife habitat restricting growth and colonization of native vegetation.

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.
6. Monitor water hyacinth and other exotic nuisance vegetation through periodic vegetation surveys.
7. Revisit the water hyacinth control program and continue to serve as advisors to the City of Corpus Christi on all vegetation control activities.

SAMPLING SCHEDULE JUSTIFICATION:

The proposed sampling schedule includes biennial electrofishing, trap netting and gill netting and mandatory monitoring in 2014/2015. Hoop nets will be utilized as an alternative sampling gear for channel catfish. A Federal Aid report will be prepared in 2015 (Table 6).

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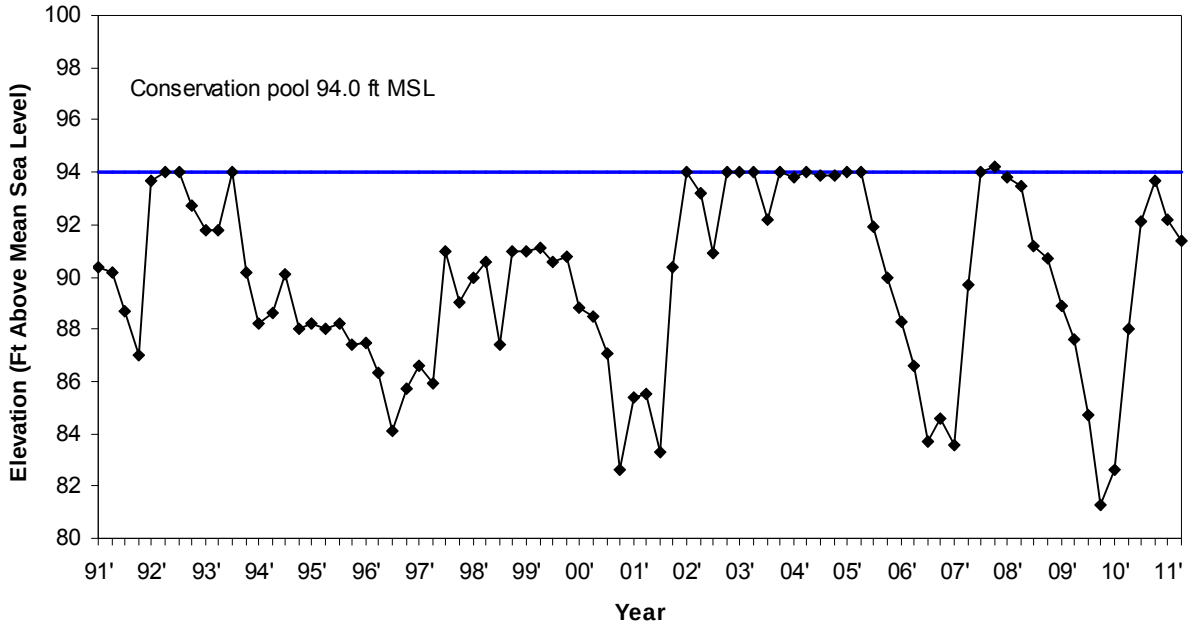


Figure 1. Quarterly water level elevations in feet above mean sea level (MSL) recorded for Lake Corpus Christi, Texas.

Table 1. Characteristics of Lake Corpus Christi, Texas.

Characteristics	Description
Year constructed	1958
Controlling authority	City of Corpus Christi
Counties	San Patricio, Jim Wells and Live Oak
Reservoir type	Main stream
Shoreline Development Index (SDI)	6.00
Conductivity	380 µmhos/cm

Table 2. Harvest regulations for Lake Corpus Christi, Texas.

Species	Bag Limit	Minimum-Maximum Length (inches)
Catfish: channel and blue catfish, their hybrids and subspecies	25 (in any combination)	12 – No Limit
Catfish, flathead	5	18 – No Limit
Bass, white	25	10 – No Limit
Bass, largemouth	5	14 – No Limit
Crappie: white and black crappie, their hybrids and subspecies	25 (in any combination)	10 – No Limit

Table 3. Stocking history of Lake Corpus Christi, Texas. Size categories are: FGL = 1-3 inches and ADL = adults.

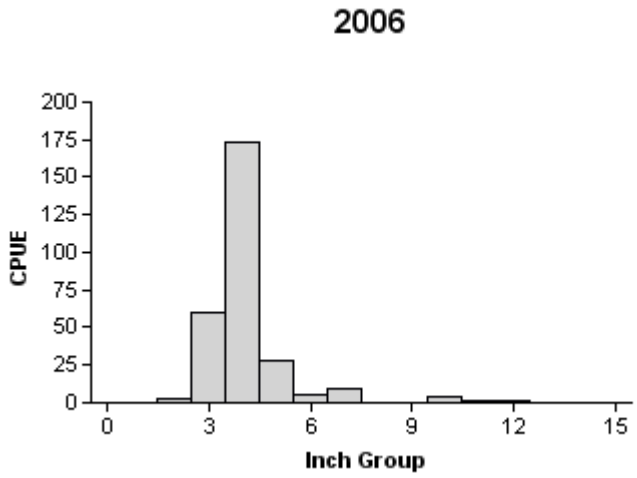
Species	Year	Number	Size
Channel catfish	1972	10,000	FGL
	Total	10,000	
Striped bass	1981	109,600	FGL
	1983	220,096	FGL
	1988	220,432	FGL
	1989	459,686	FGL
	1990	237,745	FGL
	Total	1,247,559	
Palmetto bass	1979	88,456	FGL
	1980	219,991	FGL
	1981	85,170	FGL
	1986	220,358	FGL
	1991	220,900	FGL
	1992	319,700	FGL
	1993	166,324	FGL
	1994	533,172	FGL
	1995	330,400	FGL
	Total	2,184,471	
Florida largemouth bass	1980	247,909	FGL
	1998	422,269	FGL
	2002	483,240	FGL
	2008	463,176	FGL
	2009	456,349	FGL
	Total	2,072,943	
Walleye	1973	200,000	FGL
	Total	200,000	
Rainbow trout *	1993	2,002	ADL
	1994	2,005	ADL
	1995	1,929	ADL
	1997	1,008	ADL
	1998	1,010	ADL
	2000	1,500	ADL
	2001	1,381	ADL
	2002	2,500	ADL
	2003	2,583	ADL
	2004	2,079	ADL
	2005	1,500	ADL
	2006	1,509	ADL
	2007	1,502	ADL
	2008	1,500	ADL
	2009	1,504	ADL
	2010	1,500	ADL
	2011	1,506	ADL
	Total	28,518	

*Stocked behind a block net for annual fishing clinic.

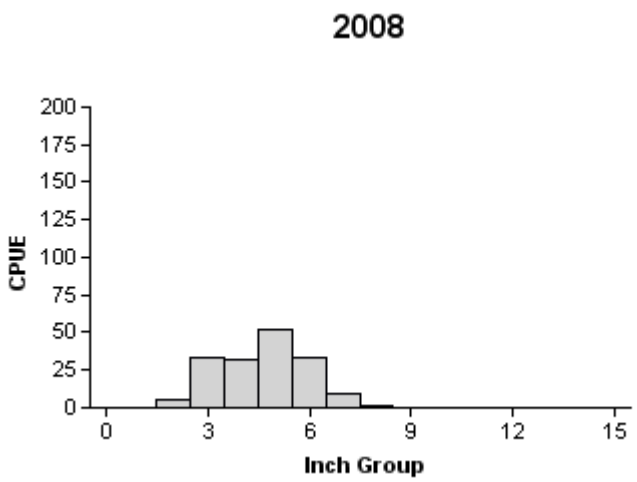
Table 4. Survey of littoral zone and physical habitat types, Lake Corpus Christi, Texas, 2006 (shoreline), 2010 (vegetation). A linear shoreline distance (miles) was recorded for each habitat type found. Surface area (acres) and percent of reservoir surface area was determined for each type of aquatic vegetation found.

		Shoreline Distance		Areal Coverage	
Habitat	Type	Miles	Percent	Acres	Percent
Shoreline	Boulder	0.3	0.3		
	Bulkhead	0.1	0.1		
	Concrete	0.5	0.4		
	Cutbank	9.5	8.8		
	Natural	85.0	78.6		
	Rip rap	0.4	0.4		
	Rocky/gravel shoreline	12.3	11.4		
	Total	108.1	100		
Vegetation	Native emergent				
	Bulrush			3.5	0.02
	Cattail			110.8	0.61
	Native floating				
	White water lily			9.5	0.05
	Native Submersed				
	Water stargrass			0.3	<0.01
	Non-native				
	Alligatorweed			985.4	5.40
	Water lettuce			134.1	0.73
	Water hyacinth			1,066.9	5.84

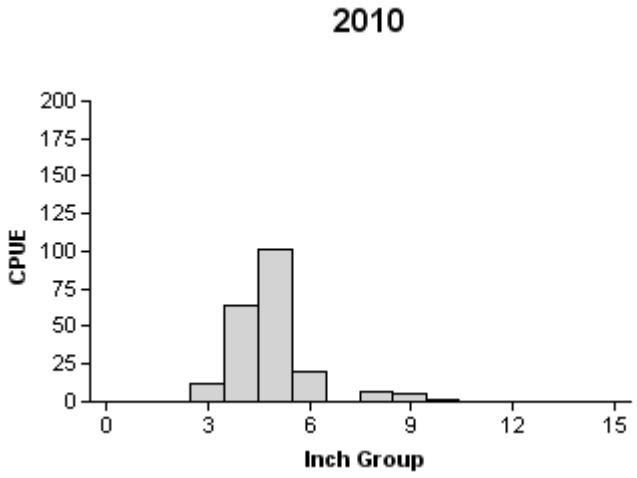
Gizzard Shad



Effort = 2.0
Total CPUE = 284.5 (36; 569)
IOV = 98 (1)



Effort = 2.0
Total CPUE = 167.5 (24; 335)
IOV = 99 (1)



Effort = 2.0
Total CPUE = 210.0 (12; 420)
IOV = 94 (2)

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, Lake Corpus Christi, Texas 2006, 2008, and 2010.

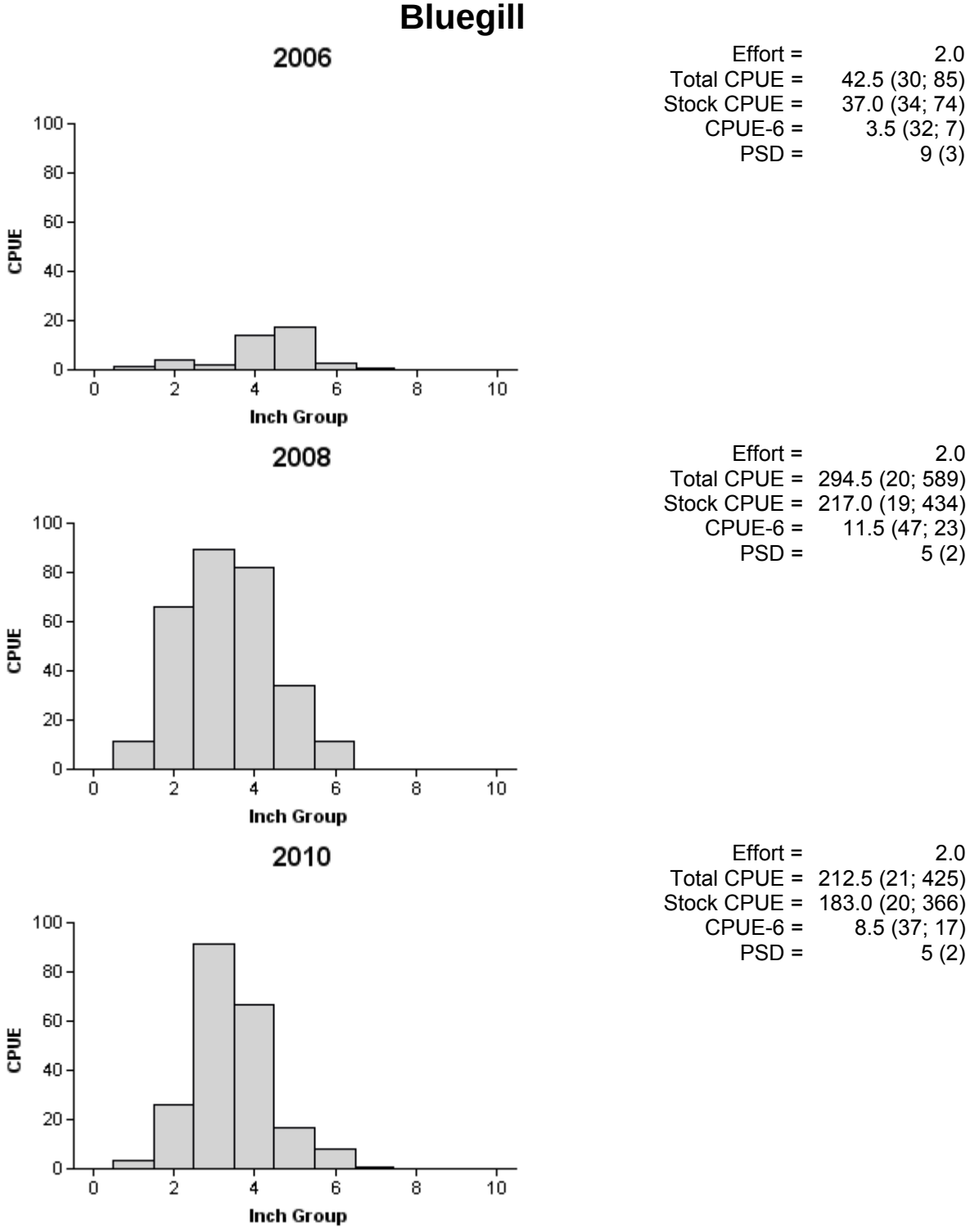


Figure 3. Number of bluegill caught per hour (CPUE, bars) and population indices (RSE and N for CPUE and SE for size structure are in parenthesis) for fall electrofishing surveys, Lake Corpus Christi, Texas, 2006, 2008, and 2010.

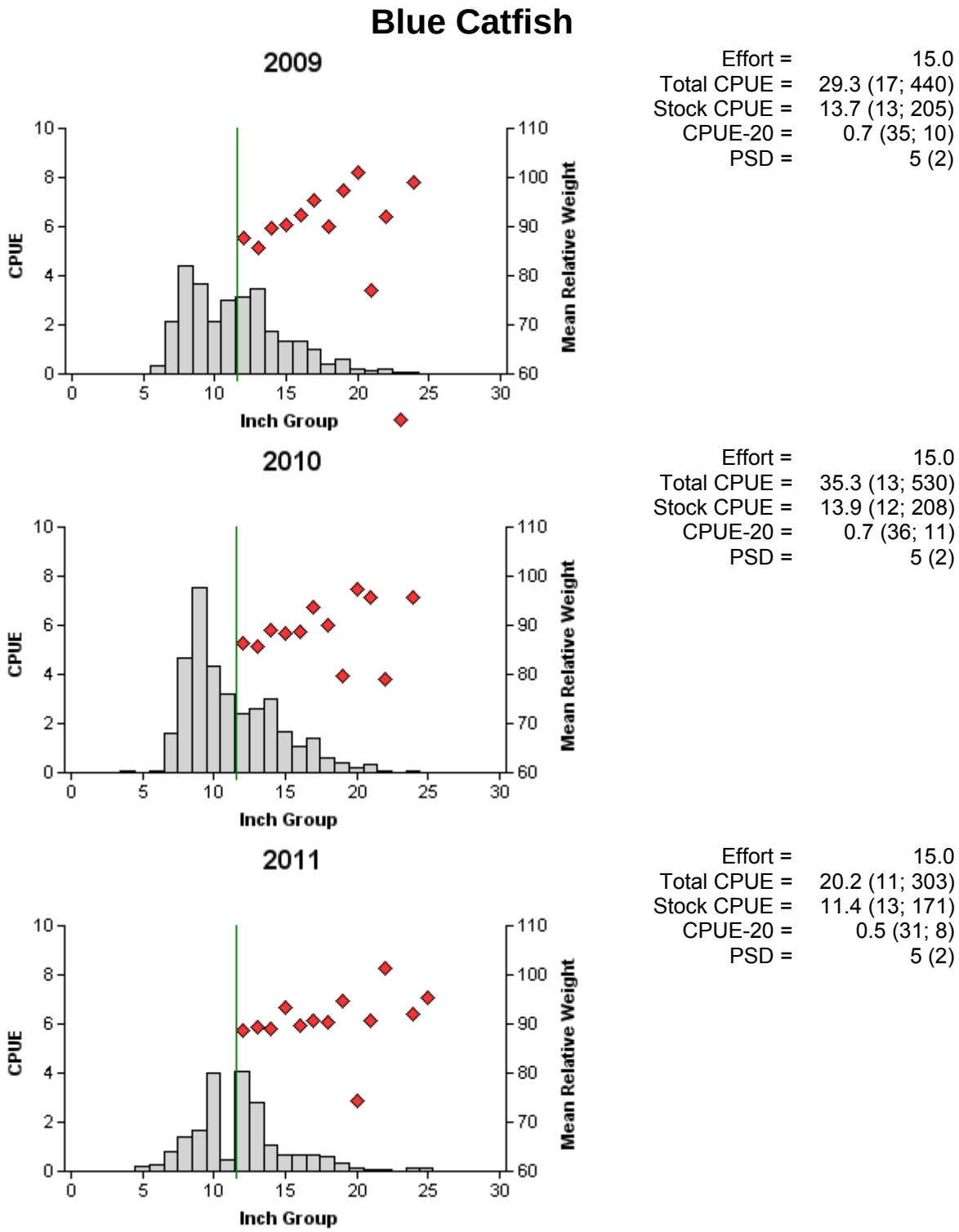


Figure 4. Number of blue catfish caught per net night (CPUE, bars), mean relative weight (diamonds), and population indices (RSE and N for CPUE and SE for size structure are in parentheses) for spring gill net surveys, Lake Corpus Christi, Texas 2009, 2010, and 2011. Vertical line denotes 12 inch minimum length limit.

Blue Catfish

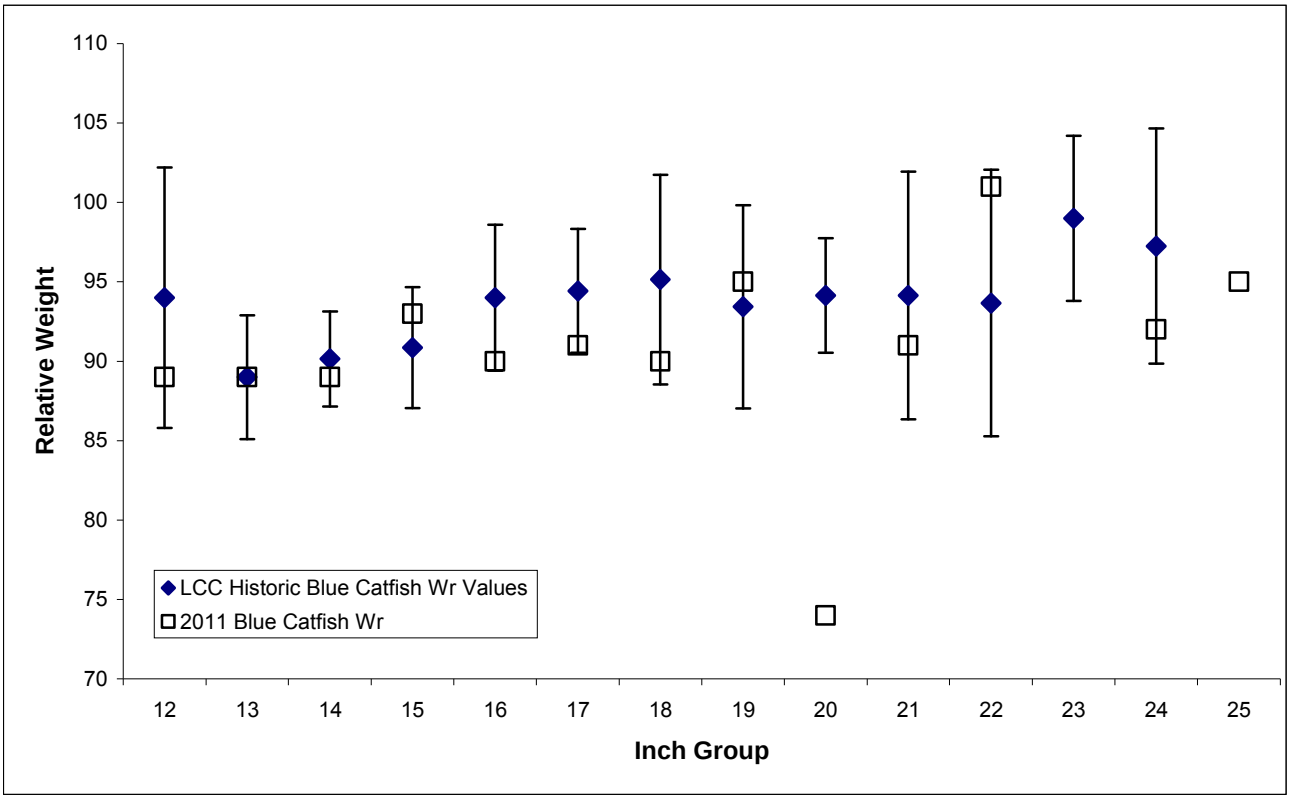


Figure 5. Comparison of 2011 blue catfish W_r values to mean W_r values from historical data by inch class. Error bars represent 95% confidence intervals.

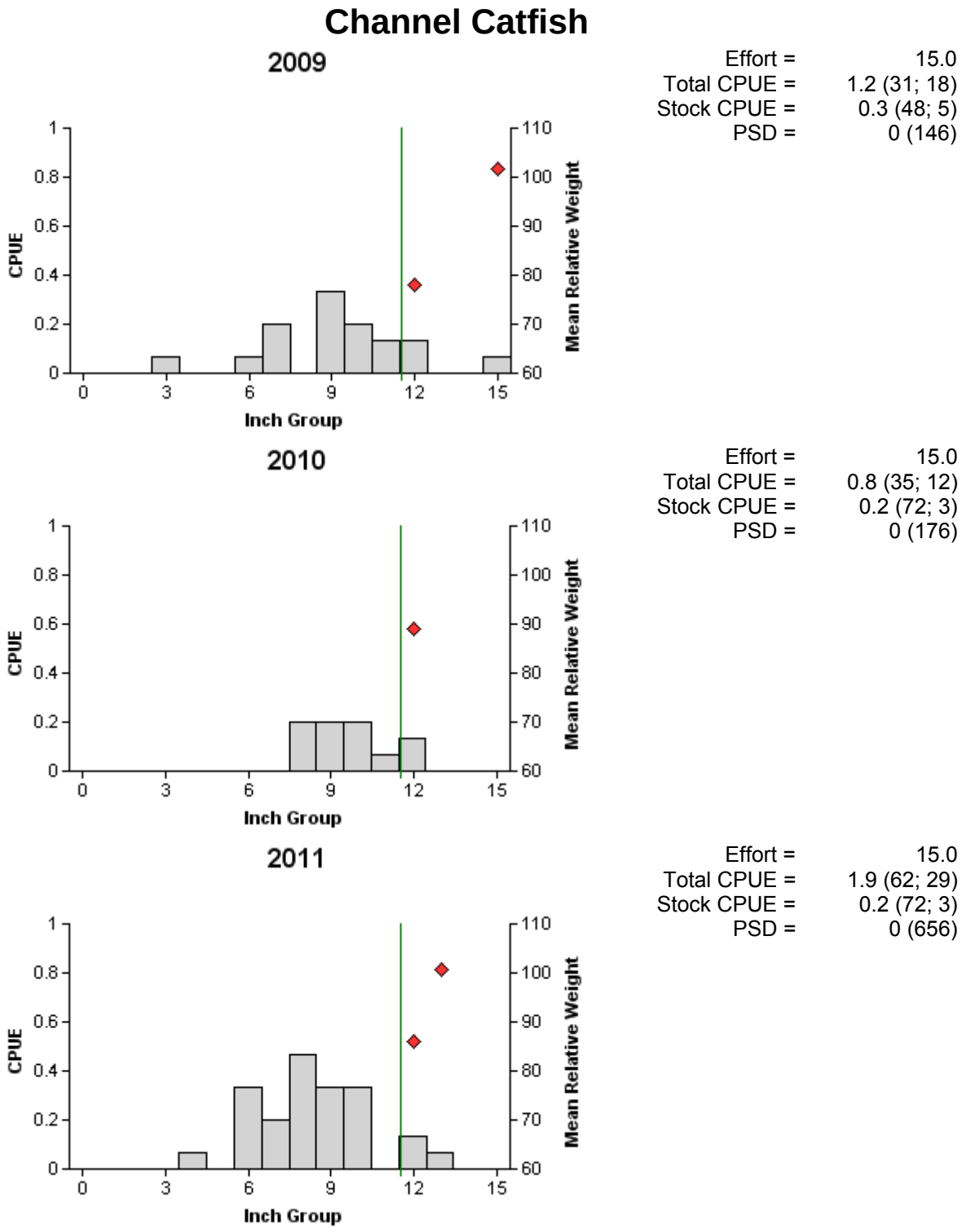


Figure 6. Number of channel catfish caught per net night (CPUE, bars), mean relative weight (diamonds), and population indices (RSE and N for CPUE and SE for size structure in parentheses) for spring gill net surveys, Lake Corpus Christi, Texas 2009, 2010, and 2011. Vertical line denotes 12 inch minimum length limit.

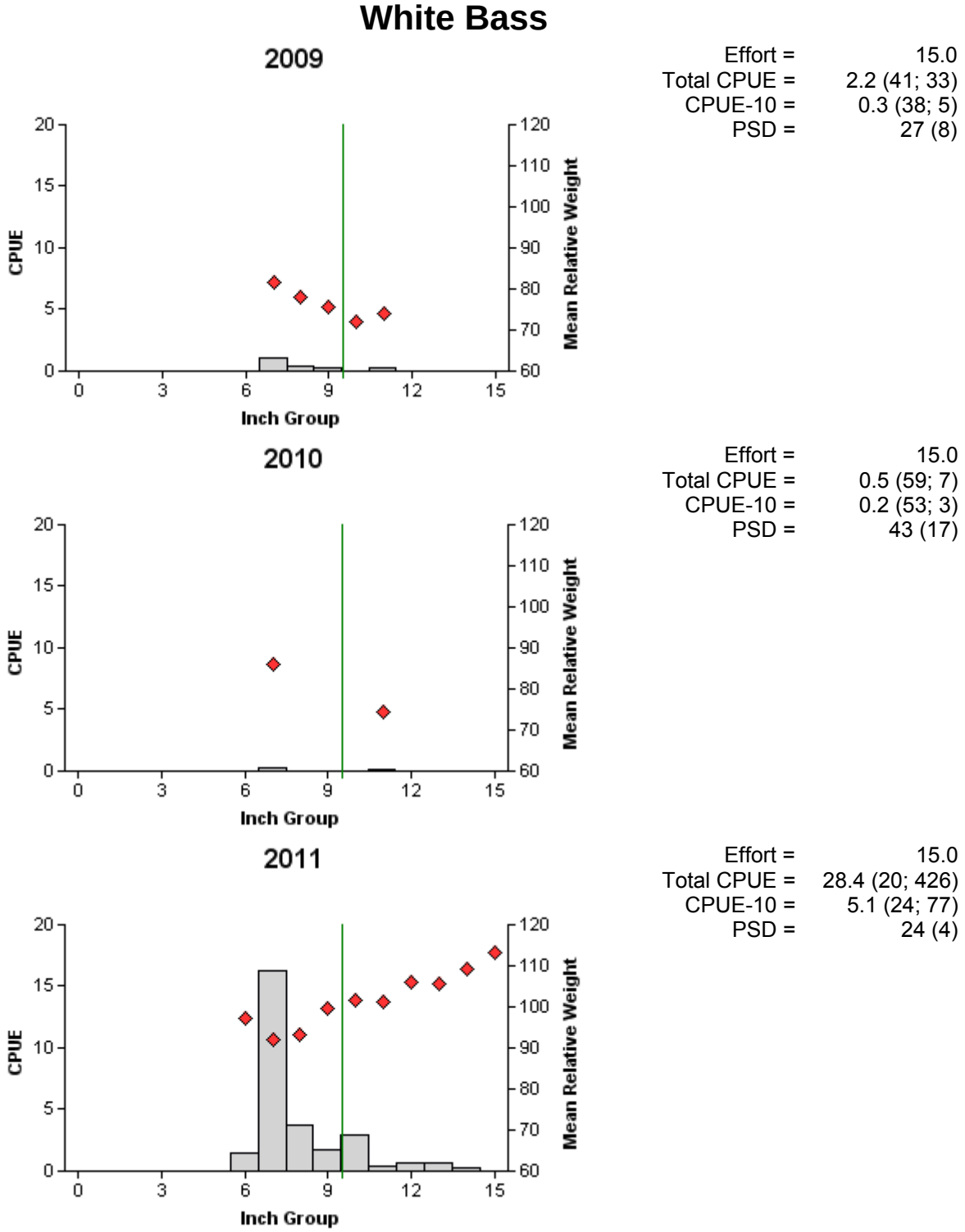
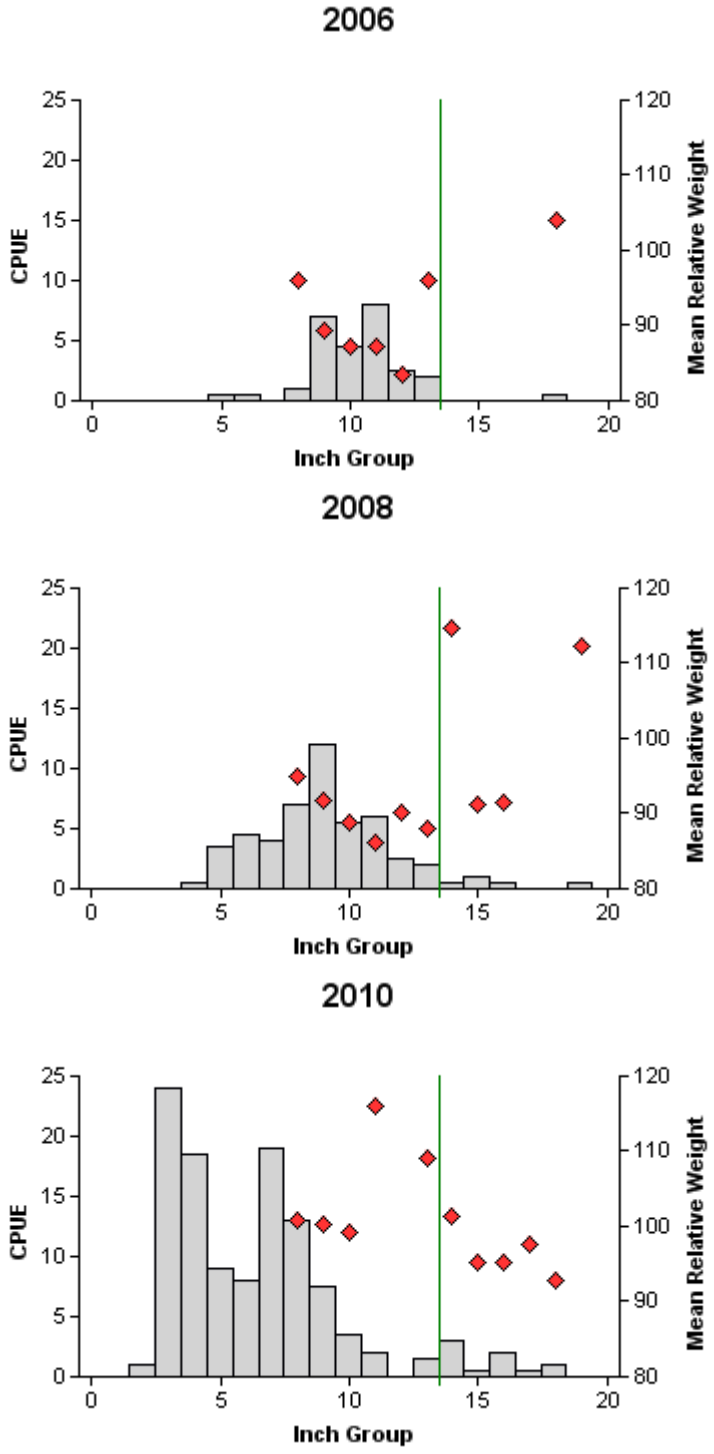


Figure 7. Number of white bass caught per net night (CPUE, bars), mean relative weight (diamonds), and population indices (RSE and N for CPUE and SE for size structure in parentheses) for spring gill net surveys, Lake Corpus Christi, Texas 2009, 2010, and 2011. Vertical line denotes 10 inch minimum length limit.

Largemouth Bass



Effort =	2.0
Total CPUE =	26.5 (33; 53)
Stock CPUE =	25.5 (32; 51)
CPUE-14 =	0.5 (100; 1)
PSD =	20 (8)
PSD-14 =	2 (2)

Effort =	2.0
Total CPUE =	50.0 (26; 100)
Stock CPUE =	37.5 (29; 75)
CPUE-14 =	2.5 (40; 5)
PSD =	19 (5)
PSD-14 =	7 (3)

Effort =	2.0
Total CPUE =	114.0 (22; 228)
Stock CPUE =	34.5 (22; 69)
CPUE-14 =	7.0 (38; 14)
PSD =	25 (6)
PSD-14 =	20 (5)

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 parenthesis) for fall electrofishing surveys, Lake Corpus Christi, Texas, 2006, 2008, and 2010. Vertical line denotes 14 inch minimum length limit.

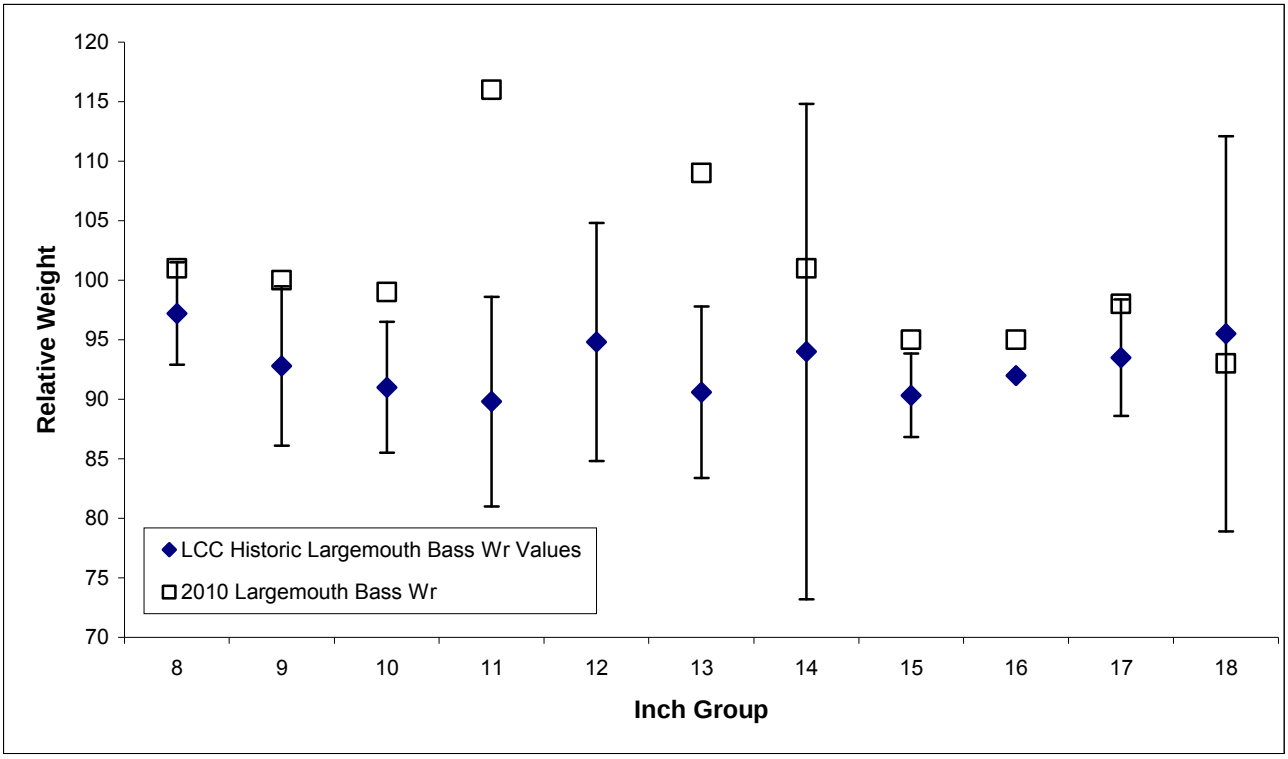


Figure 9. Comparison of 2010 largemouth bass W_r values to mean W_r values from historical data by inch class. Error bars represent 95% confidence intervals.

Table 5. Results of genetic analysis of largemouth bass collected by fall electrofishing, Lake Corpus Christi, Texas 2002, 2004, 2008 and 2010. Electrophoresis analysis was used to determine genetic composition in 2002, 2004 and micro-satellite DNA analysis was used in 2008 and 2010. Micro-satellite DNA analysis was not conducted in 2006 due to low sample size. FLMB = Florida largemouth bass, NLMB = Northern largemouth bass, F1 = first generation intergrade between FLMB and NLMB, Fx = second or higher generation intergrade between FLMB and a NLMB.

		Genotype					
Year	Sample size	FLMB	F1	Fx	NLMB	% FLMB alleles	% FLMB genotype
2002	45	23	1	21	0	84.4	Unknown
2004	30	15	3	11	1	82.5	Unknown
2008	18	0	0	18	0	73.0	0
2010	30	4	1	25	0	73.0	13.0

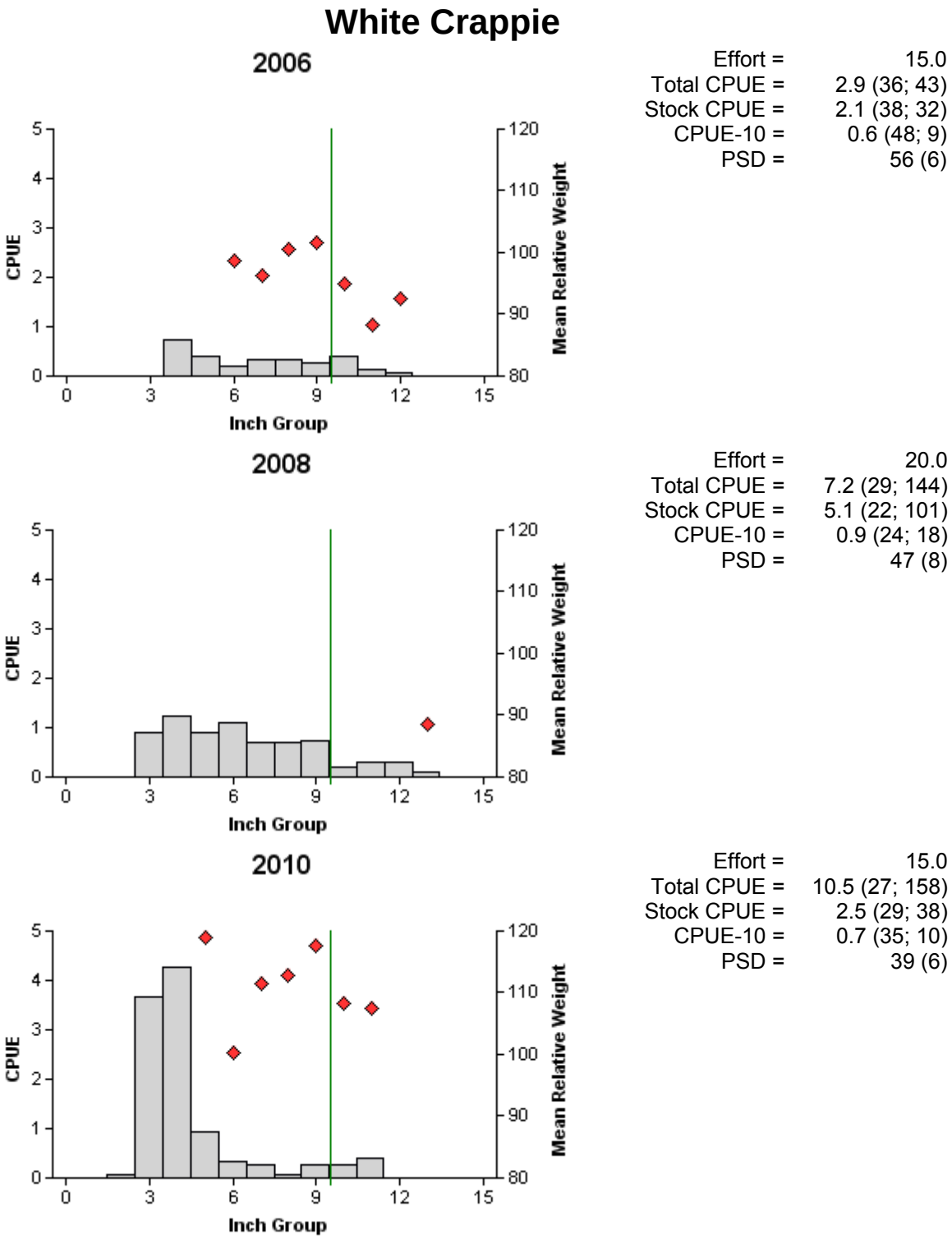


Figure 10. Number of white crappie caught per net night (CPUE, bars), mean relative weight (diamonds), and population indices (RSE and N for CPUE and SE for size structure are in parentheses) for fall trap net surveys, Lake Corpus Christi, Texas 2006, 2008, and 2010. Vertical line denotes the 10 inch minimum length limit.

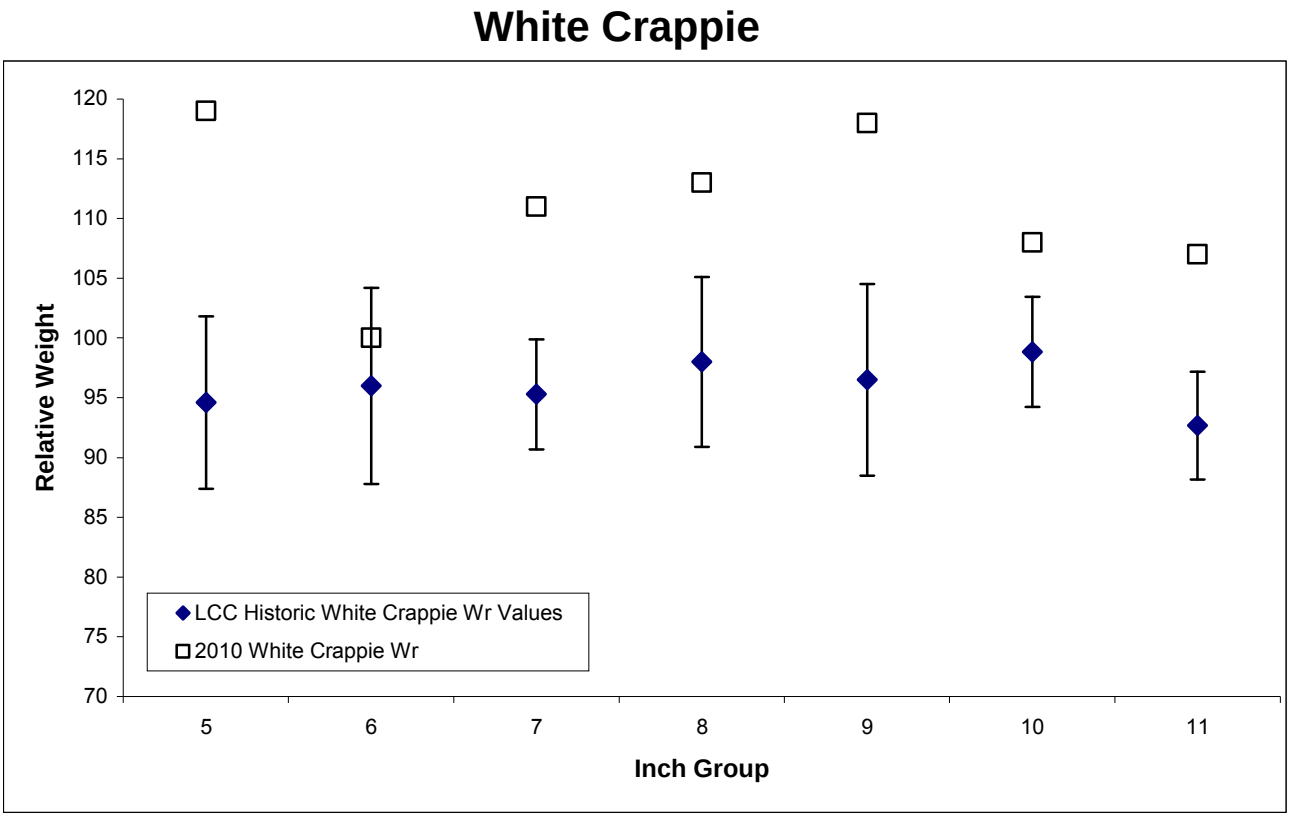


Figure 11. Comparison of 2010 white crappie W_r values to mean W_r values from historical data by inch class. Error bars represent 95% confidence intervals.

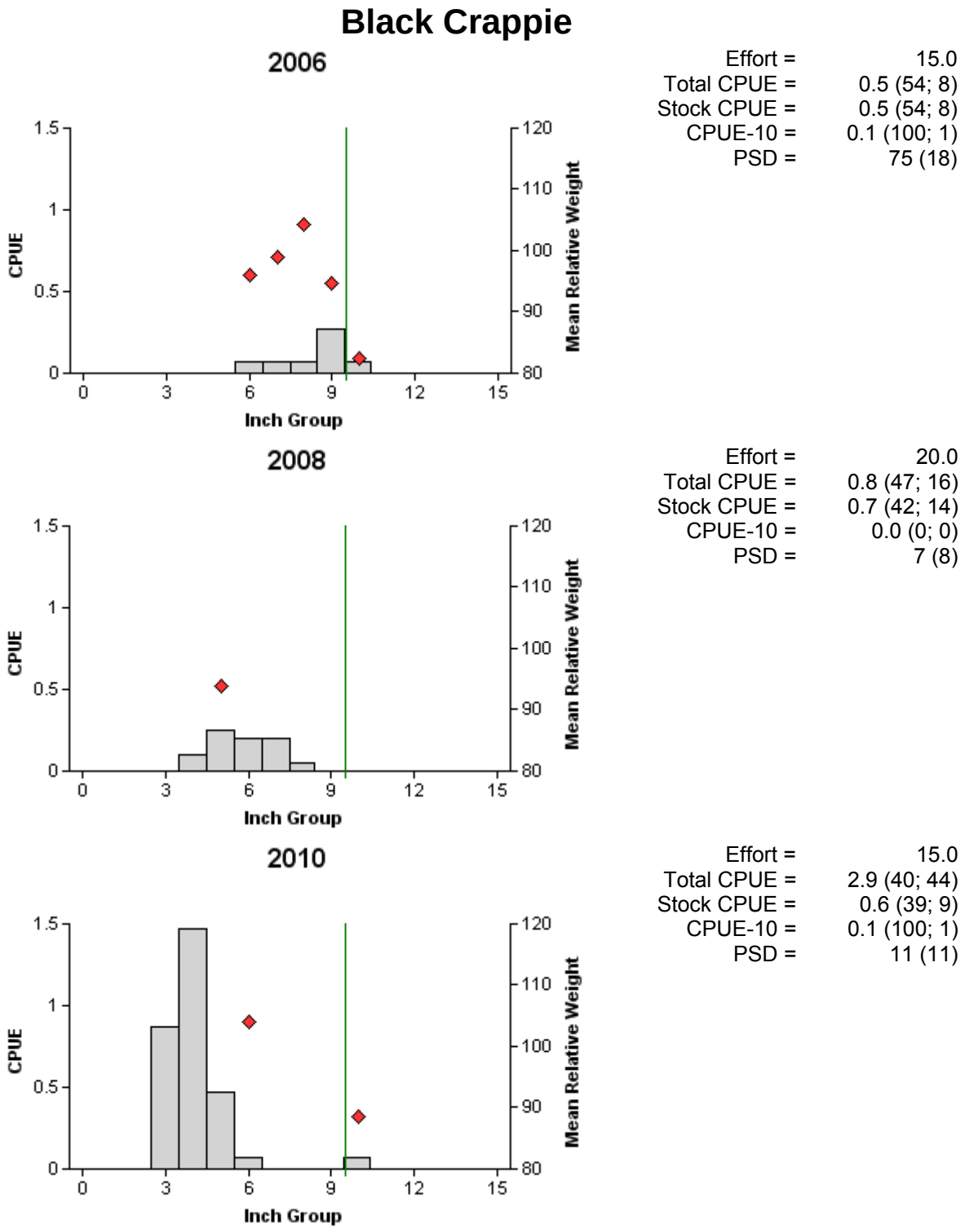


Figure 12. Number of black crappie caught per net night (CPUE, bars), mean relative weight (diamonds), and population indices (RSE and N for CPUE and SE for size structure are in parentheses) for fall trap net surveys, Lake Corpus Christi, Texas 2006, 2008, and 2010. Vertical line denotes the 10 inch minimum length limit.

Table 6. Proposed survey schedule for Lake Corpus Christi, Texas. Trap net and electrofishing surveys are conducted in the fall, gill net surveys in the spring and hoop net surveys in summer. Standard surveys are denoted by “S” and additional surveys denoted by “A”.

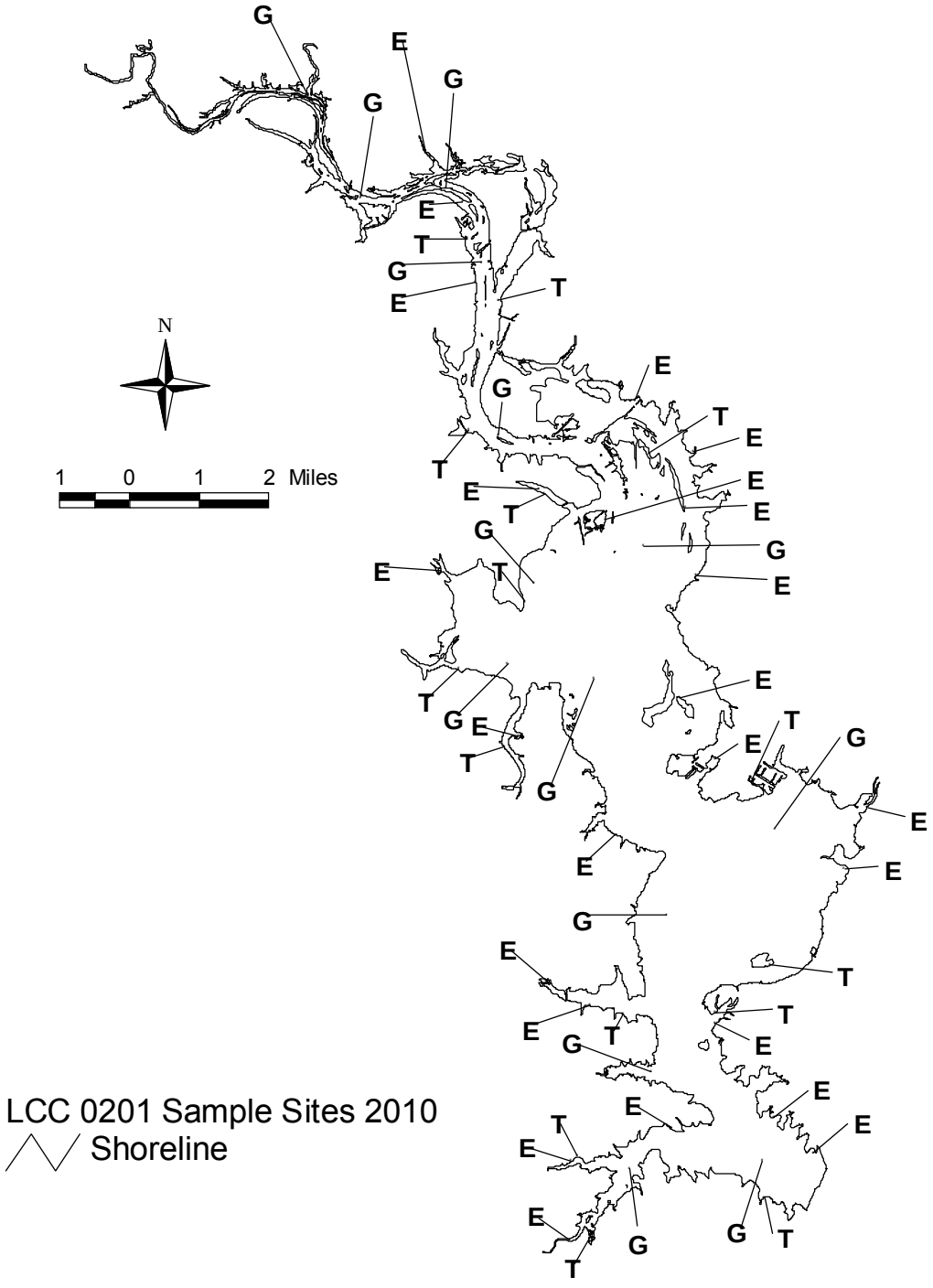
Survey year	Electrofisher	Trap Netting	Gill Netting	Hoop Netting	Vegetation Survey	Access Survey	Creel	Report
Fall 2011 – Spring 2012							A	
Fall 2012 – Spring 2013	A	A	A	A				
Fall 2013 – Spring 2014								
Fall 2014 – Spring 2015	S	S	S	A	S	S		S

APPENDIX A

Number and catch rate (CPUE) of all species collected from all gear types from Lake Corpus Christi, Texas, 2010-2011.

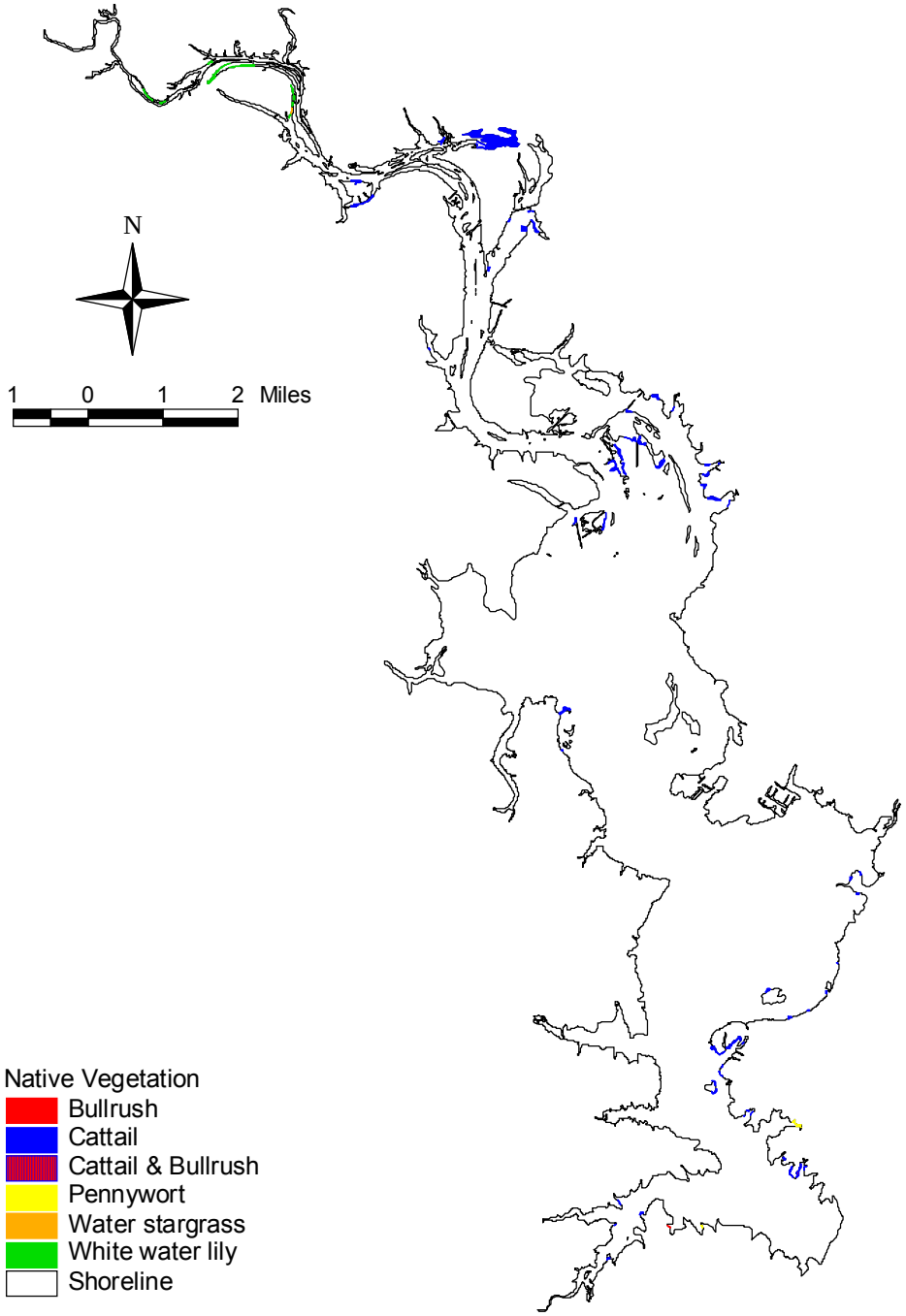
	Electrofishing		Trap Netting		Gill Netting	
Species	N	CPUE	N	CPUE	N	CPUE
Spotted gar			1	0.07	50	3.33
Longnose gar					43	2.87
Alligator gar			1	0.07	1	0.07
Gizzard shad	420	210.00	40	2.67	252	16.8
Threadfin shad	612	306.00	40	2.67	1	0.07
Common Carp			1	0.07	28	1.87
Bullhead minnow	4	2.00				
Inland silverside	3	1.50				
Smallmouth buffalo	1	0.50	10	0.67	285	19.00
Blue catfish					303	20.20
Channel catfish	1	0.50			29	1.93
Flathead catfish	1	0.50	1	0.07	2	0.13
White bass	106	53.00			426	28.40
Green sunfish	1	0.50				
Warmouth	2	1.00				
Bluegill	425	212.50	283	18.87	1	0.07
Longear sunfish	29	14.50	18	1.20		
Redear sunfish	41	20.50	3	0.20		
Largemouth bass	228	114.00			2	0.13
White crappie	22	11.00	158	10.53	51	3.40
Black crappie	50	25.00	44	2.93	10	0.67
Freshwater drum			3	0.20	66	4.40
Rio Grande cichlid	5	2.50	3	0.20		

APPENDIX B



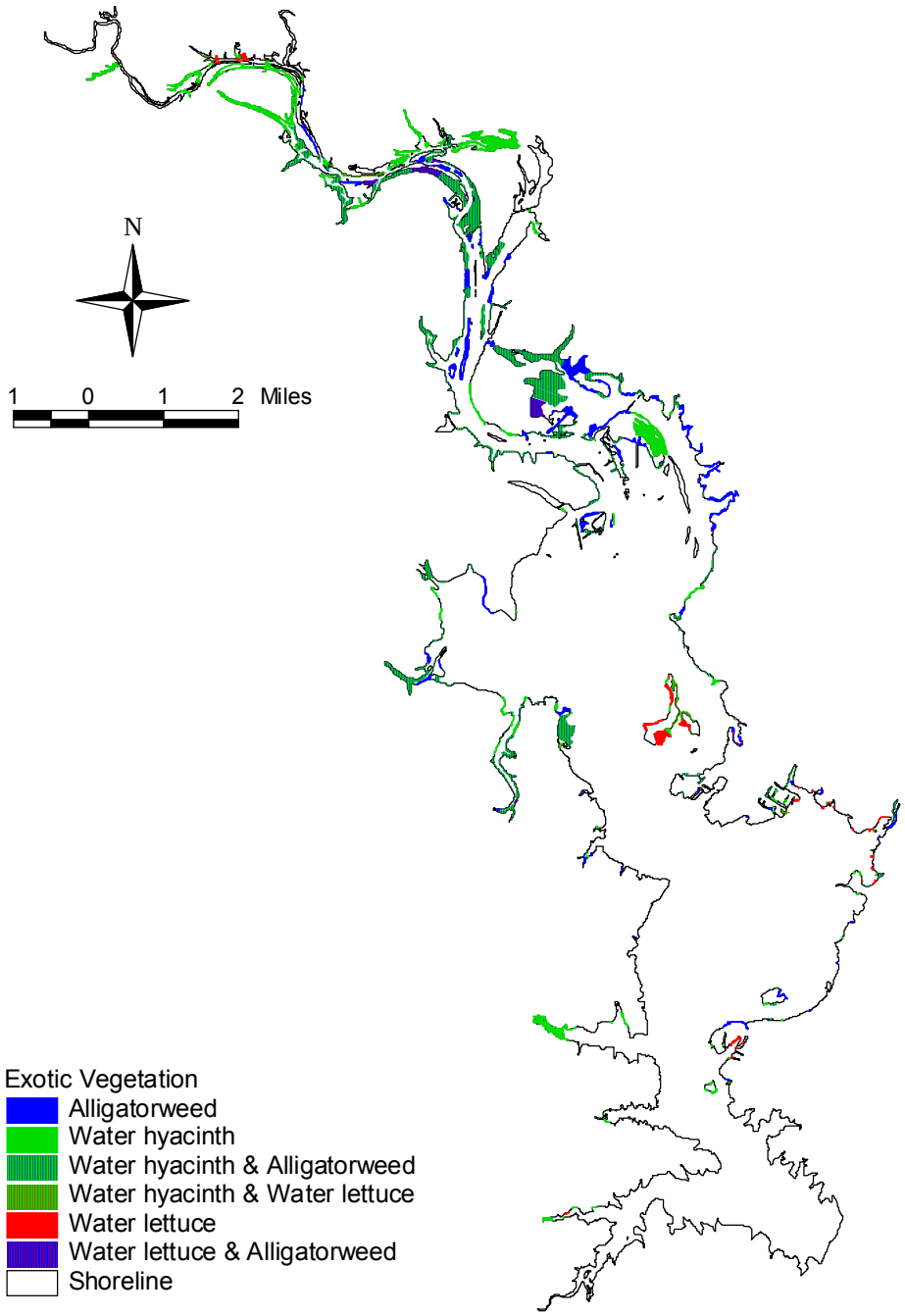
Location of sampling sites, Lake Corpus Christi, Texas, 2010-2011. Trap netting, gill netting, and electrofishing stations are indicated by T, G, and E, respectively.

APPENDIX C



Native aquatic vegetation map for Lake Corpus Christi, Texas, 2010.

APPENDIX D



Exotic aquatic vegetation map for Lake Corpus Christi, Texas, 2010.