Lake Corpus Christi

2022 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

Prepared by:

Dusty McDonald, Assistant District Management Supervisor
and
Greg Binion, District Management Supervisor

Inland Fisheries Division
Corpus Christi District, Mathis, Texas

David Yoskowitz, Ph.D.
Executive Director

Timothy Birdsong
Director, Inland Fisheries

July 31, 2023

Contents

Survey and Management Summary

Fish populations in Lake Corpus Christi were surveyed in 2022 using electrofishing and in 2023 using gill netting to assess population trends for important sport fishes. Anglers were surveyed from March through May 2023. Historical data are presented with the 2022-2023 data for comparison. White Bass were assessed in upstream Nueces River in 2022-2023 with winter electrofishing. This report summarizes the survey results and contains a management plan for the reservoir based on those findings.

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

Management History: Important sport fish species include Blue and Channel catfish, White Bass, Largemouth Bass, Alligator Gar, and crappie. Recent management efforts focused on increasing FLMB introgression through Florida Largemouth Bass stockings (2019 and 2020) and Lone Star Bass (2022), developing and implementing a sampling protocol to track population trends of White Bass in the upstream Nueces River, and evaluating the use of baited tandem hoop nets as a sampling gear for Channel Catfish. Further, staff conducts annual surveys that are specific to the expansion of nuisance vegetation. Water hyacinth was treated by spot-herbicide applications in 2019 (500 acres), 2020 (750 acres), 2021 (250 acres) and 2022 (300 acres) by either private contractors or City staff. Angler harvest of all sport fishes has been regulated according to statewide size and bag limits.

Fish Community

- **Prey species:** Threadfin and Gizzard Shad formed the reservoirs forage base, increasing in recent years. Bluegill provided additional forage for sport fish and increased in 2022. The population size structure of prey species was suitable to support sport fish populations.
- **Catfishes:** In 2023, catfish were the most sought-after species, comprising over 37% of total angling effort and anglers harvested similar numbers of Blue Catfish and Channel Catfish. Blue Catfish were the predominant species, but in lower abundance from previous years, however size structure was comprised of a wide size range of healthy fish. Channel Catfish have been available historically in very low abundance. Flathead Catfish were present in the reservoir.
- **White Bass:** White Bass supports a popular fishery in the upstream Nueces River. White Bass were available in high abundance and 98% of fish collected were available for angler harvest.
- **Largemouth Bass:** Largemouth Bass abundance has increased in the last four years. However, few legal-size fish were available to anglers. Growth was adequate and consistent with previous surveys. In 2023, interest in Largemouth Bass angling was low only accounting for 6.3% of the total angling effort occurring in the reservoir.

Management Strategies: Continue to manage sport fish under existing regulations. Identify and explore partnerships and grant opportunities to conduct a fisheries habitat enhancement project. Monitor expansion of nuisance vegetation. Continue to track population trends and monitor harvest through creel surveys and the mandatory Alligator Gar harvest reporting system.

Introduction

This document is a summary of fisheries data collected from Lake Corpus Christi in 2022-2023. The purpose of the document is to provide fisheries information and make management recommendations to protect and improve the sport fishery. While information on other species of fishes were collected, this report deals primarily with major sport fishes and important prey species. Historical data are presented with the 2022-2023 data for comparison.

Reservoir Description

Lake Corpus Christi is an 18,256-acre reservoir located on the Nueces River approximately 20 miles northwest of Corpus Christi, Texas. The reservoir was constructed in 1958 by the Lower Nueces Water Supply District to provide water for Corpus Christi and other local communities. Lake Corpus Christi was eutrophic with a mean TSI chl-*a* of 58.6 (Texas Commission on Environmental Quality 2022). Water level in the reservoir can fluctuate between 1-15 feet annually (Figure 1). Water level was the lowest in twenty years between 2012 and 2013 reaching 16 feet below conservation pool. The lake level increased in the fall of 2019 to less than one foot below conservation pool. Since 2019, water level has fluctuated annually, yet remained within 8 – 9 feet of conservation elevation. Water is typically turbid but clears during summer in the lower reservoir and small creek arms. The substrate is composed primarily of silt, sand, clay, and some gravel/rock. Littoral habitat over the survey period was composed primarily of flooded live and dead terrestrial vegetation and standing timber. Seasonally abundant water hyacinth provided additional habitat. Historically, water hyacinth has become so abundant that it inhibited boating, fishing, and shoreline access. Water lettuce and alligatorweed have also been present in the reservoir but have not negatively impacted recreational use or desirable aquatic resources. Herbicide treatments for water hyacinth control occurred in 2019, 2020, 2021 and 2022. Other descriptive characteristics of Lake Corpus Christi are in Table 1.

Angler Access

Lake Corpus Christi has six public boat ramps and several private boat ramps. Additional boat ramp characteristics can be found in Table 2. Boat access is dependent on water level, and shoreline and handicap access were limited to a few public areas around the lake. Shoreline access is limited to the public boat ramp areas and two fishing piers located within Lake Corpus Christi State Park. A construction project for a new, extended fishing pier was completed at Lake Corpus Christi State Park in 2015.

Management History

Previous management strategies and actions: Management strategies and actions from the previous survey report (Binion and McDonald 2019) included:

1. Request Florida Largemouth Bass (FLMB) for stocking to maintain Florida genetics and maximize trophy production potential.

    Action: FLMB were stocked in 2019 and 2020; Lone Star Bass were stocked in 2022 at a rate of roughly 1,000/km shoreline.

2. The need for the collection of fisheries dependent data to quantify and identify trends in angler effort, catch, and harvest, was not achieved in the last report.

    Action: A creel survey was implemented in 2023.

3. Apply for grant funding opportunities and support to improve desirable aquatic vegetation.

    Action: Due to other projects including a large-scale native vegetation re-establishment project at Coleto Creek Reservoir and ongoing Habitat and Angler Access Projects, we were not able to pursue additional projects for Lake Corpus Christi within the survey period.

4. Monitor presence, distribution, and spread of invasive aquatic vegetation through annual vegetation surveys.

    Action: Invasive vegetation was monitored annually with pre- and post-treatment vegetation surveys. District staff coordinated with the Aquatic Habitat Enhancement (AHE) team, the City of Corpus Christi, and private contractors to manage and control water hyacinth and other problematic vegetation on the reservoir.

Harvest regulation history: Sport fishes in Lake Corpus Christi have always been managed with statewide regulations (Table 3). The statewide Blue and Channel Catfish regulation was changed in 2021, allowing the harvest of 25 fish (combined species) with no minimum length limit and only 10 fish greater than 20-inches.

Stocking history: Florida Largemouth Bass fingerlings have been periodically stocked in the reservoir, most recently in 2019 (207,902) and 2020 (108,338) and Lone Star Bass in 2022 (202,718). The reservoir was stocked with Channel Catfish fingerlings (257,364) in 2014. Palmetto and Striped Bass have been stocked at Lake Corpus Christi in the past; yet neither population persists. Since 1993, Rainbow Trout have been stocked annually into a confined cove as part of a youth fishing event. The complete stocking history can be found in Table 4.

Vegetation/habitat management history: Historically, water hyacinth, a non-native floating plant, has been problematic in the upper end of the reservoir, reducing access and negatively impacting fish and wildlife habitat. Water lettuce and alligatorweed have also been present but have yet to restrict recreational use. Historically, City of Corpus Christi staff treated water hyacinth with herbicides as needed. Abundance of nuisance vegetation, particularly water hyacinth, increased substantially with increasing water level and created access issues over the current survey period. Starting in 2016, water hyacinth control was conducted through private contractors or city staff with coordination and oversight by TPWD and the City of Corpus Christi. This included treatments in 2019 (500 acres), 2020 (750 acres), 2021 (250 acres), and 2022 (300 acres).

Water transfer: Lake Corpus Christi is used for municipal/industrial water supply, recreation, and to a lesser extent, flood control. There are three water diversion categories managed by the City of Corpus Christi which include municipal, industrial, and irrigation/livestock. Three permanent pumping stations transfer untreated water to the cities of Beeville, Alice, and Mathis for use as municipal water supply. Lake Corpus Christi also periodically receives auxiliary water from upstream Choke Canyon Reservoir. There are currently no proposals to install additional pumping stations. No inter-basin transfers exist.

Methods

Surveys were conducted to achieve survey and sampling objectives in accordance with the objective-based sampling (OBS) plan for Lake Corpus Christi (Binion and McDonald 2019). Primary components of the OBS plan are listed in Table 5. All survey sites were randomly selected except for the winter White Bass survey (fixed sites) and all surveys were conducted according to the Fishery Assessment Procedures (TPWD, Inland Fisheries Division, unpublished manual revised 2022).

Electrofishing – Largemouth Bass, sunfishes, Gizzard Shad, and Threadfin Shad were collected by fall nighttime electrofishing (2.5 hour at 30, 5-min stations). An additional bass-only spring daytime electrofishing survey (1.0 hour at 12, 5-minute stations) was conducted in 2020. Catch per unit effort (CPUE) for electrofishing was recorded as the number of fish caught per hour (fish/h) of actual electrofishing. Ages for Largemouth Bass were determined using otoliths from 13 fish (range 13.0 to 14.9 inches).

White Bass were collected with daytime electrofishing (1.0 hour at 6, 10-min stations) in the upper stretches of the Nueces River during the annual spawning run (Jan – Feb) at fixed sites to assess and track population metrics.

Gill netting – Blue, Channel, and Flathead Catfish were collected by gill netting (15 net nights at 15 stations). CPUE for gill 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 all CPUE statistics.

Creel – A spring quarter roving creel survey was conducted from March 1 to May 31 in 2023 (3 months). Sampling occurred on 6 random weekend days and 4 random weekdays per quarter. Each sample day was split into equal duration time periods, with random time period selection and one period sampled per sample day. Sampling occurred at one of two possible access points (i.e., one for the upper end and one for the lower end of the reservoir). Mandatory harvest reporting for Alligator Gar was implemented 1 September 2019.

Habitat –Vegetation surveys were conducted in 2019 – 2022 to monitor expansion of water hyacinth. Vegetative habitat was assessed with the digital shapefile method in 2022 (TPWD, Inland Fisheries Division, unpublished manual revised 2022).

Water level – Source for water level data was the United States Geological Survey (USGS 2023).

Results and Discussion

Habitat: Littoral habitat consisted primarily of rocky gravel banks, standing timber, flooded terrestrial vegetation, and natural shoreline (Table 6). Both native and non-native vegetation were limited in 2022 and comprised 0.2% of the total surface area (Table 7). Water hyacinth (34.6 acres) was the most abundant aquatic vegetation. Fish habitat in the form of aquatic vegetation is lacking within the reservoir and the need for improvement is warranted. Artificial habitat with locations published (e.g., webpage, signage, etc.) may be the only viable option for improving habitat due to extreme water level fluctuations. Flooded terrestrial vegetation provided the majority of fish habitat, which can be attributed to water level rises in the summer of 2021 and fall of 2022.

Creel: Directed fishing effort by anglers in spring of 2023 was highest for all catfish species (37.6%), followed by anglers with no species preference (25.2%), crappie (22.0%), gars (6.6%), Largemouth Bass (6.3%), and carp (2.2%) (Table 8). Notable trends in directed fishing effort in 2023 include increased effort for anything, crappie, Alligator Gar, and Largemouth Bass and decreased directed effort for catfishes. Total fishing effort for all species was 49,140 h and anglers spent an estimated $390,626 on direct expenditures in Spring of 2023, this is a 60% increase compared to the Spring creel of 2015 ($157,845) (Table 9). Most anglers in the Spring of 2015 fished on the bank (71% at 19,923 h) compared to on boats (29% at 8,153 h) and in Spring of 2023 bank angling was still the preferred fishing method (58% at 28,452 h) compared to boat angling (42% at 20,686 h). This suggests an increase in overall anglers for both methods, however boat angling is increasing in popularity. Anglers traveled up to 830 miles to fish at the reservoir; however, the majority (66%) of anglers resided in counties located within 45 miles of the reservoir (Appendix D).

Prey species: Threadfin and Gizzard Shad formed the reservoirs primary forage base; catch rates were 267.6/h and 117.6/h, respectively (Figure 2 and Figure 3; Appendix A). Population size structure of Gizzard Shad was consistent among years (IOV range: 94 – 100) and indicated the majority of Gizzard Shad collected were available as prey to sport fishes. Bluegill catch rates have trended downward since 2014; however, Bluegill still contributed to the prey base and most individuals collected were < 6 in total length (Figure 4). Survey results indicated ample prey base for sport fish and that availability of prey should not be a limiting factor to the growth and condition of sport fish in the reservoir.

Catfish: Blue Catfish gill net catch rates have been trending downward since 2019 (range: 7.7/nn – 16.9/nn; Figure 5) and are low compared to the mean historical catch rate (19.9/nn; N = 23 surveys, 1988 – 2023). However, size structure improved over the survey period (2023 PSD = 18); 58% of the fish collected were of harvestable size (12 in) and many size classes were abundant. Condition of fish greater than 12 inches remained consistent across years for most size classes and tended to increase with total length (Figure 5). Blue Catfish represent an important component to the overall sport fishery at the reservoir. Since the last report a new waterbody record for Blue Catfish was caught in September of 2019 with a length of 44.5" and 46.3 lbs. No Channel Catfish were collected in 2023, but failure to collect any is not unusual, occurring previously in 1999. The historical average has remained low (1.6/nn; N = 23 surveys 1988 – 2023). Collections of Channel Catfish remain consistent with the previous three surveys (CPUE range: 0.0/nn – 0.5/nn; Figure 6). That being said, a new waterbody record for Channel Catfish was reported on May 2019 with a length of 19.25" and weight of 2.75 lbs. Catfish were the most sought-after species in the reservoir (37.6%). Angling effort for catfishes decreased significantly (33.8% decrease) since 2015. Anglers expended 18,479 h targeting catfishes and harvested 7,318 Blue Catfish and 2,456 Channel Catfish from March 1 to May 31, 2023 (Table 10). Catch success (i.e., total catch/h) in 2023 for all catfishes was 0.63 fish/h, this suggests a slight increase from the Spring of 2015 (0.49 fish/h). Harvest size ranged from 12-30 inches for Blue Catfish and 12-25 inches for Channel Catfish in 2023 (Figures 7 and Figure 8, respectively).

Alligator Gar: Gar were the fourth most popular fishery in Lake Corpus Christi accounting for 6.6% of total angling effort, and similar to the documented popularity in the Spring 2015 creel survey (5.0%). Directed fishing effort more than doubled in Spring of 2023 (3,257 h) compared to Spring of 2015 (1,392 h). Anglers harvested an estimated 150 Alligator Gar during the Spring 2023 survey period. However,

angler success was low 0.067/h in 2023, whereas none were reported as harvested in the 2014-15 creel survey (Table 11). The mandatory harvesting program found that on average 38.5 (RSE = 50.3) fish were harvested each year based on data from 2020-2023 (From April 1, 2020 to May 31, 2023). Additionally, on average 51% of harvested Alligator Gar ranged in length from 5 to 9 feet, whereas only 19% ranged from 6 to 9 feet (Figure 9). Further, data showed that anglers in Lake Corpus Christi targeting Alligator Gar primarily used the Rod and Reel gear (85% of the time) followed by bowfishing gear (10% of the time) and finally, passive gear (5% of the time). It should be noted that several waterbody records have been reported in Lake Corpus Christi since the last report. These include the March 2023-Rod and Reel record of 79" and 108-lbs., the May 2021- Bowfishing record at 188-lbs. the March 2023-Catch and Release record at 89"; and the April 2023-Jugline/All tackle record at 90". and 207-lbs), suggesting that Lake Corpus Christi offers trophy Alligator Gar for harvest.

White Bass: The winter electrofishing (spring-run) catch rate of White Bass in the Nueces River (north of Lake Corpus Christi) was 137.0/h in 2023, higher than the mean CPUE of 115.0/h; N = 9 surveys (2015 – 2023). Catch rate of legal-size (≥10 in) fish was excellent (CPUE-10 = 135.0/h) and size structure was dominated by larger individuals (PSD = 100; Figure 10); indicating ample angling opportunity. White Bass in the reservoir continue to support a very popular fishery during the annual spring run into upstream Nueces River. Anglers did not expend any time targeting White Bass within the reservoir but harvested 551 fish for Spring of 2023.

Largemouth Bass: Largemouth Bass relative abundance increased since 2018. The 2022 electrofishing catch rate was 34.0/h, compared to 10.5/h in 2020 and 10/h in 2018 (Figure 11). Size structure was still balanced but decreased (PSD = 34) relative to previous years. Catches of legal-sized fish was low (CPUE-14 = 5.6/h). Body condition in 2022 was adequate (relative weight > 80) for nearly all size classes with a slightly decreasing trend with larger fish. Mean age at legal length (14 in) was 2.2 years (N = 13; range: 1 – 3 years; Table 12) indicating moderate growth rate to 14-inches; however, growth to the minimum length limit has slowed since 2014. Introgression of FLMB genetics in the population has remained high (Table 13). Due to reduced catches in the fall 2018 collection, we initiated a spring bass-only electrofishing survey in 2019 (24.9/h) and another spring electrofishing survey was conducted in 2020 (66.0/h) (Figure 12). The highly variable catch data may be the result of the variability of water levels. Within the last survey period (2019-2023), the water level has fluctuated > 8 feet on three different occasions.

Only 6.3% of anglers sought Largemouth Bass in the spring quarter of 2023. The directed angling effort for Largemouth Bass in 2023 (3,111 h) increased considerably since the Spring of 2015 (500 h) (Table 14). Tournament angling represented 58% of total Largemouth Bass angling effort during the 2023 creel survey period. This suggests an increase in the interest in Largemouth Bass since 2015. Further, the catch success rate improved for anglers in year 2023 (0.45 fish/h) compared to 2015 (0.0 fish/h) for spring quarter. In 2023, the number of fish retained by tournament anglers was low (251 fish) and fish > 4 lbs only accounted for 4% of all released fish in 2023. No tournament data was recorded in 2014/15.

Crappies: Crappies were the third highest (22%) targeted species in Lake Corpus Christi. Crappie effort had a 5-fold increase since 2015 (Table 15). Angler success was low (0.5/h) in 2023, however it was non-existent (0/h) in 2014-15. Increases in crappie effort may be due in part to the popularity of the public fishing pier constructed in 2015. Harvested fish ranged from 10 – 14 inches and the majority of observed harvest occurred in the 11–13 inch range for Spring of 2023 (Figure 13).

Fisheries Management Plan for Lake Corpus Christi, Texas
Prepared – July 2023

ISSUE 1: The Spring creel of 2023 found that Largemouth Bass were the fifth most preferred species in Lake Corpus Christi (6.3% of anglers), an increase from the 2015 spring-quarter creel survey (sixth most preferred; 1.8% of anglers). Catch rates of 2023 (0.45 fish/h) improved since the Spring 2015 creel survey (0.0 fish/h). Population abundance has been highly variable historically ranging from 203.5 fish/h (1993) to 10 fish/h (2018) and this variability is most likely due to fluctuating water level changes and an overall lack of submerged aquatic vegetation. In 2022, the only vegetation present on the reservoir was a floating exotic (water hyacinth), no submerged vegetation native or exotic were present. Even though Lake Corpus Christi can produce trophy-sized Largemouth Bass (≥ 8 pounds), the lack of vegetation and low angler preference suggests that the current conditions are not appropriate for expending resources (i.e., fingerling stocking) for this fishery until conditions are more suitable.

MANAGEMENT STRATEGY

1. Temporarily suspend Lone Star Bass fingerling stocking until habitat improves, monitor with vegetation surveys.

2. Continue with scheduled Fall electrofishing of years 2024 and 2026 to assess the Largemouth Bass and prey population abundance (2026).

3. Evaluate the possibility of future Lone Star Bass stocking after the 2027 creel survey.

ISSUE 2: Lake Corpus Christi State Park (SP) is a popular destination for both campers and anglers; the park offers reservoir access with two fishing piers. The main pier is an impressive 500' long aluminum t-head pier that was competed in 2015. In the same year, the Corpus Christi Fisheries Management Team, with the assistance of local divers, installed 56 mossback fish habitat structures beneath the pier. These structures were weighted with concrete blocks but not tethered in place. Anecdotal information suggests that some of the mossback fish habitat structures have been snagged and relocated to different locations around the pier. Confounding the issue, boat and jet ski wakes in and around the main cove have historically been an issue for pier and bank anglers. Recently, State Parks relocated the no-wake buoys to the opening of the cove roughly 500 yards further away from the original buoys (near pier) with the intent is to lessen disturbances to anglers. Unfortunately, noncompliance of wake restrictions by jet skiers has been observed by our staff during creel surveys, and personal outings.

MANAGEMENT STRATEGY

1. Partner with State Park staff and local bass clubs in applying for grant funding opportunities, to add weighted fish habitat (natural or artificial material) underneath and/or around the pier and other locations within the lake, to help improve the fishery. Local signage displaying locations of fish habitat improvements could also be created to promote angling participation and success.

2. Partner with State Park Law Enforcement on ways to better inform the public of the no-wake zone policy.

ISSUE 3: Anecdotally the White Bass run of the Nueces River is a popular destination for anglers. Our White Bass electrofishing surveys have suggested that anglers primarily utilize one main ramp at the Hwy-59 intersection with the river. Baseline fisheries dependent data for a winter quarter such as angler effort, catch, and harvest of White Bass is warranted on this one section of river.

MANAGEMENT STRATEGY

1. Conduct a boat ramp creel survey customized to occur during the winter season from January 1 through March 31 of year 2027.

ISSUE 4: Many invasive species threaten aquatic habitats and organisms in Texas and can adversely affect the state ecologically, environmentally, and economically. The financial costs of controlling and/or eradicating invasive species are significant. Additionally, the potential for invasive species to spread to other river drainages and reservoirs via watercraft and other means is a serious threat to all public waters of the state. Exotic plants such as water hyacinth and water lettuce have historically been a severe problem, primarily in the upper end and tributaries of the reservoir. These exotic plants restrict recreational use and can impact the quality of fish and wildlife habitat restricting growth and colonization of native vegetation.

MANAGEMENT STRATEGIES

1. Cooperate with the controlling authority to post appropriate signage at access points around the reservoir.

2. Contact and educate marina owners about invasive species, and provide them with posters, literature, etc… so that they can in turn educate their customers.

3. Educate the public about invasive species through the use of media and the internet.

4. Make a speaking point about invasive species when presenting to constituent and user groups.

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

6. Monitor water hyacinth and other invasive nuisance vegetation through annual vegetation surveys.

7. Continually evaluate the water hyacinth control program and serve as advisors to the City of Corpus Christi on all vegetation control activities.

Objective-Based Sampling Plan and Schedule (2023–2027)

<u>Sport fish, forage fish, and other important fishes</u>

Sport and/or recreationally important fish in Lake Corpus Christi include Alligator Gar, Blue, Channel, and Flathead Catfish, White Bass, Largemouth Bass, and crappie. Important forage species include Gizzard and Threadfin Shad, and Bluegill.

<u>Low-density fisheries</u>

Flathead Catfish: Flathead Catfish are present in the reservoir in low abundance. Since 1988, the mean gill net CPUE is 0.2/nn. The 2023 creel survey suggested only 2.9% of all catfish caught were Flathead Catfish, with a catch rate of 0.02 fish/h, therefore presence/absence will be noted in standard gill net sampling.

Channel Catfish: Channel Catfish are present in Lake Corpus Christi, but abundance appears to be low (average gill net CPUE = 1.6/nn; N = 23; standard deviation = 1.8; range: 0.0 – 6.9/nn). The 2023 creel survey suggested 28% of all catfish caught were Channel Catfish, with a low catch rate of 0.19 fish/h, therefore presence/absence will be noted in standard gill net sampling.

<u>Survey objectives, fisheries metrics, and sampling objectives</u>

Alligator Gar: Alligator Gar are present within the reservoir and add to the sport fishery, however it should be noted that creel data suggests that angler catch rates are low <0.1 fish/h. Directed effort, angler catch, and angler harvest will be monitored with a spring creel survey conducted in 2027, and the mandatory harvest reporting data to assess large-scale changes, lending important insight into population dynamics.

Blue Catfish: Blue Catfish are present in Lake Corpus Christi in high abundance and represent a popular fishery. Annual gill net CPUE since 1988 has averaged 19.9/nn (N = 23; standard deviation = 8.5; range: 7.7 – 40.1/nn) and mean stock size CPUE is 8.6/nn (N = 23; standard deviation = 3.3; range: 4.5 – 16.0/nn). Based on the most recent survey conducted in 2023, the population appears to be substantially reduced in abundance (7.7/nn, record low CPUE). The previous record low was 8.2/nn and occurred in 2014, following a 15-foot water level rise prior to sampling. Similarly in 2023, an 8-foot water level rise occurred prior to sampling. Blue Catfish and catfishes as a group were the most popular sport fish sought (combined directed effort = 37.6%) by anglers in Spring of 2023, and anglers harvested 10,025 catfish during this time period. We will track this population closely with continued collection of biennial trend data with spring gill netting. Trend data on CPUE, size structure, and body condition have been collected at a minimum biennially since 1991 with spring gill netting. A minimum of 15 randomly selected gill net sites will be sampled in 2025 and 2027 (Table 16). Sampling will continue at additional random sites until 50 stock-size fish are collected and the RSE of CPUE-S is ≤ 25. Directed effort, angler catch, and angler harvest will be monitored with a creel survey conducted in 2027 to assess large-scale changes.

White Bass: White Bass are present in the reservoir, but population metrics and relative abundance are highly variable from sample to sample and likely is dependent on timing of sampling. The mean historical catch rate for White Bass is 5.6/nn (N = 23; standard deviation = 6.4; range = 0.0 – 28.4/nn). However, the average catch rate when sampled during the months of January and February is 9.8/nn (N = 9; range: 0.6 – 28.4/nn) compared to 2.8/nn (N = 14; range: 0.0 – 10.8/nn) when collected March – May. Creel results for White Bass in Spring of 2023 suggested anglers harvested only 551 during this period within the reservoir. A popular harvest-oriented White Bass fishery does exist in the upstream portion of the Nueces River, but quantitative data do not exist for this stretch of river. Minimal conclusions regarding the trend data on CPUE, size structure, and body condition of White Bass can be made due to high variability in the gill net catch data. To obtain more precise and consistent measures of population metrics such as size structure indices, an electrofishing sampling protocol was established in 2016.

Starting in 2016, White Bass were sampled in the upstream Nueces River January – February with a minimum of 6, 10-minute fixed site stations and monitored annually thereafter. This has resulted in a greater number of fish collected and lower RSE values relative to gill nets. Average electrofishing CPUE was 115.0/h (N = 9; standard deviation = 70.1; range: 71.0/h – 285.0/h). Survey results have indicated electrofishing White Bass in the upper stretch of the Nueces River during late winter should provide more consistent and reliable data that will allow biologists to detect large-scale changes in population dynamics that may warrant further investigation. Continue sampling the 6, 10-minute fixed site electrofishing stations will be conducted annually (Table 16). Sampling will continue at additional fixed sites until 50 stock-size fish are collected. Directed effort, angler catch, and angler harvest will be monitored with a creel survey conducted in 2027 and potential inclusion of an additional up-river creel section will be explored.

Largemouth Bass: Largemouth Bass are present in the reservoir, but abundance has reduced in recent years. The mean historical total CPUE for Largemouth Bass is 74.4/h (N = 15; standard deviation = 64.3; range: 10.0 – 203.5/h) and mean stock-size CPUE is 38.2/h (N = 15; standard deviation = 26.8; range: 7.0 – 104.0/h). Recent Spring creel data (2023) suggest that Largemouth Bass are less preferred than catfishes and crappie (6.3% directed effort compared to 37.6% and 22%, respectively). Trend data on CPUE, size structure, and body condition was collected biennially since 2000. Based on the most recent survey conducted in 2022, the population appears to have improved (34.0 fish/h) since the previous two surveys (2020 = 10.5 fish/h; 2018 = 10.0 fish/h). The low population abundance is likely the result of the lack of fish habitat within the reservoir. A minimum of 24 (fall) randomly selected electrofishing sites will be sampled in 2024 (bass-only) and 2026 (bass and prey) to further assess the decline in population abundance (Table 16). Quantity of stock-sized fish (N = 50) was met once with the last three surveys whereas RSE levels maintained at a reasonable level (≤ 25) were not achieved. The quantity of stock-sized fish and relative standard error can give perspective on bass recruitment and homogeneity throughout the reservoir; however, these will not be set objectives for future surveys due to consistent reduced number of Largemouth Bass with the last three surveys. Further, category 2 age and growth analysis [mean age at legal length (14 in), N = minimum of 13 fish between 13.0 – 14.9 in] will be conducted for fall collections (i.e., biennially) to assess any changes in growth rates. Directed effort, angler catch, and angler harvest will be monitored with a spring quarter creel survey conducted in 2027 to monitor for any large-scale changes in angler catch and harvest and to assess utilization of the fishery.

White Crappie: White Crappie are present in the reservoir, but trap net samples have yielded mixed results and variable catches (historical mean CPUE = 4.5/nn; N = 14; standard deviation = 2.7; range: 0.7 – 10.5/nn. Crappie is the third most preferred fishery within Lake Corpus Christi at 22%, behind catfishes and anything. Directed effort (h) for crappie has increased considerably in 2023 (10,835 h) since the 2015 creel survey (1,912 h). Trap net sampling efforts were discontinued due to inconsistent catch rates and creel survey data will be used to monitor large-scale changes in crappie angler catch, effort, and harvest, lending important insight into overall crappie population dynamics.

Gizzard Shad and Bluegill: Gizzard Shad and Bluegill are the primary forage at Lake Corpus Christi. Like Largemouth Bass, trend data on CPUE and size structure of Gizzard Shad and Bluegill have been collected biennially since 2000 with fall electrofishing. Continuation of sampling, as per Largemouth Bass every other survey will allow for monitoring of large-scale changes in Gizzard Shad and Bluegill relative abundance and size structure. Sampling effort based on achieving sampling objectives for Largemouth Bass will result in sufficient numbers for size structure estimation in 2026 (Gizzard Shad IOV; 50 fish minimum and Bluegill PSD; 50 fish minimum at 24 randomly selected 5-minute stations with 90% confidence) and relative abundance estimates (Gizzard Shad and Bluegill CPUE-Total; RSE ≤ 25, anticipated effort is 24 stations based on historical data). No additional effort will be expended beyond sampling effort conducted for Largemouth Bass data collection in year 2026 (Table 16).

Creel: The reservoir continues to be a popular destination for anglers. Collection of quantitative data such as angler effort, catch, and harvest is necessary to evaluate trends in fishery statistics for important sport fish populations. A non-standard access point creel survey will be conducted at the Nueces River

(Hwy-59 bridge) from January 1 through March 31, 2027, and a standard roving creel survey will be conducted at Lake Corpus Christi for the spring quarter from March 1 through May 31, 2027 (Table 16).

Habitat: Historically, invasive plants (water hyacinth, water lettuce, alligatorweed) have been problematic at the reservoir; particularly in the upper half and into the Nueces River. Specifically, water hyacinth poses a potential threat to angler and boater access and enhances other ecologically detrimental processes (i.e., degraded water quality, competition with desirable native vegetative species, water loss through evapotranspiration, etc.). Annual aquatic vegetation monitoring is required to identify potential threats to boating and angling access so control, and rapid response efforts can be implemented to reduce or eliminate threats associated with invasive aquatic plants. The next full vegetation survey (native and non-native) will occur in 2026.

Literature Cited

Anderson, R. O., and R. M. Neumann. 1996. Length, weight, and associated indices. Pages 447-482 <u>in</u> B. R. Murphy and D. W. Willis, editors. Fisheries techniques, second edition. American Fisheries Society, Bethesda, Maryland.

DiCenzo, V.J., M.J. Maceina, and M.R. Stimpert. 1996. Relationships between reservoir trophic state and Gizzard Shad population characteristics in Alabama reservoirs. North American Journal of Fisheries Management 16:888-895.

Binion, G. R, and D.L. McDonald. 2019. Statewide freshwater fisheries monitoring and management program survey report for: Lake Corpus Christi, 2018. Texas Parks and Wildlife Department, Federal Aid Report F-221-M-3, Austin.

Guy, C. S., R. M. Neumann, D. W. Willis, and R. O. Anderson. 2007. Proportional size distribution: A further refinement of population size structure index terminology. Fisheries 32: 348.

Texas Commission on Environmental Quality. 2022. Trophic classification of Texas reservoirs. 2022 Texas Integrated Report for Clean Water Act Sections 305(b) and 303(d), Austin. 17 pp.

United States Geological Society (USGS). 2023. National water information system: Web interface. Available: http://waterdata.usgs.gov/tx/nwis (*Accessed May 2023*).

Tables and Figures
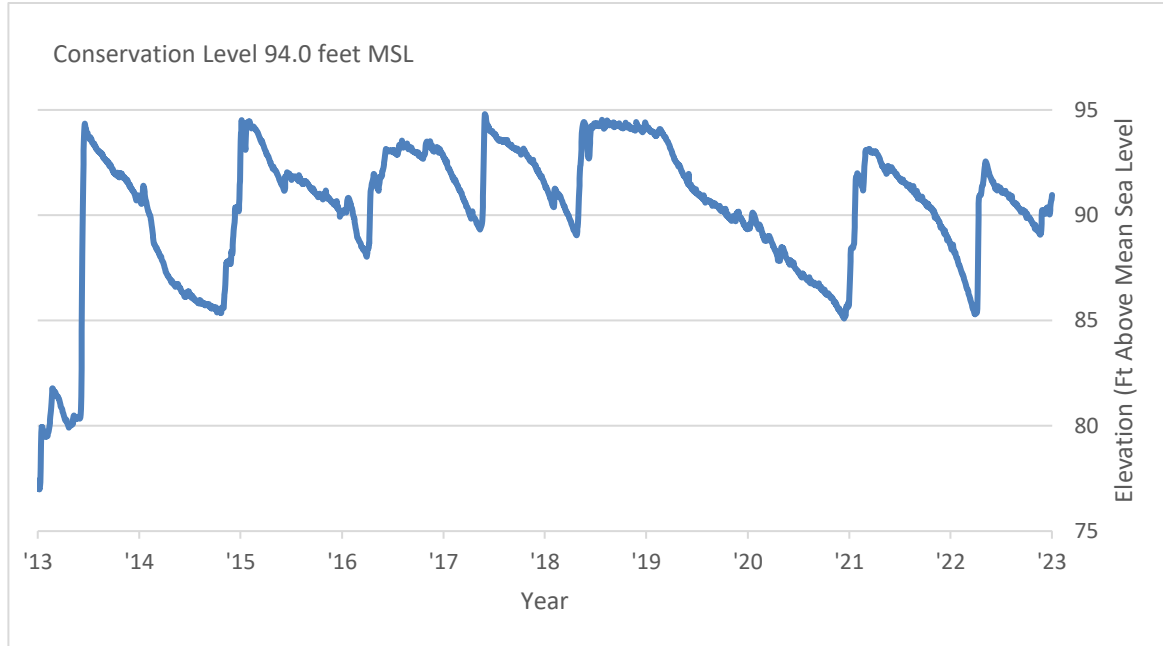
Figure 1. Daily water level elevations in feet above mean sea level (MSL) recorded for Lake Corpus Christi, Texas, May 2013 through May 2023.

Table 1. Characteristics for Lake Corpus Christi, Texas.

Characteristic	Description
Year constructed	1958
Controlling authority	City of Corpus Christi
Counties	San Patricio, Jim Wells, and Live Oak
Reservoir type	Mainstem
Shoreline Development Index	6.00
Conductivity	380 µS/cm

Table 2. Boat ramp characteristics for Lake Corpus Christi, Texas, May, 2023. Reservoir elevation at time of survey was 94 feet above mean sea level.

Boat ramp	Latitude Longitude (dd)	Public	Parking capacity (N)	Elevation at end of boat ramp (ft)	Condition
Lake Corpus Christi State Park North	28.06737 -97.88061	Y	12	UNK	Excellent, no access issues
Lake Corpus Christi State Park South	28.06307 -97.87989	Y	6	UNK	Excellent, no access issues
Sunrise Beach	28.05094 -97.87129	Y	6	UNK	Excellent, no access issues
Fiesta Marina	28.06428 -97.90706	Y	10	UNK	Excellent, no access issues
Weber's Landing	28.06811 -97.91354	Y	6	UNK	Excellent, no access issues
Mustang Hollow (KOA)	28.20161 -97.90257	Y	4	UNK	Excellent, no access issues

Table 3. Harvest regulations for Lake Corpus Christi, Texas.

Species	Bag limit	Length limit
Alligator Gar	1	none
Catfish: Channel and Blue Catfish, their hybrids and subspecies	25 (only 10 ≥ 20 inches)	none
Catfish, Flathead	5	18-inch minimum
Bass, White	25	10-inch minimum
Bass, Largemouth	5	14-inch minimum
Crappie: White and Black crappie, their hybrids and subspecies	25 (in any combination)	10-inch minimum

Table 4. Stocking history of Lake Corpus Christi, Texas. Size categories are FRY =<1 inch, FGL = 1-3 inches, ADL = adult, and UNK = unknown.

Species	Year	Number	Size
Channel Catfish	1972	10,000	UNK
	2014	257,364	FGL
	Total	267,364	
Striped Bass	1981	109,600	UNK
	1983	220,096	UNK
	1988	220,432	FGL
	1989	321,020	FRY
	1989	138,666	FGL
	1990	237,745	FGL
	Total	1,247,559	
Palmetto Bass	1979	88,456	UNK
	1980	219,991	UNK
	1981	85,170	UNK
	1986	220,358	FGL
	1991	220,900	FGL
	1992	319,700	FGL
	1993	166,324	FGL
	1994	533,172	FGL
	1995	330,400	FGL
	Total	2,184,471	
Florida Largemouth Bass	1980	247,909	FGL
	1998	422,269	FGL
	2002	483,220	FGL
	2008	463,176	FGL
	2009	456,349	FGL
	2014	460,205	FGL
	2015	205,500	FGL
	2017	213,230	FGL
	2018	202,036	FGL
	2019	207,902	FGL
	2020	108,338	FGL
	Total	3,470,134	
Lone Star Bass	2022	202,718	FGL
	Total	202,718	
Walleye	1973	200,000	UNK
	Total	200,000	
Bluegill	2020	174,958	FGL
	Total	174,958	
Rainbow Trout *	1993	2,002	ADL
	1994	2,005	ADL

	1995	1,929	ADL
	1997	1,008	ADL
	1998	1,010	ADL
	2000	1,500	ADL
	2001	1,381	ADL
	2002	2,511	ADL
	2003	2,583	ADL
	2004	2,079	ADL
	2005	1,500	ADL
	2006	1,509	ADL
	2007	1,502	ADL
	2008	1,500	ADL
	2009	1,504	ADL
Table 4 (continued)	2010	1,500	ADL
Rainbow Trout*	2011	1,506	ADL
	2012	1,359	ADL
	2013	1,379	ADL
	2014	1,508	ADL
	2015	1,701	ADL
	2016	1,605	ADL
	2017	2,014	ADL
	2018	2,295	ADL
	2019	2,212	ADL
	2020	2,222	ADL
	2021	2,213	ADL
	2022	2,020	ADL
	Total	49,057	

*Stocked behind a block net for annual youth fishing event.

Table 5. Objective-based sampling plan components for Lake Corpus Christi, Texas 2022–2023.

Gear/target species	Survey objective	Metrics	Sampling objective
Electrofishing			
Largemouth Bass	Abundance	CPUE–Stock	RSE-Stock ≤ 25
	Size structure	PSD, length frequency	N ≥ 50 stock
	Age-and-growth	Age at 14 inches	N = 13, 13.0 – 14.9 inches
	Condition	W_r	10 fish/inch group (max)
Bluegill [a]	Abundance	CPUE–Total	RSE ≤ 25
	Size structure	PSD, length frequency	N ≥ 50
Gizzard Shad [a]	Abundance	CPUE–Total	RSE ≤ 25
	Size structure	PSD, length frequency	N ≥ 50
	Prey availability	IOV	N ≥ 50
Gill netting			
Blue Catfish	Abundance	CPUE – stock	RSE-Stock ≤ 25
	Size structure	PSD, length frequency	N = 50
	Condition	W_r	10 fish/inch group (max)
Creel Survey	Angler trend information	Angler effort, CPUE, harvest and size structure	

[a] No additional effort will be expended to achieve an RSE ≤ 25 for CPUE of Bluegill 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, Lake Corpus Christi, Texas, 2006. Shoreline habitat type units are in miles.

Habitat type	Estimate	% of total
Boulder	0.3	0.3
Bulkhead	0.1	0.1
Concrete	0.5	0.4
Cutbank	9.5	8.8
Natural	85.0	78.6
Riprap	0.4	0.4
Rocky/gravel	12.3	11.4

Table 7. Survey of aquatic vegetation, Lake Corpus Christi, Texas, 2014, 2018, and 2022. Surface area (acres) is listed with percent of total reservoir surface area in parentheses.

Vegetation	2014	2018	2022
Native submersed	0.71 (< 0.01)	0.0 (0)	0.0 (0)
Native floating-leaved	0.0 (0)	0.0 (0)	0.0 (0)
Native emergent	0.0 (0)	2.4 (< 0.1)	0.0 (0)
Non-native			
Alligatorweed (Tier III)*	0.0 (0)	15.3 (< 0.1)	0.0 (0)
Water hyacinth (Tier II)*	0.0 (0)	45.8 (0.3)	34.6 (0.2)
Water lettuce (Tier III)*	0.0 (0)	23.9 (0.1)	0.0 (0)

*Tier II is Maintenance Status, Tier III is Watch Status

Table 8. Percent directed angler effort by species for Lake Corpus Christi, Texas, 2014–2023. Survey periods were from June 2014 through May 2015 (Full year: 2014/2015 dark gray), March 2015 through May 2015 (Spring 2015), and March 2023 through May 2023 (Spring 2023).

Species	2014/2015	Spring 2015	Spring 2023
Catfish	66.4	71.4	37.6
Freshwater Drum	0.4	0.0	0.0
Gars	6.6	4.9	6.6
Common Carp	0.0	0.0	2.2
Largemouth Bass	1.3	1.8	6.3
Crappie	3.8	6.8	22.0
Anything	21.5	15.0	25.2

Table 9. Total fishing effort (h) for all species and total directed expenditures at Lake Corpus Christi, Texas, 2014-2023. Survey periods were from June 2014 through May 2015 (Full year: 2014/2015 dark gray), March 2015 through May 2015 (Spring 2015), and March 2023 through May 2023 (Spring 2023). Relative standard error is in parentheses.

Creel statistic	2014/2015	Spring 2015	Spring 2023
Total fishing effort	60,715 (25)	28,076 (46)	49,140 (23)
Total directed expenditures	$274,296 (51)	$157,845 (67)	$390,626 (35)

Gizzard Shad

2018

Effort = 2.0
Total CPUE = 75.5 (20; 151)
IOV = 99 (1)

2020

Effort = 2.0
Total CPUE = 101.0 (27; 202)
IOV = 94 (2)

2022

Effort = 2.5
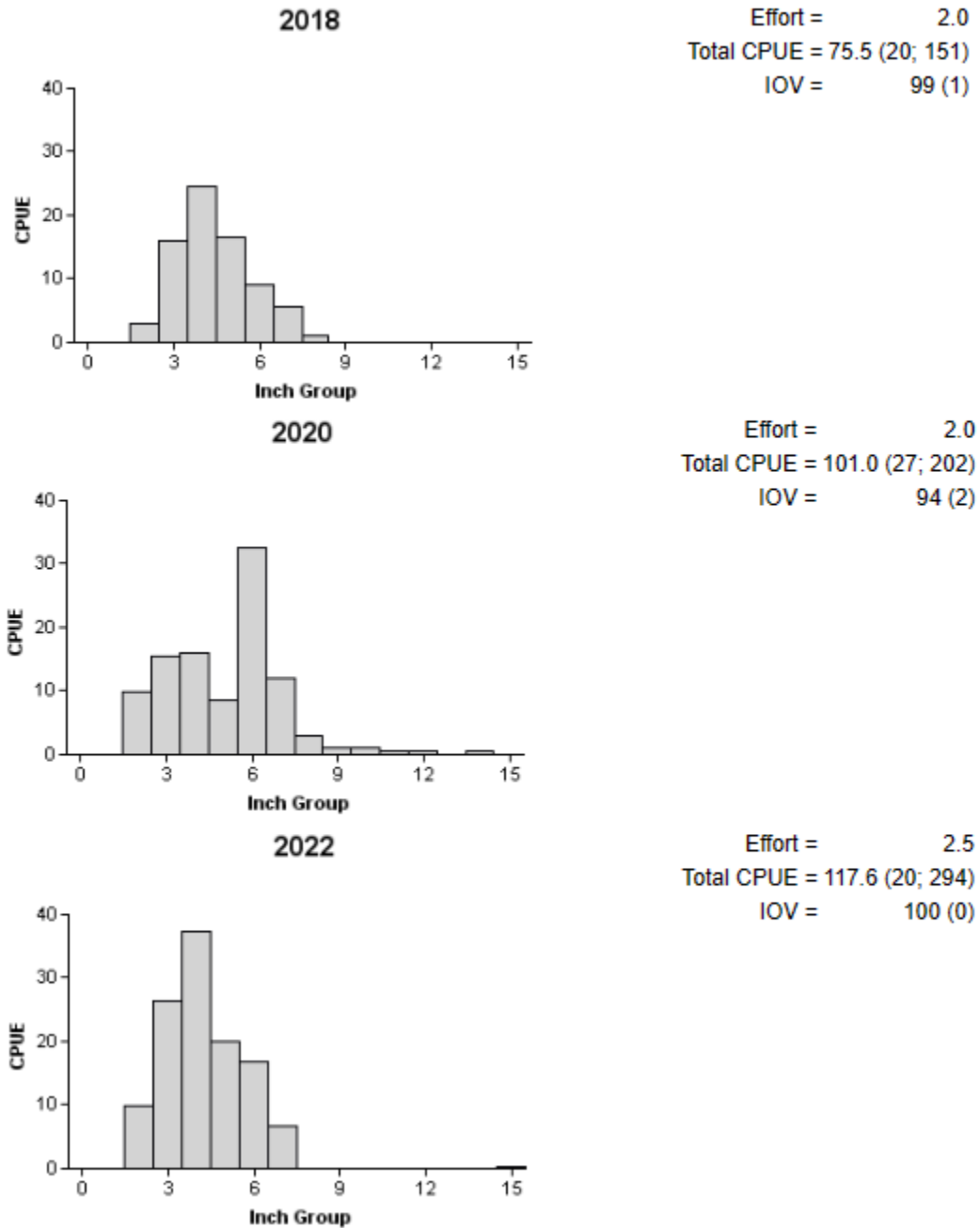Total CPUE = 117.6 (20; 294)
IOV = 100 (0)

Figure 2. Number of Gizzard Shad caught per hour (CPUE) and population indices (RSE and N for CPUE and SE for IOV are in parentheses) for fall electrofishing surveys, Lake Corpus Christi, Texas, 2018, 2020, and 2022.
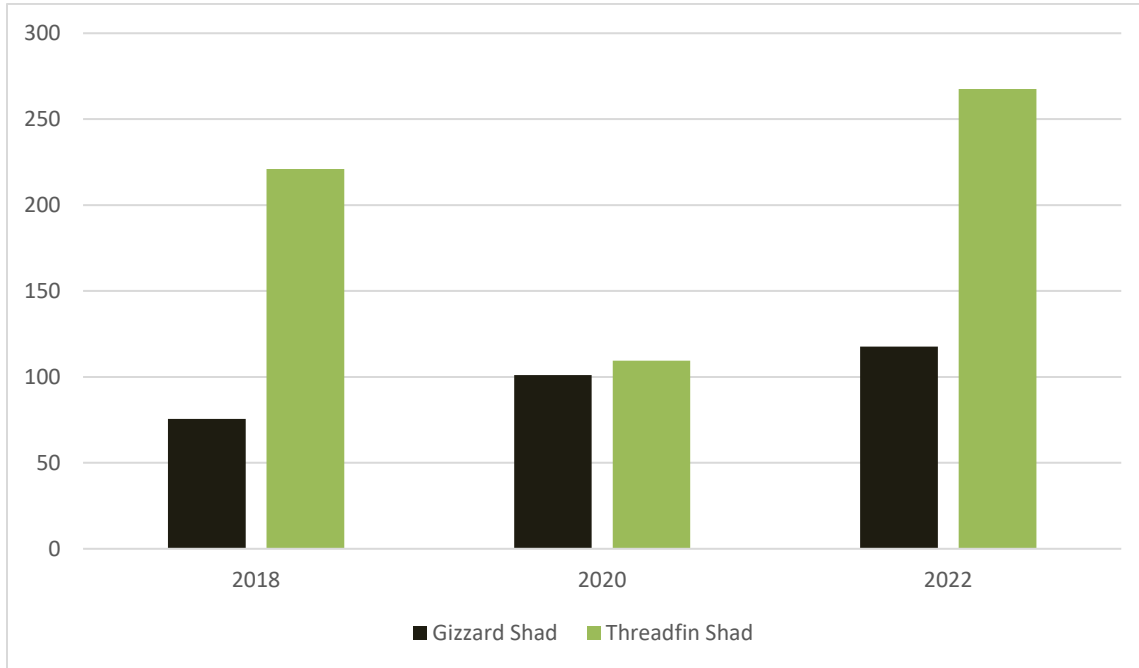
Gizzard Shad and Threadfin Shad

Figure 3. Number of Gizzard Shad (black bar) and Threadfin Shad (green bar) caught per hour (CPUE) and population indices (RSE and N for CPUE and SE for IOV are in parentheses) for fall electrofishing surveys, Lake Corpus Christi, Texas, 2018, 2020, and 2022.

Bluegill

2018

Effort = 2.0
Total CPUE = 60.5 (31; 121)
PSD = 6 (3)

2020

Effort = 2.0
Total CPUE = 29.0 (40; 58)
PSD = 4 (2)

2022

Effort = 2.5
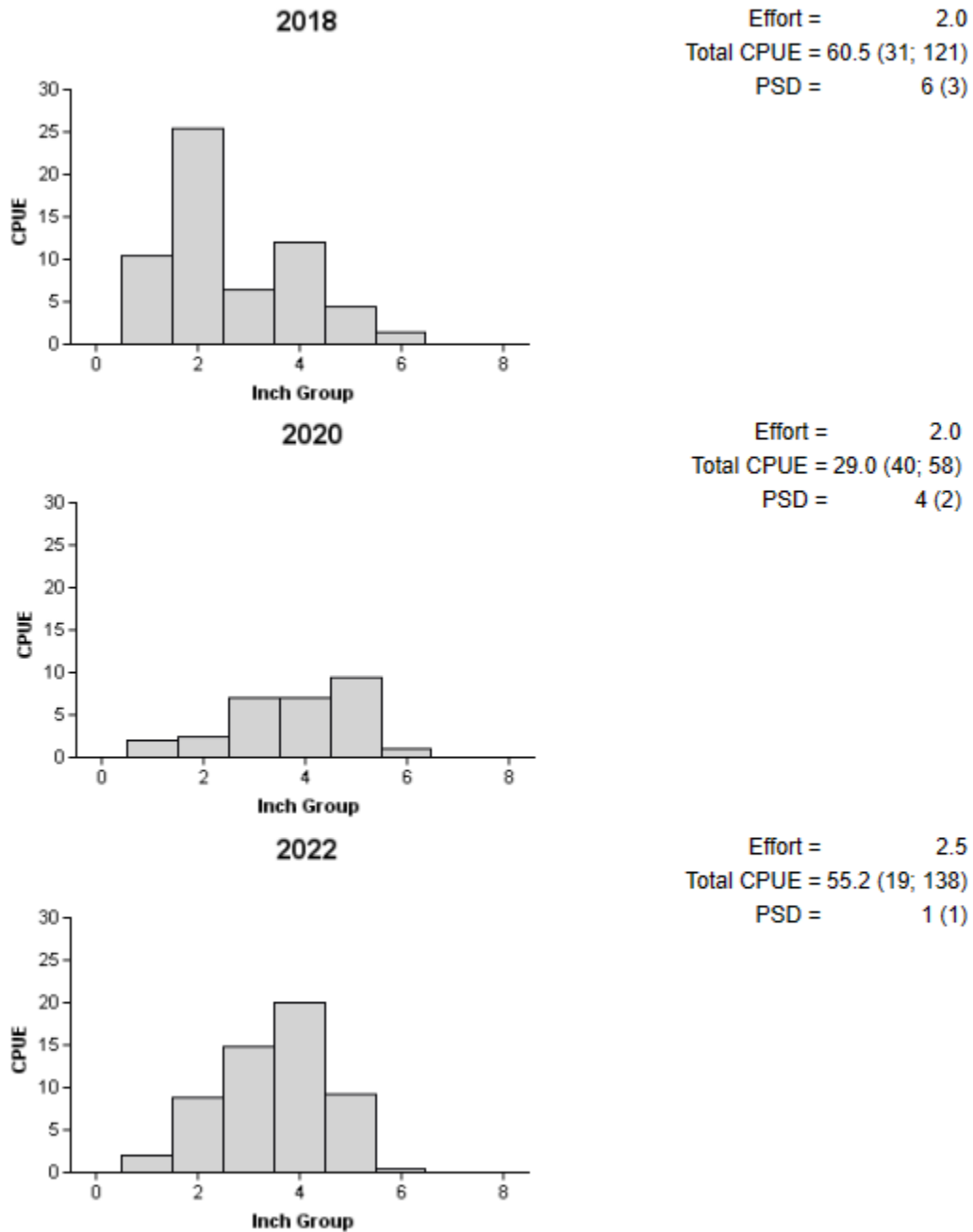Total CPUE = 55.2 (19; 138)
PSD = 1 (1)

Figure 4. 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 Corpus Christi, Texas, 2018, 2019, and 2022.

Blue Catfish

2019

Effort = 15.0
Total CPUE = 16.9 (15; 254)
Stock CPUE = 7.8 (16; 117)
PSD = 4 (2)

2021

Effort = 10.0
Total CPUE = 10.8 (22; 108)
Stock CPUE = 6.5 (23; 65)
PSD = 9 (4)

2023

Effort = 15.0
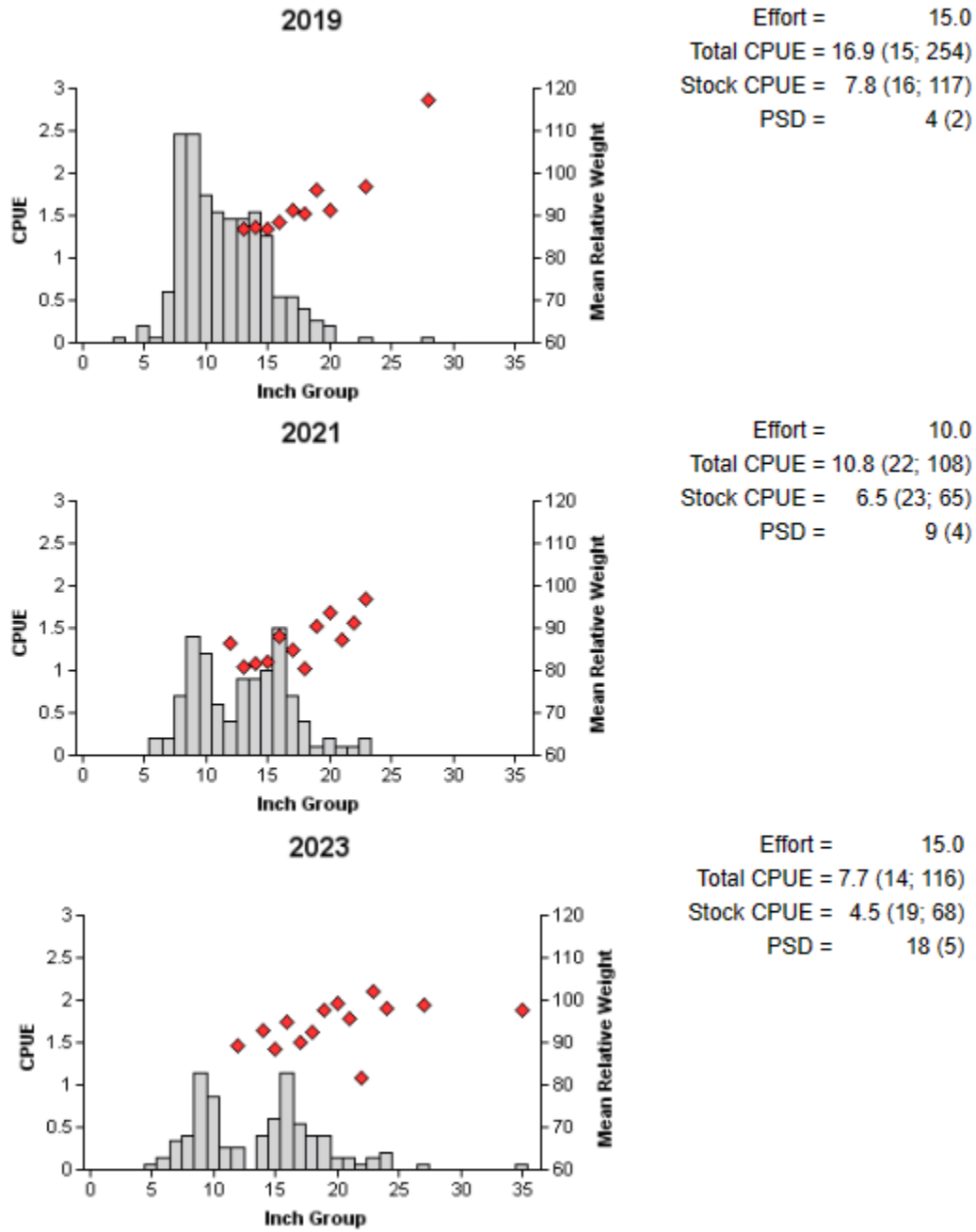Total CPUE = 7.7 (14; 116)
Stock CPUE = 4.5 (19; 68)
PSD = 18 (5)

Figure 5. Number of Blue Catfish caught per net night (CPUE), mean relative weights (diamonds) and population indices (RSE and N for CPUE and SE for size structure are in parentheses) for spring gill net surveys, Lake Corpus Christi, Texas, 2019, 2021, and 2023.

Channel Catfish

2019

Effort =   15.0
Total CPUE =   0.5 (51; 7)
Stock CPUE = 0.1 (100; 1)
PSD =   0 (0)

2021

Effort =   10.0
Total CPUE =   0.3 (71; 3)
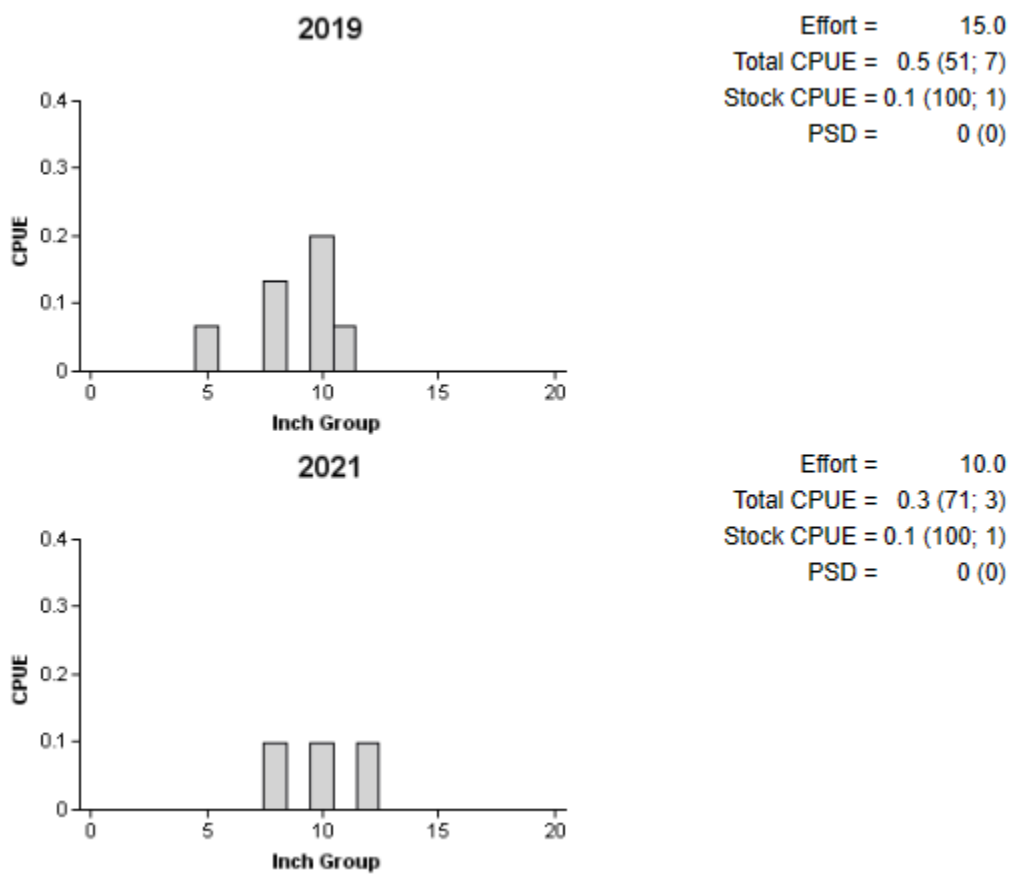Stock CPUE = 0.1 (100; 1)
PSD =   0 (0)

Figure 6. Number of Channel Catfish caught per net night (CPUE) and population indices (RSE and N for CPUE and SE for size structure are in parentheses) for spring gill net surveys, Lake Corpus Christi, Texas, 2019 and 2021, no fish were caught in year 2023.

Blue and Channel Catfishes

Table 10. Creel survey statistics for all catfishes (Blue, Channel and Flathead Catfishes) at Lake Corpus Christi, Texas were from June 2014 through May 2015 (Full year: 2014/2015 dark gray), March 2015 through May 2015 (Spring 2015), and March 2023 through May 2023 (Spring 2023). Total catch per hour is for anglers targeting catfishes and total harvest is the estimated number of catfishes harvested by all anglers. Relative standard errors (RSE) are in parentheses.

Creel Survey Statistic	Year		
	2014/2015	Spring 2015	Spring 2023
Surface area (acres)	14,944	15,885	17,145
Directed effort (h)	40,321 (20)	20,058 (36)	18,479 (23)
Directed effort/acre	2.70 (20)	1.26 (36)	1.07 (23)
Total catch per hour	0.57 (63)	0.49 (55)	0.63 (41)
Total harvest	16,229 (35)	4,476 (37)	10,025 (33)
Harvest/acre	1.08 (35)	0.28 (37)	0.58 (33)
Percent legal released	3.2	4.8	26.6*

*In 2021, minimum length regulations of Blue and Channel Catfish changed from 12" minimum length to no minimum length, therefore fish released below 12" minimum length were included in calculation.
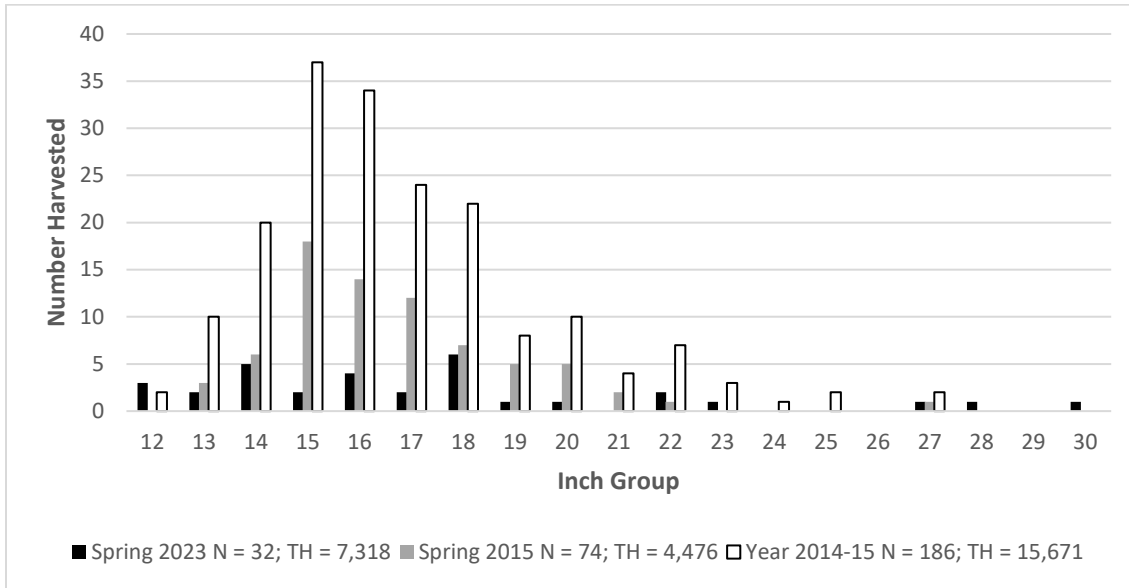
Figure 7. Length frequency of harvested Blue Catfish observed during creel surveys at Lake Corpus Christi, Texas, June 2014 through May 2015, March 2015 through May 2015, and March 2023 through May 2023, all anglers combined. N is the number of harvested Blue Catfish observed during creel surveys, and TH is the total estimated harvest for the creel period.
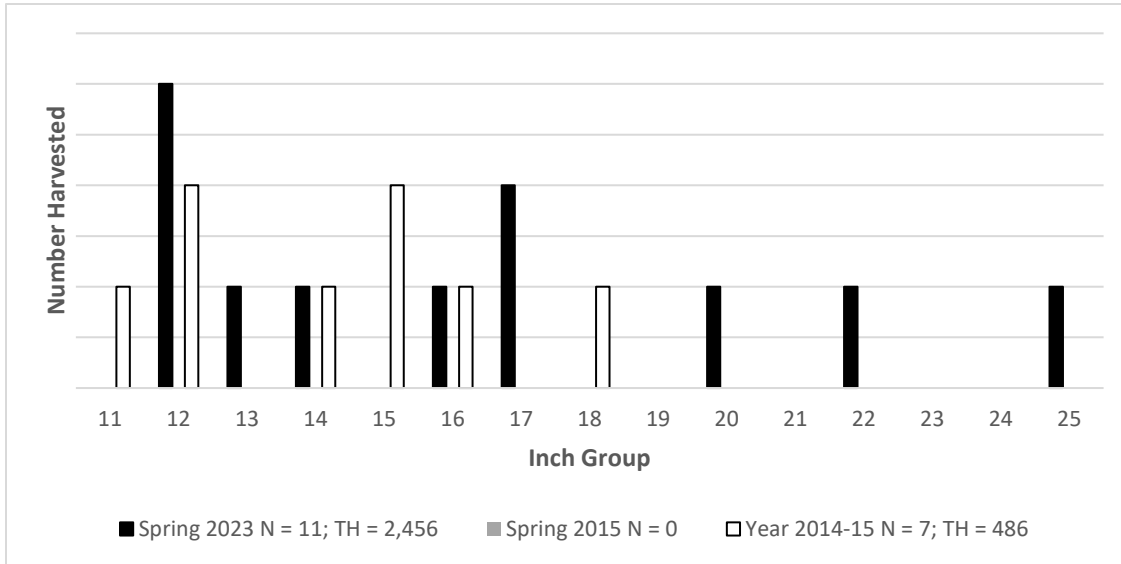

Figure 8. Length frequency of harvested Channel Catfish observed during creel surveys at Lake Corpus Christi, Texas, June 2014 through May 2015, March 2015 through May 2015, and March 2023 through May 2023, all anglers combined. N is the number of harvested Blue Catfish observed during creel surveys, and TH is the total estimated harvest for the creel period.

Alligator Gar

Table 11. Creel survey statistics for Alligator Gar at Lake Corpus Christi, Texas, were from June 2014 through May 2015 (Full year: 2014/2015 dark gray), March 2015 through May 2015 (Spring 2015), and March 2023 through May 2023 (Spring 2023). Total catch per hour is for anglers targeting Alligator Gar and total harvest is the estimated number of Alligator Gar harvested by all anglers. Relative standard errors (RSE) are in parentheses.

Creel Survey Statistic	Year		
	2014/2015	Spring 2015	Spring 2023
Surface area (acres)	14,944	15,885	17,145
Directed effort* (h)	4,034 (47)	1,392 (82)	3,257 (48)
Directed effort/acre	0.27 (47)	0.08 (82)	0.18 (48)
Total catch per hour	0	0	0.067[a]
Total harvest	0	0	150 (340)
Harvest/acre	0	0	<0.01
Percent legal released	0	0	0

*Directed effort includes effort for all gars (Alligator, Spotted and Longnose Gar).
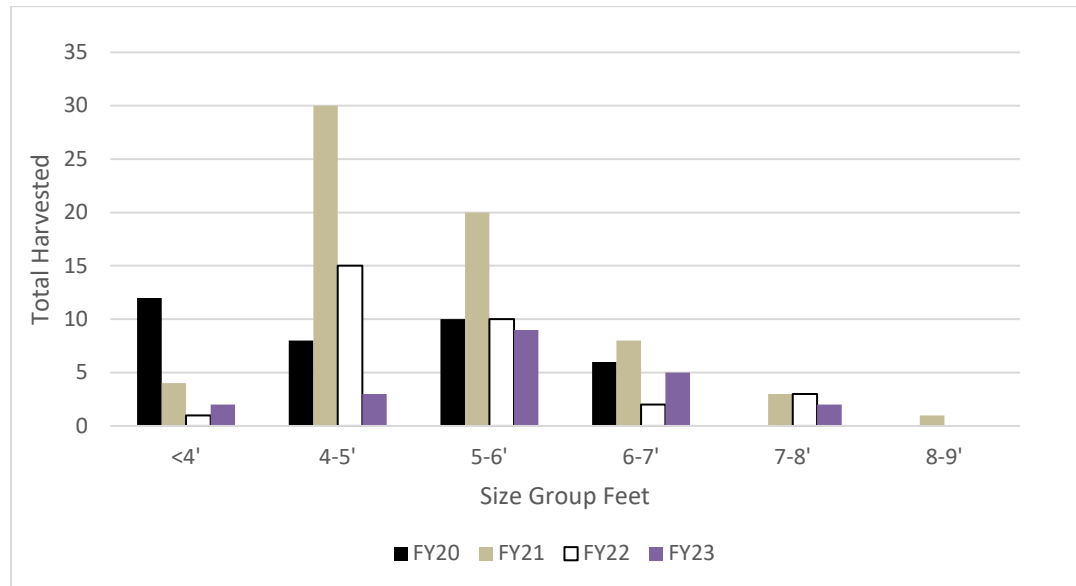
[a] Interviews too few to determine RSE.

Figure 9. Length frequency of harvested Alligator Gar reported through the mandatory harvest reporting system, Lake Corpus Christi, Texas, through three time periods (September 2019 through August 2020; September 2020 through August 2021; September 2021 through August 2022; and September 2022 through May 2023). N is the number of harvested Alligator Gar reported.

White Bass

2021

Effort =   1.0
Total CPUE = 82.0 (23; 82)
Stock CPUE = 82.0 (23; 82)
CPUE-10 = 52.0 (26; 52)
PSD =   88 (2)

2022

Effort =   1.0
Total CPUE = 285.0 (20; 285)
Stock CPUE = 285.0 (20; 285)
CPUE-10 = 208.0 (20; 208)
PSD =   86 (2)

2023

Effort =   1.0
Total CPUE = 137.0 (11; 137)
Stock CPUE = 137.0 (11; 137)
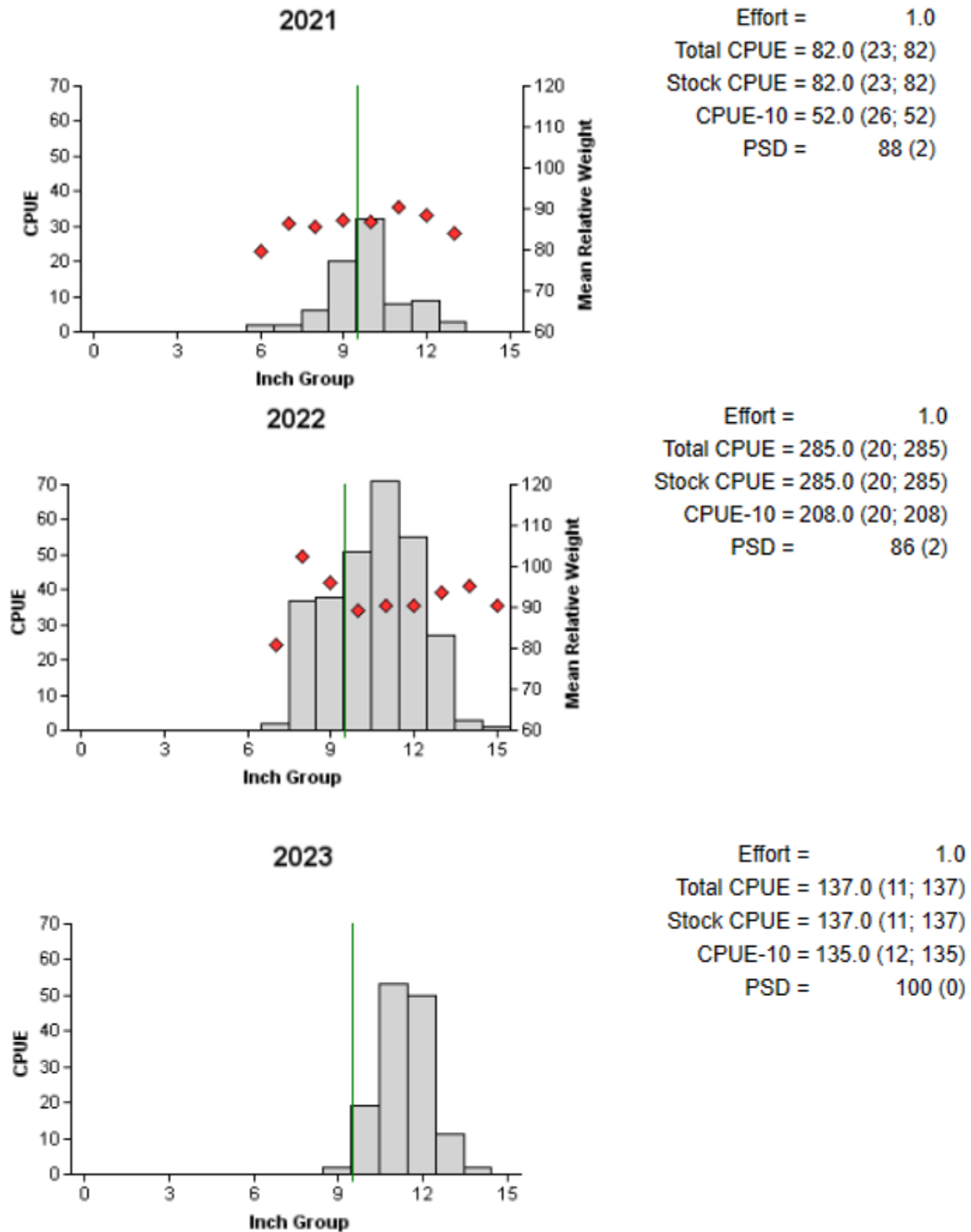CPUE-10 = 135.0 (12; 135)
PSD =   100 (0)

Figure 10. Number of White Bass caught per hour (CPUE) and population indices (RSE and N for CPUE and SE for size structure are in parentheses) for spring electrofishing surveys, Nueces River (above Lake Corpus Christi), Texas, 2021, 2022, and 2023. Vertical line denotes 10-inch minimum length limit.

Largemouth Bass

2018

Effort = 2.0
Total CPUE = 10.0 (37; 20)
Stock CPUE = 7.0 (49; 14)
CPUE-14 = 2.0 (59; 4)
PSD = 57 (18)

2020

Effort = 2.0
Total CPUE = 10.5 (47; 21)
Stock CPUE = 9.0 (49; 18)
CPUE-14 = 2.5 (58; 5)
PSD = 56 (14)

2022

Effort = 2.5
Total CPUE = 34.0 (34; 85)
Stock CPUE = 31.6 (33; 79)
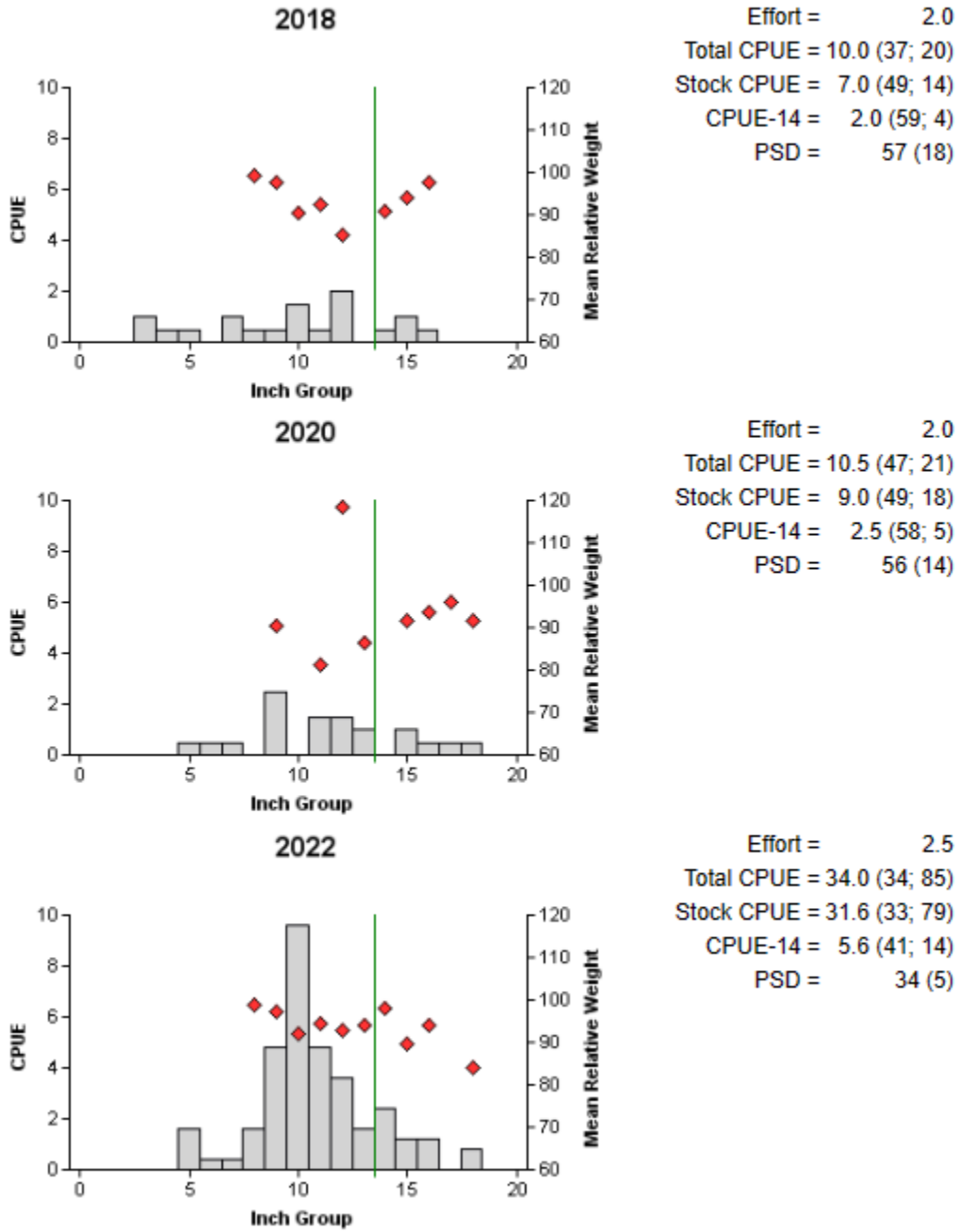CPUE-14 = 5.6 (41; 14)
PSD = 34 (5)

Figure 11. 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 Corpus Christi, Texas, 2018, 2020, and 2022. Vertical line denotes 14-inch minimum length limit.

Table 12. Mean age-at-legal length (14 in) for Largemouth Bass collected by fall electrofishing, Lake Corpus Christi, Texas. Standard deviations are in parenthesis.

Year	N	Age Range	Age-at-Length
2004	13	2 – 3	2.2 (0.38)
2010	15	1 – 3	2.7 (0.62)
2014	15	1 – 1	1.0 (0.00)
2016	14	1 – 2	1.8 (0.43)
2018	8	1 – 3	2.2 (0.71)
2022	13	1 – 3	2.2 (0.59)

Table 13. Results of genetic analysis of Largemouth Bass collected by fall electrofishing, Lake Corpus Christi, Texas, 2002, 2004, 2008, 2010, 2014 and 2022. FLMB = Florida Largemouth Bass, NLMB = Northern Largemouth Bass, Intergrade = hybrid between a FLMB and a NLMB. Largemouth Bass genetic composition was determined with micro-satellite DNA analysis.

Year	Sample Size	Genotype			% FLMB alleles	%FLMB genotype
		FLMB	Intergrade	NLMB		
2002	45	23	22	0	84.4	51.0
2004	30	15	14	1	82.5	50.0
2008	18	0	18	0	73.0	0
2010	30	4	26	0	73.0	13.0
2014	30	8	22	0	80.0	26.7
2022	30	4	26	0	77.0	13.0

Largemouth Bass

2019

Effort = 1.1
Total CPUE = 24.9 (27; 27)
Stock CPUE = 21.2 (34; 23)
CPUE-14 = 2.8 (41; 3)
PSD = 65 (13)

2020

Effort = 1.0
Total CPUE = 66.0 (26; 66)
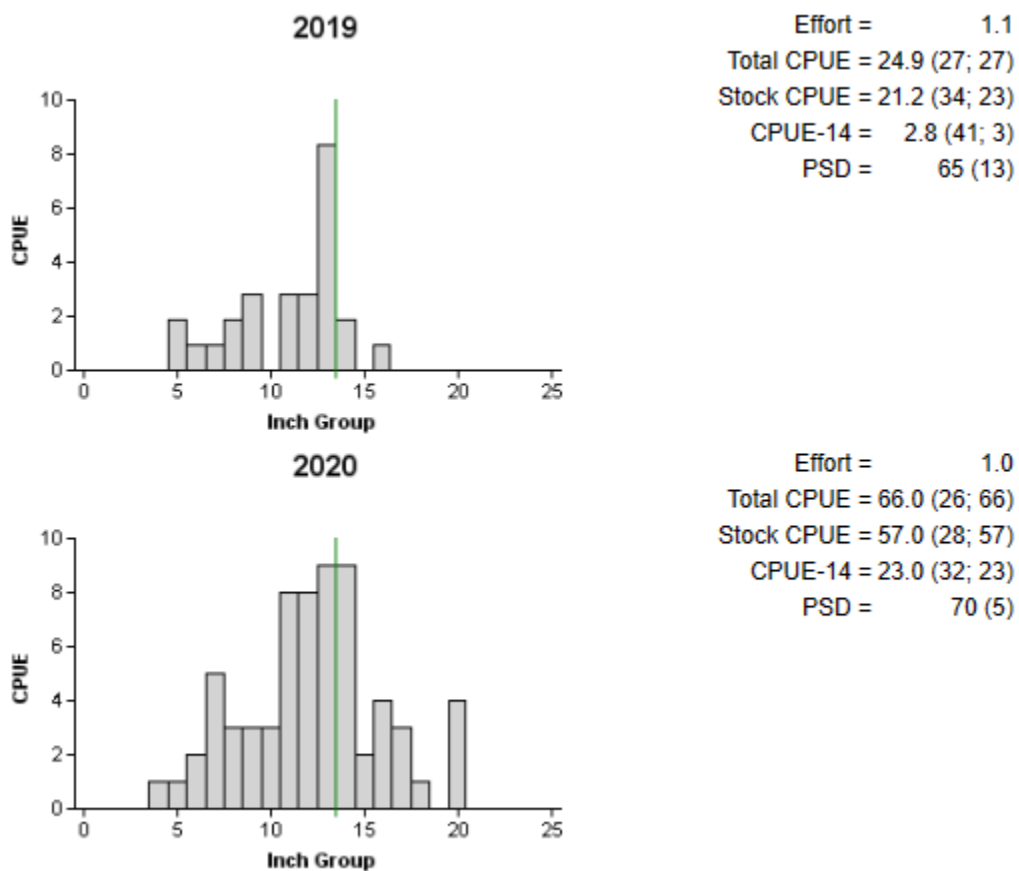Stock CPUE = 57.0 (28; 57)
CPUE-14 = 23.0 (32; 23)
PSD = 70 (5)

Figure 12. 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 survey, Lake Corpus Christi, Texas, 2019 and 2020. Vertical line denotes 14-inch minimum length limit.

Table 14. Creel survey statistics for Largemouth Bass at Lake Corpus Christi, Texas were from June 2014 through May 2015 (Full year: 2014/2015 dark gray), March 2015 through May 2015 (Spring 2015), and March 2023 through May 2023 (Spring 2023). Total catch per hour is for anglers targeting bass and total harvest is the estimated number of bass harvested by all anglers. Relative standard errors (RSE) are in parentheses.

Creel Survey Statistic	Year		
	2014/2015	Spring 2015	Spring 2023
Surface area (acres)	14,944	15,885	17,145
Directed angling effort (h)			
Tournament	0	0	1,808 (64)
Non-Tournament	794 (84)	500 (115)	1,303 (70)
All black bass angler combined	794 (84)	500 (115)	3,111(49)
Angling effort/acre	0.05 (84)	0.03 (115)	0.18 (49)
Catch rate (number/h)	0.06 (270)	0.0 (0)	0.45 (50)
Harvest			
Non-tournament harvest	0	0	0
Harvest/acre	0	0	0
Tournament weigh-in and release	0	0	251 (483)
Release by weight			
<4.0 lbs	0	0	1,542 (78)
4.0-6.9 lbs	0	0	67 (85)
7.0-9.9 lbs	0	0	0
≥10.0 lbs	0	0	0
Percent legal released (non-tournament)	0	0	100

Table 15. Creel survey statistics for all crappie (White and Black Crappie) at Lake Corpus Christi, Texas, were from June 2014 through May 2015 (Full year: 2014/2015 dark gray), March 2015 through May 2015 (Spring 2015), and March 2023 through May 2023 (Spring 2023). Total catch per hour is for anglers targeting crappie and total harvest is the estimated number of crappie harvested by all anglers. Relative standard errors (RSE) are in parentheses.

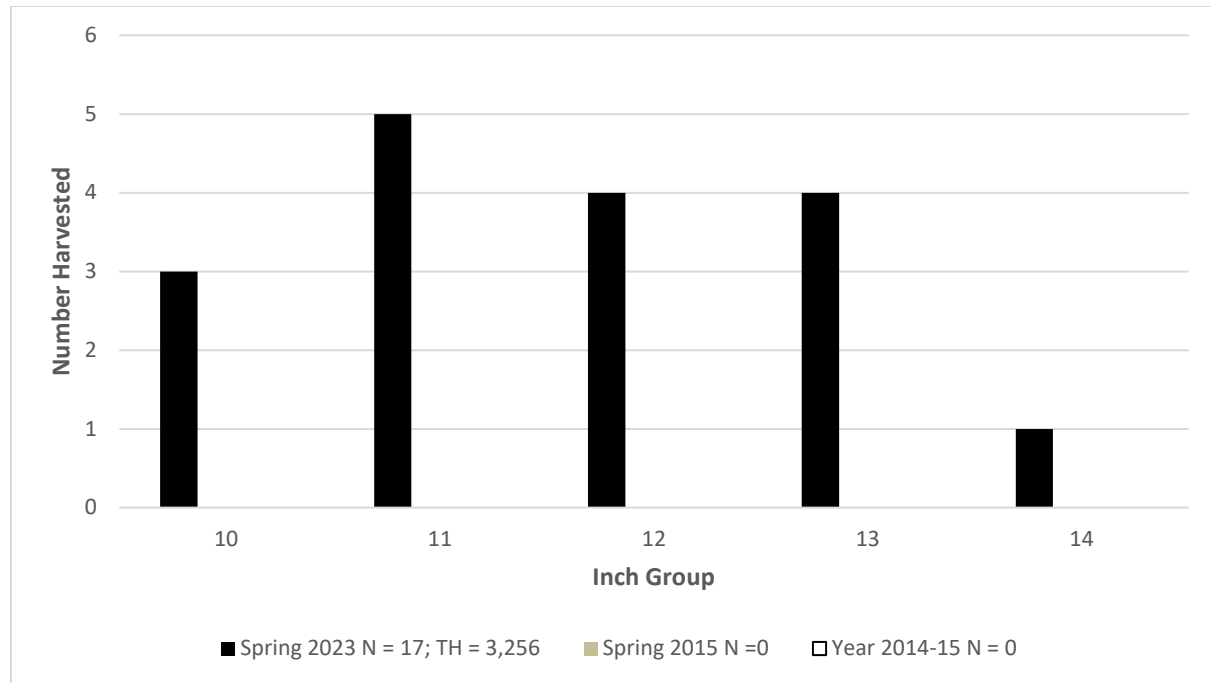| Creel Survey Statistic	Year		
	2014/2015	Spring 2015	Spring 2023
Surface area (acres)	14,944	15,885	17,145
Directed effort (h)	2,298 (59)	1,912 (68)	10,835 (27)
Directed effort/acre	0.15 (59)	0.12 (68)	0.63 (27)
Total catch per hour	0	0	0.51 (62)
Total harvest	0	0	3,256 (124)
Harvest/acre	0	0	0.19 (124)
Percent legal released	0	0	0

Figure 13. Length frequency of harvested crappies observed during creel surveys at Lake Corpus Christi, Texas, June 2014 through May 2015, March 2015 through May 2015, and March 2023 through May 2023, all anglers combined. N is the number of harvested crappies observed during creel surveys, and TH is the total estimated harvest for the creel period.

Proposed Sampling Schedule

Table 16. Proposed survey schedule for Lake Corpus Christi, Texas. Survey period is June through May. Electrofishing surveys are conducted in the fall, bass-only electrofishing and gill netting surveys in the spring.

	Survey year			
	2023-2024	2024-2025	2025-2026	2026-2027
Angler Access				X
Vegetation				X
Electrofishing – Fall				X
Electrofishing (Bass only) – Fall		X		
Gill netting		X		X
Spring Creel Survey				X
Winter Nueces Creel Survey				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 species collected from all gear types from Lake Corpus Christi, Texas, 2022-2023. Sampling effort was 2.5 hour for fall electrofishing, 1 hour for White Bass winter electrofishing (Nueces River), and 15 net nights for gill netting.

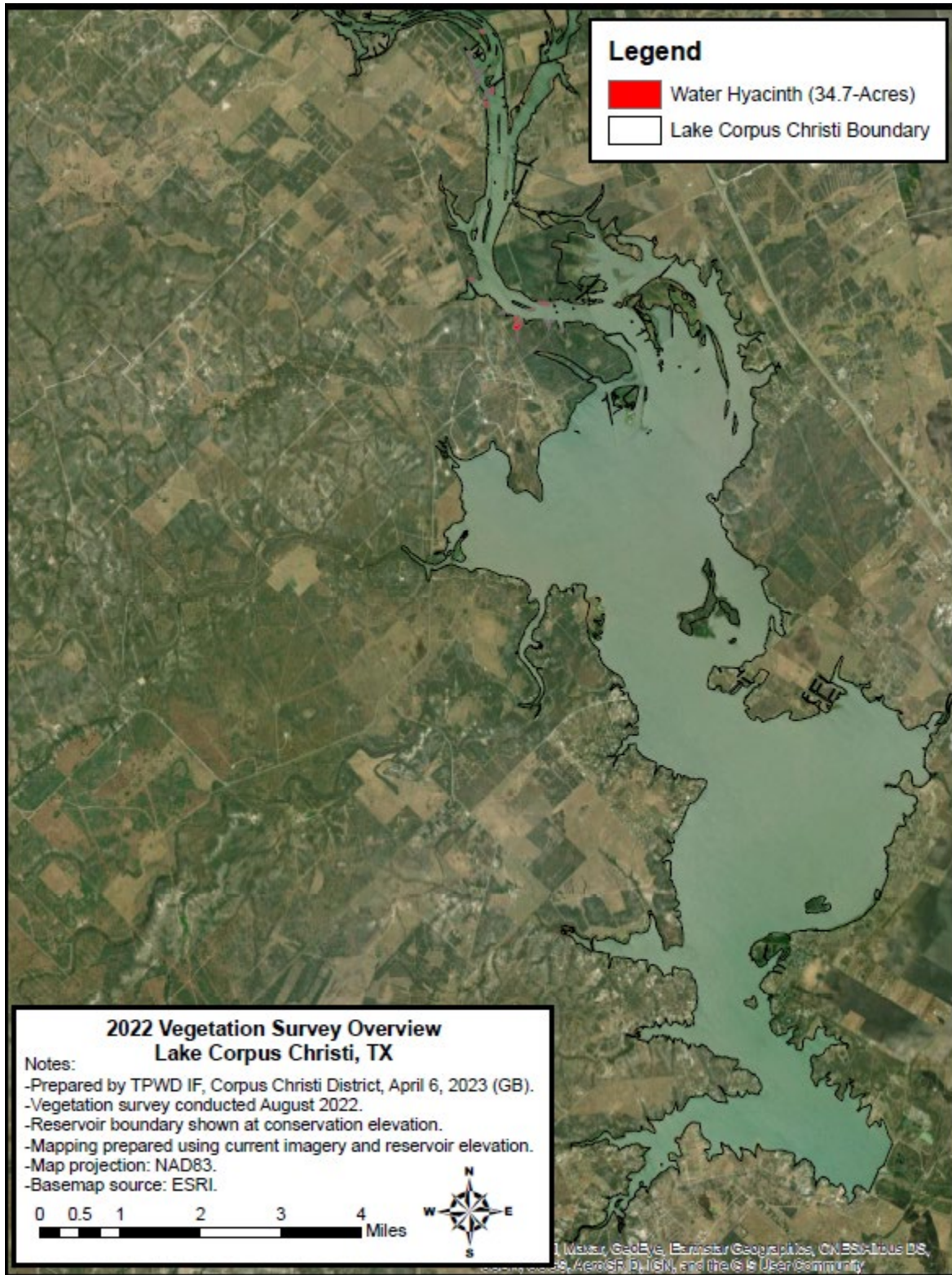| Species	Electrofishing		Gill Netting	
	N	CPUE	N	CPUE
Spotted Gar			26	1.73 (62)
Longnose Gar			68	4.53 (47)
Alligator Gar			3	0.20 (53)
Gizzard Shad	294	117.60 (20)	59	3.93 (19)
Threadfin Shad	669	267.60 (52)		
Common Carp			2	0.13 (68)
Bullhead Minnow	20	8.00 (33)		
Inland Silverside	2	0.80 (69)		
Smallmouth Buffalo			66	4.40 (24)
Blue Catfish			116	7.73 (14)
Channel Catfish				
Flathead Catfish			2	0.13 (68)
White Bass*	137	137.00 (11)	9	0.60 (48)
Bluegill	138	55.20 (19)	1	0.07 (100)
Longear Sunfish	33	13.20 (21)		
Redear Sunfish	15	6.00 (33)		
Largemouth Bass	85	34.00 (34)		
White Crappie			5	0.33 (56)
Black Crappie			2	0.13 (68)
Freshwater Drum			127	8.47 (13)
Rio Grande Cichlid	1	0.40 (100)		

*CPUE statistic from winter electrofishing (Nueces River)
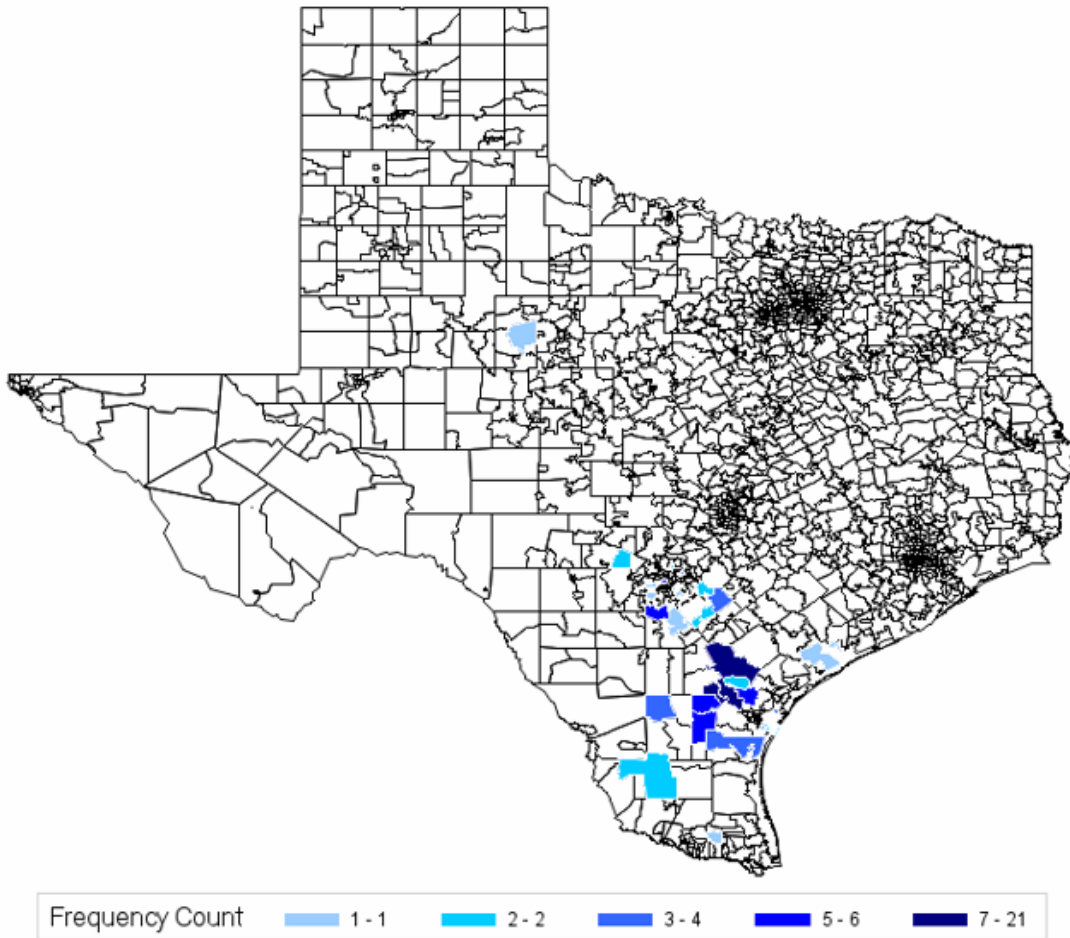
APPENDIX B – Map of sampling locations
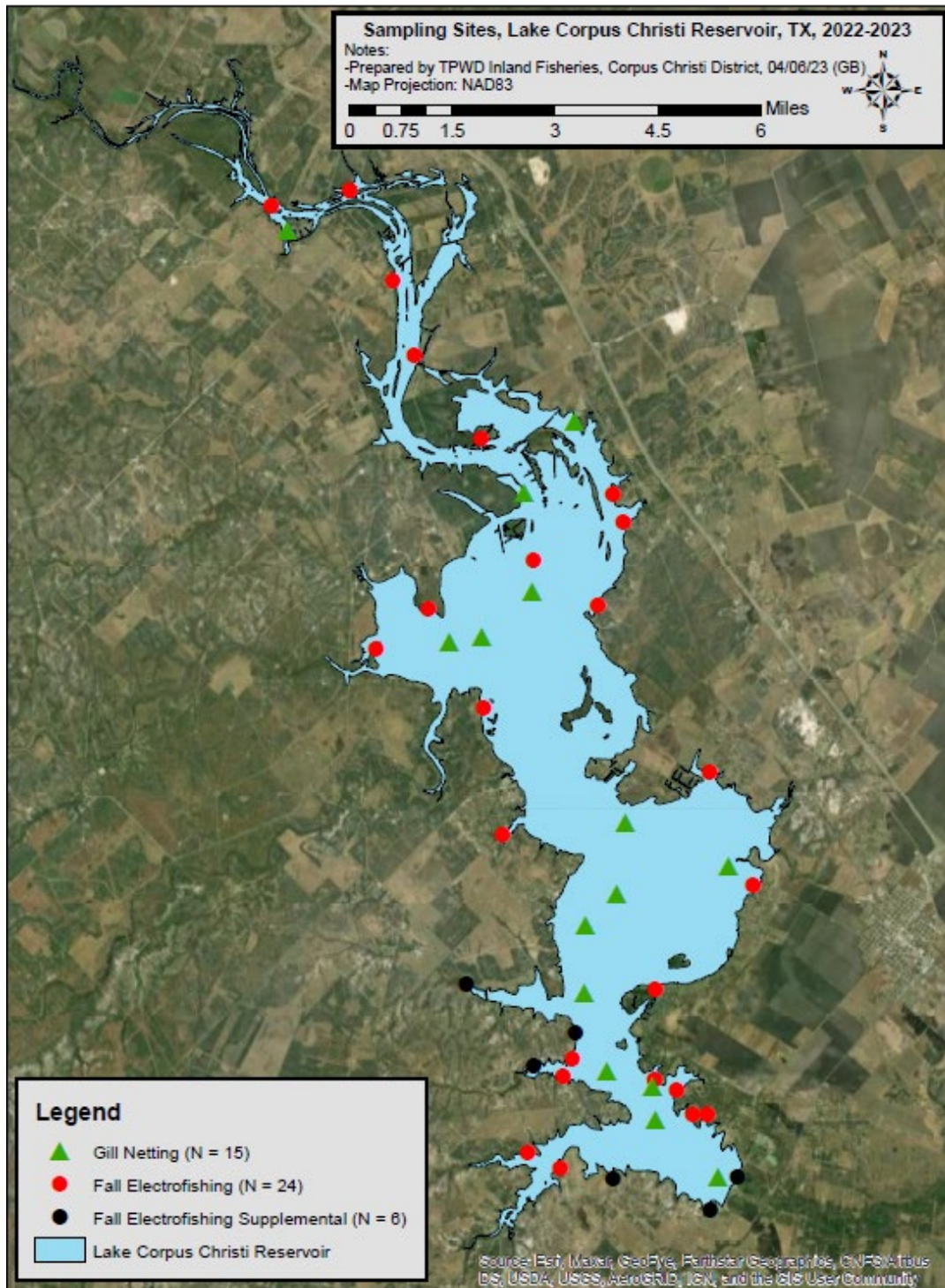
Location of sampling sites, Lake Corpus Christi, Texas, 2022-2023. Gill net, electrofishing stations and additional bass-only sampling are indicated by green triangle, red circle and black circle, respectively. Water level was at conservation elevation at time of sampling.

APPENDIX C – Distribution map of aquatic vegetation, 2022

Legend
- Water Hyacinth (34.7-Acres)
- Lake Corpus Christi Boundary

2022 Vegetation Survey Overview
Lake Corpus Christi, TX
Notes:
-Prepared by TPWD IF, Corpus Christi District, April 6, 2023 (GB).
-Vegetation survey conducted August 2022.
-Reservoir boundary shown at conservation elevation.
-Mapping prepared using current imagery and reservoir elevation.
-Map projection: NAD83.
-Basemap source: ESRI.

0 0.5 1 2 3 4 Miles

APPENDIX D – Zip Code home ranges from anglers that fish Lake Corpus Christi, 2023

Location, by ZIP code, and frequency of anglers that were interviewed at Lake Corpus Christi, Texas, during March 2015 through May 2015 creel survey.

TEXAS PARKS & WILDLIFE

Life's better outside.®