

Lake Timpson

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 Summary

Fish populations in Lake Timpson were surveyed in 2020 using fall electrofishing and trap netting and in 2021 using spring electrofishing (Largemouth Bass only). Historical data are presented with the 2020-2021 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: Lake Timpson is located in Shelby County. The Shelby County Freshwater Supply District is the controlling authority. Primary uses are water supply and recreation. This reservoir has a surface area of 223 acres, a shoreline length of 8 miles, and an average depth of 8 feet. Water level fluctuations average 1-3 feet annually. Boat and bank access are adequate, with one boat ramp present.

Management History: Important sport fish included Largemouth Bass and crappie. Prior to 1994, Largemouth Bass were managed under statewide regulations. In 1994, Largemouth Bass regulations were changed to a 14- to 21-inch slot length limit. This regulation has had the desired effect of producing increased numbers of Largemouth Bass that are within the protective slot length limit. In 2003, hydrilla was found in Lake Timpson, and coverage expanded to 40% of the reservoir surface area in 2004. Triploid Grass Carp were stocked in 2004 at a rate of 5 fish/vegetated acre (448 fish) to reduce hydrilla coverage. Since 2006, no hydrilla has been observed. In 2010, giant salvinia was discovered, and eradication efforts were attempted with numerous herbicide treatments; no plants were observed in 2011 or 2012. However, giant salvinia reappeared in 2013 and coverage peaked at 13 acres in 2017. Since then, routine herbicide treatments have maintained abundance at < 1 acre.

Fish Community

- **Prey species:** Threadfin and Gizzard Shad were present in the reservoir, with Gizzard Shad first detected in 2016. Since the previous survey in 2016, electrofishing catch rates of Redbreast Sunfish and Bluegill increased while Redear Sunfish relative abundance decreased. Potential exists for a sunfish fishery, as a high number of Redbreast and Redear Sunfish > 6 inches were collected.
- **Catfishes:** Blue Catfish were stocked in 1998, but only four large fish (> 36 inches) have been collected since 2008, indicating no natural recruitment. Channel Catfish catch in past surveys has also been low, indicating poor recruitment. Anecdotal information indicates few anglers target catfish. Directed sampling effort for catfish was discontinued in 2016.
- **Largemouth Bass:** Largemouth Bass were relatively abundant. Population size structure from recent surveys indicate the protective slot length limit has had the desired effect, with an abundance of Largemouth Bass within the 14-21 inch slot length limit. Largemouth Bass had adequate growth rates and were in moderate condition.
- **Crappies:** White Crappie abundance was relatively low. Black Crappie were abundant, although trap net catch rates in 2020 did decline from those observed in 2016. High numbers of legal length fish were available to anglers.

Management Strategies: Continue to manage Largemouth Bass with a 14- to 21-inch slot length limit. Continue to monitor trends of hydrilla and giant salvinia coverage through annual aquatic vegetation surveys. Promote status of crappie and sunfish populations in local media to increase interest in these fisheries.

Introduction

This document is a summary of fisheries data collected from Lake Timpson from 2020-2021. 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 2017-2021 data for comparison.

Reservoir Description

Lake Timpson is a 223-acre impoundment constructed in 1956. It is located in Shelby County approximately 5 miles northeast of Garrison and is operated and controlled by the Shelby County Freshwater Supply District. Primary water uses include municipal water supply and recreation. Secchi disc readings are typically 2-4 feet. Habitat at time of sampling consisted of rocks, boat docks, and limited aquatic vegetation. The majority of the land surrounding the reservoir is used for agriculture, timber production, and residential development. Other descriptive characteristics for Lake Timpson are in Table 1.

Angler Access

Lake Timpson has one public boat ramp and a courtesy dock is present. Additional boat ramp characteristics are in Table 2. Shoreline access is limited to the public boat ramp area.

Management History

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

1. Conduct annual aquatic vegetation surveys and coordinate with anglers and county officials if hydrilla reappears.

Action: Annual vegetation surveys were conducted from 2017-2020. No hydrilla was observed.

2. Continue to coordinate with Aquatic Habitat Enhancement (AHE) regarding the ongoing herbicide treatments of giant salvinia.

Action: Aquatic vegetation surveys were conducted from 2017-2020 with little to no giant salvinia observed. AHE has introduced giant salvinia weevils as a biological control and conducted several herbicide treatments as needed from 2017 through present.

3. Continue to monitor Largemouth Bass size structure and growth to assess the success of the implemented slot limit by fall and spring electrofishing.

Action: Fall and spring electrofishing surveys were conducted, and growth was examined in 2020/2021.

4. Publicize survey results via local media to ensure anglers are aware of the current Redbreast and Redear Sunfish populations.

Action: Survey results were published in the Light and Champion newspaper in Center, Texas.

Harvest regulation history: Sport fishes in Lake Timpson are currently managed with statewide regulations, with the exception of Largemouth Bass (Table 3). Prior to 1994, Largemouth Bass were managed with statewide regulations. A 14- to 21-inch slot length limit was implemented in 1994 to improve Largemouth Bass population size structure, growth, and size of bass caught by anglers.

Stocking history: Blue and Channel Catfish have been stocked into the reservoir. Florida Largemouth Bass fingerlings were stocked in 1980 and again in 1996. Threadfin Shad were introduced in 1979. Triploid Grass Carp were stocked in 2004. The complete stocking history is in Table 4.

Vegetation/habitat management history: Hydrilla was first discovered in 2003. By 2004, coverage had expanded to a problematic amount (40% of reservoir surface area) and plant abundance was likely to increase in this shallow reservoir (mean depth is 8 feet). A Triploid Grass Carp stocking in 2004 (5 fish/vegetated acre) was successful, as no hydrilla has been documented since 2006. Giant salvinia was detected in 2010 and a rapid eradication response was implemented using herbicides. No plants were observed in 2011 or 2012. Giant salvinia was observed again in 2013 and coverage increased to 13 acres in 2017 (Table 6). Since 2017, herbicide treatments have maintained salvinia coverage to less than one surface acre.

Water transfer: Lake Timpson is primarily used for municipal water supply and recreation. Currently, there are no interbasin water transfers from the reservoir.

Methods

Surveys were conducted to achieve survey and sampling objectives in accordance with the objective-based sampling (OBS) plan for Lake Timpson (Ashe and Driscoll 2017). 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 2017).

Electrofishing – Largemouth Bass, sunfishes, Gizzard Shad, and Threadfin Shad were collected by electrofishing (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. Mean age at harvest length for Largemouth Bass were determined using otoliths from 4 randomly selected fish (range 13.5 to 14.5 inches).

Trap netting – Crappie were collected using trap nets (5 net nights at 5 stations). CPUE for trap netting was recorded as the number of fish caught per net night (fish/nn).

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 CPUE.

Habitat – A structural habitat survey was conducted in 2007. Vegetation surveys were conducted in 2017–2020 to monitor hydrilla and giant salvinia coverage. Habitat was assessed with the digital shapefile method (TPWD, Inland Fisheries Division, unpublished manual revised 2017).

Results and Discussion

Habitat: A structural habitat survey conducted in 2007 indicated that the littoral zone consisted primarily of rocky and natural shoreline (Ashe and Driscoll 2008). Hydrilla has not been documented since 2006. The eradication of hydrilla can likely be attributed to the Triploid Grass Carp stocking in 2004 and low water levels in 2005, 2006, and 2011. Native aquatic vegetation was present, but coverage was limited to approximately one surface acre (Table 6).

Prey species: Primary prey species included Threadfin Shad and Bluegill. Both species provided abundant prey. In 2020, catch rate of Threadfin Shad was 2,999.0/h (Appendix A). Bluegill catch rate was 414.0/h, an increase from 2012 (301.0/h) and 2016 (349.0/h) (Figure 3). Gizzard Shad were first observed in 2016 (9.0/h) and catch rate increased to 15.0/h in 2020; index of vulnerability (IOV) was 100 for both years. Redbreast and Redear Sunfish were relatively abundant in 2020 with catch rates of 85.0/h (Figure 2) and 129.0/h (Figure 4), respectively. Numbers of fish 6 – 9 inches in length were high enough to provide a quality fishery.

Largemouth Bass: The Largemouth Bass population was relatively abundant with desirable size structure. Fall electrofishing catch rate was 148.0/h in 2020, which was higher than in 2016 (93.0/h) but similar to 2012 (148.0/h) (Figure 5). Relative weights exceeded 90 for most inch classes, indicating Largemouth Bass were in adequate condition. Growth of Largemouth Bass was desirable; average age at 14 inches (13.5 to 14.5 inches) was 1.5 years (N = 4; range = 1 to 3 years), although a low sample size it indicates good growth may be taking place. Spring electrofishing surveys consistently reflected high abundance of fish within the protected slot-length limit and PSD values were high (range = 81 – 95) as well as PSD-14 values (range 73 – 82) (Figure 6). Overall catch rates were high and similar over the last three survey years (range = 122.0 – 136.0/h).

Crappies: Although both White and Black Crappie were present in the reservoir, Black Crappie were most abundant. White Crappie abundance has been relatively low over the past three trap net surveys,

ranging from 0 to 6.0/nh (Figure 7). Black Crappie abundance was relatively high in 2020 (23.0/h) but catch rates declined from 2016 (39.8/nh) (Figure 8). Approximately half of the total catch were fish of harvestable size (≥ 10 inches).

Fisheries Management Plan for Lake Timpson, Texas

Prepared – July 2021

ISSUE 1: Hydrilla in Lake Timpson was first documented by TPWD in 2003. By 2004, hydrilla was problematic as coverage reached 40% of the reservoir surface area. Further expansion of hydrilla was likely in this shallow reservoir (mean depth is 8 feet). Triploid Grass Carp were stocked at a rate of 5 fish/vegetated acre in 2004. No hydrilla has been observed since 2006. However, tubers may be present in the substrate and plant reintroduction is likely. In 2010, giant salvinia was introduced in Lake Timpson. After rapid treatment with herbicides, no plants were observed in 2011 or 2012. In 2013, giant salvinia reappeared, and coverage increased to a maximum of 13 acres in 2017. Since 2017, herbicide treatments have maintained salvinia coverage to less than one surface acre.

MANAGEMENT STRATEGY

1. Continue to monitor aquatic vegetation annually (2021-2024). If hydrilla reappears, meet with water district officials and anglers to develop an integrated aquatic vegetation management plan.
2. Continue to coordinate with Aquatic Habitat Enhancement regarding ongoing herbicide treatments.

ISSUE 2: Lake Timpson is currently managed with a 14-21 inch slot length limit. Although Lake Timpson is not characterized as a trophy Largemouth Bass fishery, a high-quality Largemouth Bass population is present. The last FLMB stocking was in 1996.

MANAGEMENT STRATEGY

1. Request FLMB stockings when there is available surplus.

ISSUE 3: Large Redbreast and Redear Sunfish (6 – 8 inches) and Black Crappie were relatively abundant. Popularity of both fisheries is unknown.

MANAGEMENT STRATEGY

1. Promote status of sunfish and crappie populations in local media to increase interest in these fisheries.

Objective-Based Sampling Plan and Schedule (2021–2025)

Sport fish, forage fish, and other important fishes

Sport fishes in Lake Timpson include Largemouth Bass, crappies, and Channel Catfish. Important forage species include Bluegill, Redear Sunfish, and Threadfin Shad.

Low-density fisheries

Historically, Channel Catfish population abundance has been low. Although no creel surveys have been conducted, anecdotal information indicates few anglers target Channel Catfish. No future directed sampling is planned.

Survey objectives, fisheries metrics, and sampling objectives

Largemouth Bass: Anecdotal information indicates that Largemouth Bass are the most popular sport fish in Lake Timpson. A 14- to 21-inch slot length limit was implemented in 1994 to improve population size structure. Since 2007, trend data on CPUE, size structure, and body condition have been collected every four years with fall and spring electrofishing. The population is abundant, recruitment rates have been consistently high, and size structure has been desirable and stable. Continuation of trend data with nighttime electrofishing in the fall and spring (2024/2025) will allow for determination of any large-scale changes in the Largemouth Bass population that may initiate 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; $RSE-S \leq 25$) is 5-8 stations with 80% confidence.

Average age of Largemouth Bass between 13.0 and 14.9 inches ($N = 13$) will be estimated in 2024.

Crappies: Although catch rates reflect cyclical abundance, trap netting is effective at Lake Timpson and reflects an abundant crappie population with desirable size structure. Since 2007, trend data on CPUE, size structure, and body condition have been collected every four years with fall trap netting. Continuation of this sampling should provide insight relative to any large-scale changes in the crappie population. The minimum of 5 randomly selected sites will be sampled (2024) to estimate size structure ($N = 50$ stock-size fish). An additional 5 sites will be sampled if the sample size is not reached.

Prey species: Threadfin Shad, Bluegill, and Redear Sunfish are the primary forage at Lake Timpson. Fall electrofishing in 2024, sampling the minimum of 12 random sites, will result in sufficient numbers of Bluegill and Redear Sunfish to achieve sampling objectives ($N = 50$ stock-size fish; $RSE-S \leq 25$). Largemouth Bass body condition (fish ≥ 8 " TL) will be used to provide additional information on forage abundance and vulnerability.

Literature Cited

- Anderson, R. O., and R. M. Neumann. 1996. Length, weight, and associated structural indices. Pages 447-482 in B. R. Murphy and D. W. Willis, editors. Fisheries techniques, 2nd edition. American Fisheries Society, Bethesda, Maryland.
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- DiCenzo, V. J., M. J. Maceina, and M. R. Stimpert. 1996. Relations between reservoir trophic state and Gizzard Shad population characteristics in Alabama reservoirs. *North American Journal of Fisheries Management* 16:888-895.
- Guy, C. S., R. M. Neumann, D. W. Willis, and R. O. Anderson. 2007. Proportional size distribution (PSD): a further refinement of population size structure index terminology. *Fisheries* 32(7): 348.

Tables and Figures

Table 1. Characteristics of Lake Timpson, Texas.

| Characteristic | Description |
|-----------------------------|--|
| Year constructed | 1956 |
| Controlling authority | Shelby County Freshwater Supply District |
| County | Shelby |
| Reservoir type | Tributary |
| Shoreline Development Index | 3.80 |
| Conductivity | 120 $\mu\text{S}/\text{cm}$ |

Table 2. Boat ramp characteristics for Lake Timpson, Texas, March 2021. Reservoir elevation at time of survey was 317 feet above mean sea level.

| Boat ramp | Latitude Longitude (dd) | Public | Parking capacity (N) | Elevation at end of boat ramp (ft) | Condition |
|------------------|-------------------------------|--------|----------------------------|--|---|
| Public Boat Ramp | 31.84521 -94.42646 | Y | 15 | 313 | Excellent. The parking lot was recently resurfaced. |

Table 3. Harvest regulations for Lake Timpson, 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 (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 |

Table 4. Stocking history of Lake Timpson, Texas. FGL = fingerling; AFGL = advanced fingerling; ADL = adults.

| Species | Year | Number | Size |
|-------------------------|-------|--------|------|
| Blue Catfish | 1998 | 3,027 | AFGL |
| Channel Catfish | 1966 | 12,000 | AFGL |
| | 1992 | 2,000 | AFGL |
| | 1995 | 5,934 | AFGL |
| | Total | 19,934 | |
| Flathead Catfish | 1992 | 16 | ADL |
| Florida Largemouth Bass | 1980 | 10,000 | FGL |
| | 1996 | 5,981 | FGL |
| | Total | 15,981 | |
| Triploid Grass Carp | 2004 | 448 | AFGL |
| Threadfin Shad | 1979 | 1,200 | AFGL |

Table 5. Objective-based sampling plan components for Lake Timpson, Texas 2020–2021.

| 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) |
| Bluegill ^a | Abundance | CPUE – Total | |
| | Size structure | PSD, length frequency | $N \geq 50$ |
| Threadfin Shad ^a | Abundance | CPUE – Total | |
| Gizzard Shad ^a | Abundance | CPUE – Total | |
| | Size structure | PSD, length frequency | $N \geq 50$ |
| | Prey availability | IOV | $N \geq 50$ |
| <i>Trap netting</i> | | | |
| Crappies | Abundance | CPUE - Total | |
| | Size structure | PSD, length frequency | $N \geq 50$ |

^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.

Table 6. Survey of aquatic vegetation, Lake Timpson, Texas, 2016–2020. Surface area (acres) is listed with percent of total reservoir surface area in parentheses.

| Species | 2016 | 2017 | 2018 | 2019 | 2020 |
|---------------------------|---------|---------|---------|--------|---------|
| Coontail | | | <1 (<1) | | |
| Water primrose | | | | | 1 (<1) |
| Giant cutgrass | <1 (<1) | | | | |
| Spikerush | <1 (<1) | | | | |
| Southern naiad | | 27 (12) | <1 (<1) | | 1 (<1) |
| Arrowhead | | | | | <1 (<1) |
| Cattail | | | | | <1 (<1) |
| Lyngbya | | | | 10 (4) | |
| Giant salvinia (Tier II)* | <1 (<1) | 13 (6) | | | <1 (<1) |

* Tier II is Maintenance

Gizzard Shad

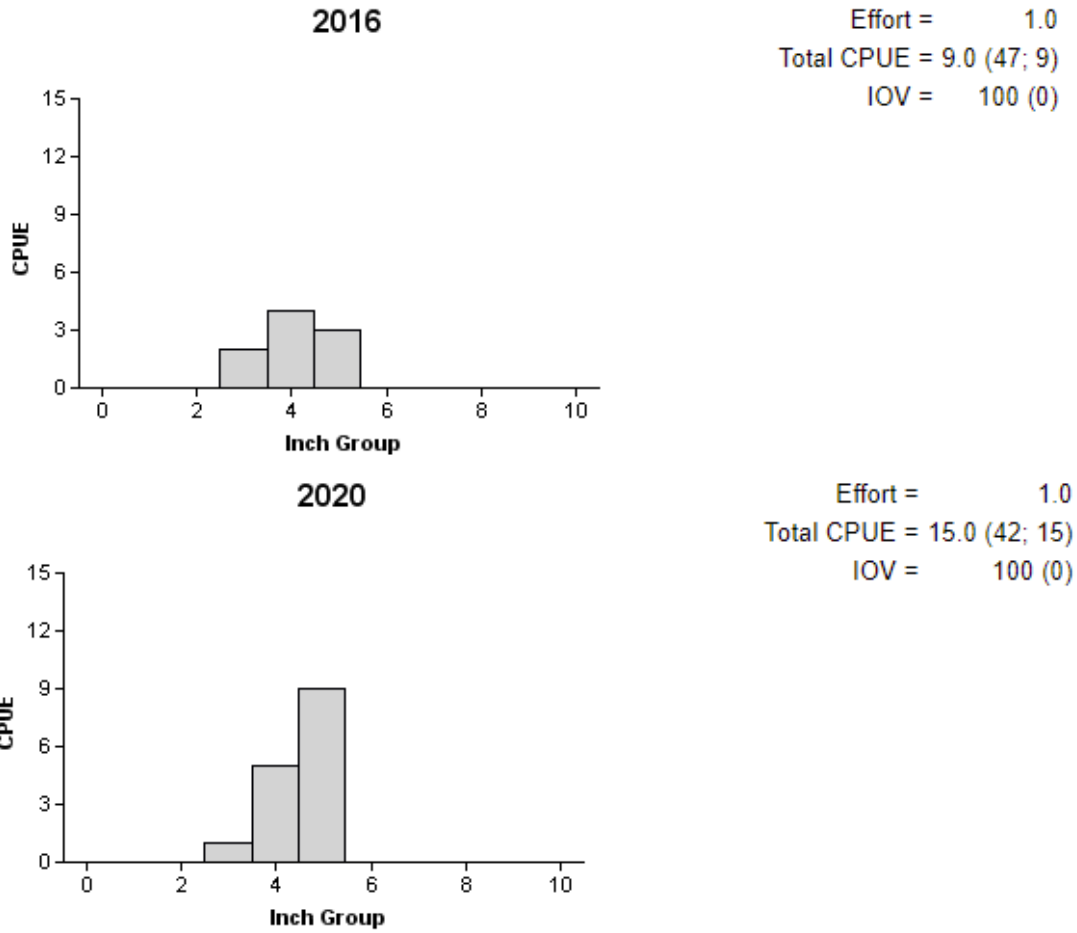


Figure 1. Number of Gizzard Shad caught per hour (CPUE) and population indices (RSE and N for CPUE and SE for IOV are in parentheses) for fall electrofishing surveys, Lake Timpson, Texas, 2016 and 2020. No Gizzard Shad were collected in 2012.

Redbreast Sunfish

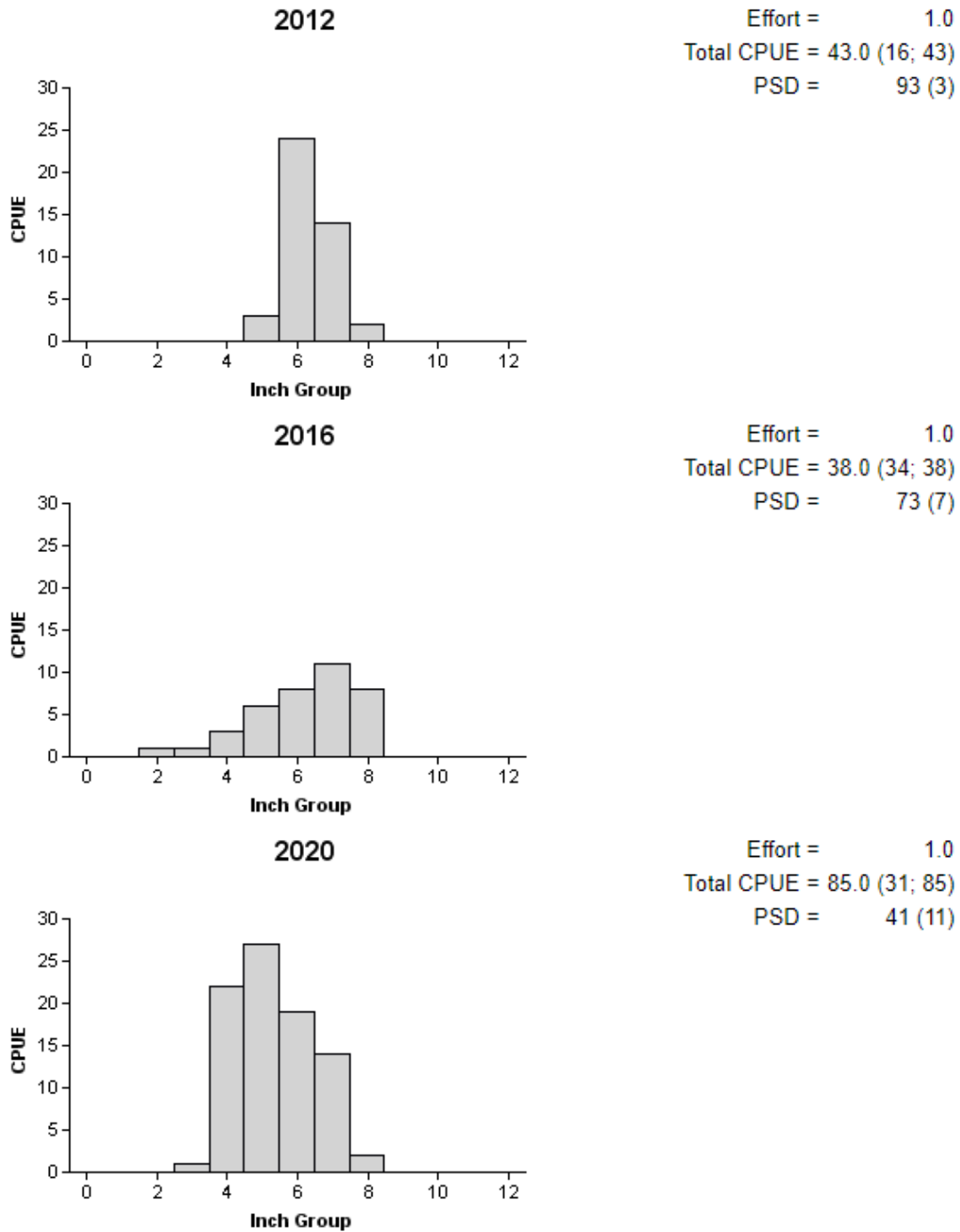


Figure 2. Number of Redbreast Sunfish caught per hour (CPUE) and population indices (RSE and N for CPUE and SE for size structure are in parentheses) for fall electrofishing surveys, Lake Timpson, Texas, 2012, 2016, and 2020.

Bluegill

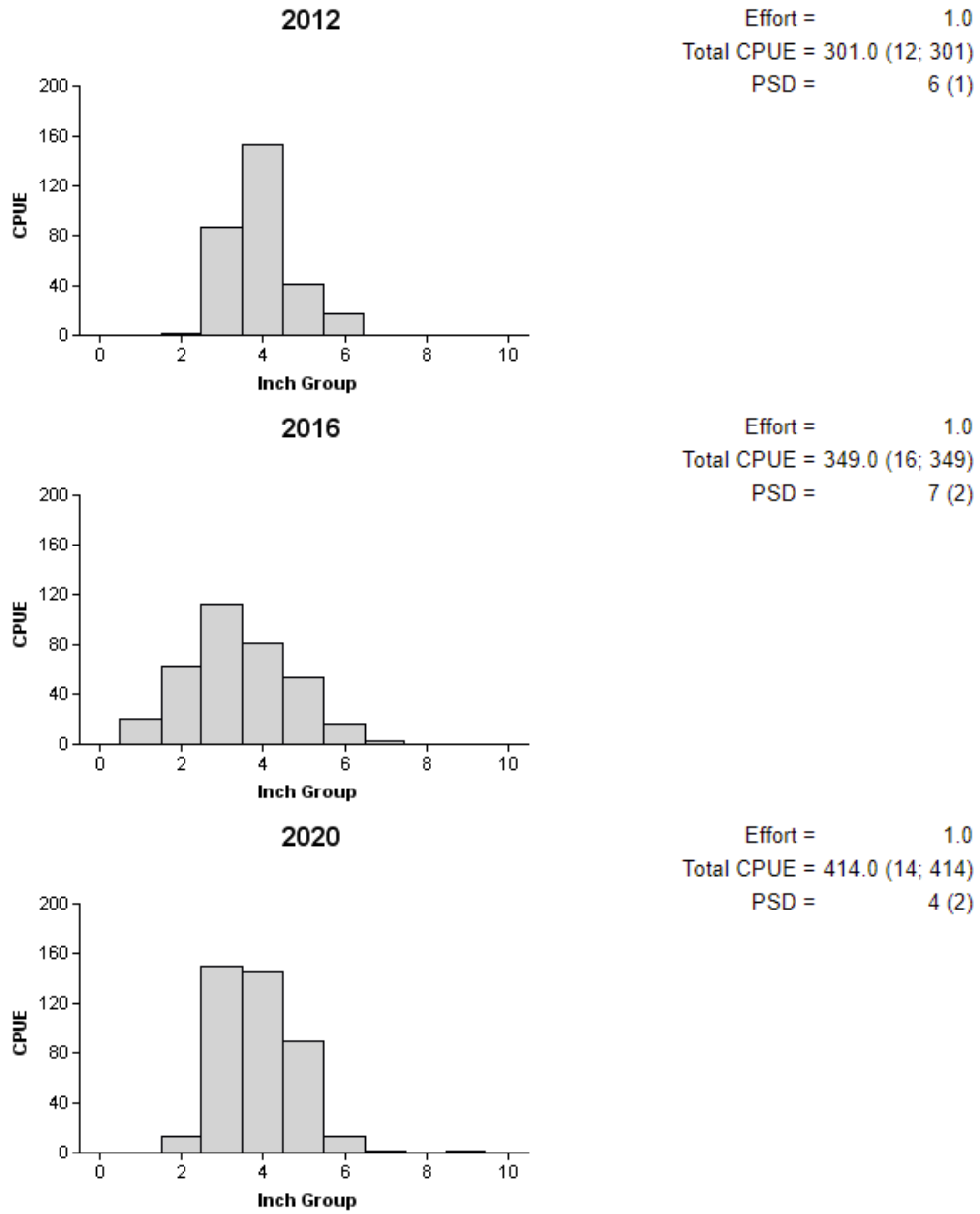


Figure 3. Number of Bluegill caught per hour (CPUE) and population indices (RSE and N for CPUE and SE for size structure are in parentheses) for fall electrofishing surveys, Lake Timpson, Texas, 2012, 2016, and 2020.

Redear Sunfish

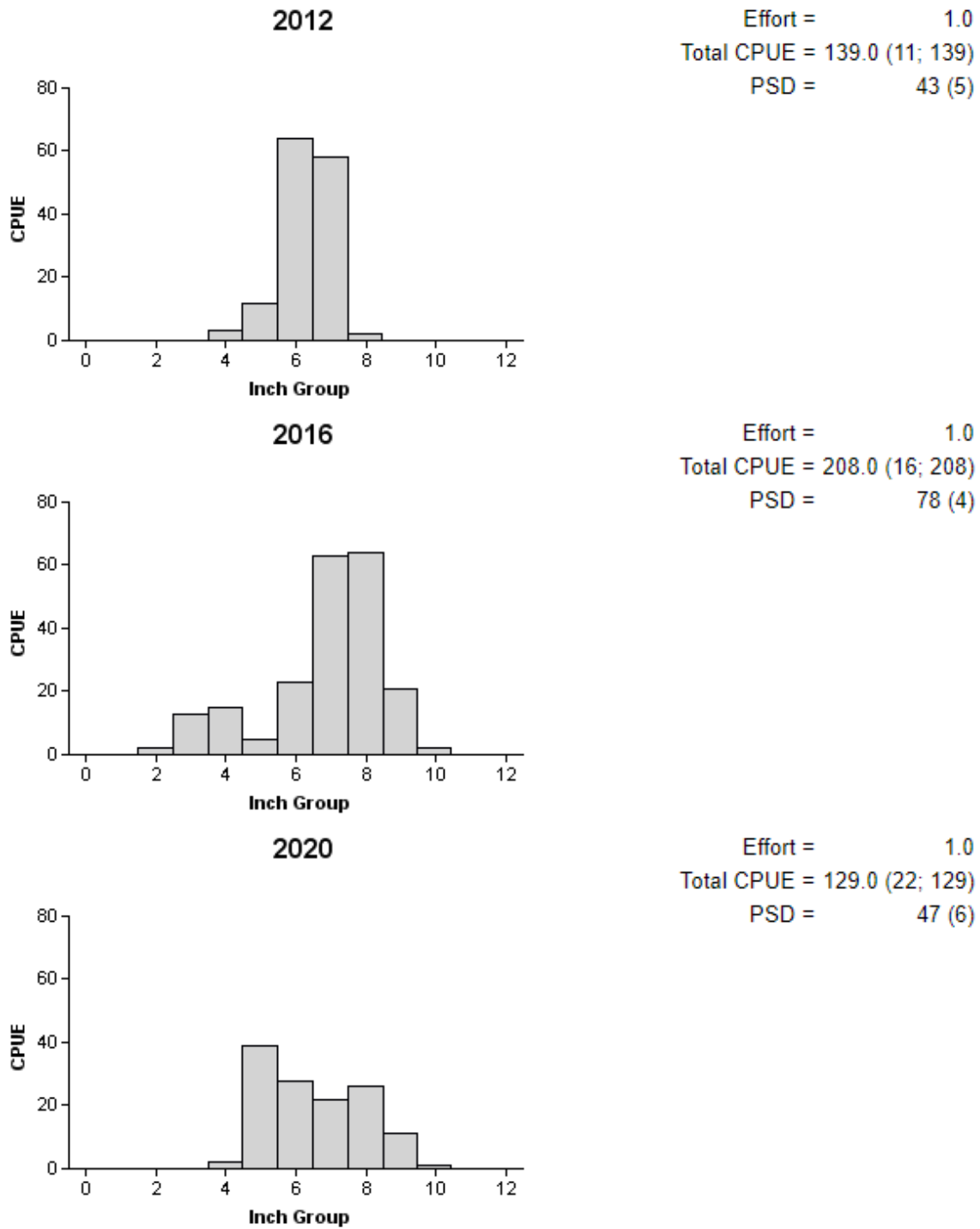


Figure 4. Number of Redear Sunfish caught per hour (CPUE) and population indices (RSE and N for CPUE and SE for size structure are in parentheses) for fall electrofishing surveys, Lake Timpson, Texas, 2012, 2016, and 2020.

Largemouth Bass

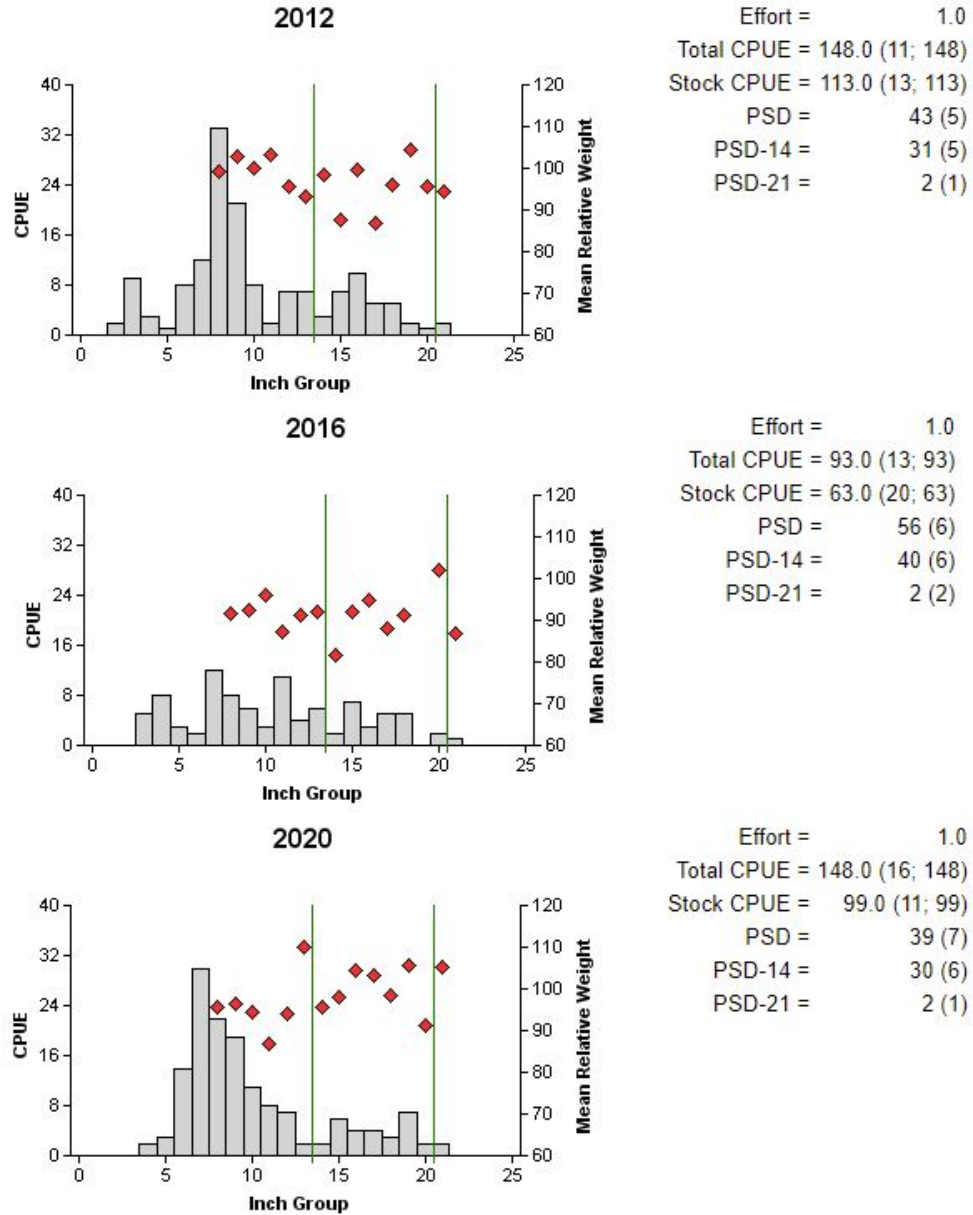


Figure 5. Number of Largemouth Bass caught per hour (CPUE, bars), mean relative weight (diamonds), and population indices (RSE and N for CPUE and SE for size structure are in parentheses) for fall electrofishing surveys, Lake Timpson, Texas, 2012, 2016, and 2020. Vertical lines represent the slot length limit.

Largemouth Bass

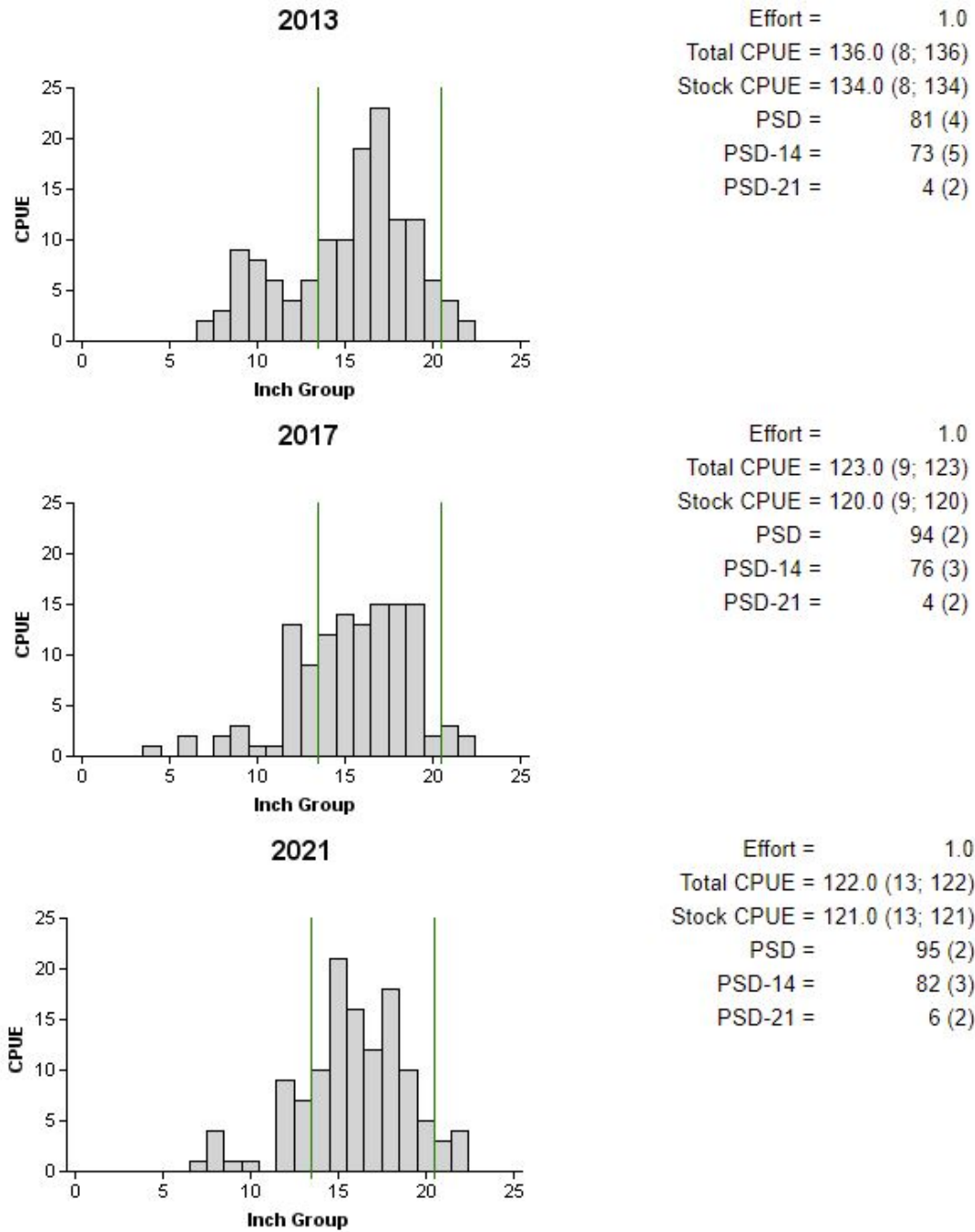


Figure 6. Number of Largemouth Bass caught per hour (CPUE, bars) and population indices (RSE and N for CPUE and SE for size structure are in parentheses) for spring electrofishing surveys, Lake Timpson, Texas, 2013, 2017, and 2021. Vertical lines represent the slot length limit.

White Crappie

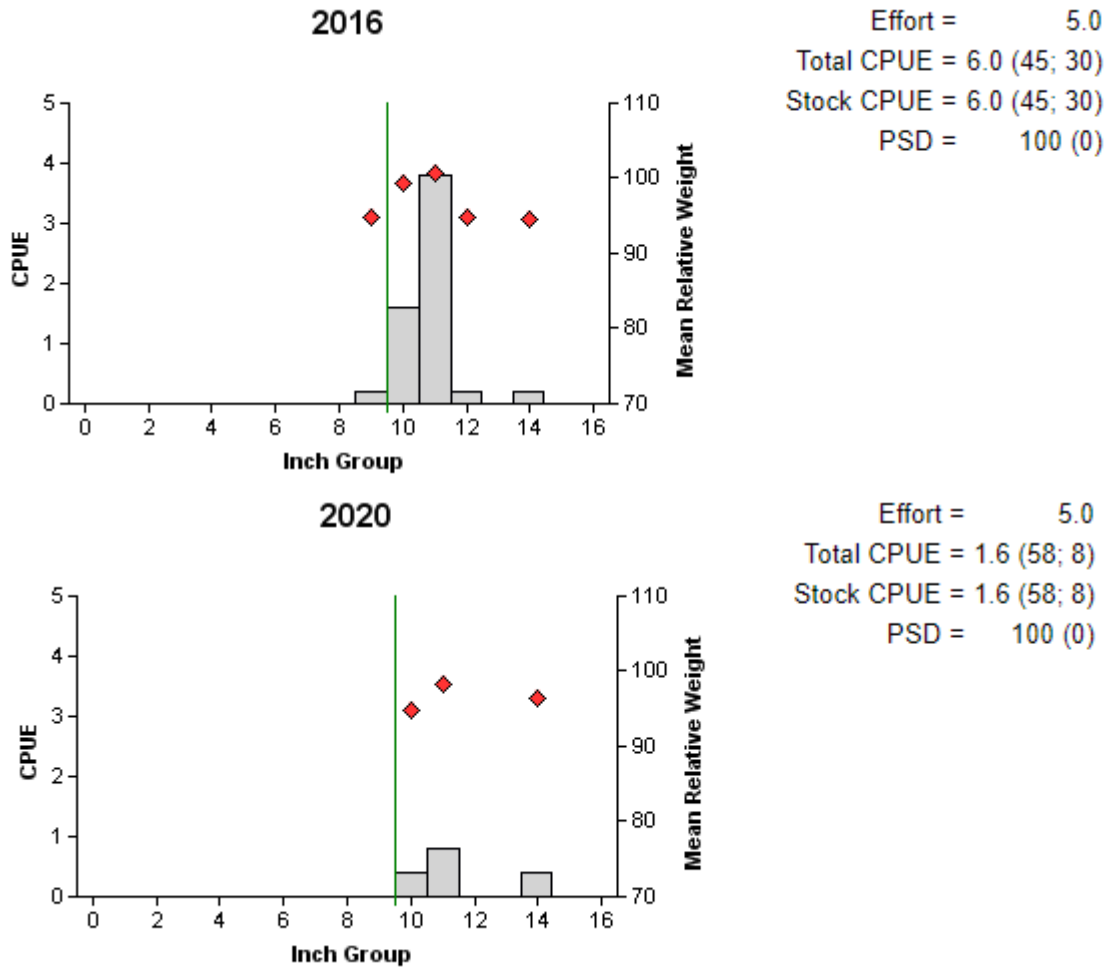
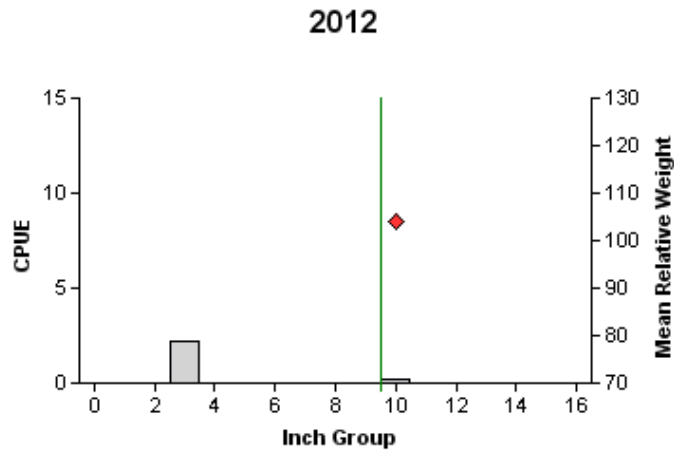
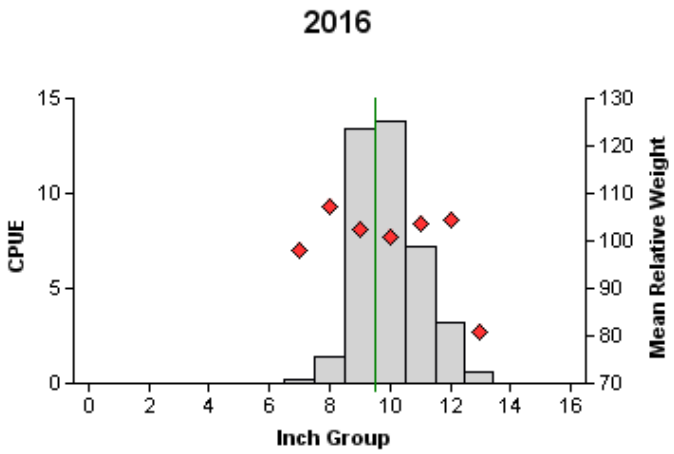


Figure 7. Number of White Crappie caught per net night (CPUE, bars), mean relative weights (diamonds), and population indices (RSE and N for CPUE and SE for size structure are in parentheses) for fall trap net surveys, Lake Timpson, Texas, 2007, 2016, and 2020. Vertical line represents the minimum length limit. No White Crappie were collected in 2012.

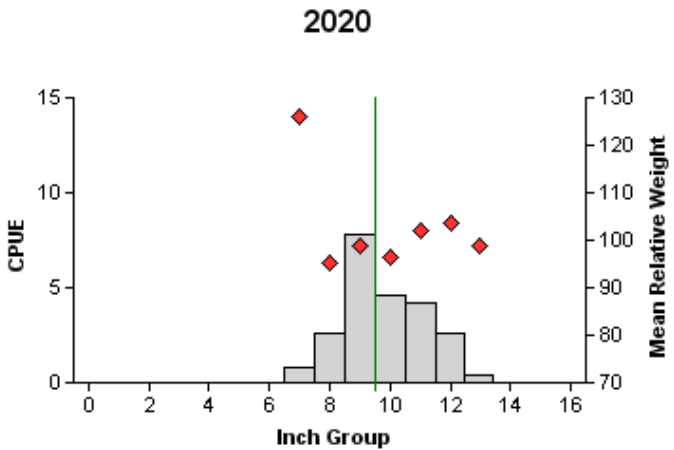
Black Crappie



Effort = 5.0
 Total CPUE = 2.4 (100; 12)
 Stock CPUE = 0.2 (100; 1)
 PSD = 100 (0)



Effort = 5.0
 Total CPUE = 39.8 (37; 199)
 Stock CPUE = 39.8 (37; 199)
 PSD = 99 (1)



Effort = 5.0
 Total CPUE = 23.0 (43; 115)
 Stock CPUE = 23.0 (43; 115)
 PSD = 97 (1)

Figure 8. Number of Black Crappie caught per net night (CPUE, bars), mean relative weights (diamonds), and population indices (RSE and N for CPUE and SE for size structure are in parentheses) for fall trap net surveys, Lake Timpson, Texas, 2012, 2016, and 2020. Vertical line represents the minimum length limit.

Proposed Sampling Schedule

Table 7. Proposed sampling schedule for Lake Timpson, Texas. Survey period is June through May. Trap netting surveys are conducted in the fall, while electrofishing is conducted both in the fall and spring.

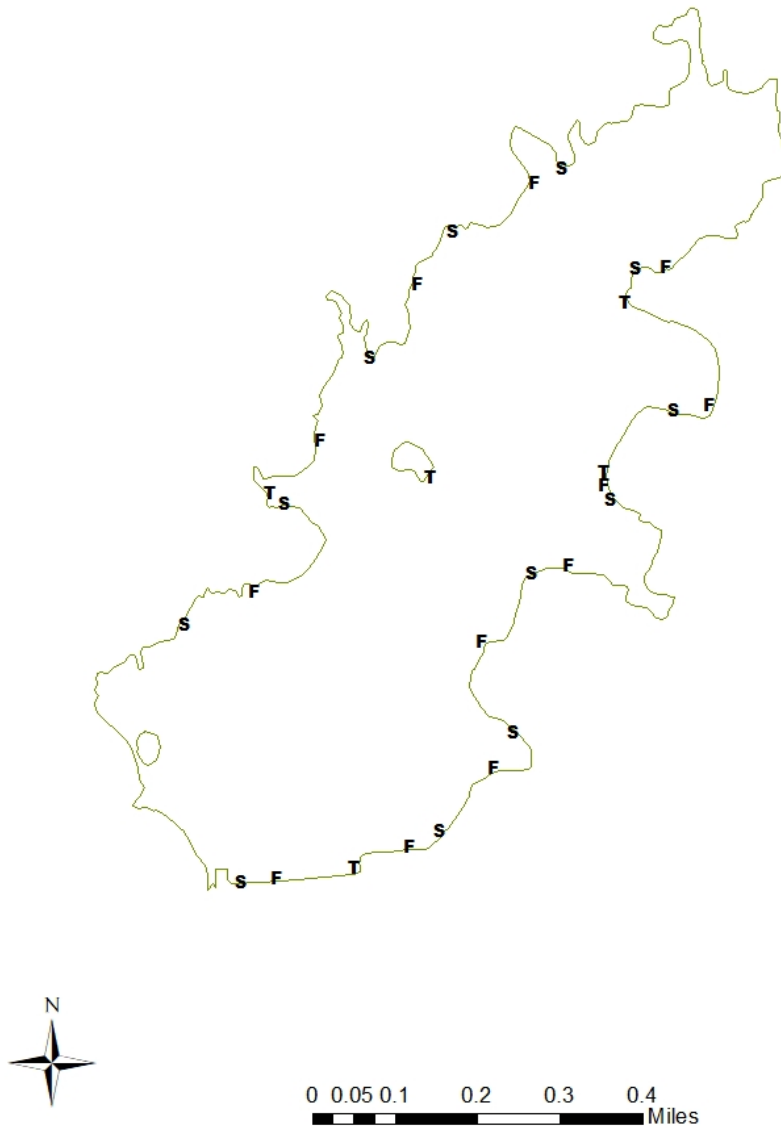
| | Survey year | | | |
|-------------------------------------|-------------|-----------|-----------|-----------|
| | 2021-2022 | 2022-2023 | 2023-2024 | 2024-2025 |
| Angler Access | | | | X |
| Vegetation | X | X | X | X |
| Electrofishing – Fall | | | | X |
| Electrofishing – Spring (bass only) | | | | X |
| Trap 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 Lake Timpson, Texas, 2020-2021. Sampling effort was 1 hour for electrofishing and 5 net nights for trap netting.

| Species | Fall Electrofishing | | Spring Electrofishing | | Trap Netting | |
|-------------------|---------------------|---------|-----------------------|-------|--------------|------|
| | N | CPUE | N | CPUE | N | CPUE |
| Gizzard Shad | 15 | 15.0 | | | | |
| Threadfin Shad | 2,999 | 2,999.0 | | | | |
| Yellow Bass | | | | | 37 | 7.4 |
| Redbreast Sunfish | 85 | 85.0 | | | | |
| Warmouth | 1 | 1.0 | | | | |
| Bluegill | 414 | 414.0 | | | | |
| Redear Sunfish | 129 | 129.0 | | | | |
| Largemouth Bass | 148 | 148.0 | 122 | 122.0 | | |
| White Crappie | | | | | 8 | 1.6 |
| Black Crappie | | | | | 115 | 23.0 |

APPENDIX B – Map of sampling locations



Location of sampling sites, Lake Timpson, Texas, 2020-2021. Fall electrofishing, spring electrofishing, and trap netting stations are indicated by F, S, and T respectively. Water level was near full pool at time of sampling.



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