

Purtis Creek State Park Lake

2020 Fisheries Management Survey Report

PERFORMANCE REPORT

As Required by

FEDERAL AID IN SPORT FISH RESTORATION ACT

TEXAS

FEDERAL AID PROJECT F-221-M-4

INLAND FISHERIES DIVISION MONITORING AND MANAGEMENT PROGRAM

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Survey and Management History

Fish populations in Purtils Creek State Park Lake were surveyed in 2018 using electrofishing and in 2020 using hoop netting, trap netting, and electrofishing. An aquatic vegetation survey was conducted in the summer of 2020. Historical data are presented with the 2018–2020 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: Purtils Creek State Park Lake is a 349-acre impoundment located on Purtils Creek in the Trinity River Basin approximately 4 miles north of Eustace, Texas. The impoundment was constructed by the Texas Parks and Wildlife Department (TPWD) in 1985 for recreation. Boat and bank access are both good and the park maintains two handicap-accessible fishing piers. Habitat features consist of standing timber, rocks, and native submersed and emergent aquatic plants.

Management History: Important sport fish include Largemouth Bass, White Crappie, and Channel Catfish. Recent management activities included changing the catch-and-release regulation for Largemouth Bass to a 16-inch maximum length limit with exemptions for ShareLunker Program entry, stocking Channel Catfish when fingerlings are available, monitoring the littoral habitat biennially, and improving bank angler successes around the two fishing piers. Efforts were also made to establish desirable native species of aquatic vegetation.

Fish Community

- **Prey species:** Threadfin Shad were abundant in the reservoir. Electrofishing catch of Gizzard Shad was moderate with 60% of Gizzard Shad available as prey to most sport fish. Electrofishing catch of Bluegill was moderate with over half of the Bluegill caught less than five inches long.
- **Channel Catfish:** Channel Catfish recruitment has historically been impacted in the reservoir from limited spawning habitat and Largemouth Bass predation. Channel Catfish catch rates in 2020 were better than previous years; however, abundance of Channel Catfish in the reservoir remains at a low level.
- **Largemouth Bass:** Largemouth Bass body condition was good; however, catch rates of the species declined in 2018 and 2020 surveys. This decline highlights the limited aquatic vegetation and littoral habitat that exists in the reservoir.
- **White Crappie:** White Crappie remain moderately abundant, display adequate growth, and exhibit good body condition.

Management Strategies: Inform the public about the negative impacts of aquatic invasive species. Attempt to improve Channel Catfish natural reproduction through the addition of catfish spawning boxes. Install green lights around both fishing piers to improve angling opportunities at night. Improve habitat through the application of artificial shoreline habitats. Continue to manage Largemouth Bass with a 16-inch maximum length limit and all other species under the statewide Community Fishing Lake (CFL) regulations.

Introduction

This document is a summary of fisheries data collected from Purtis Creek State Park Lake in 2018–2020. The purpose of the document is to provide fisheries information and make management recommendations to protect and improve the sport fishery. While information on other fishes was collected, this report deals primarily with major sport fishes and important prey species. Historical data are presented with the 2018–2020 data for comparison.

Reservoir Description

Purtis Creek State Park Lake is a 349-acre impoundment located on Purtis Creek in the Trinity River Basin approximately 4 miles north of Eustace, Texas. The impoundment was constructed by the Texas Parks and Wildlife Department in 1985 for recreation. Habitat at time of sampling consisted primarily of standing timber. Other descriptive characteristics for Purtis Creek State Park Lake are in Table 1.

Angler Access

Purtis Creek State Park Lake has one public boat ramp located on the southeast corner of the reservoir. Additional boat ramp characteristics are available in Table 2. Shoreline access is excellent, and two handicap-accessible fishing piers offer ample fishing opportunities for bank anglers.

Management History

Previous management strategies and actions: Management strategies and actions from the previous survey report (Norman and Ott 2017) included:

1. Adjust catch-and-release regulation for Largemouth Bass to improve the potential of a quality fishery and continue to monitor the Largemouth Bass population.

Action: September 1, 2018 the regulations were changed to a 5-fish bag limit with a 16-inch maximum length limit. Fall electrofishing surveys were conducted in 2018 and 2020.
2. Stock Channel Catfish when surplus production is available and monitor the population every four years with hoop net surveys.

Action: Channel Catfish were stocked in 2017, 2018, and 2019. A hoop net survey was conducted in fall 2020.
3. Monitor the aquatic macrophyte community in the reservoir and maintain enclosure cages designed to reestablish native vegetation within the reservoir.

Action: Shoreline aquatic vegetation was assessed in 2020. Vegetation failed to persist within the enclosure cages and have not been replanted since 2017. Vegetation has occasionally been observed within the cages but has yet to remain for longer than one growing season.
4. Enhance the quality of fishing for bank anglers, specifically along the two fishing piers through the addition of artificial habitat.

Action: 30 Mossback artificial structures were deployed within casting distance of each fishing pier.

Harvest regulation history: On September 1, 2018 regulations for Largemouth Bass were modified to a five fish bag limit with a 16-inch maximum length limit where one Largemouth Bass over 24 inches can be temporarily retained to be submitted to the ShareLunker program. Prior to this regulation Largemouth Bass were managed under a catch-and-release regulation where one fish over 24 inches could be retained to be donated to the ShareLunker program. Prior to September 1, 2008, anglers could retain one fish greater than 21 inches to be weighed at a lake-side weigh station and immediately released or donated to the ShareLunker program. A list of all current regulations can be found in Table 3.

Stocking history: Approximately 24,180 advanced-size (6-inch) ShareLunker Largemouth Bass were stocked from 2006–2012. In 2019 approximately 68,045 Florida Largemouth Bass fry were stocked. Channel Catfish have been stocked periodically since 1985 to maintain the population. One thousand triploid (sterile) Grass Carp were stocked in 2007. The complete stocking history is in Table 4.

Vegetation/habitat management history: Historically, hydrilla required annual treatments with aquatic herbicide by TPWD Inland Fisheries Aquatic Habitat Enhancement staff to maintain access to the reservoir. Hydrilla covered roughly 6% of the reservoir in 2004 and had expanded to cover 60% of the reservoir surface area by the fall of 2006. In 2007, strong currents from a flood event reduced hydrilla coverage to trace levels (Bennett and Ott 2009). One thousand triploid Grass Carp (stocked in 2007 prior to flood event) have prevented the re-growth of hydrilla. A native vegetation enhancement project involving submersed and emergent species was initiated in July 2013; maintenance, expansion and replanting have continued as needed. A total of 10 enclosure cages have been constructed around the native vegetation colonies to prevent Grass Carp grazing. Using a model based on 32% annual mortality of triploid Grass Carp (Kirk and Socha 2003), it is estimated that only 7 (0.02/acre) are currently present in Purtil Creek State Park Lake in 2020, indicating that Grass Carp grazing is no longer a major impediment to aquatic vegetation growth.

Water transfer: Purtil Creek State Park Lake is one of the few water bodies owned and operated by Texas Parks and Wildlife Department. The primary purpose for the lake is recreation, and to a lesser extent flood control. No interbasin transfers are known to exist.

Methods

Surveys were conducted to achieve survey and sampling objectives in accordance with the objective-based sampling (OBS) plan for Purtil Creek State Park Lake (Norman and Ott 2017). Primary components of the 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 2017).

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

Trap netting – Crappie were collected using trap nets (10 net-nights at 10 stations). CPUE for trap netting was recorded as the number of fish caught per net night (fish/nn). Mean age at harvest length for crappie were determined using otoliths from 15 randomly selected fish (range 9.2 to 10.9 inches).

Tandem hoop nets – Channel Catfish were collected using 9 tandem hoop-net series at 9 stations. Nets were baited with soap and deployed for two-night soak durations. CPUE for tandem hoop netting was recorded as the number of fish caught per tandem hoop net series (fish/series).

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 = $100 \times \text{SE of the estimate/estimate}$) was calculated for all CPUE and creel statistics.

Habitat – A vegetation survey was conducted in 2020. Habitat was assessed with the digital shapefile method (TPWD, Inland Fisheries Division, unpublished manual revised 2017).

Results and Discussion

Habitat: Due to the negligible coverage of aquatic vegetation in the reservoir, efforts were shifted from biennial vegetation surveys (as prescribed in 2017 OBS plan) to surveys every four years. The most recent survey (summer 2020) revealed limited surface-acre coverage of all aquatic vegetation (Table 6).

Waterwillow and cattail each occupied less than one acre. Several other species were present in trace amounts including American lotus, water leaf, bull tongue, water primrose, common bulrush, and buttonbush. Water stargrass and American pondweed were found growing within enclosure cages. Non-native species that have been present in Purts Creek in the past—including alligator weed and hydrilla—were not present in the 2020 survey.

Prey species: Gizzard Shad, Threadfin Shad and sunfish are all important prey species within the reservoir. Threadfin Shad catch rates in 2020 were 2,145.0/h, which greatly improved from the 2014 and 2016 surveys (235.0/h and 135.0/h, respectively). Gizzard Shad catch rates in 2020 were 136.0/h which was lower than the 2014 and 2016 surveys (276.0/h and 167.0/h, respectively). Index of vulnerability (IOV) for Gizzard Shad was moderate, indicating that 60% of Gizzard Shad were available to existing predators. The 2020 IOV was slightly improved from the 2014 survey, but lower than the 2016 survey (Figure 1). Electrofishing catch rates of Bluegill in 2020 were 132.0/h, which was lower than the 2014 and 2016 surveys (227.0/h and 234.0/h, respectively). Bluegill size structure has been dominated by small individuals over the last three surveys (PSD ranged from 2–17). The proportion of small Bluegill declined in 2020 but over 60% of the Bluegill captured in 2020 were still less than five inches (Figure 2). Catch rates of other sunfishes were relatively low and included Redbreast Sunfish (34.0/h), Longear Sunfish (11.0/h), Redear Sunfish (49.0/h), and Redspotted Sunfish (2.0/h; Appendix A). Overall, prey abundance and size composition should not be a limiting factor to the growth and condition of sport fishes.

Channel Catfish: Channel Catfish have historically displayed poor recruitment within the reservoir, presumably due to a combination of an abundant Largemouth Bass population and limited spawning habitat. The recent decline in Largemouth Bass abundance has likely led to reduced predation on juvenile Channel Catfish which subsequently would improve the survival of fingerling stockings. This also potentially allows for more consistent natural reproduction and recruitment of Channel Catfish. The success of the catfish fishery has been dependent upon stocking advanced fingerlings that had greater chances of survival to sustain the population. However, the reliance upon fish stockings has resulted in fluctuating catfish densities, and subsequent variable gill net and hoop net catch rates (Figure 3 and Figure 4). Hoop nets were substituted for gill net surveys in 2017. While the hoop net survey in 2020 did not produce indications of strong abundance of Channel Catfish, there was an improved CPUE (4.0/series) with a much larger breadth of size structure compared to the 2017 survey, indicating some successes of recent stockings.

Largemouth Bass: The fall catch rates of 7.0/h and 57.0/h (2018 and 2020, respectively) were both notable reductions from historic catch rates (2010–2016 average CPUE = 114.8/h). However, it is important to note that fall electrofishing surveys also have a recent history of producing variable results within Purts Creek, particularly related to CPUE-stock. While CPUE-stock was low in 2018 and 2020 (2.0/h and 36.0/h, respectively), fall surveys over the past decade have consistently caught low numbers of fish > 8 inches (2010–2016 average CPUE-stock = 51.0/h; range: 15.0/h–81.0/h). While catch rates declined from 2016 (105.0/h) to 2020, size structure improved in the 2020 survey (2016 PSD = 18; 2020 PSD = 42). The 2020 PSD was also similar to historic fall electrofishing levels (2010–2016 average PSD = 38). However, it should be noted that the increased PSD in the 2020 survey was a function of a reduced catch of stock-size fish (8–12 inches) rather than an increased catch of quality sized fish (> 12 inches; Figure 5). Body condition was good (mean $W_r = 97$) for each inch class of fish collected (range: 86–109) in the 2020 survey and did not decline with larger fish (> 15 inches) as indicated in the 2016 survey (Figure 5). The increased body condition indices are likely a product of the increased abundance of Threadfin Shad in the reservoir; however, this also may also be a function of less intraspecific competition as abundance declines. With only two fish above stock length, there were not enough individuals collected in the 2018 survey to properly evaluate body condition or size structure. Age and growth analysis was not conducted as prescribed in the OBS plan due to only four fish collected in the target size range (13.0–14.9 inches) during the 2020 survey. Additionally, the target of 50 fish above stock-size was not met as prescribed in the OBS plan with the number of fish above stock-size for 2018 and 2020 at two and 36, respectively. Due to the low catch rates of Largemouth Bass in the reservoir, additional stations were not conducted as the sampling effort required to reach OBS sampling objectives was not feasible or warranted.

Crappie: The catch rate of 7.3/nn for White Crappie in 2020 was a moderate decline from 2016 (11.5/nn; Figure 7). Size structure was moderate (PSD = 52); however, this also displayed a decline from previous surveys (2012 PSD = 92; 2016 PSD = 81). Body condition was good (mean $W_r = 94$) with relative weights ranging from 84–100 for all inch classes collected. White Crappie growth rate in 2020 was adequate with an average age at 10 inches (9.2–10.9 inches) of 1.9 years (N = 15; range: 1–2 years). Black Crappie continue to provide angling opportunities in the reservoir but at very low densities (Appendix A).

Fisheries Management Plan for Purtils Creek State Park Lake, Texas

Prepared – July 2021.

ISSUE 1: Largemouth Bass at Purtils Creek State Park Lake remain one of the primary targets for anglers and recent electrofishing surveys (2018 and 2020) have displayed declining catch rates, particularly within fish 8–12 inches in length. This is indicative of poor year classes since the last survey report (2016), which may be a result of minimal shoreline habitat in the reservoir.

MANAGEMENT STRATEGIES

1. Due to continued poor successes of establishing aquatic vegetation within enclosure cages, our efforts to enhance littoral habitat will shift toward the application of artificial habitats. The Bass Conservation License Plate (CLP) funds will be pursued to purchase shallow water artificial habitats. Those habitats will be distributed throughout the littoral zone to enhance shoreline habitat in the reservoir.
2. Spring electrofishing surveys have not been conducted since 2017. Spring surveys generally provide a better overall picture of size structure and this information is necessary to evaluate the extent of the apparent decline. A spring electrofishing survey will be conducted in 2022 to evaluate the Largemouth Bass population. If catch rates and size structure are poor for this survey, further steps to enhance the Largemouth Bass population will be evaluated.

ISSUE 2: Historically, Channel Catfish recruitment at Purtils Creek State Park Lake has been poor and consistent stocking was required to maintain the population. While recent surveys suggest some improved abundance, the improvement of spawning habitat is likely to improve natural recruitment of Channel Catfish within Purtils Creek State Park Lake.

MANAGEMENT STRATEGIES

1. Introduce catfish spawning boxes throughout reservoir to potentially improve spawning habitat and recruitment into the fishery.
2. Evaluate the population and fishery as prescribed in the OBS plan.

ISSUE 3: The most recent creel data (2014–2015) indicated a high percentage of bank angling proportionally to boat angling on Purtils Creek State Park Lake. Two fishing piers and the surrounding accessible shoreline offer good access to anglers. Habitat around the fishing piers has been enhanced through the implementation of artificial structures, but attempts will continue in working to enhance the fishing quality for bank anglers at the park.

MANAGEMENT STRATEGIES

1. Install underwater green lighting on the two fishing piers to improve success of fishing by congregating fish near the piers at night.
2. Determine state park staff interest in installing and maintaining a fish feeder near the fishing piers. If park staff are interested, funding will be pursued through Conservation License Plate funds to add a fish feeder near one of the fishing piers to congregate fish and improve pier catch rates.

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 park staff to post appropriate signage at access points around the reservoir.
2. Contact and educate park staff about invasive species and provide them with posters and literature 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 (e.g., 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 Purtil Creek State Park Lake include Blue and Channel Catfish, Largemouth Bass, and White Crappie. Important forage species include Gizzard Shad, Threadfin Shad, and sunfishes.

Low-density fisheries

White Bass: Historically, White Bass catch rates from gill netting have been low (2009 4.6/nn; 2013 0.2/nn). Furthermore, no directed angler effort was recorded for White Bass in the most recent creel survey (2014-2015), further indicating a negligible fishery.

Blue Catfish: Few Blue Catfish remain in Purtil Creek from stockings in 2000 and 2003, and very few have been collected in gill nets or documented in creel surveys.

Survey objectives, fisheries metrics, and sampling objectives

Crappie: Historically the crappie fishery has been dominated by White Crappie, however, Black Crappie do exist in Purtil Creek at a relatively low abundance. Crappie are a popular sport fish in Purtil Creek and accounted for 19.6% of the directed angler effort during the most recent creel survey (2014–2015).

Due to the popularity of this fishery in Purvis Creek, crappie trend data on relative abundance, size structure, body condition, and growth (measured by CPUE, PSD, W_r , age at 10 inches) will continue to be monitored every four years to determine large-scale changes in the population and as a tool to promote the population to park visitors and area anglers. Historical fall trap netting data suggests that sampling objectives ($RSE \leq 25$ for CPUE-stock, $N \geq 50$ for stock-size fish) can be met with 10 randomly selected sampling sites. A minimum of 10 randomly selected trap netting sites will be sampled in the fall of 2024 with up to 5 additional randomly selected stations, if needed, to meet survey objectives. If captured, a sample of 13 White Crappie will be collected for ageing near the minimum length limit (9.0 to 10.9 inches).

Channel Catfish: Channel Catfish were the third most popular species targeted during the most recent creel survey (2014–2015; 8.4% directed effort). Historically, the Channel Catfish population was sampled with gill nets alongside the White Bass and Blue Catfish population. The low density and infrequent catches of Blue Catfish coupled with a negligible White Bass fishery has led to the exploration of other gear types. Hoop nets will continue to be evaluated to determine if they are an adequate gear to sample Channel Catfish at Purvis Creek. Nine randomly selected hoop net sites will be sampled in the summer of 2024. No additional sampling effort be expended for Channel Catfish.

Largemouth Bass: Largemouth Bass was the most popular species targeted during the last creel survey (2014–2015; 22.7% directed effort). Purvis Creek has a history of producing trophy Largemouth Bass including the lake record, a 13.73-pound fish caught in 1995 and four TPWD Legacy ShareLunker entries (1994, 1996, 2006, 2010); however, recent fall electrofishing surveys have displayed poor abundance. While declining abundance of Largemouth Bass within fall electrofishing surveys coincided with the recent regulation change, we do not attribute this decline to increased fishing mortality as Purvis Creek has a history of producing variable results within fall electrofishing surveys. Continued monitoring will occur to further evaluate the efficacy of the recent regulation change. Bass trend data on relative abundance, size structure, body condition, and growth (CPUE, PSD, W_r , age at 14 inches) will continue to be monitored with biennial nighttime electrofishing, alternating between spring (2022) and fall (2024) surveys. 12 randomly selected nighttime electrofishing stations will be conducted in spring 2022, with up to 6 additional stations, if needed, to collect at least 50 stock-size fish. Otoliths will be removed from 13 specimens (13.0 – 14.9 inches) during the 2024 survey for age and growth analysis. Age and growth analysis has not occurred on Purvis Creek since 2012; therefore, additional biologist selected stations will occur, if needed, to collect 13 specimens. 12 randomly selected stations will be conducted in fall 2024 with nighttime electrofishing with additional stations, if needed, to collect fish for age and growth analysis. Additionally, if standard fall surveys continue to produce poor catch rates, alternative sampling methods (e.g., biologist selected or spring-only surveys) will be considered to evaluate the Largemouth Bass population in Purvis Creek.

Prey Species: Gizzard Shad, Threadfin Shad, and sunfishes are all important prey species in Purvis Creek. Long term monitoring trend data is desired for these populations to evaluate their relative abundance (CPUE), size structure (PSD), and IOV. Relative weights of the Largemouth Bass population, along with size structure of the sunfish and shad communities will be used to gauge prey fish availability for sport fishes. In accordance with the Largemouth Bass sampling objectives, 12 randomly selected night-time electrofishing sites will be sampled in the fall of 2024. No additional sampling effort be expended for Bluegill, Gizzard Shad, or Threadfin Shad.

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Tables and Figures

Table 1. Characteristics of Purtis Creek State Park Lake, Texas.

Characteristic	Description
Year constructed	1985
Controlling authority	Texas Parks and Wildlife Department
County	Henderson and Van Zandt
Reservoir type	Tributary
Shoreline Development Index (SDI)	3.4
Conductivity	0.000212 mho/cm

Table 2. Boat ramp characteristics for Purtis Creek, Texas, August 2020. Reservoir elevation at time of survey was 315 feet above mean sea level.

Boat ramp	Latitude Longitude (dd)	Public	Parking capacity (N)	Elevation at end of boat ramp (ft)	Condition
State Park Ramp	32.35755 - 95.99502	Y	21	309	Excellent, no access issues

Table 3. Harvest regulations for Purtis Creek State Park Lake, Texas.

Species	Bag limit	Length limit
Catfish: Channel and Blue Catfish, their hybrids and subspecies	5 (in any combination)	None
Flathead Catfish	5	18-inch minimum
White Bass	25	10-inch minimum
Largemouth Bass	5 (only 1 > 24 inches may be retained to submit to the ShareLunker program)	16-inch maximum
Crappie: White and Black crappie, their hybrids and subspecies	25 (in any combination)	10-inch minimum

Table 4. Stocking history of Purtil Creek State Park Lake, Texas. Size categories are: FRY = fry; FGL = fingerling; AFGL = advanced fingerling; ADL = adults.

Species	Year	Number	Size
Threadfin Shad	1985	1,840	ADL
	1994	500	ADL
	Total	2,340	
Blue Catfish	2000	8,906	FGL
	2003	8,746	FGL
	Total	17,652	
Channel Catfish	1985	54,140	FGL
	1986	10,080	FGL
	1987	4,400	FGL
	1989	11,230	ADL
	1990	177,503	FGL
	1991	8,875	FGL
	1992	14,650	FGL
	1993	17,882	FGL
	1994	8,876	FGL
	1995	8,170	FGL
	1995	2,703	ADL
	1996	8,850	ADL
	1998	8,973	FGL
	1999	8,870	FGL
	2001	8,875	FGL
	2002	8,875	FGL
	2005	20,824	FGL
	2006	4,604	FGL
	2009	12,288	FGL
	2009	6,187	AFGL
2010	14,741	FGL	
2013	3,750	FGL	
2014	2,204	FGL	
2016	4,039	FGL	
2017	8,761	FGL	
2018	9,047	FGL	
2019	8,787	FGL	
Total	458,184		
Bluegill	1994	2,500	FGL
Bluegill x Green Sunfish	1997	700	FGL
Coppernose Bluegill	1987	7,300	FGL

Table 4. Stocking history continued.

Name	Year	Number	Size
Redear Sunfish	1985	86,792	FGL
Largemouth Bass	1995	19,959	FGL
	1996	17,987	FGL
	Total	37,946	
Florida Largemouth Bass	1985	31,440	FGL
	1985	248	ADL
	2019	68,045	FRY
	Total	99,733	
ShareLunker Largemouth Bass	2006	8,734	AFGL
	2008	8,807	AFGL
	2010	3,919	AFGL
	2012	2,720	AFGL
	Total	24,180	
Grass Carp	2007	1,000	ADL

Table 5. Objective-based sampling plan components for Purtil Creek State Park Lake, Texas 2018 – 2020.

Gear/target species	Survey objective	Metrics	Sampling objective
<i>Electrofishing (fall 2020)</i>			
Largemouth Bass	Relative 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)
Bluegill ^a	Relative abundance	CPUE – Total	RSE ≤ 25
	Size structure	PSD, length frequency	$N \geq 50$
Gizzard Shad ^a	Relative abundance	CPUE – Total	RSE ≤ 25
	Prey availability	IOV	$N \geq 50$
<i>Electrofishing (fall 2018)</i>			
Largemouth Bass	Relative abundance	CPUE – stock	RSE-Stock ≤ 25
	Size structure	PSD, length frequency	$N \geq 50$ stock
<i>Trap netting</i>			
Crappie	Relative abundance	CPUE – stock	RSE-Stock ≤ 25
	Size structure	PSD, length frequency	$N = 50$
	Age-and-growth	Age at 10 inches	$N = 13$, 9.0 – 10.9 inches
	Condition	W_r	10 fish/inch group (max)
<i>Tandem hoop netting</i>			
Channel Catfish	Relative abundance	CPUE – stock	RSE-Stock ≤ 25

^a No additional effort was expended to achieve an RSE ≤ 25 for Bluegill and Gizzard Shad CPUE if not reached from designated Largemouth Bass sampling effort. Instead, Largemouth Bass body condition provided information on forage abundance, vulnerability, or both relative to predator density.

Table 6. Survey of aquatic vegetation, Purtis Creek State Park Lake, Texas, 2014 – 2020. Surface area (acres) is listed with percent of total reservoir surface area in parentheses.

Vegetation	2014	2015	2016	2020
<u>Native submersed</u>			Trace	
Pondweed			Trace	Trace
Eelgrass				
Waterstargrass				Trace
<u>Native floating-leaved</u>				
American lotus			Trace	Trace
<u>Native emergent</u>				
Cattail			Trace	<1(<1)
Bull tongue			Trace	Trace
Water primrose			Trace	Trace
Waterwillow			<1(<1)	<1(<1)
Smartweed			<1(<1)	
Buttonbush			Trace	Trace
Waterleaf			<1(<1)	Trace
Panicum sp.			<1(<1)	
Bulrush				Trace
<u>Non-native</u>				
Alligator weed (Tier III)*			Trace	
Hydrilla (Tier III)*	Trace	Trace	Trace	

* Tier III is Watch Status

Gizzard Shad

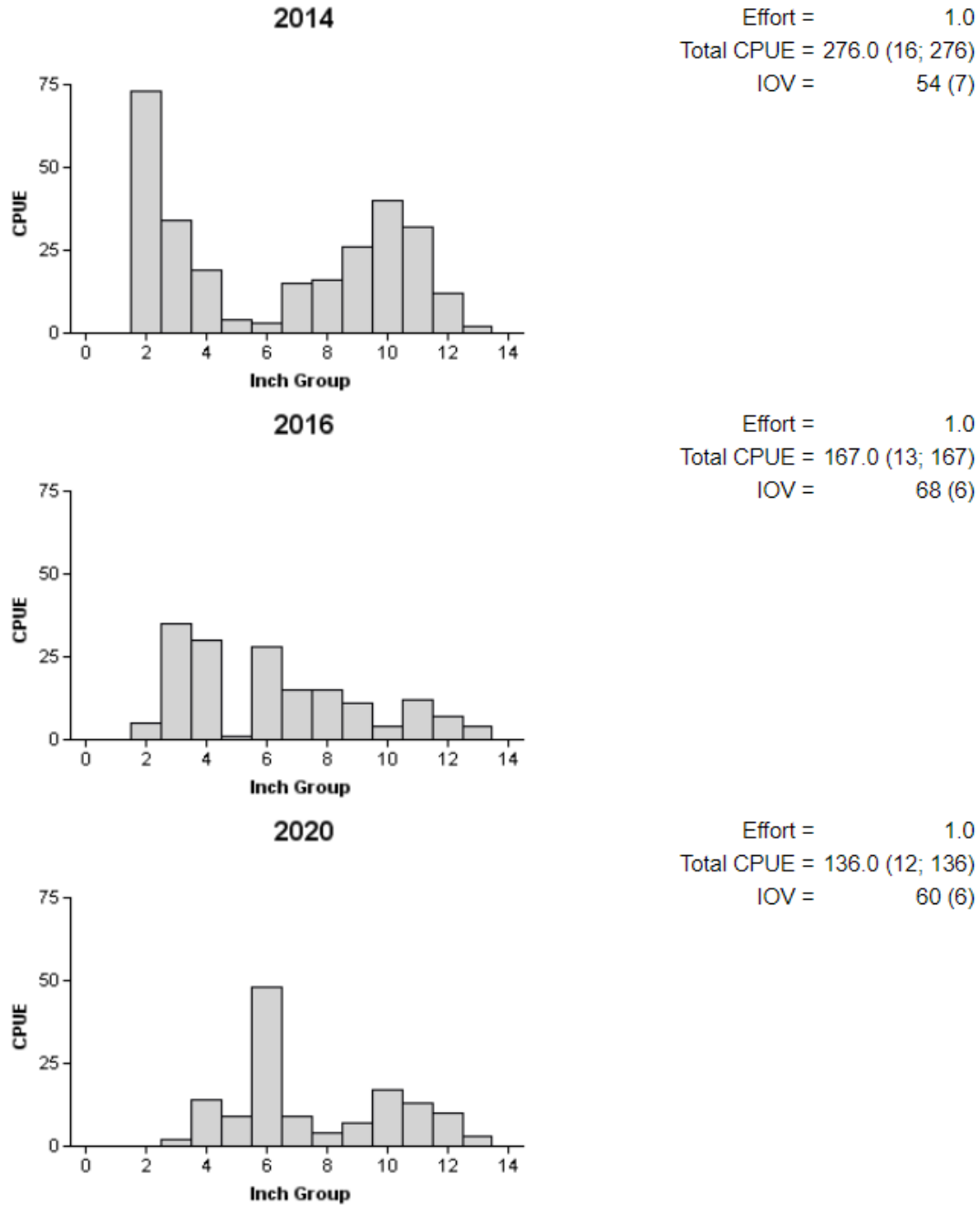
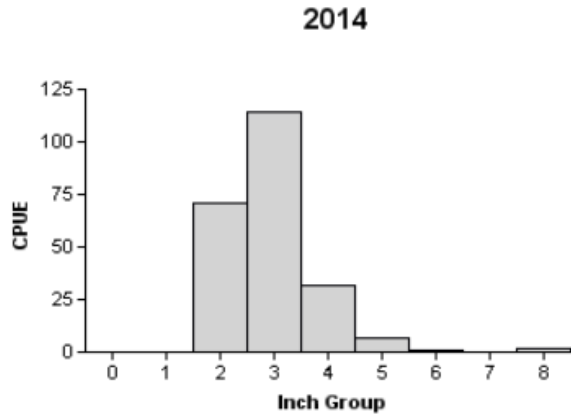
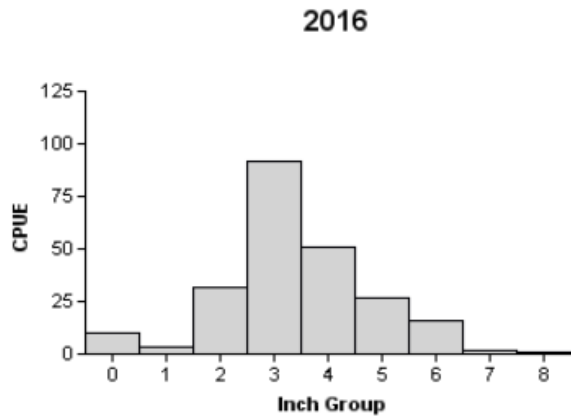


Figure 1. Number of Gizzard Shad caught per hour (CPUE) and population indices (RSE and N for CPUE and SE for IOV are in parentheses) for fall electrofishing surveys, Purtil Creek State Park Lake, Texas, 2014, 2016, and 2020.

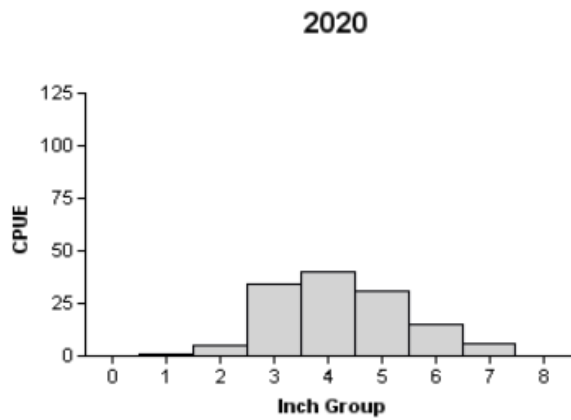
Bluegill



Effort = 1.0
 Total CPUE = 227.0 (11; 227)
 PSD = 2 (1)



Effort = 1.0
 Total CPUE = 234.0 (22; 234)
 PSD = 10 (3)



Effort = 1.0
 Total CPUE = 132.0 (17; 132)
 PSD = 17 (6)

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, Purtil Creek State Park Lake, Texas, 2014, 2016, and 2020.

Channel Catfish

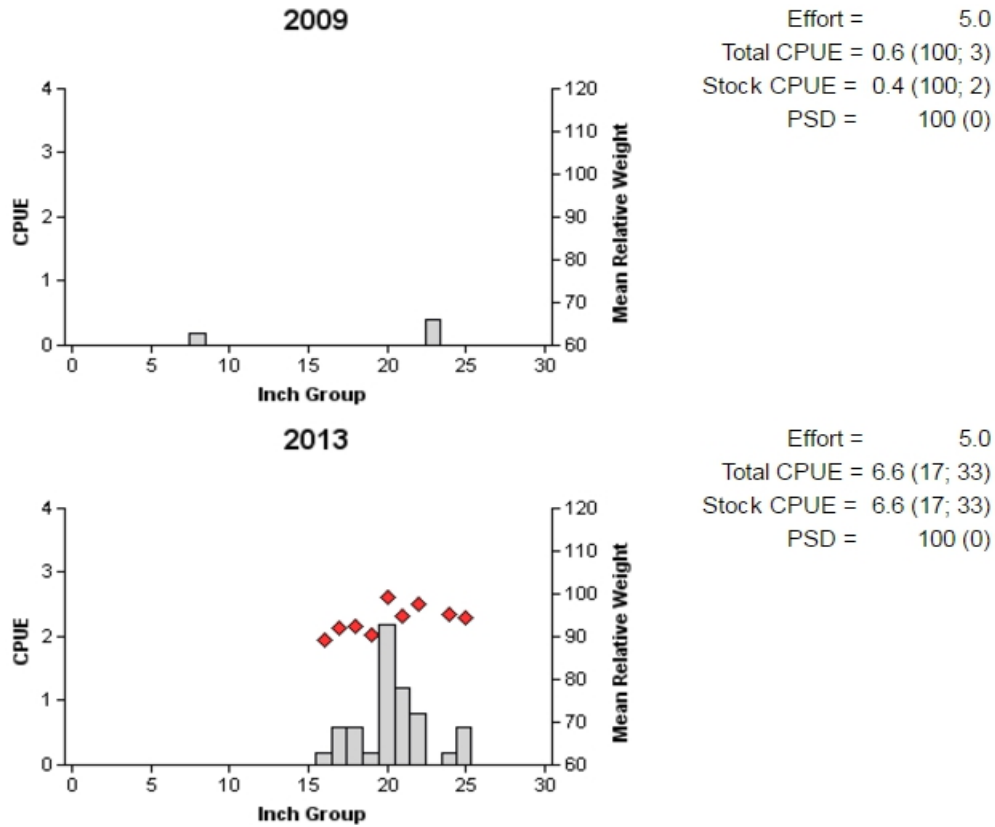


Figure 3. Number of Channel Catfish caught per gill net night (CPUE, bars), mean relative weight (diamonds) and population indices (RSE and N for CPUE and SE for size structure are in parentheses) for spring gill net surveys, Purtil Creek State Park Lake, Texas.

Channel Catfish

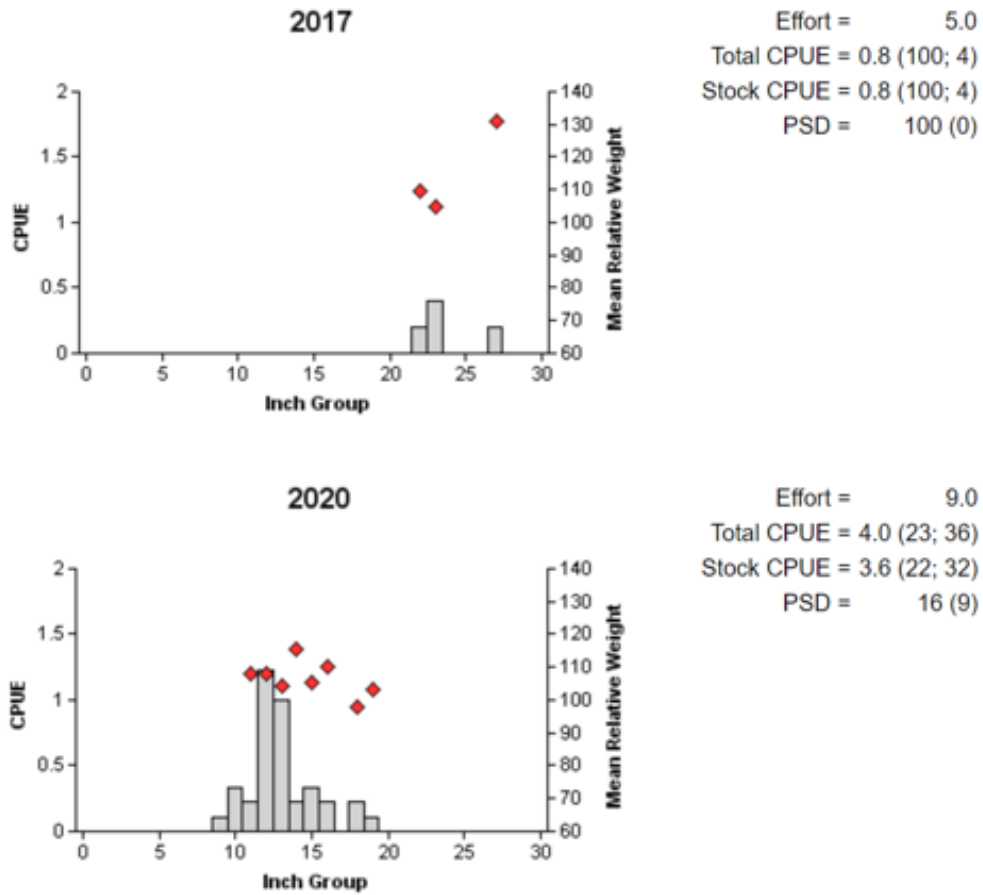


Figure 4. Number of Channel Catfish caught per hoop net series (CPUE, bars), mean relative weight (diamonds) and population indices (RSE and N for CPUE and SE for size structure are in parentheses) for spring (2017) and fall (2020) hoop net surveys, Purtils Creek.

Largemouth Bass

Fall Surveys

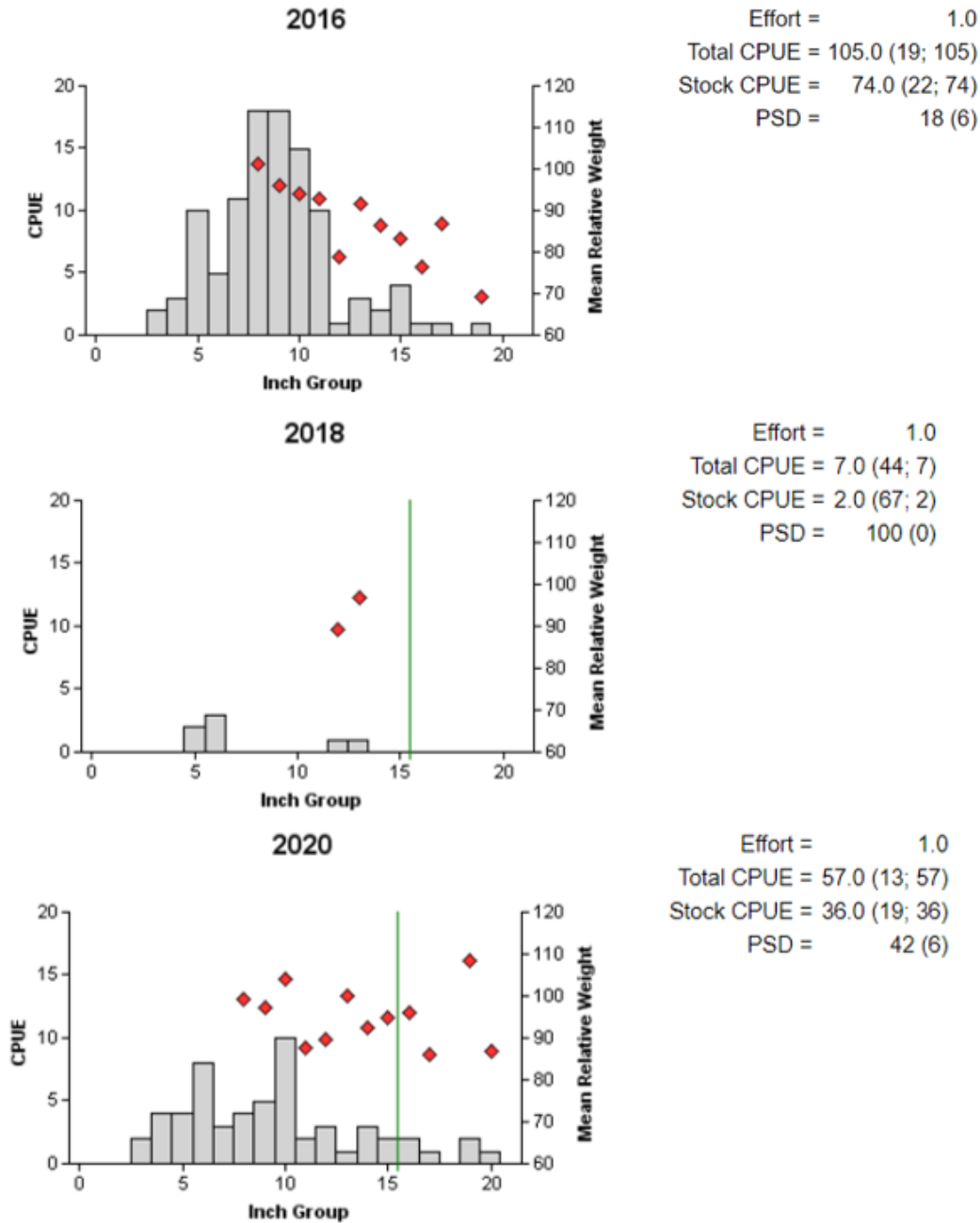


Figure 5. Number of Largemouth Bass caught per hour (CPUE, bars), mean relative weight (diamonds), and population indices (RSE and N for CPUE and SE for size structure are in parentheses) for fall electrofishing surveys, Puritus Creek State Park Lake, Texas, 2014

Largemouth Bass Spring Surveys

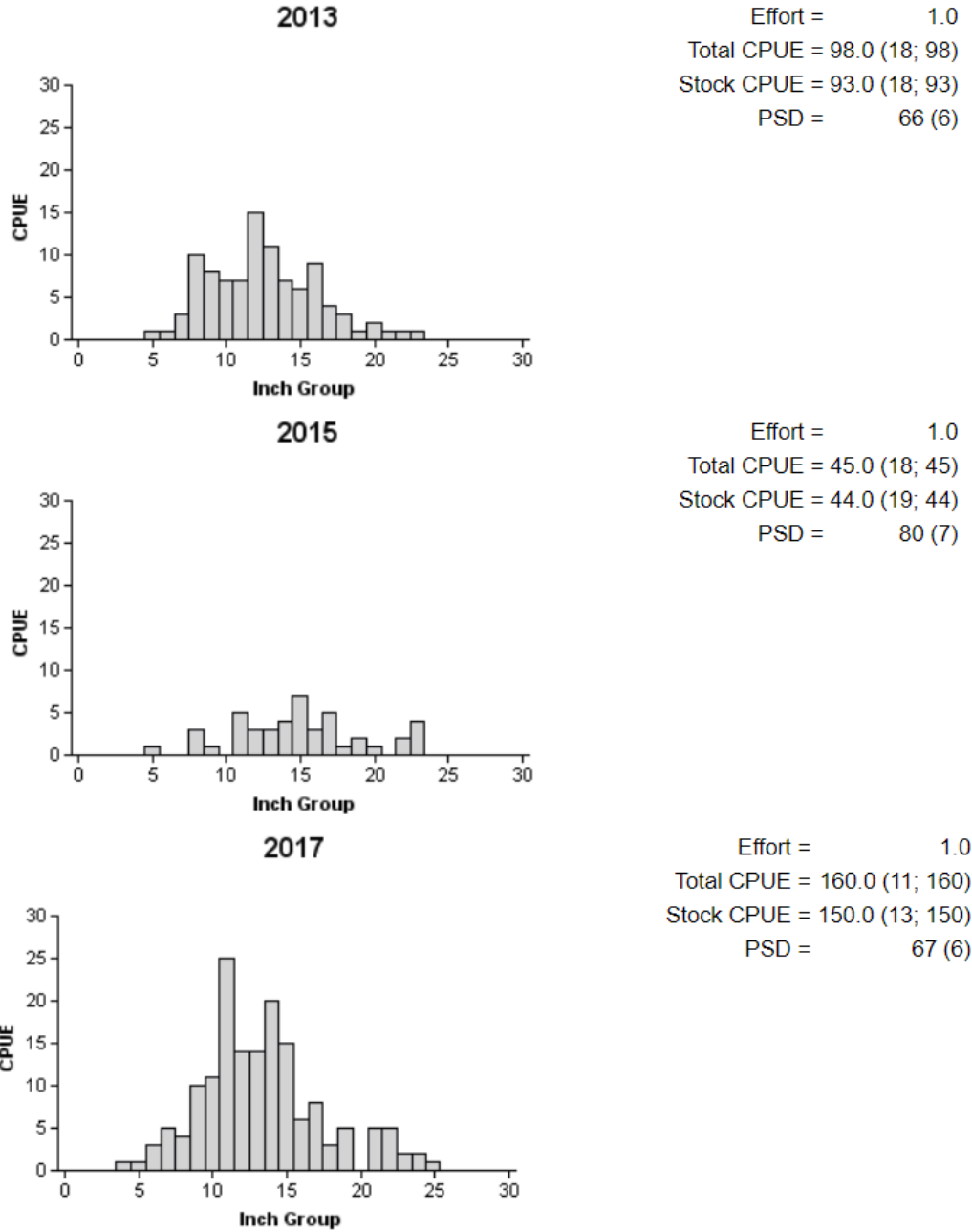


Figure 6. Number of Largemouth Bass caught per hour (CPUE, bars), and population indices (RSE and N for CPUE and SE for size structure are in parentheses) for spring electrofishing surveys, Purtil Creek State Park Lake, Texas, 2013, 2015, and 2017.

White Crappie

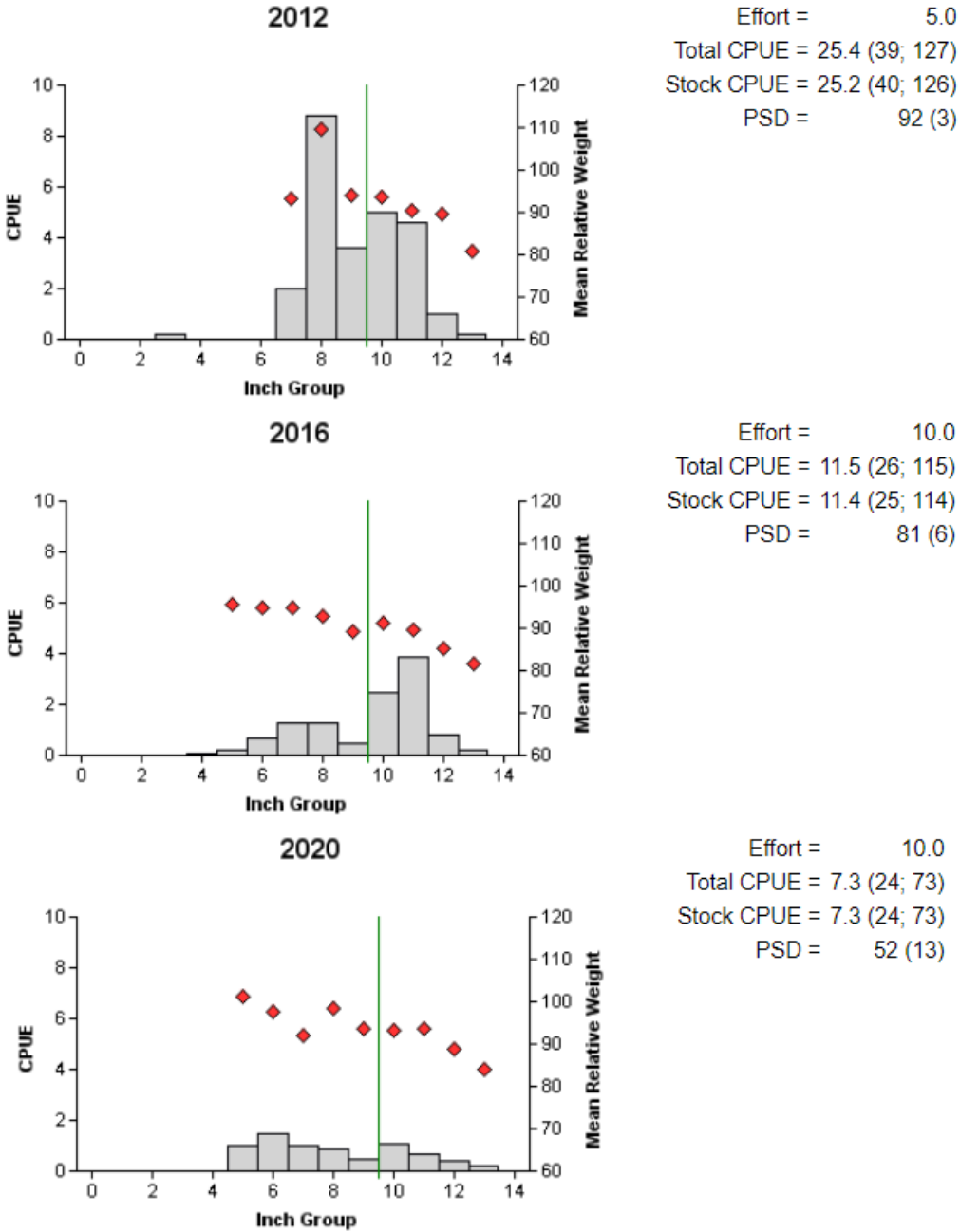


Figure 7. Number of White Crappie caught per net night (CPUE, bars), mean relative weight (diamonds), and population indices (RSE and N for CPUE and SE for size structure are in parentheses) for fall trap netting surveys, Purtil Creek State Park Lake, Texas, 201

Table 7. Proposed sampling schedule for Purtis Creek State Park Lake, Texas. Survey period is June through May.

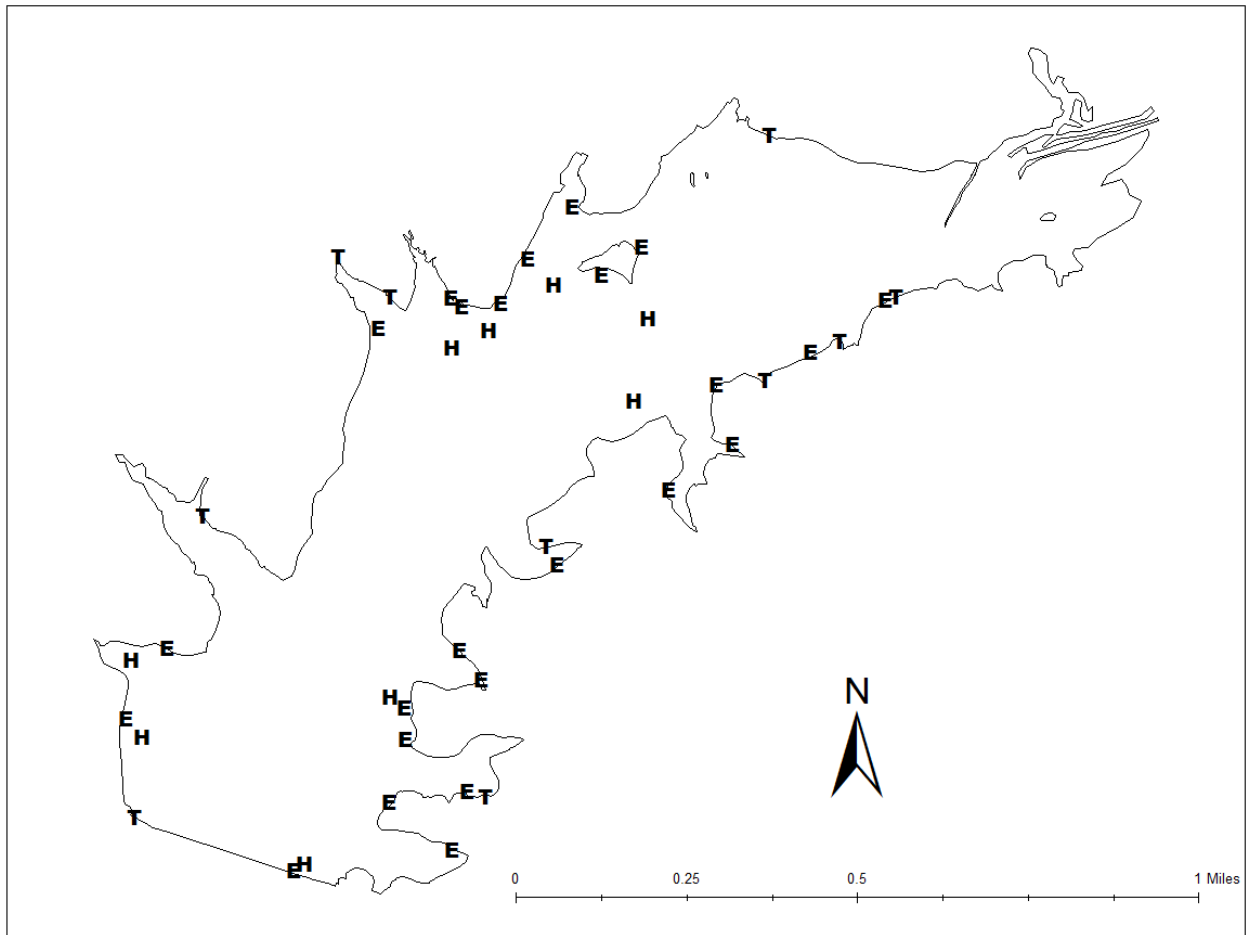
	Survey year			
	2021–2022	2022–2023	2023–2024	2024–2025
Angler Access				X
Vegetation				X
Electrofishing – Fall				X
Electrofishing – Spring	X			
Trap netting				X
Hoop-netting				X
Report				X

APPENDIX A – Catch rates for all species from all gear types

Number (N) and catch rate (CPUE; RSE in parentheses) of all target species collected from all gear types from Purtil Creek State Park Lake, Texas, 2020. Sampling effort was 9 series for hoop netting, 10 net nights for trap netting, and 1 hour for electrofishing.

Species	Hoop Netting		Trap Netting		Electrofishing (2020)	
	N	CPUE	N	CPUE	N	CPUE
Gizzard Shad					136	136.0 (12)
Threadfin Shad					2,145	2,145.0 (31)
Channel Catfish	36	4.0 (23)				
Redbreast Sunfish					34	34.0 (27)
Bluegill					132	132.0 (17)
Longear Sunfish					11	11.0 (49)
Redear Sunfish					49	49.0 (16)
Redspotted Sunfish					2	2.0 (100)
Largemouth Bass					57	57.0 (13)
White Crappie			73	7.3 (24)		
Black Crappie			2	0.2 (67)		

APPENDIX B – Map of sampling locations



Location of electrofishing (E), trap netting (T), and hoop netting (H) stations, Puritis Creek State Park Lake, Texas, 2018–2020. Water was near full pool at the time of sampling.



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