PERFORMANCE REPORT

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FEDERAL AID IN SPORT FISH RESTORATION ACT

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INLAND FISHERIES DIVISION MONITORING AND MANAGEMENT PROGRAM

2015 Fisheries Management Survey Report

Pinkston Reservoir

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SURVEY AND MANAGEMENT SUMMARY

Fish populations in Pinkston Reservoir were surveyed in 2015 and 2016 using electrofishing. Historical data are presented with the 2015-2016 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:** Pinkston Reservoir is an impoundment of Sandy Creek, a tributary of the Attoyac Bayou in the Neches River Basin. The City of Center is the controlling authority. Primary uses are water supply and recreation. This reservoir has a surface area of 447 acres at conservation pool (300 feet msl), a shoreline length of 4 miles, and an average depth of 20 feet. Water level fluctuations average 1 - 5 feet annually. Boat access is available with two boat ramps present, but they are in need of repair. Bank access is limited to areas around the public boat ramps and the dam.

- **Management History:** Largemouth Bass are the primary sport fish, but crappies are also present. The 14-18 inch slot-length limit for Largemouth Bass (implemented in 1991) was changed to a 14-21 inch slot-length limit in 2001. Hydrilla has been problematic over the years, and coverage has exceeded 50% of the reservoir surface area. In 1997, triploid Grass Carp were stocked at a rate of 7 fish/vegetated acre (2,100 fish total) in an attempt to reduce hydrilla coverage to 30%. Hydrilla coverage declined to less than 1% coverage in 2015. Although giant salvinia was discovered in the reservoir in 2006, it was eradicated via manual removal several months after introduction.

- **Fish Community**
  - **Prey species:** Gizzard Shad, Threadfin Shad, and Bluegill were the most abundant prey species and provided ample forage for sport fish**.**

  - **Catfishes:** Although Channel Catfish were stocked in 1987, no Channel Catfish have been collected from monitoring surveys since 1989. Channel Catfish recruitment has likely been limited by predation from the abundant Largemouth Bass population.

  - **Largemouth Bass:** Largemouth Bass were abundant. Size structure has remained consistent from past surveys with a high abundance of fish within the protective slot length limit. Largemouth Bass had good growth rates and were in average condition. The current Largemouth Bass water body record is 16.90 pounds set in February 1986.

  - **Crappie:** Historically, anecdotal information indicates that the crappie fishery was cyclical but productive during some years. However, no directed angling effort was observed during spring creel surveys in 2008 and 2012. Trap netting was discontinued in 2003 due to low catch (<0.6/nn).

- **Management Strategies:** Continue to manage Largemouth Bass with 14-21 inch slot-length limit. Continue to monitor trends of hydrilla coverage through annual aquatic vegetation surveys (2016-2019). Conduct additional biennial spring electrofishing surveys in 2018 and 2020 and a spring quarter (March-May) creel survey in 2018. Conduct standard fall electrofishing in 2019.

INTRODUCTION

This document is a summary of fisheries data collected from Pinkston Reservoir in 2015-2016. The purpose of the document is to provide fisheries information and make management recommendations to protect and improve the sport fishery. While information on other fishes was collected, this report deals primarily with major sport fishes and important prey species. Historical data are presented with the 2015-2016 data for comparison.

Reservoir Description

Pinkston Reservoir is a 447-acre impoundment constructed in 1976 on Sandy Creek (Table 1). It is located in Shelby County approximately 10 miles west of Center and is operated and controlled by the City of Center. Primary water uses included municipal water supply and recreation. Habitat at time of sampling consisted of concrete, standing timber, and aquatic vegetation. The majority of the land surrounding the reservoir is used for agriculture, timber production, and residential development.

Angler Access

Pinkston Reservoir has two public boat ramps, and both are in need of repair. Both ramps need to be extended to offer access during periods of low water levels. Parking areas at both ramps are unpaved and need proper grading and surfacing. Additional boat ramp characteristics are in Table 2. Shoreline access is limited to the public boat ramp areas and the dam.

Management History

Previous management strategies and actions: Management strategies and actions from the previous survey report (Ashe and Driscoll 2012) included:

1. Conduct annual vegetation surveys to monitor hydrilla coverage. If hydrilla coverage prompts public complaints, consult with the City of Center and the angling public to develop management strategies.
   Action: Aquatic vegetation surveys were conducted annually from 2012 to 2015. In the summer of 2015, hydrilla coverage was less than 1% (historical high = 50% coverage).
2. Cooperate with the controlling authority to maintain appropriate signage at access points warning anglers regarding the threat of giant salvinia introductions.
   Action: Signs have been maintained at access points.
3. Encourage the City of Center to improve access and parking.
   Action: Recommendations were provided to the City of Center (i.e., road surface repairs and accommodations for the physically challenged). In addition, possible grant opportunities through the Boating Access Program were explored but the city lacked matching funds.
4. Monitor success of the 14- to 21-inch slot-length limit for Largemouth Bass.
   Action: Spring electrofishing surveys were conducted in 2014 and 2016 and a fall electrofishing survey was conducted in 2015. Largemouth Bass growth was examined in 2015, and fish reached 14 inches by age 2.

Harvest regulation history: Sport fishes in Pinkston Reservoir are currently managed with statewide regulations with the exception of Largemouth Bass (Table 3). From 1991 to 2001, Largemouth Bass were managed with a 14- to 18-inch slot-length limit. A 14- to 21-inch slot-length limit was implemented in 2001 to increase the abundance of large fish.

Stocking history: Sharelunker Largemouth Bass fingerlings were stocked in 2006 and 2008 as part of Operation World Record. Triploid Grass Carp were stocked in 1997. Florida Largemouth Bass were stocked in 1976. The complete stocking history is in Table 4.

Vegetation/habitat management history: Hydrilla has been problematic over the years, and coverage has exceeded 50% of the reservoir surface area. In 1997, triploid Grass Carp were stocked at a rate of 7 fish/vegetated acre (2,100 fish total) in an attempt to reduce hydrilla coverage to 30%. Hydrilla coverage declined to 30% coverage during the summer of 2007, however coverage subsequently increased to 57% in 2014 (Table 6). Little hydrilla was observed in 2015 (< 1% coverage) due to high, turbid water from heavy spring and early summer rains. In 2006, giant salvinia was found, but it was quickly eradicated with manual removal. No giant salvinia has been observed since 2006.

Water transfer: Pinkston Reservoir is primarily used for municipal water supply and recreation. There are no plans for inter-basin transfer of water.

METHODS

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

Electrofishing – Largemouth Bass, sunfishes, Gizzard Shad, and Threadfin Shad were collected by fall electrofishing (1 hour at 12, 5-min stations) in 2015. In 2014 and 2016, spring electrofishing surveys were conducted (Largemouth Bass only; 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. Ages for Largemouth Bass were determined using otoliths from 13 randomly-selected fish (range 13.0 to 14.9 inches) collected during the 2015 fall electrofishing survey.

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). 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.

Creel survey – An access-point creel survey was conducted in 2008 and 2012. The creel period was March through May. 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 2015). Total angler catch of Largemouth Bass $\geq$ 4, 7, and 10 pounds was also estimated. Anglers were asked if released fish were within weight categories. Harvested fish lengths were converted to weights for classification (19 inches = 4 pounds; 23 inches = 7 pounds; 25 inches = 10 pounds). Harvested and released fish were combined to represent total catch for weight categories.

Habitat – A structural habitat survey was conducted in 2007. Vegetation surveys were conducted in 2012 – 2015 to monitor hydrilla coverage. Habitat was assessed with the digital shapefile method (TPWD, Inland Fisheries Division, unpublished manual revised 2015).

RESULTS AND DISCUSSION

Habitat: A habitat survey conducted in 2007 indicated that the littoral zone included primarily dead timber, concrete, and hydrilla (Ashe and Driscoll 2008). Historically, hydrilla has comprised nearly all of the vegetative coverage (2007 - 2014 range = 30 – 57%). However, in 2015 hydrilla coverage was < 1% (Table 6). High water levels and turbid runoff from heavy spring and early summer rains likely impeded vegetative growth and survival. The most prevalent vegetation observed in 2015 was spikerush (5% coverage).

Creel: Results of the 2008 and 2012 spring quarter creel surveys were similar. Most (> 87%) of the directed effort was for Largemouth Bass (Table 7), and fishing effort was relatively high (17 – 18 hours/acre) (Table 8).

Prey species: Electrofishing catch rates of Gizzard Shad and Bluegill in 2015 were 39.0/h and 141.0/h,

respectively. Index of vulnerability (IOV) for Gizzard Shad was 0 in 2003 and 2007, indicating that none of the Gizzard Shad were available to existing predators. However, 46% of Gizzard Shad were available as forage in 2015 (Figure 1). Total CPUE of Gizzard Shad in 2015 was similar compared to the 2007 survey, but lower than observed in 2003. Total CPUE of Bluegill in 2015 was lower than that from surveys in 2007 and 2003, and size structure was dominated by small individuals (Figure 2). Threadfin Shad were present during the 2015 electrofishing survey (Appendix A).

Channel Catfish: A Channel Catfish stocking in 1987 exceeding 300 fish/acre had only short-term success, as none have been collected since 1989. There was no observed directed angler effort for catfish during the spring 2008 or 2012 creel surveys (Table 7). Channel Catfish recruitment is likely limited by Largemouth Bass predation. In addition, high vegetative cover during most years likely limits nutrients available for preferred food items (i.e., benthic invertebrates).

Largemouth Bass: Fewer Largemouth Bass were observed during the 2015 fall electrofishing (98.0/h) when compared to 2007 (218.0/h) and 2003 surveys (160.0/h) (Figure 3). Size structure has remained desirable over the past three surveys (PSD range = 41 – 81). Body condition from the past three surveys was adequate (relative weight above 80) for nearly all size classes of fish (Figure 3). The catch rate decrease was likely due to fewer fish in the littoral zone from lack of hydrilla; especially considering results from spring electrofishing. The spring catch rate in 2016 (212/h) was similar to 2014 (225/h) and 2012 (182/h), and all three surveys indicated relatively stable population structure and high recruitment into the slot-length limit (PSD range = 84 – 87) (Figure 4).

Largemouth Bass accounted for nearly all of the angling effort observed in the spring 2012 creel (97%; Table 7). Directed effort was high (16.9 h/acre) and similar to 2008 (15.5 h/acre; Table 9). Angler catch rates in 2008 and 2012 were similar (0.5 and 0.7/h, respectively; Table 9). In 2012, 98% of harvestable fish were released and only 60 fish were estimated as harvested. There were no Largemouth Bass > 7.0 pounds observed during the 2008 creel survey and an estimated 20 fish 7 – 9.9 pounds were caught during the 2012 creel survey. In 2012, the catch of Largemouth Bass 4 – 6.9 pounds increased to 872 fish, accounting for 13% of the total catch. The majority of anglers interviewed during the 2012 spring creel (51%) reported that they always practice catch and release, which was an increase compared to 2008 (32%). In addition, 75% of anglers indicated they would always release fish > 21 inches in 2012, compared to only 40% in 2008.

Growth of Largemouth Bass was good; average age at 14 inches (13.5 to 14.5 inches) was 2.1 years (N = 13; range = 2 - 3 years). Florida Largemouth Bass influence has remained relatively constant as allele frequency has ranged from 75 to 78% (Table 10).

Crappie: Historically, trap net catch rates of crappie have been low ($\leq$0.6/nn). Trap net surveys were discontinued in 2003. No directed angler effort was observed during the spring 2008 and 2012 creel surveys and few fish were estimated as harvested (Table 11 and Figure 6).

Fisheries management plan for Pinkston Reservoir, Texas

Prepared – July 2016.

ISSUE 1: Hydrilla coverage in Pinkston Reservoir has exceeded 50% and impeded municipal use and angler access. Although hydrilla covered < 1% of the reservoir in 2015, coverage will likely increase with the potential to affect municipal use or prompt public complaints.

MANAGEMENT STRATEGIES

1. Continue to monitor aquatic vegetation annually (2016-2019). If hydrilla coverage prompts public or controlling authority complaints, meet with city officials and angling public to develop vegetation management strategies.
2. Permit lakeside homeowners (at their expense) to treat hydrilla adjacent to their property.

ISSUE 2: Access roads and parking lots at both boat ramps are unpaved and in poor condition.

MANAGEMENT STRATEGY

1. Continue to recommend access point improvements and funding opportunities from the Boating Access Program to the City of Center.

ISSUE 3: Data indicate the 14- to 21-inch slot-length limit for Largemouth Bass is producing desirable results. Density of 14- to 21-inch fish is relatively high and growth rates are good. Recruitment of Largemouth Bass into the protective slot length limit is high and stable.

MANAGEMENT STRATEGY

1. Continue to monitor Largemouth Bass population size structure and growth to assess the success of the implemented slot length limit by spring electrofishing (2018 and 2020) and fall electrofishing (2019). Conduct a spring quarter creel survey (2018) to assess catch and angler trends in regards to the 14- to 21-inch slot-length limit.

ISSUE 4: Many invasive species threaten aquatic habitats and organisms in Texas and can adversely affect the state ecologically, environmentally, and economically. For example, zebra mussels 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 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

Sport fish, forage fish, and other important fishes

Sport fishes in Lake Pinkston include Largemouth Bass and crappie. Important forage species include Bluegill, Gizzard Shad, and Threadfin Shad.

Low-density fisheries

Crappie: Historically, anecdotal information indicates that the crappie fishery was cyclical but productive during some years. However, no directed angling effort has been observed during spring quarter creel surveys in 2008 and 2012. Trap netting was discontinued in 2003 due to low catch (<0.6/nn). Although no future directed sampling is planned, the crappie fishery will be monitored via spring quarter creel surveys (2018, and every four years thereafter) directed at the Largemouth Bass fishery.

Channel Catfish: In 1987, a Channel Catfish stocking exceeding 300 fish/acre had only short-term success, as none have been collected since 1989. There was no observed directed angler effort for catfish during the spring 2008 or 2012 creel surveys. Channel Catfish recruitment is likely limited by Largemouth Bass predation. In addition, high vegetative cover during most years likely limits nutrients available for preferred food items (i.e., benthic invertebrates). Gillnetting was discontinued was discontinued due to non-existent catch rates. Although no future directed sampling is planned, the catfish fishery will be monitored via spring quarter creel surveys (2018, and every four years thereafter) directed at the Largemouth Bass fishery.

Survey objectives, fisheries metrics, and sampling objectives

Largemouth Bass: Largemouth Bass are the most popular sport fish in Lake Pinkston, accounting for approximately 90% of the annual angling effort. The reservoir currently supports an abundant, high-quality Largemouth Bass fishery. Largemouth Bass have been managed with a 14-21 inch slot length limit since 2001. Creel surveys were conducted in 2008 and 2012 to collect trend data on angling catch, effort, and harvest. Since 2005, trend data on CPUE, size structure, and body condition have been collected every four years with fall electrofishing, and biennially with spring electrofishing. The population is abundant, recruitment rates have been high and steady, and size structure has been desirable and stable. Continuation of trend data with night electrofishing in the fall (2019, and every four years thereafter) and spring (biennially, 2018 and 2020) and with a spring quarter creel survey (Table 12) will allow for determination of any large-scale changes in the Largemouth Bass population and fishery that may spur further investigation. The minimum of 12 randomly selected 5-min electrofishing sites will be sampled, but the anticipated effort to meet sampling objectives (N = 50 stock-size fish; RSE-S is $\leq$ 25) is 6-8 stations with 80% confidence.

In addition, average age of Largemouth Bass between 13.0 and 14.9 inches (Category 2; N = 13) will be estimated in 2019, and every four years thereafter. If growth problems are detected from this cursory estimate, mean length-at-age will be estimated from a random population sample of 400 fish > 6 in, subsampled at 10 fish per 0.4 in strata (Category 4). Fin samples will be taken from 30 fish every 4 years beginning in 2019 and submitted for genetic analysis to monitor trends of Florida Largemouth Bass genetic influence in the population.

Prey species: Bluegill, Gizzard Shad, and Threadfin Shad are the primary forage at Lake Pinkston. Fall electrofishing every four years (Table 12), sampling the minimum of 12 random sites, will result in sufficient numbers of Bluegill to achieve sampling objectives (N = 50 stock-size fish; RSE-S is $\leq$ 25). No additional effort will be expended to achieve an RSE- Total $\leq$ 25 for Gizzard Shad and Threadfin Shad, but Largemouth Bass body condition (fish $\geq$ 8" TL) will be used to provide additional information on forage abundance and vulnerability.

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Table 1. Characteristics of Pinkston Reservoir, Texas.

Characteristic	Description
Year constructed	1976
Controlling authority	City of Center
County	Shelby
Reservoir type	Secondary stream
Shoreline Development Index (SDI)	5.05
Conductivity	85 uS/cm

Table 2. Boat ramp characteristics for Pinkston Reservoir, Texas, February, 2015. Reservoir elevation at time of survey was 302 feet above mean sea level.

Boat ramp	Latitude Longitude (dd)	Public	Parking capacity (N)	Elevation at end of boat ramp (ft)	Condition
East Ramp	31.70464 -94.33678	Y	10	298	Parking area poor, ramp extension needed
Dam	31.71018 -94.36289	Y	10	296	Parking area poor, ramp extension needed

Table 3. Harvest regulations for Pinkston Reservoir, Texas.

Species	Bag limit	Length limit
Catfish: Channel and Blue catfish, their hybrids and subspecies[a]	25 (in any combination)	12-inch minimum
Bass, Largemouth	5 (only 1 > 21 inches)	14- to 21-inch slot
Crappie: White and Black Crappie, their hybrids and subspecies	25 (in any combination)	10-inch minimum

[a]Use of trotlines is prohibited.

Table 4. Stocking history of Pinkston Reservoir, Texas. AFGL = advanced fingerling.

Species	Year	Number	Size
Channel Catfish	1976	40,000	AFGL
	1987	165,040	AFGL
	Total	205,040	
Flathead Catfish	1977	2,000	
	Total	2,000	
Florida Largemouth Bass	1976	85,000	FRY
	Total	85,000	
Northern Pike	1976	24,000	
	Total	24,000	
ShareLunker Largemouth Bass	2006	11,150	AFGL
	2008	10,967	AFGL
	Total	22,117	
Triploid Grass Carp	1997	2,100	
	Total	2,100	
Threadfin Shad	1979	1,500	AFGL
	Total	1,500	

Table 5. Objective-based sampling plan components for Pinkston Reservoir, Texas 2015 – 2016.

Gear/target species	Survey objective	Metrics	Sampling objective
Electrofishing			
Largemouth Bass	Abundance	CPUE – stock	RSE-Stock ≤ 25
	Size structure	PSD, length frequency	N ≥ 50 stock
	Age-and-growth	Age at 14 inches	N = 13, 13.0 – 14.9 inches
	Condition	W_r	10 fish/inch group (max)
	Genetics	% FLMB	N = 30, any age
Bluegill [a]	Abundance	CPUE – Total	RSE ≤ 25
	Size structure	PSD, length frequency	N ≥ 50
Threadfin Shad [a]	Abundance	CPUE – Total	
Gizzard Shad [a]	Abundance	CPUE – Total	
	Size structure	PSD, length frequency	N ≥ 50
			N ≥ 50
	Prey availability	IOV	
Creel survey			
Black basses	Trend information on angler utilization	Angler effort, CPUE, total harvest and size composition	
Crappies	Trend information on angler utilization	Angler effort, CPUE, total harvest and size composition	
Catfishes	Trend information on angler utilization	Angler effort, CPUE, total harvest and size composition	

[a] No additional effort will be expended to achieve an RSE ≤ 25 for CPUE of Bluegill, Threadfin Shad, or Gizzard Shad, if not reached from designated Largemouth Bass sampling effort.
[b]Angler utilization data and associated statistics will be calculated for all sport fish.

Table 6. Survey of aquatic vegetation, Pinkston Reservoir, Texas, 2011 - 2015. Surface area (acres) is listed with percent of total reservoir surface area in parentheses.

Species	2011	2012	2013	2014	2015
Lizard's tail	0 (0)	< 1 (<1)	0 (0)	0 (0)	0 (0)
Spikerush	0 (0)	2.5 (<1)	0 (0)	0 (0)	21 (5)
Arrowhead	0 (0)	1 (<1)	0 (0)	0 (0)	0 (0)
Eurasian watermilfoil	0 (0)	0 (0)	0 (0)	0 (0)	1 (<1)
Hydrilla (Tier III)*	201 (44)	183 (41)	172 (38)	255 (57)	2 (<1)

* Tier III is Watch Status

Table 7. Percent directed angler effort by species for Pinkston Reservoir, Texas, 2008 and 2012. Survey periods were 1 March through 31 May.

Species	2008	2012
Sunfishes	1.6	0.0
Largemouth Bass	86.7	97.2
Anything	11.7	2.8

Table 8. Total fishing effort (h) for all species and total directed expenditures at Pinkston Reservoir, Texas, 2008 and 2012. Survey periods were 1 March through 31 May. Relative standard error is in parentheses.

Creel Statistic	2008	2012
Total fishing effort	8,550 (20)	7,766 (20)
Total directed expenditures	$37,101 (48)	$32,326 (58)

Gizzard Shad

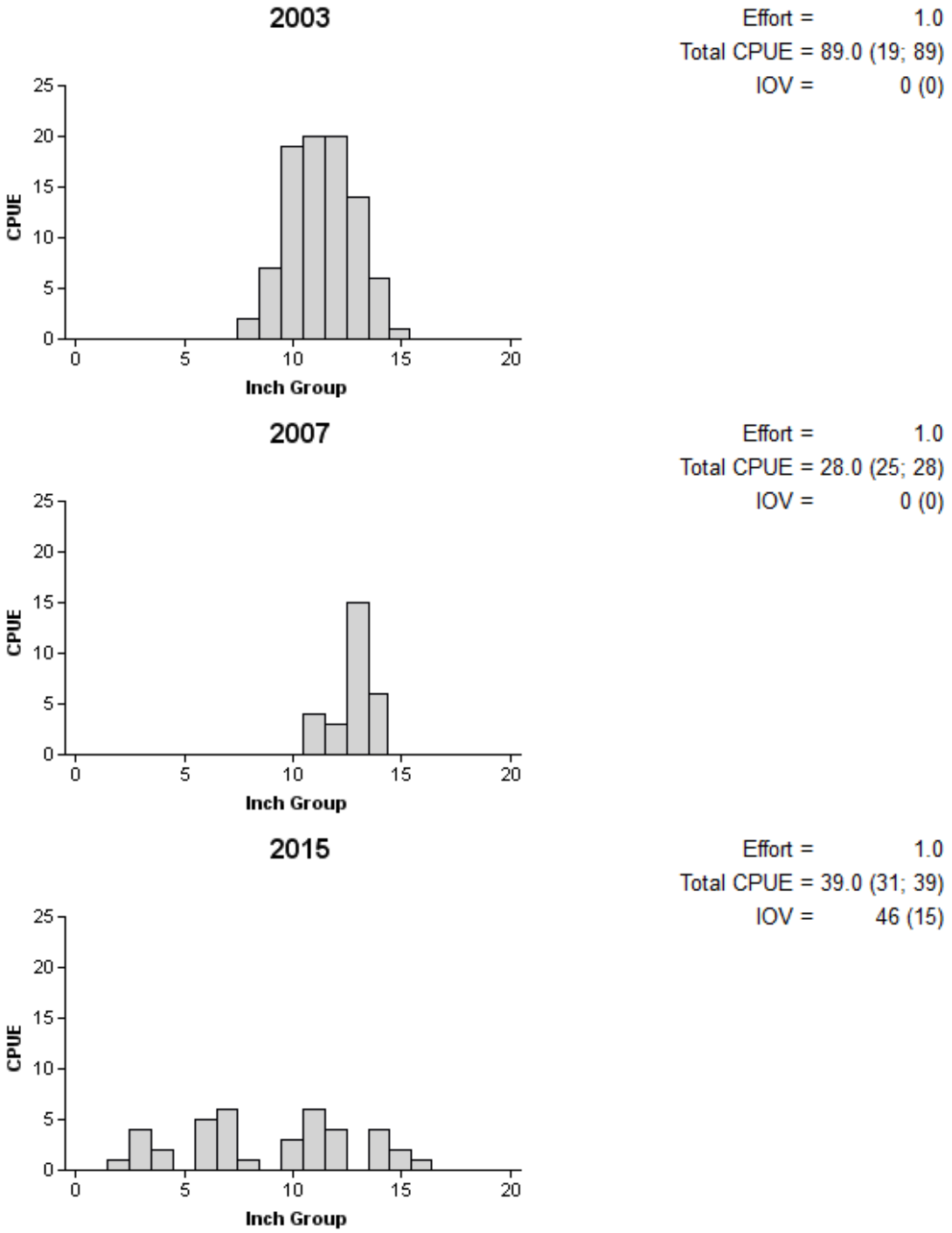


Figure 1. Number of Gizzard Shad caught per hour (CPUE) and population indices (RSE and N for CPUE and SE for IOV are in parentheses) for fall electrofishing surveys, Pinkston Reservoir, Texas, 2003, 2007, and 2015.

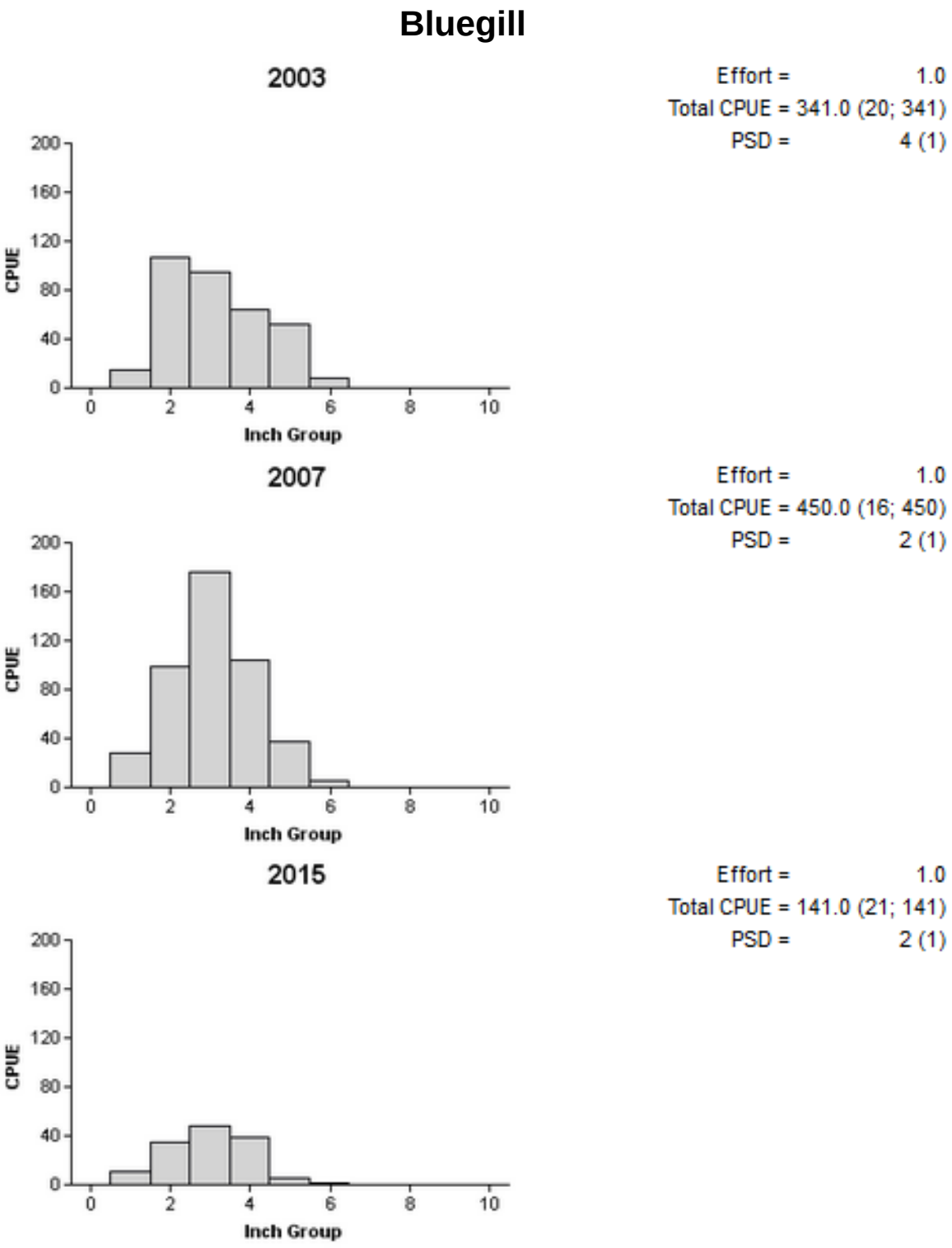


Figure 2. Number of Bluegill caught per hour (CPUE) and population indices (RSE and N for CPUE and SE for size structure are in parentheses) for fall electrofishing surveys, Pinkston Reservoir, Texas, 2003, 2007, and 2015.

Largemouth Bass

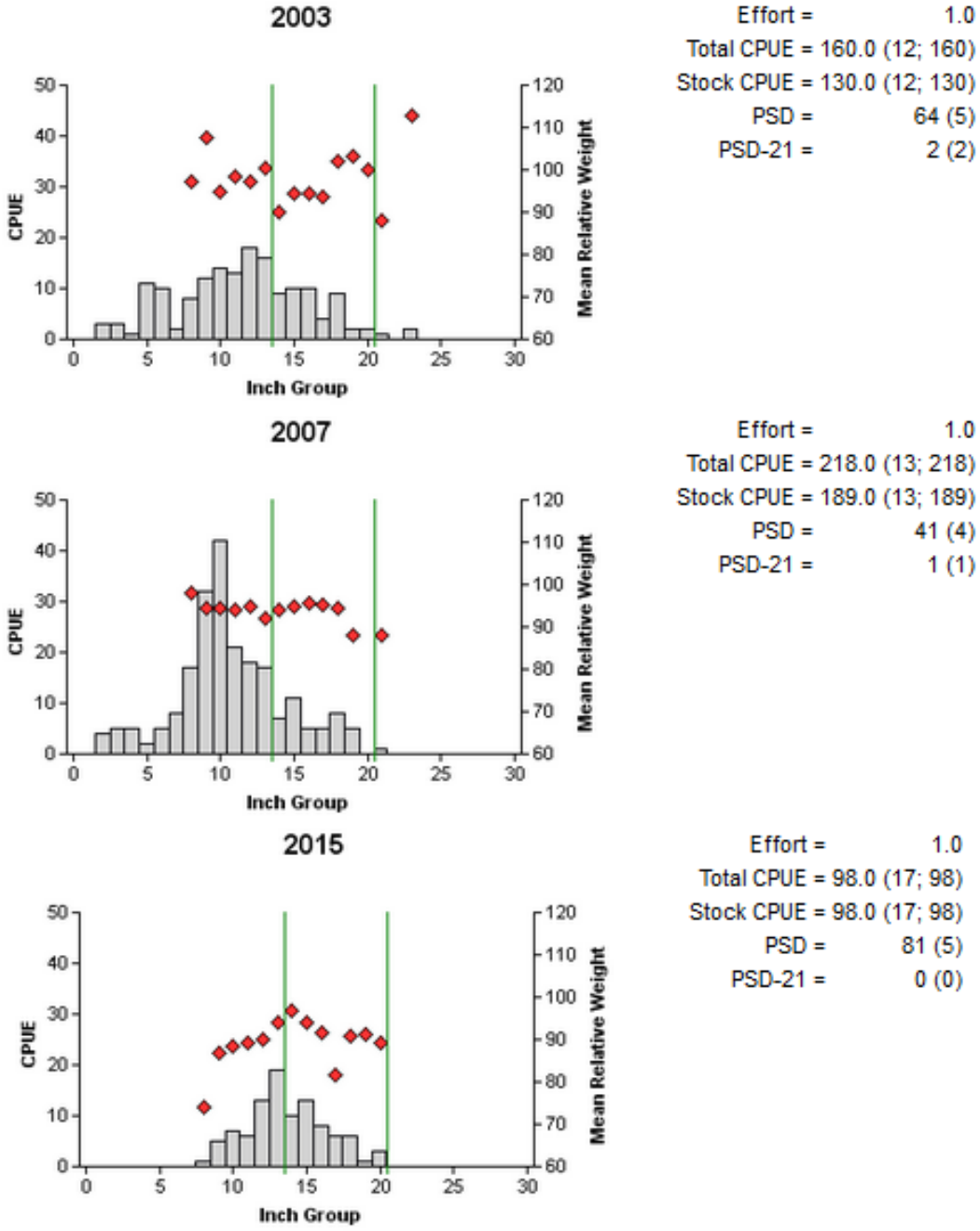


Figure 3. Number of Largemouth Bass caught per hour (CPUE, bars), mean relative weight (diamonds), and population indices (RSE and N for CPUE and SE for size structure are in parentheses) for fall electrofishing surveys, Pinkston Reservoir, Texas, 2003, 2007, and 2015. Vertical lines represent the slot length limit.

Largemouth Bass

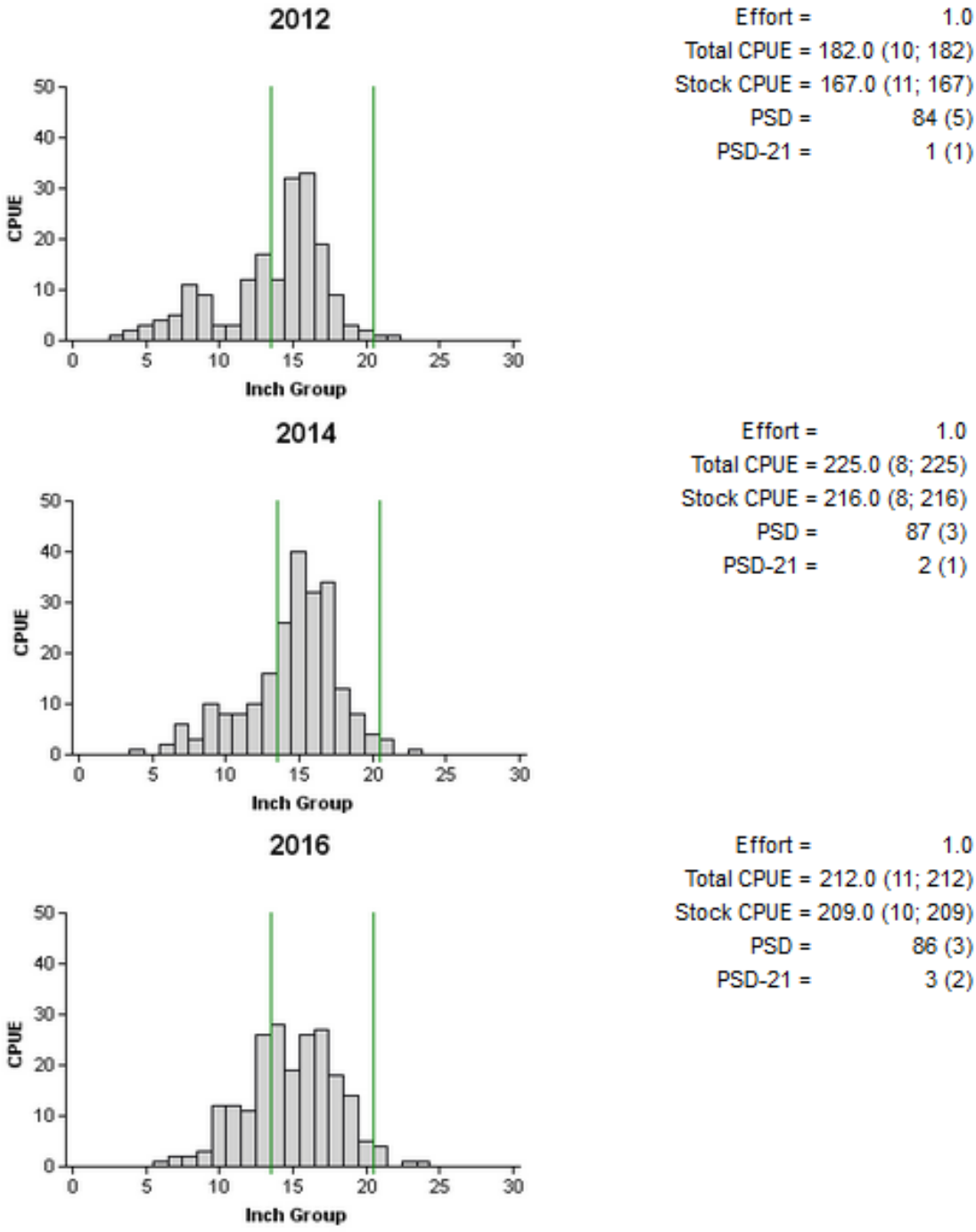


Figure 4. Number of Largemouth Bass caught per hour (CPUE, bars) and population indices (RSE and N for CPUE and SE for size structure are in parentheses) for spring electrofishing surveys, Pinkston Reservoir, Texas, 2012, 2014, and 2016. Vertical lines represent the slot length limit.

Largemouth Bass

Table 9. Creel survey statistics for Largemouth Bass at Pinkston Reservoir from March - May 2008 and 2012. Catch rate is for all anglers targeting Largemouth Bass. For estimated catch of 4, 7, and 10-pound fish, the percentages of total catch are provided. Relative standard errors (RSE) are in parentheses.

Statistic	2008	2012
Directed angling effort (h)	6,935.8 (22)	7,549.6 (19)
Angling effort/acre	15.5 (22)	16.9 (19)
Catch rate (number/h)	0.5 (18)	0.7 (30)
Total catch	3,453	6,578 (37)
< 4.0 lbs	3,292 – 95.3%	5,686 – 86.4%
4.0-6.9 lbs	161 - 4.7%	872 – 13.3%
7.0-9.9 lbs	0 – 0%	20 – 0.3%
≥ 10lbs	0 – 0%	0 – 0%
Harvest	310 (85)	60 (72)
Harvest/acre	0.7 (85)	0.1 (72)
Percent legal released	76.1	97.3

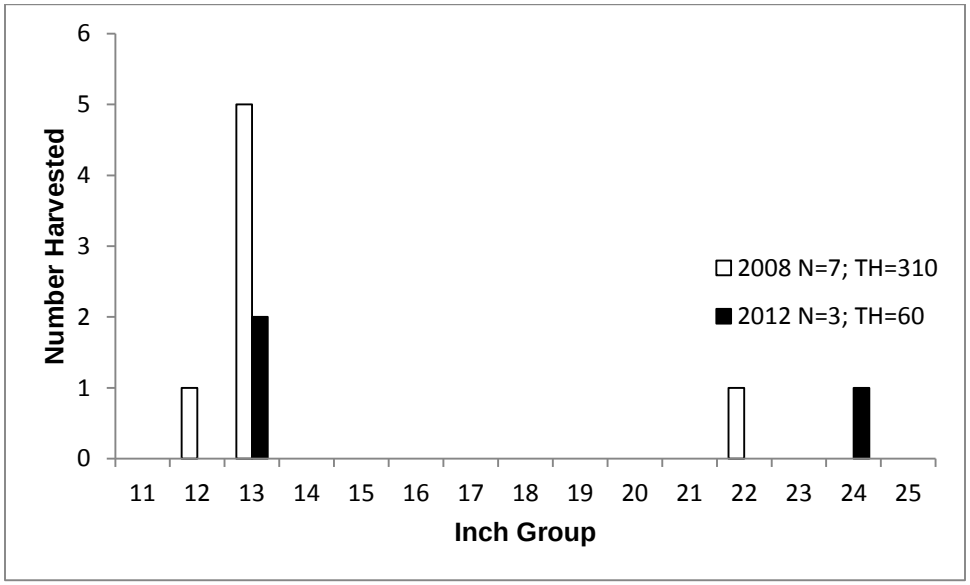


Figure 5. Length frequency of harvested Largemouth Bass observed during creel surveys at Pinkston Reservoir, Texas, March through May 2008 and 2012, all anglers combined. N is the number of harvested Largemouth Bass observed during creel surveys, and TH is the total estimated harvest for the creel period.

Largemouth Bass

Table 10. Results of genetic analysis of Largemouth Bass collected by fall electrofishing, Pinkston Reservoir, Texas, 2007, 2011, and 2015. FLMB = Florida Largemouth Bass, NLMB = Northern Largemouth Bass, F1 = first generation hybrid between a FLMB and a NLMB, Fx = second or higher generation hybrid between a FLMB and a NLMB. Genetic composition was determined with micro-satellite DNA analysis.

Year	Sample size	Number of fish				% FLMB alleles	% pure FLMB
		FLMB	F1	Fx	NLMB		
2007	24	3			0	77.6	12.5
2011	28	1	0	27	0	75.0	4.0
2015	30	3	0	27	0	76.0	10.0

Crappie

Table 11. Creel survey statistics for crappies at Pinkston Reservoir from March through May 2008 and 2012. Total catch per hour is for anglers targeting crappies and total harvest is the estimated number crappies harvested by all anglers. Relative standard errors (RSE) are in parentheses.

Statistic	2008	2012
Directed effort (h)		
Directed effort/acre		
Total catch per hour		
Total harvest	89 (128)	23 (111)
Harvest/acre	0.2 (82)	0.1 (111)
Percent legal released	0.0	0.0

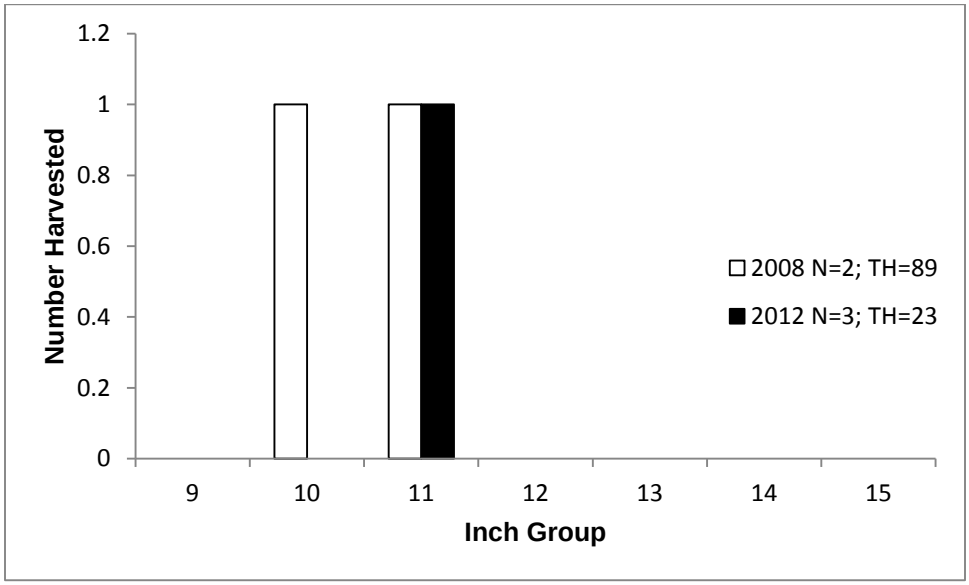


Figure 6. Length frequency of harvested Black Crappie observed during creel surveys at Pinkston Reservoir, Texas, March through May 2008 and 2012, all anglers combined. N is the number of harvested Black Crappie observed during creel surveys, and TH is the total estimated harvest for the creel period.

Table 12. Proposed sampling schedule for Pinkston Reservoir, Texas. Survey period is June through May. Electrofishing surveys are conducted in the fall and spring. Standard survey denoted by S and additional survey denoted by A.

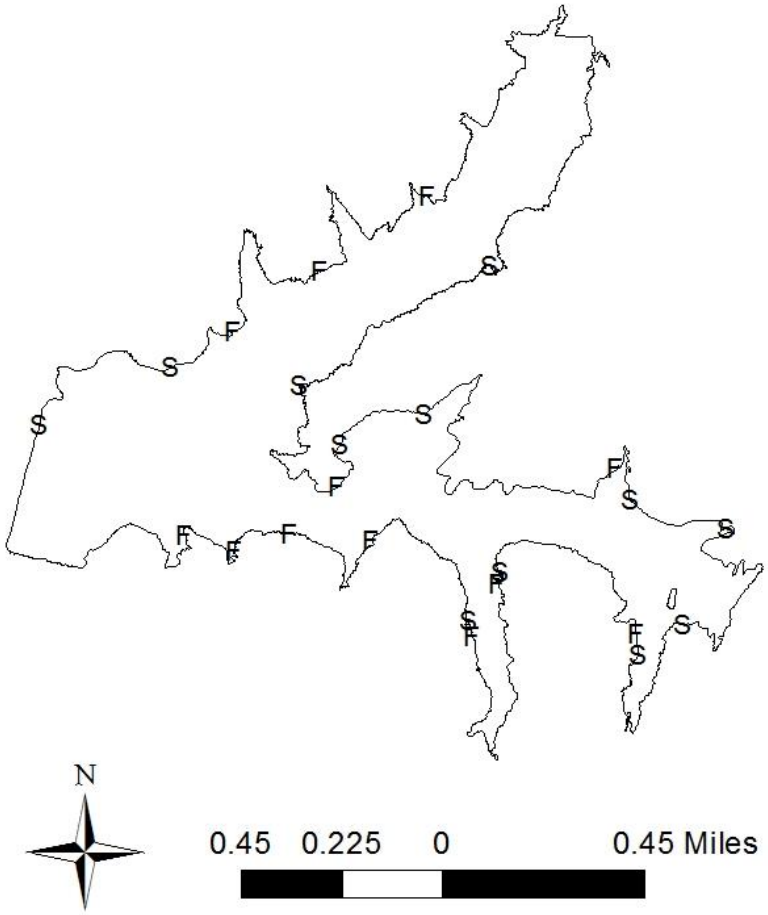
Survey year	Electrofish Fall(Spring)	Habitat		Access	Creel survey	Report
		Structural	Vegetation			
2016-2017			S			
2017-2018	(A)		S		A	
2018-2019			S			
2019-2020	S (A)	S	S	S		S

APPENDIX A

Number (N) and catch rate (CPUE) of all target species collected from all gear types from Pinkston Reservoir, Texas, 2015-2016. Sampling effort was 1 hour for electrofishing.

Species	Fall Electrofishing		Spring Electrofishing	
	N	CPUE	N	CPUE
Gizzard Shad	39	39.0		
Threadfin Shad	91	91.0		
Bluegill	141	141.0		
Redear Sunfish	16	16.0		
Spotted Sunfish	1	1.0		
Largemouth Bass	98	98.0	212	212.0

APPENDIX B



Location of sampling sites, Pinkston Reservoir, Texas, 2015-2016. Fall and spring electrofishing stations are indicated by F and S, respectively. Water level was near full pool at time of sampling.