

PERFORMANCE REPORT

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FEDERAL AID IN SPORT FISH RESTORATION ACT

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FEDERAL AID PROJECT F-221-M-6

INLAND FISHERIES DIVISION MONITORING AND MANAGEMENT PROGRAM

2015 Fisheries Management Survey Report

Fayette County Reservoir

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SURVEY AND MANAGEMENT SUMMARY

Fish populations in Fayette County Reservoir were surveyed in 2015 using electrofishing and hoop nets. Historical data are presented with the 2015 data for comparison. This report summarizes results of the surveys and contains a fisheries management plan for the reservoir based on those findings.

- **Reservoir Description:** Fayette County Reservoir is a 2,394-acre impoundment of Cedar Creek; an intermittent stream in the Colorado River watershed. It was constructed in 1978 by the Lower Colorado River Authority (LCRA) for the purpose of supplying cooling water for steam-electric power generation. The reservoir is located in Fayette County, approximately seven miles east of La Grange, Texas. The reservoir lies within the Post Oak Savannah ecological area.

Water in the reservoir is maintained at a near-constant level (1-2 ft. annual fluctuation). During periods of low rainfall, water is pumped into the reservoir from the Colorado River. Surrounding shoreline is mostly undeveloped. Shoreline length is approximately 20 miles. Fayette County Reservoir was opened to fishing in 1979.

- **Management History:** Important sport fish include Largemouth Bass and catfish species. Florida Largemouth Bass were stocked into nursery ponds during 1977 prior to reservoir filling. Largemouth Bass have been managed since 1979 with several differing length limit regulations; but currently managed under a 14- to 24-inch slot length limit with a 5-fish daily bag, only one over 24 inches may be retained.

Trap netting for White Crappie was not performed due to historically low catch rates and the high cost/benefit ratio associated with collecting these data. Crappie have not been collected with any gear type since the early 1990s. There was no directed angling effort for crappie.

A volunteer angler survey was conducted from October 2004 to May 2006 to determine catch trends and length distribution of trophy Largemouth Bass.

Aquatic vegetation habitat surveys have been conducted annually to monitor invasive species and evaluate angler access conditions.

- **Fish Community**
 - **Prey species:** Gizzard Shad, Redear Sunfish, Threadfin Shad, and Bluegill were the predominant prey species. Catch rates for Redear Sunfish, Threadfin Shad, and Bluegill declined compared to previous surveys.
 - **Channel Catfish:** Channel Catfish abundance was low.
 - **Largemouth Bass:** Largemouth Bass were abundant and in excellent condition. Growth was average for the Edwards Plateau ecological area.
- **Management Strategies:** Based on current information, the reservoir should continue to be managed with existing regulations. Conduct an additional electrofishing and hoop net survey in 2017-2018, and general monitoring surveys with hoop nets and electrofishing surveys in 2019-2020. Aquatic vegetation surveys should be conducted annually to monitor invasive species.

INTRODUCTION

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

Reservoir Description

Fayette County Reservoir is a 2,394-acre impoundment of Cedar Creek; an intermittent stream in the Colorado River watershed. It was constructed in 1978 by the Lower Colorado River Authority for the purpose of supplying cooling water for steam-electric power generation. This is a stable-level reservoir (conservation level is 390 feet above mean sea level). The reservoir is located in Fayette County, approximately seven miles east of La Grange, Texas. The reservoir lies within the Post Oak Savannah ecological area.

Water in the reservoir is maintained at a near-constant level (1-2 ft. annual fluctuation). During periods of low rainfall, water is pumped into the reservoir from the Colorado River. Shoreline surrounding the reservoir was undeveloped and shoreline length is approximately 20 miles. Fayette County Reservoir was opened to fishing in 1979. Other descriptive characteristics for Fayette County Reservoir are in Table 1.

Angler Access

Shoreline access was limited within LCRA park boundaries, with main access by fishing pier in two parks. Multi-lane, concrete boat ramps (two boat lanes total) were located within both parks, offering adequate boat access to the reservoir. Additional boat ramp characteristics are in Table 2.

Management History

Previous management strategies and actions: Management strategies and actions from the previous survey report (Cummings and De Jesus 2012) included:

1. Continue to promote the quality Largemouth Bass fishery at Fayette County Reservoir when possible.
Action: The Largemouth Bass fishery was promoted through social media and staff interactions with the general public.
2. Continue to conduct additional fall electrofishing surveys to monitor the Largemouth Bass population.
Action: An additional fall electrofishing survey to monitor the Largemouth Bass population was conducted in 2013.
3. Continue annual aquatic vegetation surveys to monitor aquatic vegetation coverage with particular attention to hydrilla and any other invasive species.
Action: Annual aquatic vegetation surveys were conducted from 2012 to 2015.
4. Educate the public about invasive species through the use of media and the internet.
Action: Outreach efforts regarding invasive species included the district's Facebook page, press releases, and written articles in the San Marcos Daily Record.
5. Make a speaking point about invasive species when presenting to constituent and user groups.
Action: Issues related to invasive species were raised at public presentations, and through informal staff interactions with constituents.

6. Keep track of (i.e., map) future inter-basin water transfers to facilitate potential invasive species responses.

Action: There are no plans for inter-basin water transfers at Fayette County Reservoir.

Harvest regulation history: Sportfish in Fayette County Reservoir were managed with statewide regulations with the exception of Largemouth Bass. From 1979 to 1985, Largemouth Bass were managed with a 16-inch minimum length limit. Slot length limits have been implemented since September 1, 1985 to: increase abundance of bass greater than 14 inches in length; increase angler catches of bass greater than 14 inches in length; and re-direct harvest at individuals less than 14 inches in length. A 14- to 24-inch slot length limit with a 5-fish daily bag, only 1 over 24-inches was implemented on September 1, 1995 to try to protect larger, quality fish from harvest while trying to increase the availability of trophy-size Largemouth Bass. Current regulations are found in Table 3.

Stocking history: Florida Largemouth Bass and catfishes were important species stocked. The Reservoir has not been stocked since 1997. A complete stocking history is in Table 4.

Vegetation/habitat management history: Fayette County Reservoir supported a mix of aquatic vegetation species. Aquatic vegetation surveys were conducted every summer from 2008 to 2015. The plant community composition has remained relatively unchanged since the 2007 survey, when Marine Naiad (*Najas marina*) was the dominant aquatic vegetation (De Jesus and Magnelia 2008). The exotic plant “hydrilla” (*Hydrilla verticillata*) was present in this reservoir.

Water Transfer: There were no inter-basin water diversion structures at Fayette County Reservoir. Water is pumped in from the Colorado River to maintain reservoir levels needed to maintain power plant operations when levels decline.

METHODS

Surveys were conducted to achieve survey and sampling objectives in accordance with the objective-based sampling (OBS) plan for Fayette County 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 electrofishing (1.5 hours at 18, 5-min stations; Appendix A). 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 by a category-2 evaluation using otoliths from 13 randomly-selected fish (range 13.0 to 14.9 inches).

Tandem hoop nets – Channel Catfish were collected using a total of 27 tandem hoop net series (nine tandem hoop net series set on three occasions) at 27 stations. Nets were baited with range cubes and deployed for 2-night soak durations. CPUE for tandem hoop netting was recorded as the number of fish caught per tandem hoop net series (fish/series).

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 from 2005 through 2015 and by electrophoresis for previous years.

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_t)] were calculated for target fishes according to Anderson and Neumann (1996). Index of vulnerability (IOV) was calculated for Gizzard Shad (DiCenzo et al. 1996). Standard error (SE) was calculated for structural indices and IOV. Relative standard error (RSE = 100 X SE of the estimate/estimate) was calculated for all CPUE and creel statistics.

Habitat – A structural habitat and vegetation survey was conducted in 2015. Habitat was assessed with the digital shapefile method (TPWD, Inland Fisheries Division, unpublished manual revised 2015). Shoreline emergent aquatic vegetation coverage map was produced using aerial photography.

RESULTS AND DISCUSSION

Habitat: In 2015, littoral zone structural habitat consisted primarily of natural shoreline (78.0%; Table 6, Appendix B).

Total native vegetation coverage (90.9 acres; predominantly marine naiad) constituted approximately 3.8% of the reservoir's surface area compared to less than 0.1% (1.5 acres) coverage by non-native vegetation (Table 7; Appendix C and D). Total aquatic vegetation coverage in this reservoir from 2012 to 2015 was considerably less than that considered optimum for productive fisheries (Dibble et al. 1996, Durocher et al. 1984). Since 2013, coverage of hydrilla has remained less than 3.0% of the reservoir's surface area. Eurasian watermilfoil was documented in 2012 (0.5 acres), but has not been observed in subsequent annual surveys.

Prey species: Gizzard Shad, Redear Sunfish, Threadfin Shad, and Bluegill were the predominant prey species in 2015 (Appendix E). Tilapia were also available as forage.

Total CPUE of Gizzard Shad in 2015 (55.3/h) was higher than in the 2011 (14.7/h) and 2007 (4.0/h) surveys (Figure 1). However, the IOV for Gizzard Shad in 2015 was low (IOV = 16) indicating that only 16% of the Gizzard Shad population were of vulnerable size (≤ 8 inches) and available to existing predators. By comparison, the IOV was 64 in 2011 and was zero in 2007. Low Gizzard Shad catch rates have been characteristic for this reservoir. Threadfin Shad were collected at the rate of 24.0/h in 2015, which is lower than in the 2011 survey (70.7/h).

Total CPUE of Bluegill in 2015 (22.0/h) was relatively low and on a downward trend over the last three surveys. Total CPUE was 64.0/h in 2011 and 174.0/h in 2007. In 2015, some larger fish (up to 9 inches in length) were present (PSD-P = 6.0; Figure 2).

Total CPUE of Redear Sunfish in 2015 (24.7/h) was lower than that obtained in the 2011 (52.0/h) and 2007 (35.0/h) surveys; the majority of fish were between 5 to 8 inches in length and the largest was 12 inches (Figure 3). A new waterbody record (rod and reel) for Redear Sunfish was established in 2012 (1.2 pounds, 11.0 inches).

Channel Catfish: In 2015, Channel Catfish were the focus of objective-based sampling procedures using hoop nets. Total catch rate for Channel Catfish was 1.2/tandem set; while stock-size catch rate was 1.1/tandem set. While CPUE estimates were within the preferred level of precision (RSE – stock ≤ 25), the sample of stock-size fish ($N = 32$) was less than required ($N \geq 50$ stock; Figure 4) after deploying nine tandem hoop nets three times. Thus, descriptors of population size structure cannot be fully addressed, but are presented for completeness (Figure 4).

The relatively low total catch rate of Channel Catfish (1.2/tandem set) in relation to the high sampling effort (27 tandem hoop net series) suggests a low density Channel Catfish population. Previous catch rates based on gill netting showed a declining trend. Total gill net catch rate for Channel Catfish in 2004,

2008, and 2012 was 14.8/nn, 10.0/nn and 3.8/nn, respectively (Cummings and De Jesus 2012). Also, anecdotal information suggests that Channel Catfish catch rates and angler satisfaction have declined.

Largemouth Bass: In 2015, the reservoir was characterized by a high-density Largemouth Bass population relative to bass populations in other central Texas reservoirs. The total catch rate of Largemouth Bass was 208.7/h in 2015 compared to catch rates of 108.7/h in 2011, and 188.0/h in 2013 (Figure 5). In 2015, the catch rate of Largemouth Bass greater than 14 inches (CPUE-14 = 73.3.0/h) was greater than that obtained in 2011 (48.0/h). However, during the last three surveys, no fish above the upper slot length limit (24 inches) have been caught.

On average, Largemouth Bass in Fayette County Reservoir reached 14 inches in length between ages 2 and 3 (Figure 6) which is about average compared to values for the Edwards Plateau ecological area (Prentice 1987). Largemouth Bass were in excellent condition; mean relative weight for all size classes of fish was ≥ 100 in 2015. Population size structure was good; PSD was 69, which was within the range expected for a balanced population (Gabelhouse 1984). Florida Largemouth Bass influence in this reservoir has remained high during the last three assessments. In 2015, 91% of the sample contained Florida Largemouth Bass alleles and 30% of the fish consisted of pure Florida Largemouth Bass (Table 8). The reservoir was last stocked with Florida Largemouth Bass in 1994.

Fisheries management plan for Fayette County Reservoir, Texas

Prepared – July 2016.

ISSUE 1: With respect to hoop netting for Channel Catfish, the relatively low total catch rate (1.2/tandem set) in relation to the high sampling effort (27 tandem hoop net series) suggests a low-density Channel Catfish population. In addition, gill net catch rates for Channel Catfish have been declining from 2004 to 2012. Prior to this, the reservoir had been a top destination for catfish anglers in the district.

MANAGEMENT STRATEGIES

1. Monitor the Channel Catfish population with hoop nets in 2017 and 2019 to determine abundance and population size structure for trend analysis.
2. If the hoop net data is insufficient to manage the population, consider conducting a spring and summer creel survey in 2019.

ISSUE 2: Aquatic vegetation abundance and species composition in Fayette County Reservoir have the potential to fluctuate. These fluctuations have the potential to affect predator/prey composition in the reservoir.

MANAGEMENT STRATEGIES

1. Continue annual aquatic vegetation surveys.
2. Continue biennial fall electrofishing surveys to monitor the Largemouth Bass population.

ISSUE 3: 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. Monitor the status of hydrilla and Eurasian milfoil during annual aquatic vegetation surveys.
2. Educate the public about invasive species through the use of media and the internet.
3. Make a speaking point about invasive species when presenting to constituent and user groups.
4. Keep track of (i.e., map) future inter-basin water transfers to facilitate potential invasive species responses.

Objective-Based Sampling Plan and Schedule for Fayette County Reservoir

2016 - 2020

Sportfish, forage fish, and other important fishes

Sportfish in Fayette County Reservoir include Largemouth Bass and Channel Catfish. Known important forage species include Bluegill, Redear Sunfish, Redbreast Sunfish, and Threadfin Shad.

Low-density/lower priority fisheries

Crappie: Hybrid crappie were stocked in Fayette Reservoir in 1994, 1996 and 1997; and if present, their population abundance is very low, based on poor captures in historic trap netting surveys. A creel survey in 2007 did not capture directed effort for this species, revealing little interest by anglers to pursue this species at Fayette Reservoir. Sampling this population is not a priority in 2016 - 2020.

Blue Catfish: Blue Catfish were stocked in Fayette Reservoir in 1976, 1985, and 1986; and are expected to be extirpated. Conditions at this power plant reservoir appear to be unsuitable for the development of a Blue Catfish fishery. Our gill netting surveys have failed to collect Blue Catfish specimens. Sampling this population is not a priority in 2016-2020.

Flathead Catfish: Flathead Catfish are present in low abundance based on gill netting surveys conducted between 1999 and 2012. During this time, CPUE-total averaged 0.7 fish/nn, and ranged between 0 and 2.0 fish/nn. A creel survey in 2007 did not capture directed effort for this species, revealing little interest by anglers to pursue this species at Fayette Reservoir. Sampling this population is not a priority in 2016-2020.

White Bass: White Bass are not believed to be present in Fayette Reservoir; however they are present in the Colorado River drainage, in which this reservoir lies. Gill netting surveys have not captured this species and no incidental catches have been reported in creel surveys nor anecdotally. Sampling this population is not a priority in 2016-2020.

Survey objectives, fisheries metrics, and sampling objectives

Largemouth Bass: Largemouth Bass are the most popular sport fish in Fayette Reservoir. The popularity and reputation for quality Largemouth Bass fishing at this reservoir warrant sampling time and effort. Results from a 2006 creel survey showed directed angling effort for Largemouth Bass to be 42.7 hours/acre, and accounted for 83% of the total directed effort. Largemouth Bass are managed with a 14- to 24-inch slot regulation. This lake is known for quality fish and good catch rates (0.97/h in 2007). Trend data on CPUE, size structure, and body condition have been collected biennially since 2006 with fall nighttime electrofishing. The population appears to be in good shape, and anglers are anecdotally satisfied with the fishing. Continuation of biennial trend data in this clear reservoir with night electrofishing in the fall will allow for determination of any large-scale changes in the Largemouth Bass population that may spur further investigation. A minimum of 12 randomly selected 5-min electrofishing sites will be sampled in 2017 and 2019, but sampling will continue at random sites until 50 stock-size fish are collected and the RSE of CPUE-S is ≤ 25 (the anticipated effort to meet both sampling objectives is 12-15 stations with 80% confidence). Exclusive of the original 12 random stations, three additional random stations will be pre-determined in the event some extra sampling is necessary. If failure to achieve either objective has occurred after one night of sampling and objectives can be attained with 6-12 additional random stations, another night of effort will be expended.

Channel Catfish: The 2007 creel survey indicated Channel Catfish angling comprised 4.0% of total angling effort (third to Largemouth Bass and anglers fishing for anything). Directed total effort for this species was 4,481 at 1.9 hours/acre. Gill netting total CPUE ranged from 3.8 to 17.2 fish/nn (11.5 fish/nn average) from 1999 to 2012, in a steady declining trend. These data only allowed us to determine presence or absence of the population. We would like to collect information allowing us to monitor size structure and body condition. We propose switching from standard gill nets, set overnight to tandem hoop nets set for two nights. We anticipate that setting a minimum of nine tandem hoop nets, with a soak time of two nights, will achieve our sampling objective (50 Channel Catfish >11 inches; RSE of CPUE-S \leq 0.25). A minimum of nine randomly selected tandem hoop netting sites will be sampled in summer 2017 and 2019, but sampling will continue at random sites until 50 stock-size fish are collected and the RSE of CPUE-S is \leq 25 (the anticipated effort to meet both sampling objectives is nine stations with 75% confidence). Exclusive of the original nine random stations, nine additional random stations will be pre-determined in the event some extra sampling is necessary. If failure to achieve either objective has occurred after one soak session, and objectives can be attained with up to nine additional random stations, another soak session of effort will be expended.

Sunfish and Threadfin Shad: Bluegill, Redear Sunfish, Redbreast Sunfish, and Threadfin Shad are the primary forage at Fayette Reservoir. Like Largemouth Bass, trend data on CPUE and size structure of these sunfish have been collected biennially since 1996. Abundance of Threadfin Shad was also measured as a function of CPUE during those surveys, and will remain the main sampling objective to measure Threadfin Shad abundance. Continuation of sampling, as per Largemouth Bass above, will allow for monitoring of large-scale changes in sunfish relative abundance and size structure. Sampling effort based on achieving sampling objectives for Largemouth Bass will result in sufficient numbers of sunfish for size structure estimation (PSD and IOV; 50 stock-size fish minimum at 5-12 stations with 80% confidence) but not for relative abundance estimates (RSE \leq 25 of CPUE-Total (CPUE-T); anticipated effort is 25-30 stations). At the sampling effort needed to achieve sampling objectives for Largemouth Bass, the expected RSE for CPUE-T is 30 for sunfish species combined. No additional effort will be expended to achieve an RSE25 for CPUE of sunfish. Instead, Largemouth Bass body condition can provide information on forage abundance, vulnerability, or both relative to predator density. Relative weight of Largemouth Bass \geq 8" TL will be determined from their length/weight data (maximum of 10 fish weighed and measured per inch class).

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Table 1. Characteristics of Fayette County Reservoir, Texas.

Characteristic	Description
Year constructed	1978
Controlling authority	Lower Colorado River Authority
County	Fayette
Reservoir type	Power cooling
Shoreline development index	Unknown
Conductivity	1259 μ S/cm

Table 2. Boat ramp characteristics for Fayette County Reservoir, Texas, September, 2015. This is a stable-level Reservoir (conservation level is 390 feet above mean sea level).

Boat ramp	Latitude Longitude (dd)	Public	Parking capacity (N)	Elevation at end of boat ramp (ft.)	Condition
Park Prairie Park	29.945867 -96.747619	Y	125	N/A	Good
Oak Thicket Park	29.947372 -96.727044	Y	100	N/A	Good

Table 3. Harvest regulations for Fayette County Reservoir, Texas.

Species	Bag limit	Length limit
Catfish: Channel and Blue Catfish, their hybrids and subspecies	25 (in any combination)	12-inch minimum
Catfish, Flathead	5	18-inch minimum
Bass: Largemouth	5 ^a	14- to 24-inch slot
Crappie: White and Black Crappie, their hybrids and subspecies	25 (in any combination)	10-inch minimum

^a Only one fish over 24 inches may be retained.

Table 4. Stocking history of Fayette County Reservoir, Texas. Life stages are fry (FRY), fingerlings (FGL), advanced fingerlings (AFGL), adults (ADL), and unknown (UNK). Life stages for each species are defined as having a mean length that falls within the given length range. For each year and life stage the species mean total length (Mean TL; in) is given. For years where there were multiple stocking events for a particular species and life stage the mean TL is an average for all stocking events combined.

Species	Year	Number	Life Stage	Mean TL (in)
Black Crappie x White Crappie	1994	111,979	FRY	0.9
	1996	120,895	FRY	0.9
	1997	<u>118,977</u>	FRY	0.9
	Total	351,851		
Blue Catfish	1976	27,860	UNK	UNK
	1985	6,784	FGL	2.0
	1986	<u>12,150</u>	FGL	2.0
	Total	46,794		
Channel Catfish	1976	96,000	AFGL	7.9
	1985	13,803	AFGL	5.0
	1986	<u>12,070</u>	AFGL	5.0
	Total	121,873		
Flathead Catfish	1976	<u>12,000</u>		UNK
	Total	12,000		
Florida Largemouth Bass	1977	96,375	FRY	1.0
	1994	<u>208</u>	ADL	12.0
	Total	96,583		

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

Gear/target species	Survey objective	Metrics	Sampling objective
<i>Electrofishing</i>			
Largemouth Bass	Abundance	CPUE – stock	RSE – stock ≤ 25
	Size structure	PSD, length frequency	$N \geq 50$ 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 – stock ≤ 25
	Size structure	PSD, length frequency	$N \geq 50$ stock
Redear Sunfish ^a	Abundance	CPUE – total	RSE – stock ≤ 25
	Size structure	PSD, length frequency	$N \geq 50$ stock
Gizzard Shad ^a	Abundance	CPUE – total	RSE – stock ≤ 25
	Size structure	Length frequency	$N \geq 50$ stock
	Prey availability	IOV	$N \geq 50$
<i>Tandem hoop netting</i>			
Channel Catfish	Abundance	CPUE – stock	RSE – stock ≤ 25
	Size structure	PSD, length frequency	$N \geq 50$ stock
	Condition	W_r	10 fish/inch group (max)

^a No additional effort will be expended to achieve an RSE ≤ 25 for CPUE and $N \geq 50$ stock of Bluegill, Redear Sunfish, and Gizzard Shad if not reached from designated Largemouth Bass sampling effort. Instead, Largemouth Bass body condition can provide information on forage abundance, vulnerability, or both relative to predator density.

Table 6. Survey of structural habitat types, Fayette County Reservoir, Texas, 2015. Shoreline habitat type units are in miles and standing timber is acres.

Habitat type	Estimate	% of total
Natural Shoreline	16.3 miles	78.0
Rocky Shoreline	3.7 miles	18.0
Bulkhead	0.9 miles	4.0
Standing Timber	74.0 acres	3.1

Table 7. Survey of aquatic vegetation, Fayette County Reservoir, Texas, 2012 – 2015. Surface area (acres) is listed with percent of total reservoir surface area in parentheses.

Vegetation	2012	2013	2014	2015
Native submersed	101.5 (4.2)	42.0 (1.8)	41.4 (1.7)	71.8 (2.9)
Native floating-leaved		1.0 (0.04)	0.1 (0.004)	0.0 (0.0)
Native emergent		1.0 (0.04)	3.0 (0.1)	18.9 (0.8)
Non-native				
Eurasian watermilfoil (Tier III)*	0.5 (0.02)			
Hydrilla (Tier III)*	27.9 (1.2)	1.0 (0.04)	2.8 (0.1)	1.5 (0.06)

* Tier III is Watch Status

Gizzard Shad

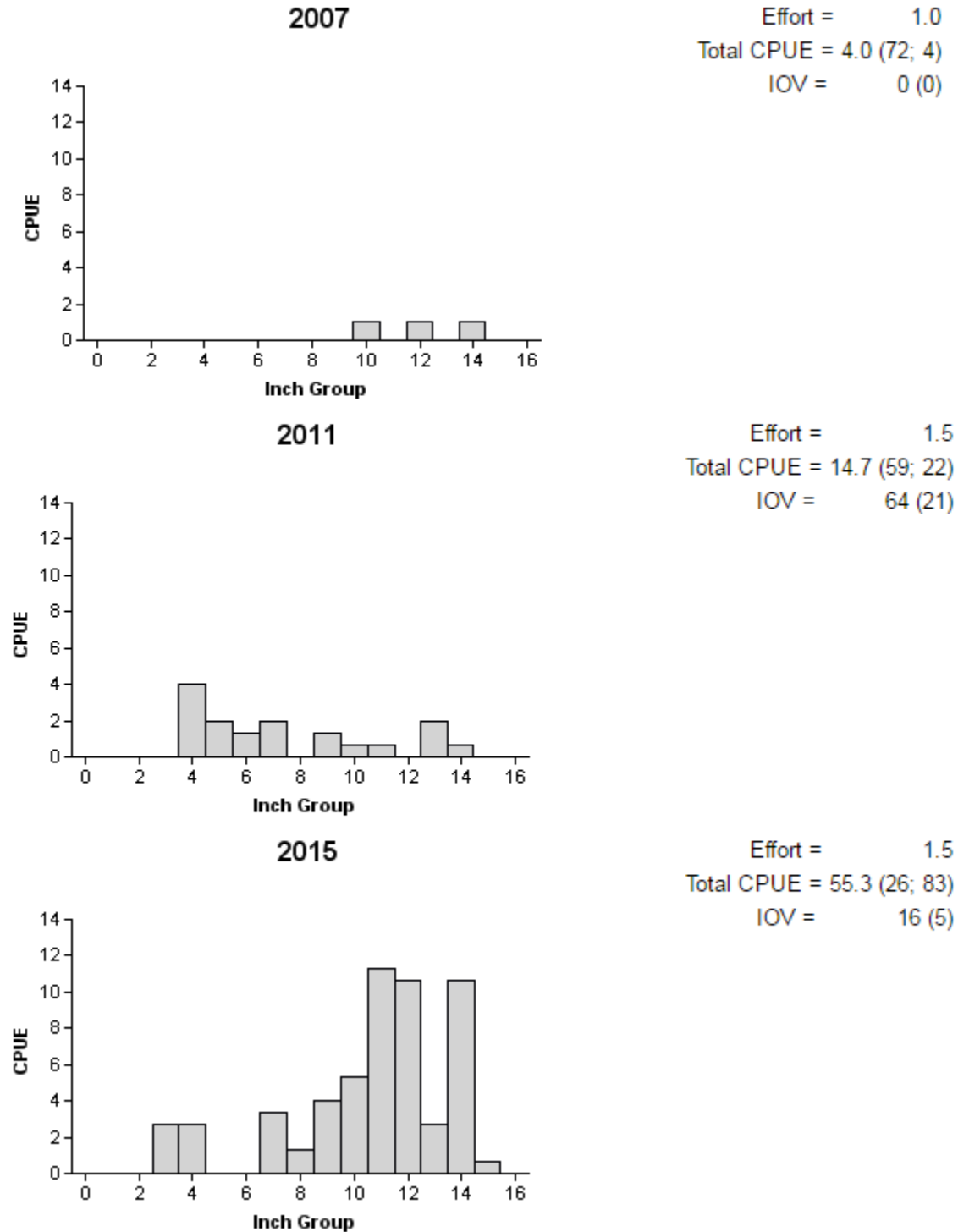


Figure 1. Number of Gizzard Shad caught per hour (CPUE) population indices (RSE and N for CPUE and SE for IOV are in parentheses) for fall electrofishing surveys, Fayette County Reservoir, Texas, 2007, 2011 and 2015.

Bluegill

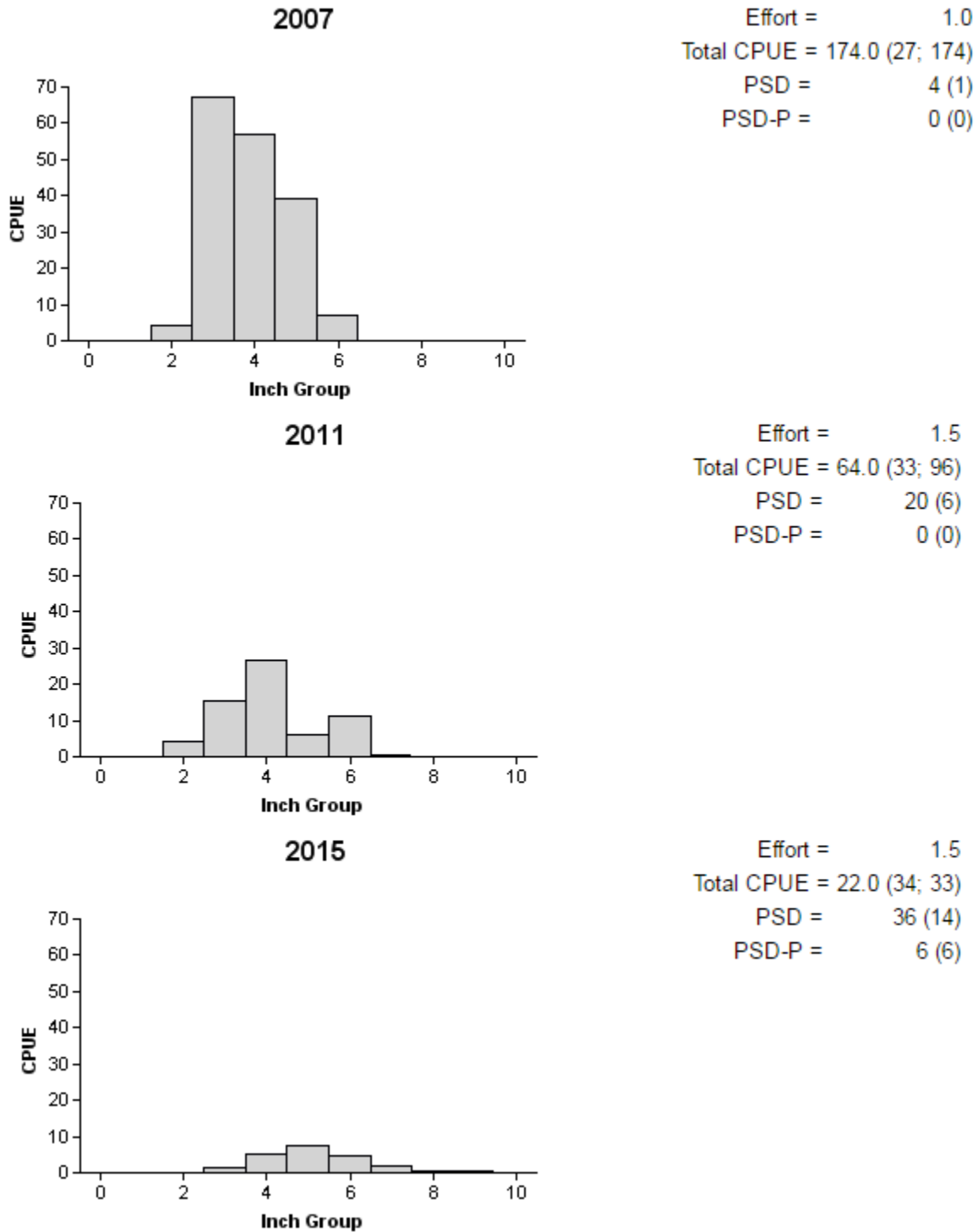


Figure 2. Number of Bluegill caught per hour (CPUE) population indices (RSE and N for CPUE and SE for size structure are in parentheses) for fall electrofishing surveys, Fayette County Reservoir, Texas, 2007, 2011 and 2015.

Redear Sunfish

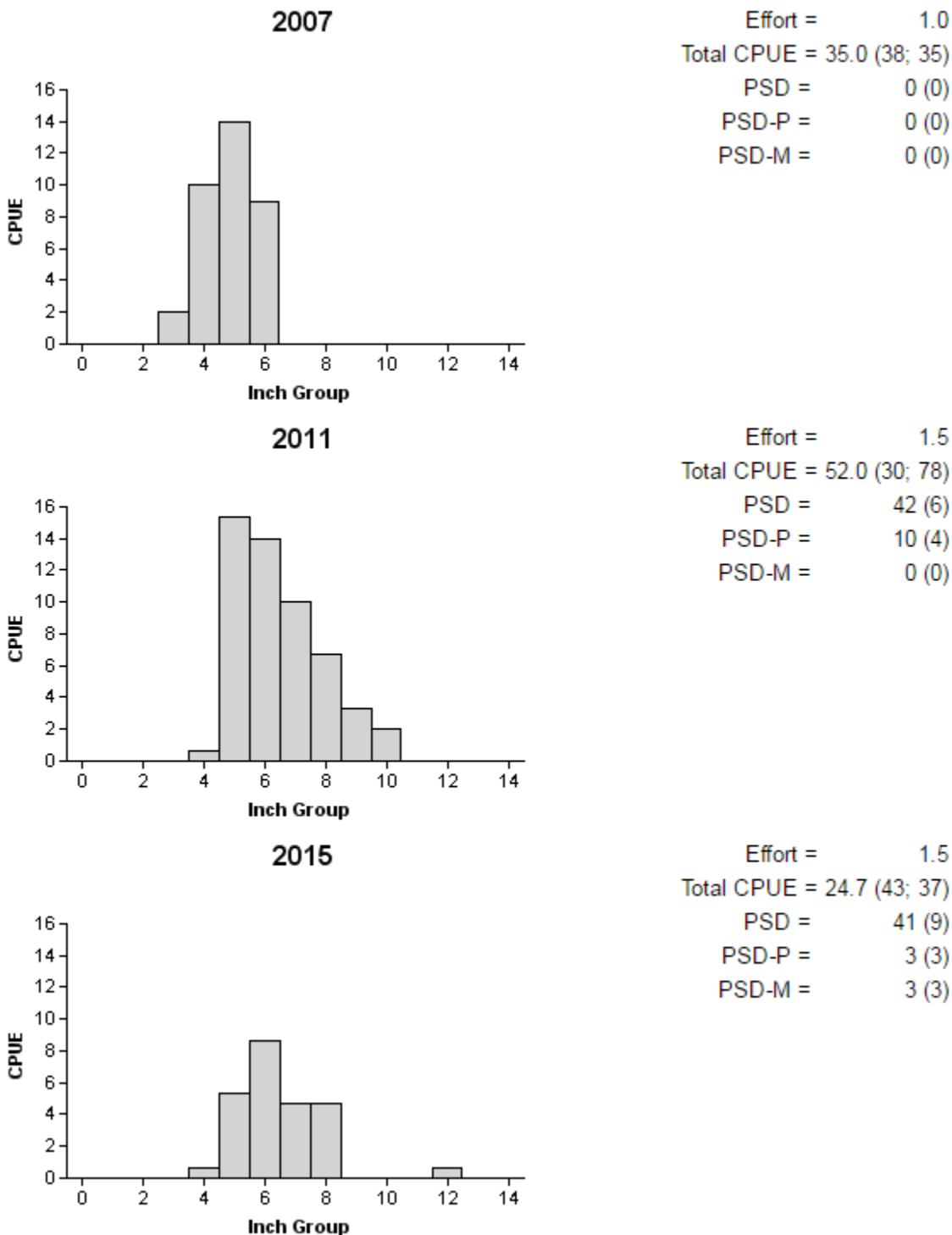


Figure 3. Number of Redear Sunfish caught per hour (CPUE) population indices (RSE and N for CPUE and SE for size structure are in parentheses) for fall electrofishing surveys, Fayette County Reservoir, Texas, 2007, 2011 and 2015.

Channel Catfish

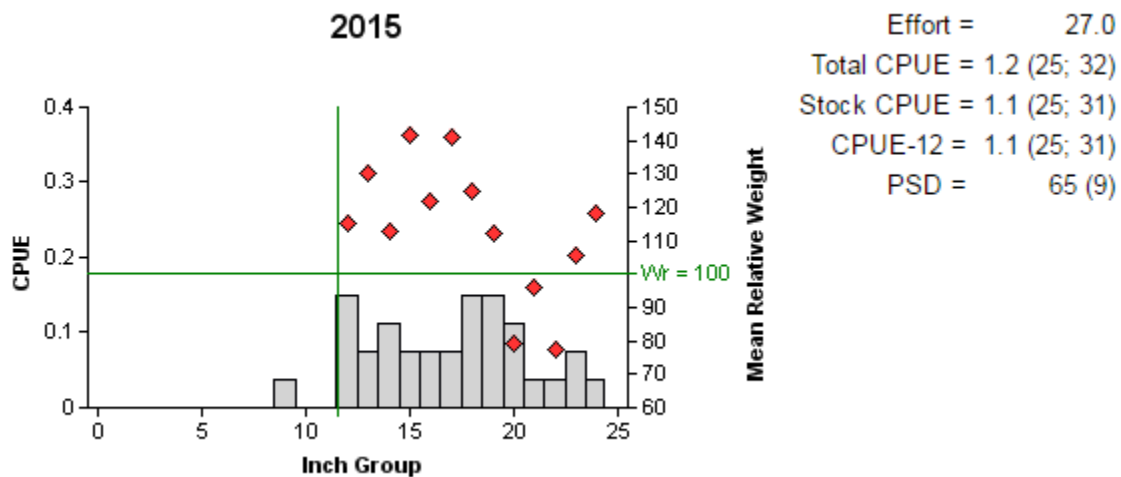


Figure 4. Number of Channel Catfish caught per tandem hoop net series (fish/series; CPUE, bars), mean relative weight (diamonds), and population indices (RSE and N for CPUE and SE for size structure are in parentheses) for summer hoop net surveys, Fayette County Reservoir, Texas, 2015. Vertical line represents minimum length limit at the time of sampling.

Largemouth Bass

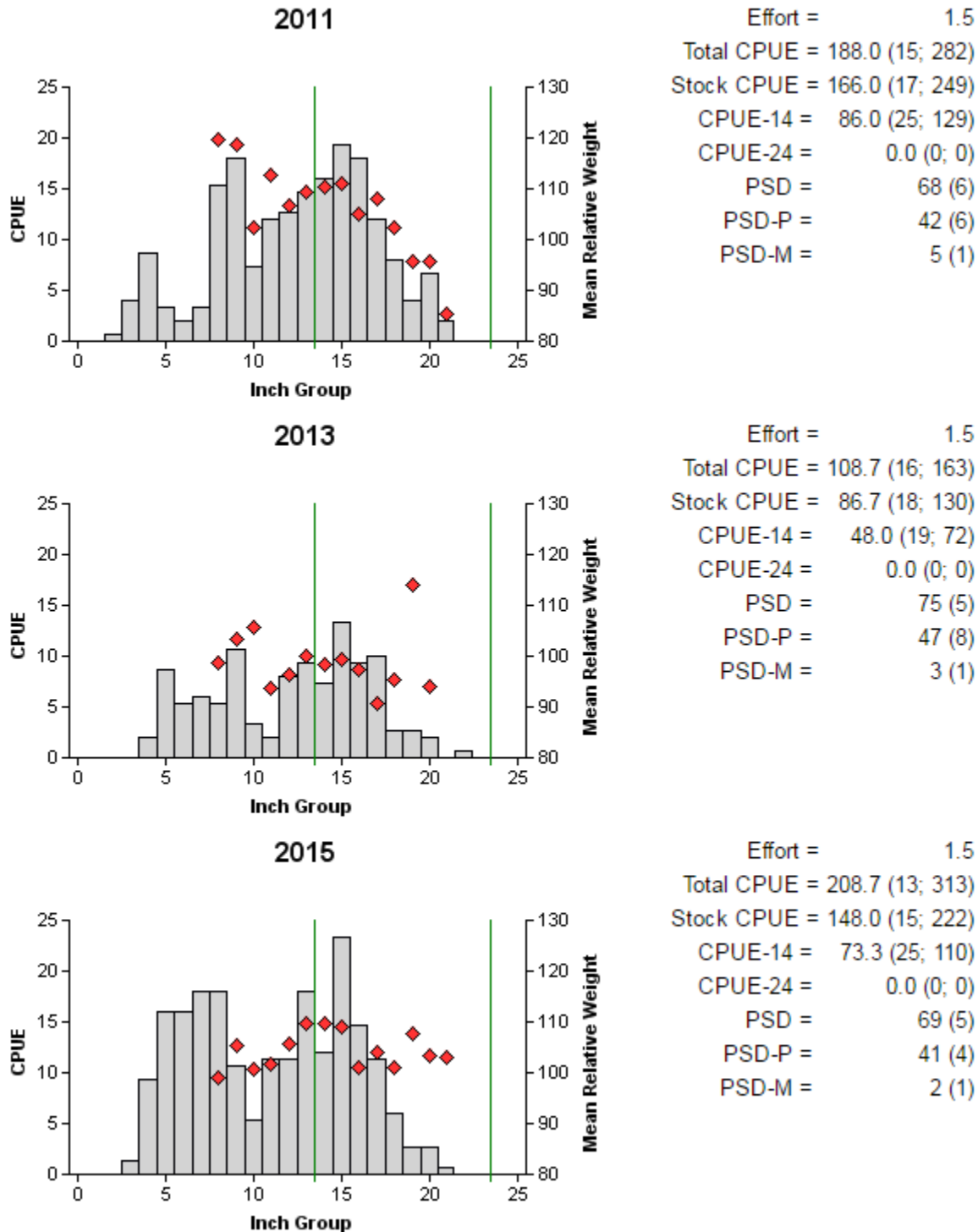


Figure 5. Number of Largemouth Bass caught per hour (CPUE, bars), mean relative weight (diamonds), and population indices (RSE and N for CPUE and SE for size structure are in parentheses) for fall electrofishing surveys, Fayette County Reservoir, Texas, 2011, 2013, and 2015. Vertical lines represent slot length limit at the time of sampling.

Largemouth Bass

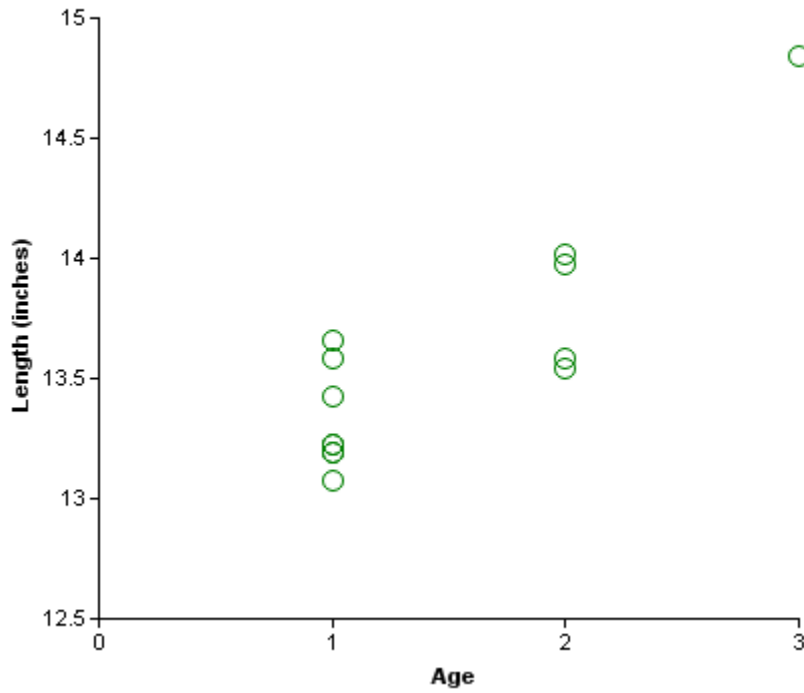


Figure 6. Length at age for Largemouth Bass (n=13) collected by electrofishing at Fayette County Reservoir, Texas, November 2015.

Table 8. Results of genetic analysis of Largemouth Bass collected by fall electrofishing, Fayette County Reservoir, Texas, 2003, 2007, and 2015. FLMB = Florida Largemouth Bass, NLMB = Northern Largemouth Bass, Intergrade = hybrid between a FLMB and a NLMB. Genetic composition was determined by electrophoresis prior to 2005 and with micro-satellite DNA analysis since 2005.

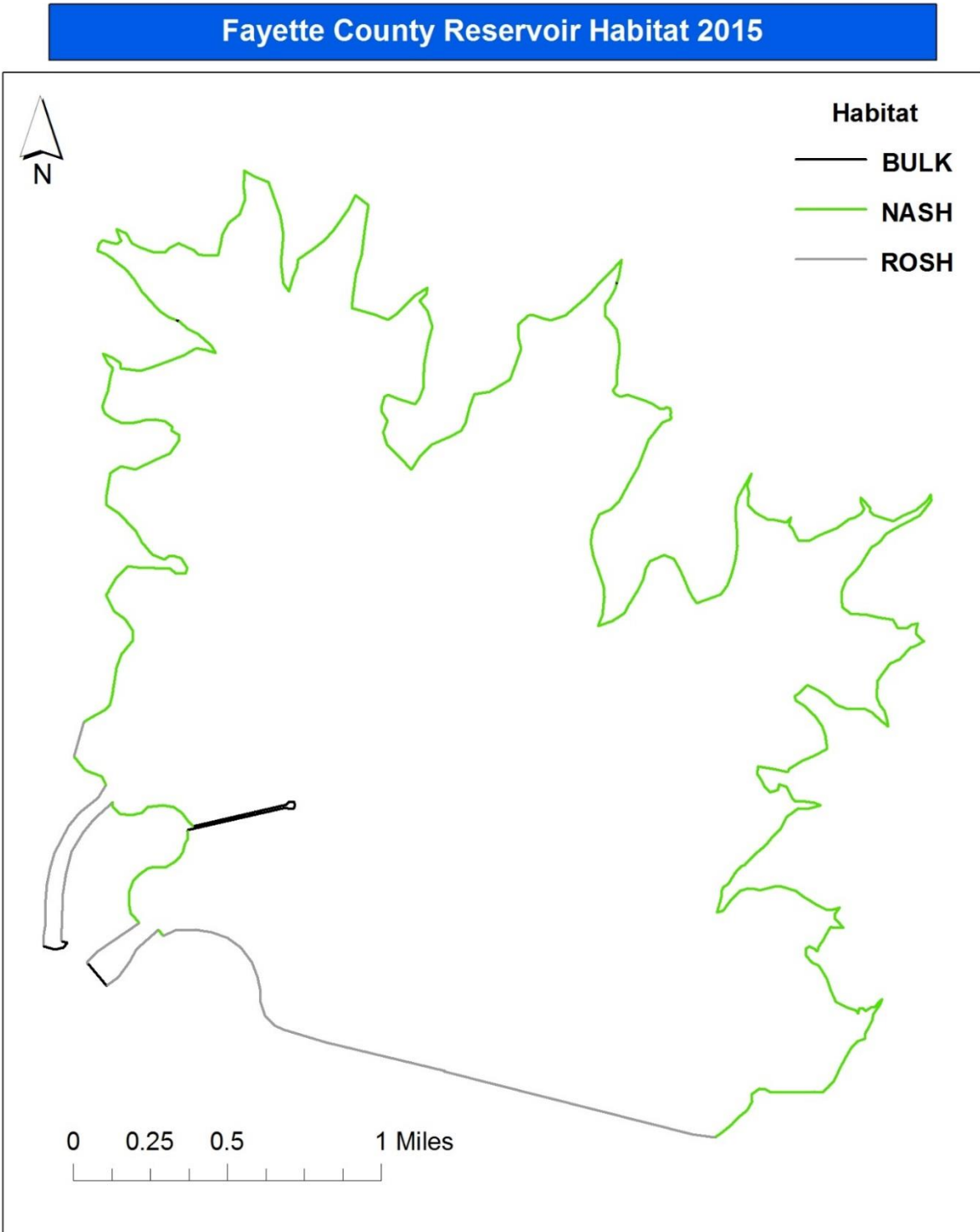
Year	Sample size	Number of fish			% FLMB alleles	% FLMB
		FLMB	Intergrade	NLMB		
2003	30	21	9	0	90.0	70.0
2007	30	12	18	0	93.7	40.0
2015	30	9	21	0	91.0	30.0

Table 9. Proposed sampling schedule for Fayette County Reservoir, Texas. Survey period is June through May. Hoop netting surveys are conducted in the summer, and electrofishing surveys are conducted in the fall. Standard survey denoted by S and additional survey denoted by A.

Survey year	Electrofishing fall(spring)	Hoop net	Gill net	Habitat			Creel survey	Report
				Structural	Vegetation	Access		
2016-2017					A			
2017-2018	A	A			A			
2018-2019					A			
2019-2020	S	S		S	S	S		S

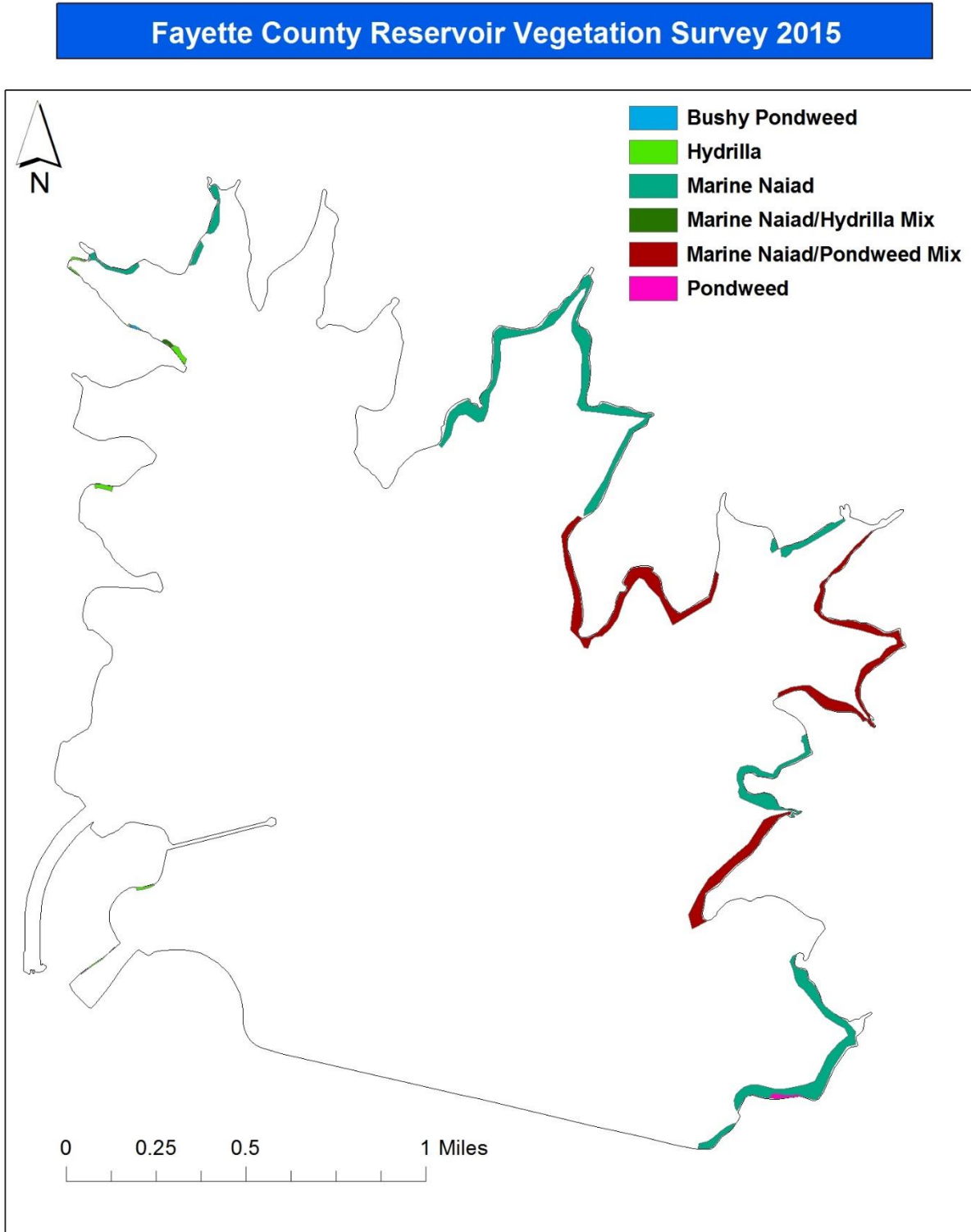
APPENDIX B

Structural habitat survey map for Fayette County Reservoir, Texas, September 2015 (BULK = bulkhead, NASH = natural shoreline, ROSH = rocky shoreline).



APPENDIX C

Aquatic vegetation survey coverage map for Fayette County Reservoir, Texas, September 2015.



APPENDIX D

Shoreline emergent aquatic vegetation coverage map obtained from aerial photography for Fayette County Reservoir, Texas, October 2015.



APPENDIX E

Number (N) and catch rate (CPUE) of all target species collected from all gear types from Fayette County Reservoir, Texas, 2015. Sampling effort was 1.5 h for electrofishing and 27 tandem hoop-net series deployed for 2-night soak durations.

Species	Hoop Netting		Electrofishing	
	N	CPUE	N	CPUE
Gizzard Shad			83	55.3
Threadfin Shad			36	24.0
Inland Silverside			10	6.7
Channel Catfish	32	1.2		
Redbreast Sunfish			1	0.7
Bluegill			33	22.0
Redear Sunfish			37	24.7
Largemouth Bass			313	208.7
Rio Grande Cichlid			2	1.3
Tilapia			17	11.3