

Somerville Reservoir

2020 Fisheries Management Survey Report

PERFORMANCE REPORT

As Required by

FEDERAL AID IN SPORT FISH RESTORATION ACT

TEXAS

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INLAND FISHERIES DIVISION MONITORING AND MANAGEMENT PROGRAM

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Contents

Contents	i
Survey and Management Summary	1
Introduction.....	2
Reservoir Description	2
Angler Access.....	2
Management History	2
Methods.....	3
Results and Discussion	4
Fisheries Management Plan for Lake Somerville, Texas	7
Objective-Based Sampling Plan for Lake Somerville	8
Literature Cited.....	11
Tables and Figures	12
Water Level	12
Reservoir Characteristics	12
Boat Ramp Characteristics.....	13
Harvest Regulations	14
Stocking History.....	15
Objective-Based Sampling Plan for 2012-2013	16
Structural Habitat Survey.....	17
Aquatic Vegetation Survey	17
Percent Directed Angler Effort per Species.....	18
Total Fishing Effort and Fishing Expenditures.....	18
Gizzard Shad	19
Bluegill	20
Blue Catfish	21
Channel Catfish	22
White Bass.....	25
Hybrid Striped Bass.....	28
Largemouth Bass	30
Crappies	33
Proposed Sampling Schedule	35
Appendix A – Catch rates for all species from all gear types	36
Appendix B – Map of sampling locations	37
Appendix C – Reporting of creel ZIP code data	38
Appendix D – Historical Population Trends 1987-Present.....	39

Survey and Management Summary

Fish populations in Lake Somerville were surveyed in 2019 and 2021 using gill netting and in 2020 using electrofishing. Anglers were surveyed from June 2020 through May 2021 with a roving creel survey. Historical data are presented with the 2017-2021 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 Somerville is a 11,456-acre flood-control reservoir constructed by the U.S. Army Corps of Engineers (USACE) on Yegua Creek in Burleson, Lee, and Washington Counties, Texas. Principle tributaries are Middle Yegua, West Yegua, and Nails Creeks. Lake Somerville has a drainage area of approximately 1,006 square miles.

Management History: Important sport fishes include Channel Catfish, Blue Catfish, White Bass, Hybrid Striped Bass, Largemouth Bass, White Crappie, and Black Crappie. Recent stockings include Florida Largemouth Bass and Hybrid Striped Bass. Hydrilla was observed in small quantities in 2020 but did not negatively impact recreational access. Water hyacinth was introduced into the lake and eradicated with herbicide applications in 2008; none was observed in 2020.

Fish Community

- **Prey species:** Threadfin Shad, Gizzard Shad, and Bluegill were the predominant prey species in Lake Somerville with populations dominated by small-bodied fish; suggesting adequate availability of prey to larger sportfish.
- **Catfishes:** Channel Catfish were the dominant catfish species, offering good angling opportunities. Blue Catfish, although less numerous, also support a fishery. Catfishes were the fourth-most targeted species group at Lake Somerville.
- **Temperate basses:** Gill net population survey data and angler effort in 2020-2021 for White Bass and Hybrid Striped Bass were the highest seen in recent years. Temperate basses were the fifth most targeted species group at Lake Somerville, with 11.3% of total angling effort and represented an important component of the overall sport fishery.
- **Largemouth Bass:** Largemouth Bass were present, and the size distribution comprised mainly sub-legal fish. Largemouth Bass grew quickly and reached the 14-inch legal length at 1.4 years. The 2020-2021 creel survey indicated that Largemouth Bass were the third most popular species among anglers at Lake Somerville. Participation ShareLunker Program increased during the survey period.
- **Crappies:** Both White Crappie and Black Crappie were present in Lake Somerville and crappies were the most sought species group and provided ample opportunity for harvest-oriented anglers. Combined total harvest for crappies was high and fish up to 15 inches were harvested by anglers. The 2020-2021 creel data indicate a robust and healthy crappie population.

Management Strategies: Request annual stockings of Hybrid Striped Bass. Enhance Largemouth Bass fishery potential with annual stocking of Florida Largemouth Bass. Secure funds to replace collapsed bridges on the Nails and Yegua Creeks that allow fish passage. Aquatic Invasive Species vegetation surveys will be conducted annually to monitor and identify potential angler access issues.

Introduction

This document is a summary of fisheries data collected from Lake Somerville from June 2017 through May 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 Somerville is an 11,456-acre flood-control reservoir constructed by the U.S. Army Corps of Engineers on Yegua Creek in Burleson, Lee, and Washington Counties, Texas. Principle tributaries are Middle Yegua, West Yegua, and Nails Creeks. Lake Somerville has a drainage area of approximately 1,006 square miles and a very low Shoreline Development Index of 5.7 (RPS Espey 2012). The reservoir has a mean depth of 11 feet and a maximum depth of 38 feet. Average rainfall in the watershed since 1900 is 180 inches per year (NOAA 2021). Conservation elevation is 238 feet above mean sea level (MSL, Figure 1). The reservoir lies within the Post Oak Savannah Land Resource Area with soils consisting of Falba-Burlewash, Kaufman-Gowen, and Tabor-Axtell associations (sandy loam-clay). Land uses around the reservoir are primarily agricultural and recreational. Other descriptive characteristics for Lake Somerville are included in Table 1.

Angler Access

Lake Somerville has ten public boat ramps and two private boat ramps. Two public ramps remain closed due to past damage, but secondary ramps are open and available in the same park. Additional boat ramp characteristics are listed in Table 2. Shoreline access is available at several parks and marinas including the Nails Creek and Birch Creek Units of Lake Somerville State Park, Welch Park, Overlook Park, and Lake Somerville Marina.

Management History

Previous management strategies and actions: Management strategies and actions since the previous survey report in 2016 included:

1. Support the Hybrid Striped Bass fishery and seek to better document Hybrid Striped Bass fishing pressure and catches at Lake Somerville (Ragan and Webb 2017).

Action: Hybrid Striped Bass were stocked annually in 2017-2021 and contained a mixture of Sunshine Bass (female White Bass X male Stiped Bass) and Palmetto Bass (female Striped Bass X male White Bass hybrid). Previous creel surveys excluded anglers that were trolling, the preferred method for fishing for Hybrid Striped Bass. The 2020-2021 creel survey interviewed trolling anglers when possible in an effort to better document Hybrid Striped Bass fishing effort and angler dynamics (i.e., catch, harvest, harvest size distribution).
2. Improve trophy potential of the Largemouth Bass fishery and increase Largemouth Bass angling at Lake Somerville (Ragan and Webb 2017).

Action: Florida Largemouth Bass were stocked into Lake Somerville in 2019, 2020, and 2021. The number of large fish observed during the creel survey increased. ShareLunker program entries from Somerville increased during the report period following local outreach. From 2018 to 2021 there were four Lunker entries (> eight pounds) and six Elite Lunker entries (> 10 pounds).
3. Invasive exotic aquatic plants—giant reed (ie. *Arunod donax*) and hydrilla—are present on Lake Somerville and could potentially restrict access (Ragan and Webb 2017).

Action: Invasive aquatic species (AIS) surveys were conducted 2020. Hydrilla was observed for the first time since 2012; 1.64 acres near Nails Creek. Giant reed abundance dropped after extended periods of inundation and a severe freeze.

4. Improve structural fish habitat and congregate fish to improve angler success.

Action: Structural habitat improvements were not included in the last management recommendation due to a lack of resources, however unanticipated grants from the Brazos River Authority allowed for the purchase and installation 85 of Mossback Fish Habitat structures in 2018 and 92 structures in 2019. All habitat structures were grouped into reefs and distributed at 17 sites through Lake Somerville.

Harvest regulation history There are no exceptions to statewide fishing regulations at Lake Somerville. Current regulations are found in Table 3.

Stocking history: Lake Somerville is regularly stocked with Hybrid Striped Bass and Florida Largemouth Bass. The complete stocking history is in Table 4.

Vegetation/habitat management history: Native emergent vegetation is common in shallow areas of Lake Somerville when the reservoir is at conservation pool. Invasive giant reed, water hyacinth, and hydrilla have all been found in Lake Somerville. Giant reed was observed in 2020. Water hyacinth has not been seen since it was initially discovered in 2008, subsequently physically removed, and the remainder treated with herbicide. Hydrilla is occasionally observed but rarely persists for more than a few years due to wide water level fluctuations and was observed in 2020, the first time since 2012

Water transfer: Lake Somerville is operated by the US Army Corp of Engineers (USACE) for water supply, flood control, and recreation. Water released from Lake Somerville is transferred via Yegua Creek to the Brazos River to supply agricultural, industrial, and municipal customers downstream. 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 Lake Somerville (Ragan and Webb 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 (2 hours at 24, 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 all suitable collected fish (range 13.0 to 14.9 inches).

Gill netting – Channel Catfish, White Bass, and Hybrid Striped Bass 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).

Genetics – Genetic analysis of Largemouth Bass was conducted according to the Fishery Assessment Procedures (TPWD, Inland Fisheries Division, unpublished manual revised 2017). Micro-satellite DNA analysis was used to determine genetic composition of individual fish.

Statistics – Sampling statistics (CPUE for various length categories), structural indices [Proportional Size Distribution (PSD), Guy et al. 2007], and condition indices [relative weight (W_r)] were calculated for target

fishes according to Anderson and Neumann (1996). Palmetto Bass PSD was calculated according to Dumont and Neely (2011). Index of Vulnerability (IOV) was calculated for Gizzard Shad (DiCenzo et al. 1996). Standard error (SE) was calculated for structural indices and IOV. Relative standard error (RSE = 100 X SE of the estimate/estimate) was calculated for all CPUE and creel statistics.

Creel survey – An annual roving creel survey was conducted from June 1, 2020 through May 31, 2021. Angler interviews were conducted on five weekend days and four weekdays per quarter to assess angler use and fish catch/harvest statistics. The creel covered all areas of the lake greater than 3 foot in depth: parts of the Nails Creek area were inaccessible in the later part of the creel period due to low water. Total fishing effort was calculated from an instantaneous circuit of the reservoir, and angler interviews conducted on a second, slower circuit. The 2009-2010 and 2020-2021 creel surveys utilized a roving survey design and the 2014-2015 creel survey was an access point survey.

Habitat – A structural habitat survey was conducted in 2020. Aquatic vegetation surveys were conducted in 2020. Adverse weather and flooding prevented vegetation surveys in 2017-2019. Habitat and vegetation were assessed with the digital shapefile method (TPWD, Inland Fisheries Division, unpublished manual revised 2017).

Water level – Source for water level data was the United States Geological Survey (USGS 2021)

Results and Discussion

Habitat: Habitat at Lake Somerville consists primarily of rocky shoreline and submerged timber and had little aquatic vegetation in 2020 (Table 6 and Table 7). The previous OBS plan, called for annual vegetation surveys; however, high water leading to unsafe conditions prevented surveys from being conducted in 2017, 2018, and 2019 (Ragan and Webb 2017). Riprap occurs along the dam and along jetties within some parks. Standing timber is present near where tributaries enter the reservoir. Littoral vegetation was historically composed of native emergent rushes and grasses, and non-native giant reed. Giant reed abundance has remained low since floods in 2015-2016 and a sustained freeze in 2021. Similarly to giant reed, native vegetation has also been sparse since 2016. The only native vegetation observed during the 2020 vegetation survey—which was conducted when the reservoir was two feet below pool—was a trace amount of American lotus at one location. Hydrilla was observed for the first time since 2012: 1.64 acres near Nails Creek. Water hyacinth was not detected during the most recent vegetation survey.

Creel: Directed fishing effort by anglers was highest for crappies (38%), followed by anything (19%), Largemouth Bass (17%), catfishes (13%) and temperate basses (11%, Table 8). Most notably, the relative popularity of Largemouth Bass fell from its position as the most targeted species in 2009-2010 and 2014-2015 and crappies again became the most popular target species as they were prior to 2009 (Henson and Webb 2005, Homer and Webb 2013, Ragan and Webb, 2017). The proportion of anglers targeting “anything” increased to 19% of anglers and many of these anglers anecdotally reported that they were new to fishing, having started during the COVID-19 pandemic. Total fishing effort and expenditures greatly increased in the 2020-2021 creel over previous years’ surveys with anglers spending an estimated 359,504 hours and \$2,077,862 fishing Lake Somerville (Table 9). Catch and harvest of most species increased dramatically, however angler catch rates mostly declined (Table 10 - Table 15). Most anglers in 2020-2021 live within 75 miles of Lake Somerville (Appendix C).

Prey species: Electrofishing catch rates of Gizzard Shad and Bluegill were 141.5.0/h and 139.5/h, respectively and threadfin shad remain abundant in the reservoir (Figure 2, Figure 3, Appendix A). Index of Vulnerability (IOV) for Gizzard Shad was good, indicating that 99% of Gizzard Shad were available to

existing predators, but total CPUE of Gizzard Shad was less than the 2012 and 2016 catch rates. Total CPUE of Bluegill in 2020 was also lower than in previous surveys with the population dominated by fish less than 6 inches. Few anglers reported targeting sunfish, though an estimated 55,102 Bluegill were harvested during the creel survey (Table 8).

Catfishes: The gill net catch rate of Blue Catfish was 1.1/nn and 1.7/nn in 2019 and 2021, respectively, and the population size structure was dominated by legal-size (≥ 12 inches) fish (Figure 4). The catch rate for Channel Catfish in 2019 was 8.5/nn and the population was dominated by large individuals. The 2021 Channel Catfish catch rate was similar at 8.7/nn, yet PSD fell from 75 to 22, indicating a decline in the population size structure relative to the 2019 population size composition (Figure 5). However, ample Channel Catfish were available for angler harvest (CPUE-12 = 6.9/nn). While Channel Catfish catch rates in 2019 and 2021 were lower than 2017, 2019 and 2021 catch rates are within historical ranges and it appears that 2017 was simply an exceptionally good year for Channel Catfish on Lake Somerville. It is unclear whether the catch rate fluctuations were driven by increased harvest of Channel Catfish or changes in habitat availability during the water level fluctuations of recent years. Regardless, relative abundance (CPUE) and size structure indices (PSD) of both Channel Catfish and Blue Catfish were within their respective historic ranges (Appendix D).

Catfishes were the fourth most popular fishery at Lake Somerville during the 2020-2021 creel. As with all fishing effort on the reservoir, fishing effort for catfish set a record high, with 45,481 hours of fishing effort directed at catfishes (Table 10). Angler catch rates of Blue Catfish and Channel Catfish combined were similar to 2009-2010 rates at 0.66 fish per hour. Harvest of Blue Catfish increased from 380 fish in 2009-2010 and 114 fish in 2014-2015 to 3,654 fish in 2020-2021. Total harvest of Channel Catfish (20,045 fish) was lower than in 2014-2015 (36,434 fish) despite the increased fishing effort. Many anglers provided anecdotal information during the creel survey indicating that they were novice anglers, driven outside and to new hobbies during the COVID-19 pandemic, which may have contributed to the increased fishing effort, but low success in catching legal-size fish.

White Bass: The gill net catch rate of White Bass was 3.0/nn in 2019 and 11.0/nn in 2021. Population size structure was excellent, providing ample harvestable (≥ 10 inch) fish (Figure 8). Inconsistent spring water levels in Lake Somerville often result in variable gillnet catch rates of White Bass. The primary spawning area for White Bass in Lake Somerville is Yegua Creek. Yegua Creek and other minor tributaries have a shallow mouth and is easily disconnected from the main reservoir during low water conditions, such as those during the spring of 2021 when gill net sampling occurred. Adult fish, unable to move into the tributaries to spawn, are more vulnerable to spring gill net surveys.

During this survey period, two bridges—one on Nails Creek and one on Yegua Creek in Somerville State Park—washed out during floods. Both bridges are located near the river-reservoir interface. Replacing the bridges with new single-span structures will be necessary to maintain stream connectivity and allow White Bass spawning run passage. Engineering and designs for such replacements have been completed within TPWD, however, construction funds are still lacking.

During the 2020-2021 creel survey, anglers spent 40,422 h targeting White Bass, a substantial increase in directed effort from previous creel surveys (Table 11). Despite increased effort, fewer White Bass were harvested in 2020-2021 (35,331 fish) than in 2014-2015 (67,647 fish). Harvested fish ranged in size from 10 to 15 inches (Figure 9).

The 2020-2021 creel survey was conducted as a roving creel on the main body of the reservoir; however White Bass anglers often follow their target species up into the creeks during spawning runs. Quantifying total fishing effort for White Bass in Lake Somerville's tributaries is particularly difficult; most White Bass creek fishing is conducted at informal access points at bridge crossings and self-made trails in thick hardwood bottomland forest. Two formal access points at Newman's Bottom and Irwin Bridge presumably host a large portion of White Bass angler traffic and are maintained by the Nails Creek Unit of the Lake Somerville State Park and Trailway. Monthly totals of self-pay entry permits show the majority of use occurring during the White Bass spawn, peaking in February and March, with high use during years of high spring flows (2017-2019) and low use during years of low spring flows (2020, Figure 10).

Hybrid Striped Bass: The gill net catch rate of Hybrid Striped Bass was 3.9/nn in 2021, much higher than the catch rates observed in both 2017 and 2019 (0.3/nn; Figure 11).

Directed effort, angler catch, and angler harvest of Hybrid Striped Bass have increased considerably since 2014-2015 (Table 12). Anglers harvested an estimated 506 fish in 2020-2021 ranging in total length between 21 – 24 inches (Figure 12). Percent legal release was high (94%), indicating a high catch and release ethic and a less harvest-oriented angler group. Hybrid Striped Bass harvest remains difficult to accurately quantify on Lake Somerville (i.e., high relative standard errors). Previous creel surveys excluded anglers that were trolling, the preferred method for fishing for Hybrid Striped Bass. In an effort to better document Hybrid Striped Bass fishing, the 2020-2021 creel survey interviewed trolling anglers when conditions allowed and anglers were amenable. However, many vessels were observed trolling that were not interviewed; thus, some Hybrid Striped Bass anglers were not captured and likely underrepresented in the survey results.

Largemouth Bass: The 2020 Largemouth Bass survey struggled to collect sufficient fish and objective based sampling objectives were not met; resulting data had higher than desired variability and too few fish were collected to accurately estimate growth (Ragan and Webb 2017, Table 5). Largemouth Bass relative abundance (as measured by the catch per unit effort) was considerably reduced in 2020 relative to prior years. The total electrofishing catch rate Largemouth Bass was 27.0/h in 2020, the second lowest rate since management surveys began in 1987 (Figure 13; Appendix D). Similar low catches have been seen in past years when low water levels reduced littoral vegetative habitat. Body condition of collected Largemouth Bass was good and growth seemed excellent; average age at 14 inches was 1.4 years however, but only seven fish between 13.0 and 14.9 inches were collected resulting in low quality data. While PSD was low (35), younger fish should recruit to the 14-inch minimum length limit quickly. Florida Largemouth Bass influence has remained consistent since 2012 with 55-57% Florida-strain alleles (Table 13).

Like all other species-directed angling effort, Largemouth Bass directed effort rose dramatically in the 2020-2021 creel survey (Table 14). Total directed fishing effort for Largemouth Bass was 61,777 h. Tournament anglers represented a substantial component and comprised 41% of the total Largemouth Bass angling effort. Total angling effort per acre was 5.39 h/acre. Lake Somerville remains a challenging reservoir to fish but angler success (i.e., angler CPUE) did increase from 0.28 fish/h in 2009-2010 and 0.06 fish/h in 2014-2015, to 0.39 fish/h in 2020-2021 and more large fish—up to 9.9 lb.—were observed during the 2020-2021 creel. Most legal-sized Largemouth Bass were.

Crappies: Trap net sampling was discontinued for crappies in lake Somerville due to low catch rates and poor sampling precision. Both White Crappie and Black Crappie were present in electrofishing surveys in 2021 and represented a significant portion of the total angler creel (Appendix A, Table 8).

Historically, crappies have been an extremely important component of the overall sport fishery and were often the most targeted species group at Lake Somerville (Henson and Webb 2005). After falling in relative popularity in recent years, crappies were again the most popular species group targeted at Lake Somerville in 2020-2021 (Table 8). Anglers spent more time targeting crappies and harvested more crappies than ever before: anglers spent 137,977 h (12.0 h/acre) targeting crappies and harvested an estimated 48,701 White Crappie and 34,768 Black Crappie (Table 15). Yet catch rates declined from 4.78/h for both species combined in 2009-2010 and 1.35/h in 2014-2015 to 0.98 in 2020-2021. It is likely the reduced catch rate was a result of both increased effort by inexperienced novice anglers' and increased angling pressure on the crappie populations.

Fisheries Management Plan for Lake Somerville, Texas

Prepared – July 2021

ISSUE 1: Hybrid Striped Bass are highly valued and remain a popular fishery at Lake Somerville. Stockings are regularly requested by members of an avid Hybrid Striped Bass fishing community.

MANAGEMENT STRATEGY

1. Stock Hybrid Striped Bass annually at 10 fish/acre to maintain the fishery.

ISSUE 2: Largemouth Bass are a popular fishery at Lake Somerville and the reservoir has the potential to produce trophy Largemouth Bass: the current lake record is 13.6 lbs., and four Lunker entries (> eight pounds) and six Elite Lunker entries (> 10 pounds) were entered into the ShareLunker Program from 2018- 2021. Furthermore directed angler effort has increased over the last three creel surveys and 7- to 9-pound fish were reported in the 2020-2021 creel survey.

MANAGEMENT STRATEGIES

1. Request annual stockings of Florida Largemouth Bass to improve the opportunity for continued trophy Largemouth Bass catches at Lake Somerville.
2. Continue to reach out to anglers in the Lake Somerville area and encourage participation in all TPWD angler recognition programs, including ShareLunker.
3. Solicit local, collegiate, and semi-professional tournament organizers to use Lake Somerville as a tournament venue and partner with tournament organizers to collect tournament catch data.

ISSUE 3: Bridges on Nails and Yegua Creeks along the Somerville Trailway in Somerville State Park were severely damaged in floods and pose barriers to fish passage, especially of spawning White Bass. Engineering and designs for two single-span bridges have been completed by the TPWD Infrastructure Division, but funds are needed for construction.

MANAGEMENT STRATEGIES

1. Assist in securing additional funds to install single-span bridge crossing that will allow for adequate fish passage.

ISSUE 4: Angler catch rate of crappie species has declined while directed effort dramatically increased.

MANAGEMENT STRATEGIES

1. Install additional structural habitat to congregate fish when funds are available and publish the location of habitat additions online.

ISSUE 5: Lake Somerville has limited vegetative habitat.

MANAGEMENT STRATEGIES

1. Continue annual monitoring vegetation at Lake Somerville.
2. Expansion of native aquatic plants is currently limited by long holding periods of flood waters by the controlling authority while repairs on the dam are made. Discuss future water level goals with the controlling authority and assess the feasibility and efficacy of future native plant establishment programs

ISSUE 6: Many invasive species threaten aquatic habitats and organisms in Texas and can adversely affect the state ecologically, environmentally, and economically and Lake Somerville is high risk for several species. Hydrilla and giant reed are present in Lake Somerville and water hyacinth has been found in the past. Water hyacinth, hydrilla, and other invasive vegetation species can form dense mats, interfering with recreational activities like fishing, boating, skiing, and swimming. Zebra mussel environmental-DNA (eDNA) surveys have returned positive results in the past at Lake Somerville, however no veligers or adult zebra mussels have been documented. 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. 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. Conduct annual exotic vegetation surveys and if access issues are identified, keep the USACE informed and work with the controlling authority and Aquatic Habitat Enhancement Team to coordinate management actions and facilitate herbicide treatments, if necessary.
2. Conduct biannual eDNA and plankton tow surveys for zebra mussels.
3. Cooperate with the controlling authority to post appropriate signage at access points around the reservoir.
4. Contact and educate marina owners about invasive species, and provide them with posters, literature, etc. so that they can in turn educate their customers.
5. Educate the public about invasive species through the use of media and the internet.
6. Make a speaking point about invasive species when presenting to constituent and user groups.
7. Keep track of (i.e., map) existing and future inter-basin water transfers to facilitate potential invasive species responses.

Objective-Based Sampling Plan for Lake Somerville

2021 - 2025

Sport fish, forage fish, and other important fishes.

Sport fishes in Lake Somerville include Blue Catfish, Channel Catfish, White Bass, Hybrid Striped Bass, Largemouth Bass, Black Crappie, and White Crappie. Important forage species include Gizzard Shad, Threadfin Shad, and Bluegill.

Low Density fisheries

All sportfish species at Lake Somerville contribute to the overall fishery and justify sampling effort.

Survey objectives, fisheries metrics, and sampling objectives

Catfishes: Blue Catfish and Channel Catfish are popular target species on Lake Somerville, with 18.3% of anglers targeting catfishes in 2009-2010, 21.9% in 2014-2015, and 12.7% in 2020-2021. Channel catfish are the more dominant species, and historical gill net surveys of 15 net nights provided sufficiently precise data to determine survey objectives of relative abundance and size structure. Blue Catfish are less common and bootstrap analysis of historical data predict that more than 45/nn would be required to obtain precise data. Sampling objectives for surveying the Channel catfish in 2025 will be 50 stock-sized fish with an RSE of less than 25 and will be accomplished with 15 net nights of gillnetting across 15 randomly chosen stations. Blue Catfish will be monitored along with Channel Catfish effort for presence/absence.

White Bass: White Bass are a popular spring target species in Lake Somerville. An estimated 12,644 hours were spent targeting White Bass in the 2014-2015 creel survey and 61,777 hours in 2020-2021. Historical surveys were conducted using 15 net nights and regularly provide sufficiently precise relative abundance, size structure, and condition data with CPUE RSEs under 25. White Bass will be monitored in 2025 with 15 net nights of gillnetting. If at least 13 specimens are collected between 9.0-10.9 inches in length, they will be used to estimate mean age at legal length. Sampling objectives will be to collect 50 stock-sized fish, with a CPUE-Stock less than 25. No additional gill nets will be set if sampling objectives are not met.

Hybrid Striped Bass: Hybrid Striped Bass have been regularly stocked in Lake Somerville since 1975; however, historical catch rates during gillnet surveys have been erratic, with most years exhibiting high CPUE variance (RSEs > 50). Hybrid Striped Bass will be monitored for relative abundance and size structure in 2025 with spring gill netting in conjunction with the catfish survey described above and during a roving creel survey in 2024-2025. If at least 13 specimens are collected between 17.0 and 18.9 inches in length, they will be used to estimate mean age at legal length.

Largemouth Bass: Largemouth Bass have been historically surveyed on Lake Somerville every four years with two hours of fall electrofishing and most surveys resulted in sufficient data quality (i.e., low RSEs) to monitor trends in population metrics (CPUE, size structure, body condition). However, the 2020 fall electrofishing survey collected few fish and indicated a decline in several population metrics (Total-CPUE, Stock-CPUE, and PSD). While these declines in relative abundance and size composition may be the effects of water fluctuations, they necessitate increased scrutiny: Largemouth Bass will be surveyed in 2022 and 2024 with two hours of fall electrofishing at 24 randomly selected five-minute electrofishing stations to determine relative abundance, size structure, age-at-harvest and condition. To reach these survey objectives, sampling objectives will be to collect at least 50 stock-sized fish with an RSE of less than 25 and 13 fish between 13.0-14.9 inches to estimate mean age at legal harvest length. Additional stations effort will not be expended if sampling objectives are not met. Creel surveys every four years provide additional information on fishing effort and the Largemouth Bass population. Entries into the ShareLunker Program will supplement information on trophy potential.

Crappie: White Crappie and Black Crappie are present in Lake Somerville and have been one of the top three preferred target species, if not the most popular, since creel surveys began. During the 2020-2021 creel, crappies were the most popular species group with anglers expending 137,977h (12.0 hours/acre) targeting crappies. Despite their popularity reflected in angler catches, historical trap net surveys often had low catch rates and high variability. Bootstrap analysis of historical data estimates that it would take > 24 trap nets to attain acceptable precision ($RSE \leq 25$, $N > 50$) at least 80% of the time. Crappie will be monitored for presence/absence every four years with fall electrofishing as described above. Further, an annual creel every four years will provide supplemental information on the White Crappie and Black Crappie populations.

Gizzard Shad, Threadfin Shad, and Bluegill: Gizzard Shad, Threadfin Shad, and Bluegill were the dominant prey fish in Lake Somerville. Sampling Gizzard Shad, Threadfin Shad, and Bluegill at the same intensity as is proposed for Largemouth Bass will allow the detection of any large-scale fluctuations in the

prey population abundance or size structure that may warrant further evaluation. Relative weight estimates for Largemouth Bass will be used for supplemental qualitative assessment of prey suitability.

Habitat and Vegetation: The shoreline and littoral areas around Lake Somerville are owned by the USACE and as such, are relatively protected from large scale structural habitat changes; however, a structural habitat survey will be conducted in 2024 if significant changes in structural habitat are suspected. Vegetation on Lake Somerville varies greatly between years depending on water level fluctuations. Aquatic invasive vegetation is also present and has the potential to impact recreational access. Vegetation, including aquatic invasive species, will be surveyed annually during the summer to monitor expansion of native and non-native vegetation.

Creel Survey: An annual roving angler creel survey will be conducted in 2024-2025 to estimate directed angling effort, catch, harvest, and expenditures for all game fish species. Angler catch data will also provide supplemental information on sportfish populations that are historically difficult to measure, like Blue Catfish and crappies, with fisheries-independent surveys.

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.
- 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.
- Dumont, S. C., and B. C. Neely. 2011. A proposed change to Palmetto Bass proportional size distribution length categories. North American Journal of Fisheries Management 31: 722-725.
- 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.
- Henson, J, and M. Webb. 2005. Statewide freshwater fisheries monitoring and management program survey report for Lake Somerville, 2004. Texas Parks and Wildlife Department, Federal Aid Report F-30-R-30, Austin. 32 pp.
- Homer, M, Jr, and M. Webb 2013. Statewide freshwater fisheries monitoring and management program survey report for Lake Somerville, 2008. Texas Parks and Wildlife Department, Federal Aid Report F-221-M-3, Austin. 34 pp.
- NOAA National Centers for Environmental information, Climate at a Glance: County Mapping, <https://www.ncdc.noaa.gov/cag/> (June 2021).
- Ragan, A, N, and M. Webb. 2017. Lake Somerville, 2016 Fisheries Management Survey Report. Texas Parks and Wildlife Department, Federal Aid Report F-221-M-7, Austin.
- RPS Espey. Watershed Protection for Texas Reservoirs: Addressing Sedimentation and Water Quality Risks, report, January 31, 2012; Austin, Texas.
- Texas Commission on Environmental Quality. 2011. Trophic classification of Texas reservoirs. 2010 Texas Water Quality Inventory and 303 (d) List, Austin. 18 pp.
- United States Geological Society (USGS). 2021. National Water Information System: Web Interface. Available: <http://waterdata.usgs.gov/tx/nwis> (May 2021).

Tables and Figures

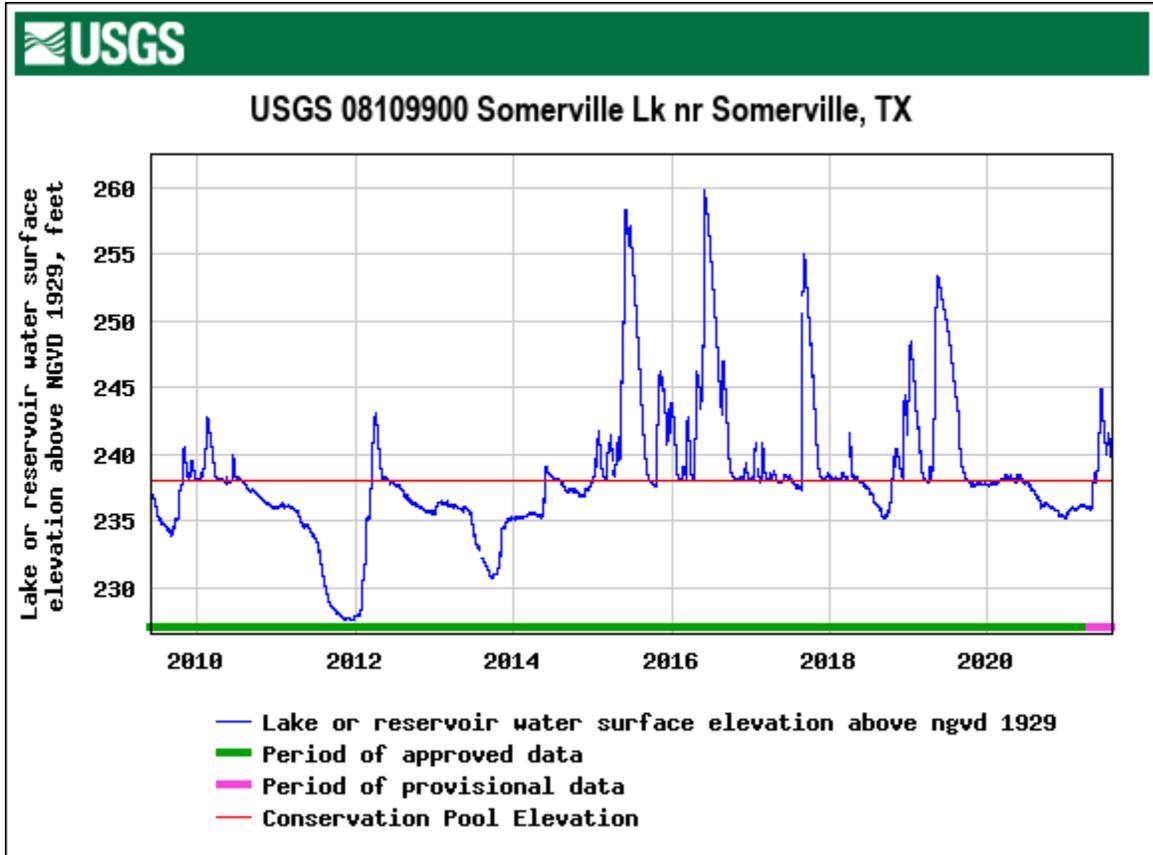


Figure 1. Quarterly water level elevations in feet above mean sea level (MSL) recorded for Lake Somerville, Texas. Conservation Pool elevation is 238 MSL.

Table 1. Characteristics of Lake Somerville, Texas.

Characteristic	Description
Year constructed	1967
Controlling authority	U.S. Army Corps of Engineers
County	Washington, Lee, and Burleson
Reservoir type	Tributary
Shoreline Development Index (SDI)	5.7
Conductivity	290-330 $\mu\text{S}/\text{cm}$

Table 2. Boat ramp characteristics for Lake Somerville, Texas, August 2020. Reservoir elevation at time of survey was 236 feet above mean sea level.

Boat ramp	Latitude Longitude (dd)	Public	Parking capacity (N)	Elevation at end of boat ramp (ft)	Condition
Apache Hills	30.34719 -96.57730	Y	32	235	Open, no access issues
Big Creek Park	30.32343 -96.57185	N	8	232	Open, no access issues
Birch Creek Forest	30.31962 -96.62030	N	15	234	Open, no access issues
Lake Somerville Marina & Campground at Overlook Park	30.30954 -96.51765	Y	50	230	Open, no access issues
Lake Somerville State Park – Birch Creek Unit	30.30943 -96.61884	Y	80	228	Open, no access issues
Lake Somerville State Park – Nails Creek Unit	30.29531 -96.66401	Y	27	230	Open, no access issues
Pecan Lake	30.29036 -96.60568	Y	10	235	Open, unimproved ramp
Rocky Creek Park – 1	30.29963 -96.57211	Y	35	226	Closed
Rocky Creek Park – 2	30.30597 -96.56443	Y	30	226	Open for registered campers only ^a
Welch Park	30.33857 -96.55160	Y	25	231	Open, no access issues
Yegua Creek Park – 1	30.30737 -96.54563	Y	50	226	Closed
Yegua Creek Park – 2	30.30611 -96.53626	Y	20	230	Open for registered campers only ^a

^a Rocky Creek Park and Yegua Creek Park boat ramps were open for day use during the survey period. Ramp access will be limited to registered overnight-campers starting in October 2021.

Table 3. Harvest regulations for Lake Somerville, 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, White	25	10-inch minimum
Bass, Hybrid Striped	5	18-inch minimum
Bass, Largemouth	5a	14-inch minimum
Bass: Spotted	5a	None
Crappie: White and Black crappie, their hybrids and subspecies	25 (in any combination)	10-inch minimum

^a Daily bag for Largemouth Bass and Spotted Bass = 5 fish in any combination.

Table 4. Stocking history of Lake Somerville, Texas. FRY = fry; FGL = fingerling; ADL = adults; UNK = unknown size.

Species	Year	Number	Size	Species	Year	Number	Size
Blue Catfish	1967	23,000	UNK	Sunshine Bass ^b	2017	60,545	FGL
	Total	23,000			2019	45,050	FGL
Channel Catfish	1967	73,850	UNK		2020	600,000	FRY
	1968	302,000	UNK		2021	114,600	FGL
	1973	29,500	UNK		Total	840,195	
	Total	405,350		Black Crappie	1967	4,000	UNK
			Total		4,000		
Palmetto Bass ^a	1975	50,000	UNK	White Crappie	1967	4,000	UNK
	1977	72,649	UNK		Total	4,000	
	1979	128,000	UNK	Sharelunker Largemouth Bass	2009	2,990	FGL
	1981	67,416	UNK		Total	2,990	
	1983	76,912	UNK	Florida Largemouth Bass	1990	287,680	FRY
	1984	250,576	FGL		2000	287,642	FGL
	1985	144,271	FGL		2001	259,707	FGL
	1986	170,600	FGL		2008	296,657	FGL
	1987	184,600	FGL		2010	304,656	FGL
	1988	232,497	FGL		2013	99,998	FRY
	1989	232,497	FGL		2019	69,042	FGL
	1991	116,651	FGL		2020	35,041	FGL
	1992	178,626	FGL		2021	44	ADL
	1993	92,723	FGL		Total	1,640,467	
	1994	170,800	FGL	Walleye	1973	655,000	FRY
	1995	324,800	FGL		1974	171,000	FRY
	1996	173,638	FGL		1975	253,200	FRY
	1997	50,215	FGL		Total	1,079,800	
	1998	177,621	FGL				
	1999	85,436	FGL				
2000	29,800	FGL					
2002	22,020	FGL					
2004	115,312	FGL					
2005	100,175	FGL					
2006	58,085	FGL					
2007	58,375	FGL					
2008	110,079	FGL					
2009	80,406	FGL					
2011	80,676	FGL					
2013	107,963	FGL					
2014	50,284	FGL					
2017	69,157	FGL					
2018	82,289	FGL					
2019	46,900	FGL					
Total		3,992,399					

^a Female Stripe Bass X male White Bass^b Female White Bass X male Striped Bass

Table 5. Objective-based sampling plan components for Lake Somerville, Texas 2017–2021.

Gear/target species	Survey objective	Metrics	Sampling objective
<i>Electrofishing</i>			
Largemouth Bass	Abundance	CPUE – stock	RSE – Stock \leq 25
	Size structure	PSD, length frequency	N \geq 50 stock
	Age-and-growth	Age at 14 inches	N = 13, 13.0 – 14.9 inches
	Condition	W_r	10 fish/inch group (max)
	Genetics	% FLMB	N = 30, any age
Crappie	Presence/Absence		
Bluegill ^a	Abundance	CPUE – Total	RSE \leq 25
	Size structure	PSD, length frequency	N \geq 50
Gizzard Shad ^a		Abundance	CPUE – Total
	Prey availability	IOV	N \geq 50
<i>Gill Netting</i>			
Channel Catfish	Abundance	CPUE – stock	RSE – Stock \leq 25
	Size structure	PSD, length frequency	N \geq 50 stock
Blue Catfish	Presence/absence		
White Bass	Abundance	CPUE – stock	RSE – Stock \leq 25
	Size structure	PSD, length frequency	N \geq 50 stock
	Age-and-growth	Age at 10 inches	N = 13, 9.0 – 10.9 inches
	Condition	W_r	10 fish/inch group (max)
Hybrid Striped Bass	Presence/absence		

^a No additional effort will be expended to achieve an RSE \leq 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 Somerville, Texas, 2020. Shoreline habitat type units are in miles and standing timber is acres. Water level was at 236 MSL at the time of survey, two feet below conservation pool level of 238 MSL.

Habitat type	Estimate	% of total
Rocky Shoreline	12.9 miles	12 %
Riprap	2.3 miles	2 %
Natural shoreline – overhanging brush and native emergent *	23.4 miles	23 %
Natural Shoreline – bare	28.6 miles	28 %
Bulkhead	0.6 miles	1 %
Dead timber/dead vegetation	246.2 acres	2.1 %

Table 7. Survey of aquatic vegetation, Lake Somerville Reservoir, Texas, 2016 and 2020. Water level was 244 MSL at the time of the 2016 survey (six feet above conservation pool) and 236 MSL at the time of the 2020 survey 2020 (two feet below conservation pool level). Surface area (acres) is listed with percent of total reservoir surface area in parentheses.

Vegetation	2016	2020
Native submersed	0.0	0.0
Native floating-leaved	0.0	<0.01 (<0.01%)
Native emergent	0.0	0.0
Non-native		
Giant Reed (Tier III)*	0.0	0.0
Hydrilla (Tier III)*	0.0	1.64 (<0.01%)

*Tier III is Watch Status

Table 8. Percent directed angler effort by species for Lake Somerville, Texas, 2009-2010 and 2020-2021. Survey periods were from June 1 through May 31 for 2009-2010 and 2020-2021, and March 1 through February 28 for 2014-2015. The 2009-2010 and 2020-2021 creel surveys utilized a roving survey design and the 2014-2015 creel survey was an access point survey.

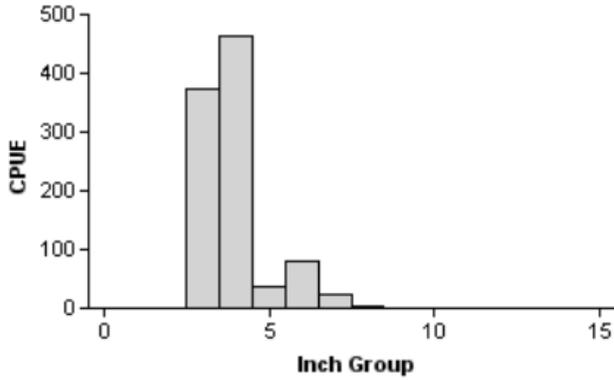
	2009-2010	2014-2015	2020-2021
Catfishes	19.4	21.9	12.7
Temperate Basses	15.0	22.0	11.2
Black Basses	33.2	31.1	17.2
Crappies	20.1	8.2	38.4
Panfishes	0.0	0.9	1.8
Anything	12.3	15.9	18.7

Table 9. Total fishing effort (h) for all species and total directed expenditures at Lake Somerville, Texas, 2009-2010. Survey periods were from June 1 through May 31 for 2009-2010 and 2020-2021, and 1 March 1 through February 28 for 2014-2015. The 2009-2010 and 2020-2021 creel surveys utilized a roving survey design and the 2014-2015 creel survey was an access point survey. Relative standard error is in parentheses.

Creel statistic	2009-2010	2014-2015	2020-2021
Total fishing effort	48,541 (11)	96,435 (23)	359,504 (10)
Total directed expenditures	\$336,517 (27)	\$719,909 (41)	\$2,077,862 (32)

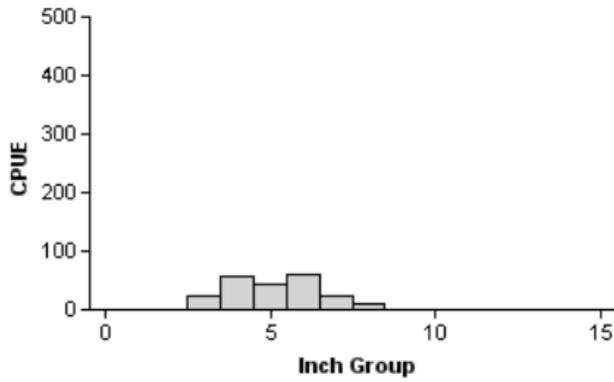
Gizzard Shad

2012



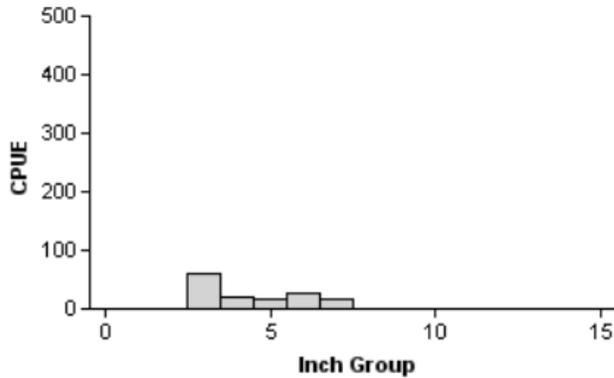
Effort = 2.0
 Total CPUE = 1,111.5 (21; 2223)
 IOV = 88 (3)

2016



Effort = 2.0
 Total CPUE = 219.5 (21; 439)
 IOV = 95 (2)

2020



Effort = 2.0
 Total CPUE = 141.5 (22; 283)
 IOV = 99 (1)

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 Somerville, Texas, 2012, 2016, and 2020.

Bluegill

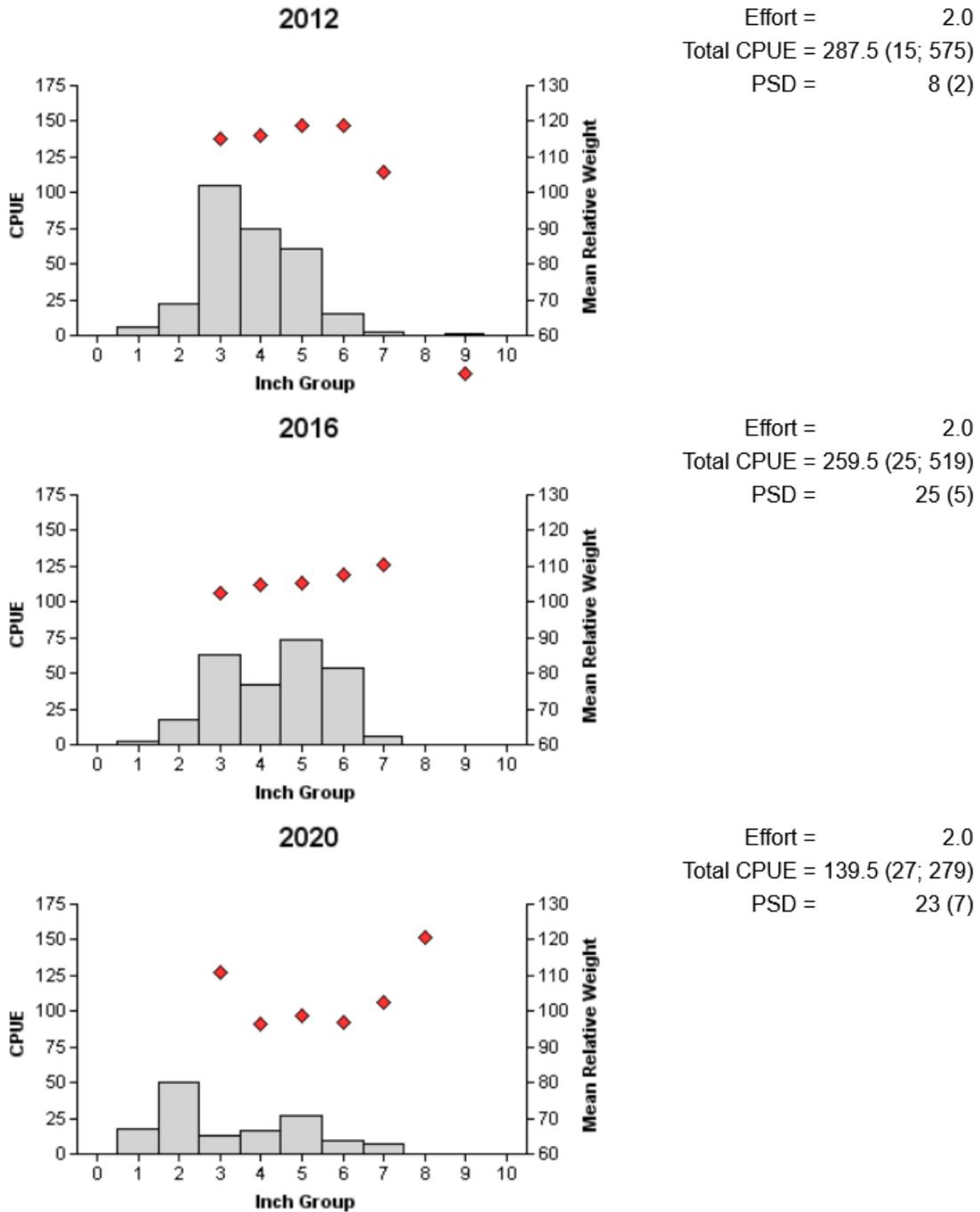


Figure 3. Number of Bluegill caught per hour (CPUE), relative weights (diamonds), and population indices (RSE and N for CPUE and SE for size structure are in parentheses) for fall electrofishing surveys, Lake Somerville, Texas, 2012, 2016, and 2020.

Blue Catfish

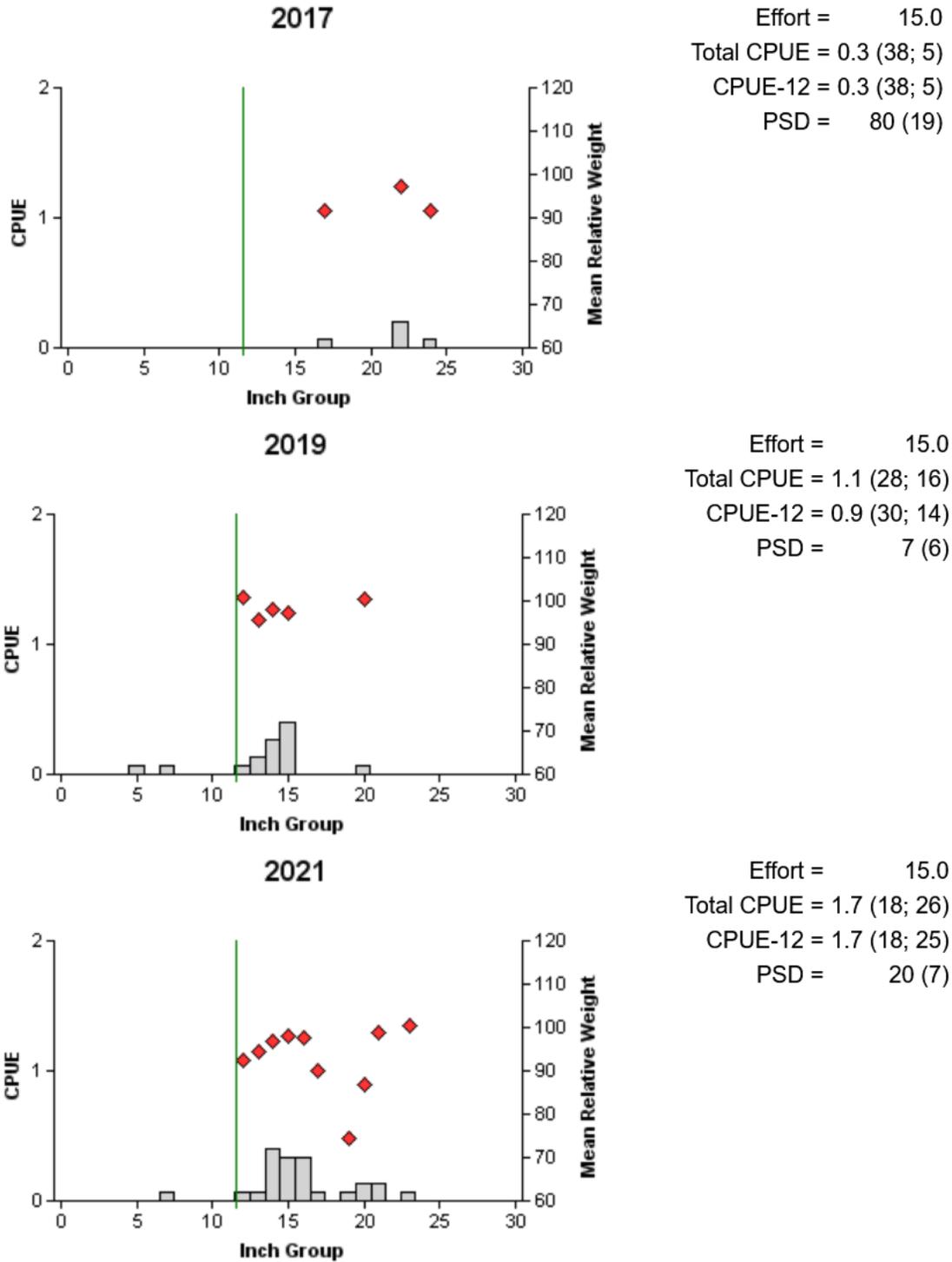


Figure 4. Number of Blue Catfish caught per net night (CPUE), relative weights (diamonds), and population indices (RSE and N for CPUE and SE for size structure are in parentheses) for spring gill net surveys, Lake Somerville, Texas, 2017, 2019, and 2021.

Channel Catfish

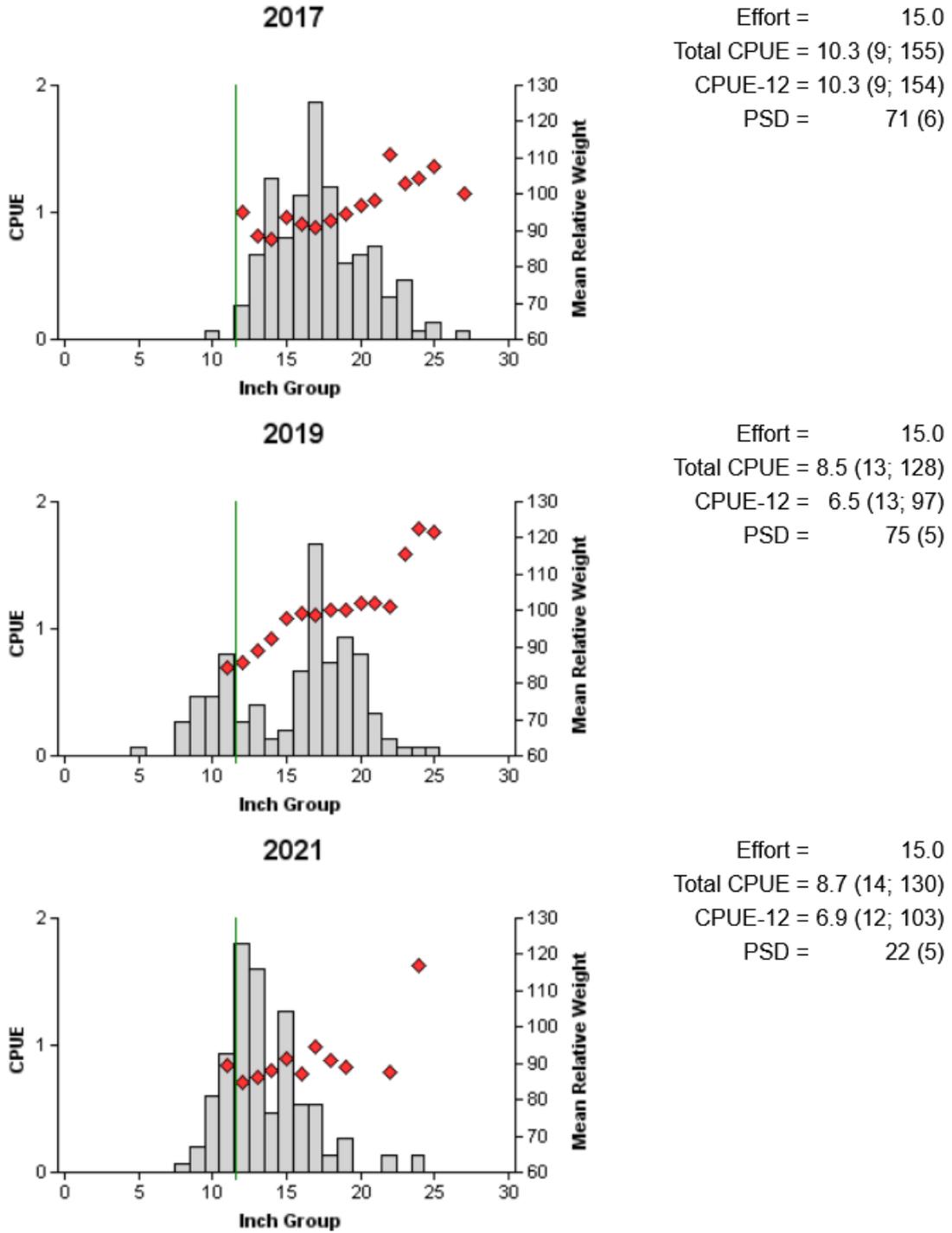


Figure 5. Number of Channel Catfish caught per net night (CPUE), relative weights (diamonds), and population indices (RSE and N for CPUE and SE for size structure are in parentheses) for spring gill net surveys, Lake Somerville, Texas, 2017, 2019, and 2021.

Table 10. Creel survey statistics for Blue Catfish and Channel Catfish at Lake Somerville, Texas, all anglers combined. Creel periods were June 2009 through May 2010, March 2014 through February 2015, and June 2020 through May 2021. Total catch per hour is for anglers targeting each species and total harvest is the estimated number of each species harvested by all anglers. Percent legal released is the percentage of all legal-sized fish that were released. Percent of catch released – undersized is the percentage of the catch that was released because it did not meet minimum length limit. Relative standard errors (RSE) are in parentheses.

Creel survey statistic	Year		
	2009-2010	2014-2015	2020-2021
Surface area (acres)	11,456	11,456	11,456
Directed effort (h)	9,028 (21)	21,163 (47)	45,481 (19)
Directed effort/acre	0.79 (21)	1.85 (47)	3.97 (19)
Total catch per hour	0.68 (46)	2.51 (22)	0.66 (72)
Total harvest			
Blue Catfish	380 (210)	114 (107)	3,654 (113)
Channel Catfish	5,440 (19)	36,434 (28)	20,045 (43)
Total harvest/acre			
Blue Catfish	0.03 (210)	0.01 (107)	0.32 (113)
Channel Catfish	0.47 (19)	3.18 (28)	1.75 (43)
Percent legal released			
Blue Catfish	80.80	0.0	0.0
Channel Catfish	2.51	1.23	11.86
Percent of catch released - undersized			
Blue Catfish	2.90	0.00	5.75
Channel Catfish	93.72	92.35	89.32

Blue Catfish

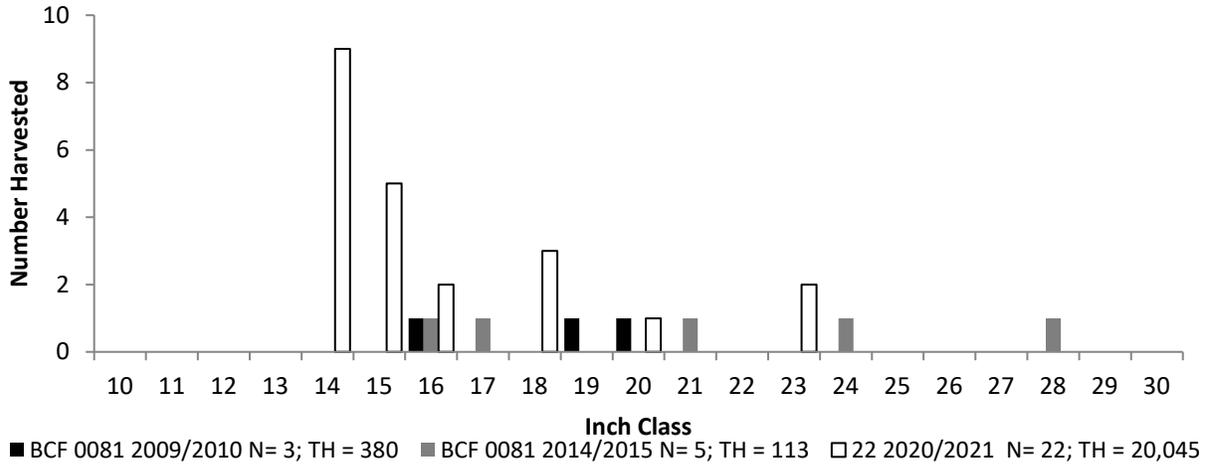


Figure 6. Length frequency of harvested Blue Catfish observed during creel surveys at Lake Somerville, Texas, all anglers combined. Creel periods were June 2009 through May 2010, March 2014 through February 2015, and June 2020 through May 2021. N is the number of harvested Blue Catfish observed during creel surveys, and TH is the total estimated harvest for the creel period.

Channel Catfish

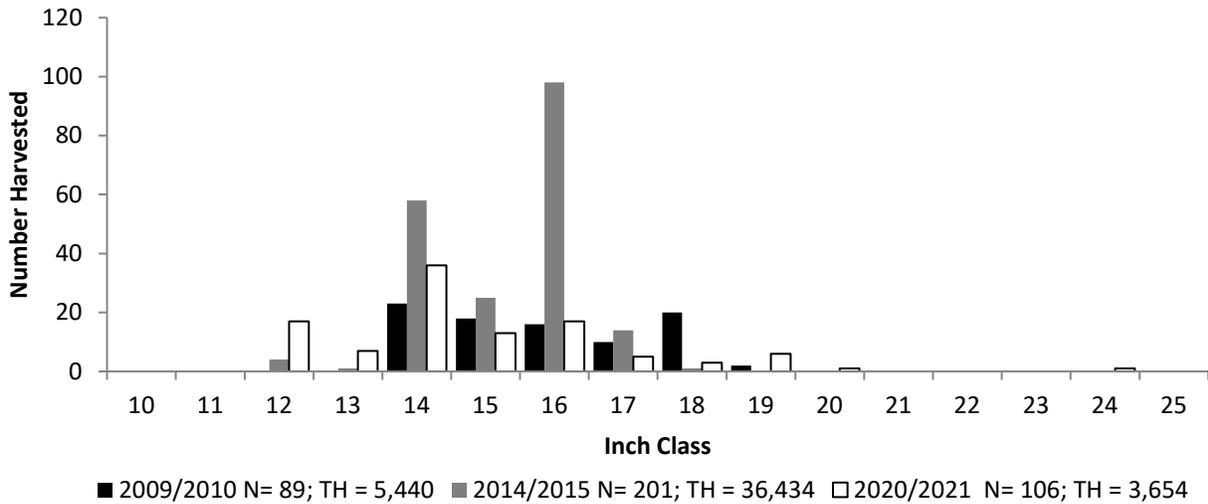


Figure 7. Length frequency of harvested Channel Catfish observed during creel surveys at Texas, Lake Somerville, Texas, all anglers combined. Creel periods were June 2009 through May 2010, March 2014 through February 2015, and June 2020 through May 2021. N is the number of harvested Channel Catfish observed during creel surveys, and TH is the total estimated harvest for the creel period.

White Bass

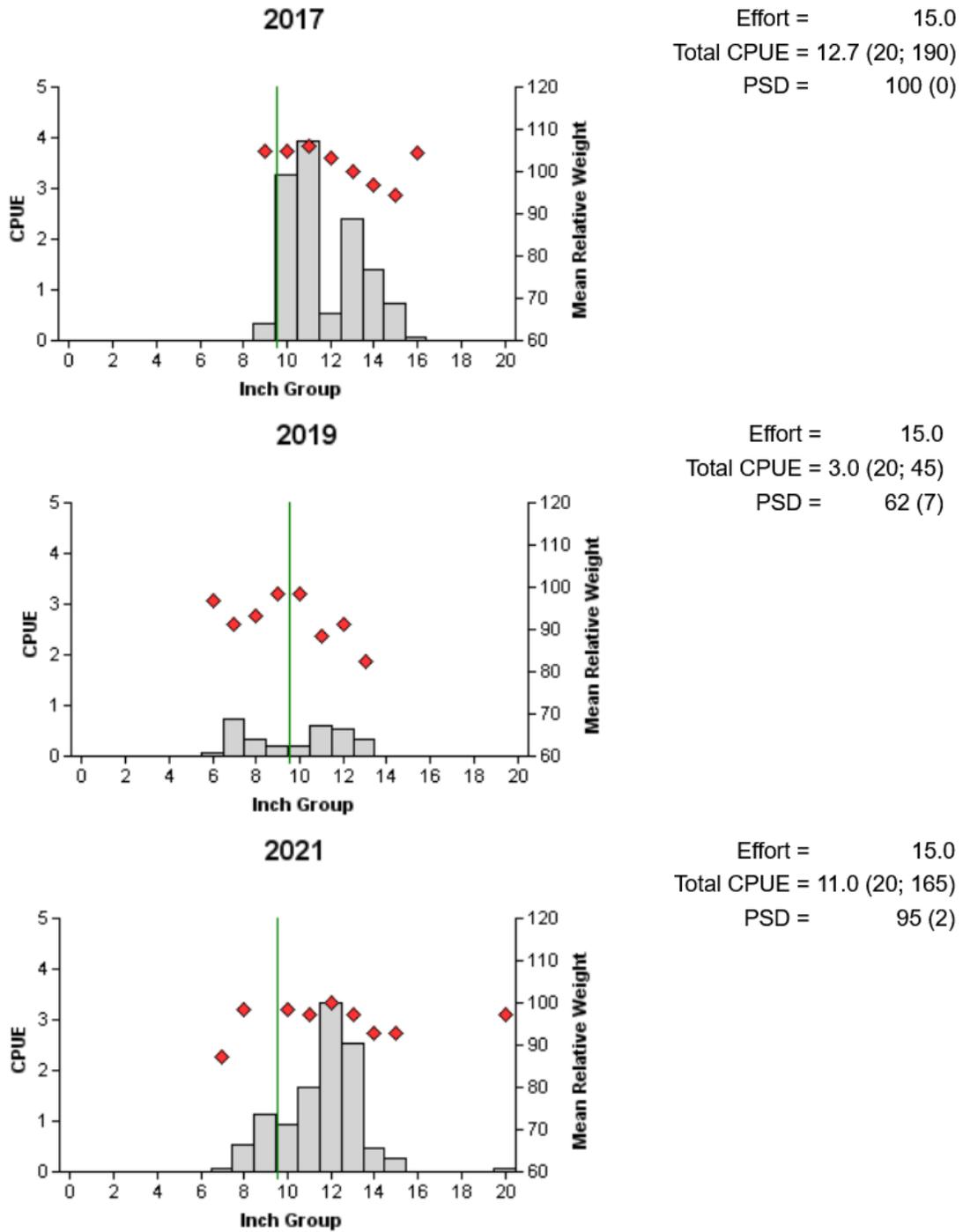


Figure 8. Number of White Bass caught per net night (CPUE), relative weights (diamonds), and population indices (RSE and N for CPUE and SE for size structure are in parentheses) for spring gill net surveys, Lake Somerville, Texas, 2017, 2019, and 2021.

Table 11. Creel survey statistics for White Bass at Lake Somerville, Texas, all anglers combined. Creel periods were June 2009 through May 2010, March 2014 through February 2015, and June 2020 through May 2021. Total catch per hour is for anglers targeting White Bass and total harvest is the estimated number of White Bass harvested by all anglers. Percent legal released is the percentage of all legal-sized fish that were released. Relative standard errors (RSE) are in parentheses.

Creel survey statistic	Year		
	2009-2010	2014-2015	2020-2021
Surface area (acres)	11,456	11,456	11,456
Directed effort	7,004 (27)	21,242 (30)	40,422 (17)
Directed effort/acre	0.61	1.85	3.53
Total catch per hour	2.53 (66)	3.78 (43)	1.11 (30)
Total harvest	6,058 (73)	67,647 (44)	35,331 (32)
Harvest/acre	0.53	5.90	3.08
Percent legal released	0.0	5.81	35.80

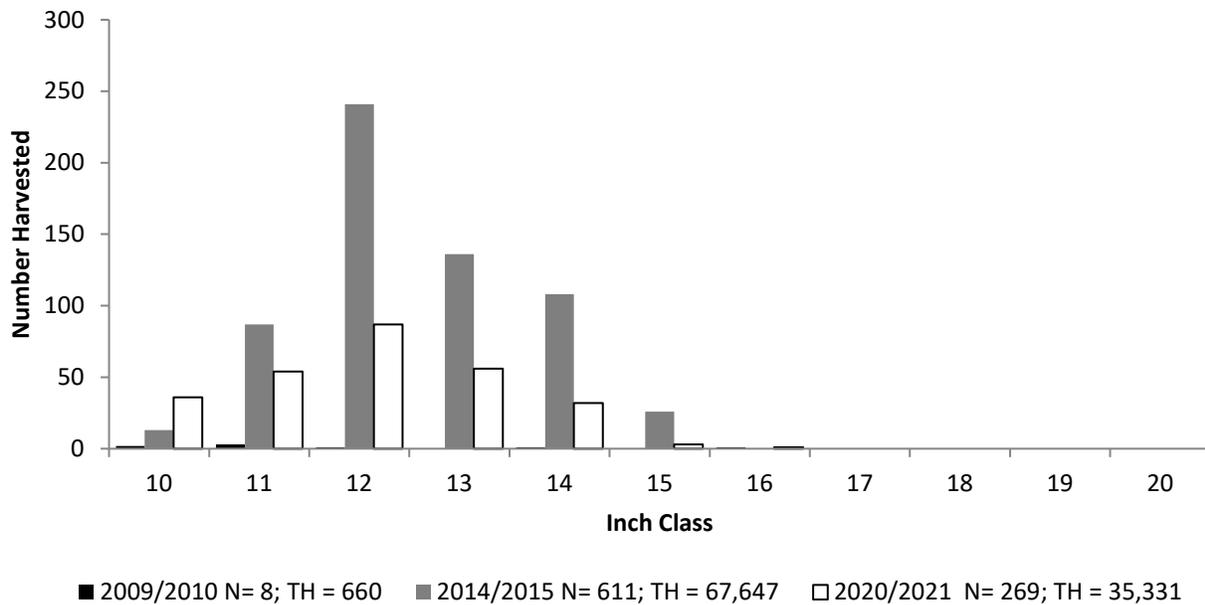


Figure 9. Length frequency of harvested White Bass observed during creel surveys at Lake Somerville, Texas, all anglers combined. Creel periods were June 2009 through May 2010, March 2014 through February 2015, and June 2020 through May 2021. N is the number of harvested White Bass observed during creel surveys, and TH is the total estimated harvest for the creel period.

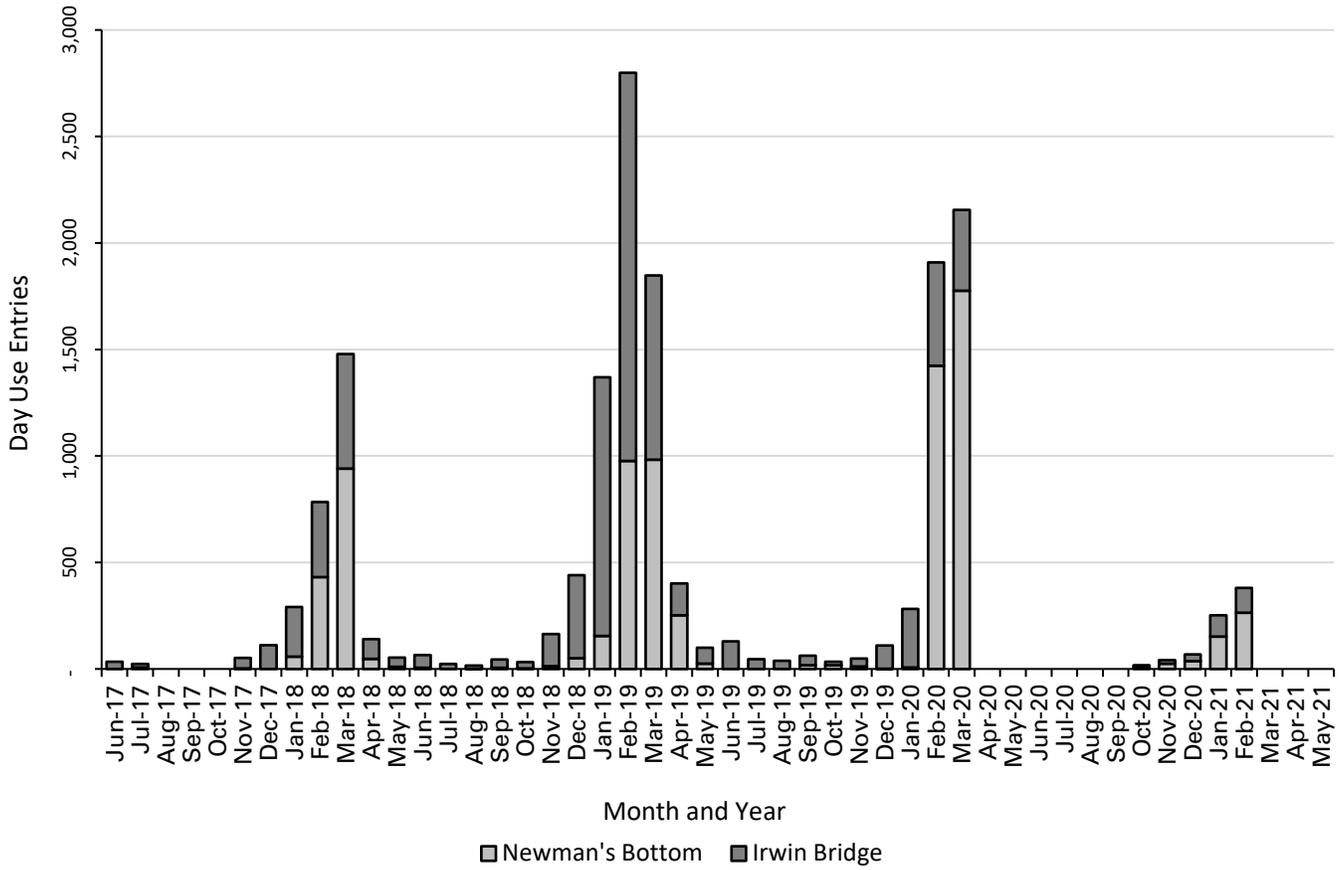


Figure 10.. Monthly total day use entry permits from self-pay stations at the Irwin Bridge and Newman's Bottom access points on the Yegua Creek from June 2017 to May 2021. Bars represent total entries for both access points combined. Lighter bars indicating the proportion generated from Newman's Bottom, and dark bars indicating the proportion from Irwin Bridge. Pay stations are operated and the visitation data was provided by the Nails Creek Unit of Lake Somerville State Park and Trailway.

Hybrid Striped Bass

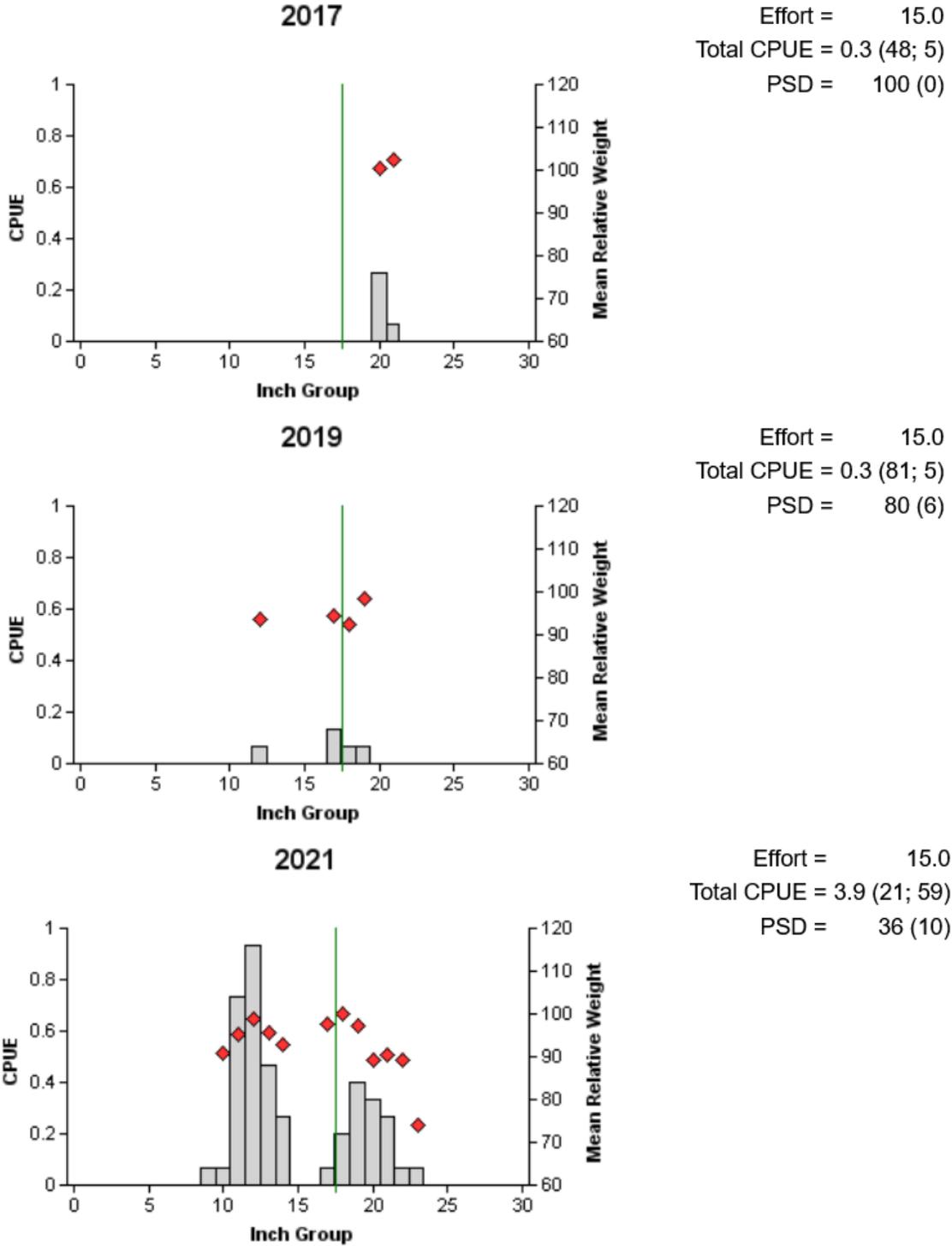


Figure 11. Number of Hybrid Striped Bass caught per net night (CPUE), relative weights (diamonds), and population indices (RSE and N for CPUE and SE for size structure are in parentheses) for spring gill net surveys, Lake Somerville, Texas, 2017, 2019, and 2021.

Table 12. Creel survey statistics for Hybrid Striped Bass at Lake Somerville, Texas, all anglers combined. Creel periods were June 2009 through May 2010, March 2014 through February 2015, and June 2020 through May 2021. Total catch per hour is for anglers targeting Hybrid Striped Bass and total harvest is the estimated number of Hybrid Striped Bass harvested by all anglers. Percent legal released is the percentage of all legal-sized fish that were released. Relative standard errors (RSE) are in parentheses.

Creel survey statistic	Year		
	2009-2010	2014-2015	2020-2021
Surface area (acres)	11,456	11,456	11,456
Directed effort	7,004 (27)	21,242 (30)	40,422 (17)
Directed effort/acre	0.61	1.85	3.53
Total catch per hour	2.53 (66)	3.78 (43)	1.11 (30)
Total harvest	82 (343)	220 (750)	506 (262)
Harvest/acre	< 0.01(0)	0.02 (750)	0.04 (262)
Percent legal released	0.0	0.0	94.2

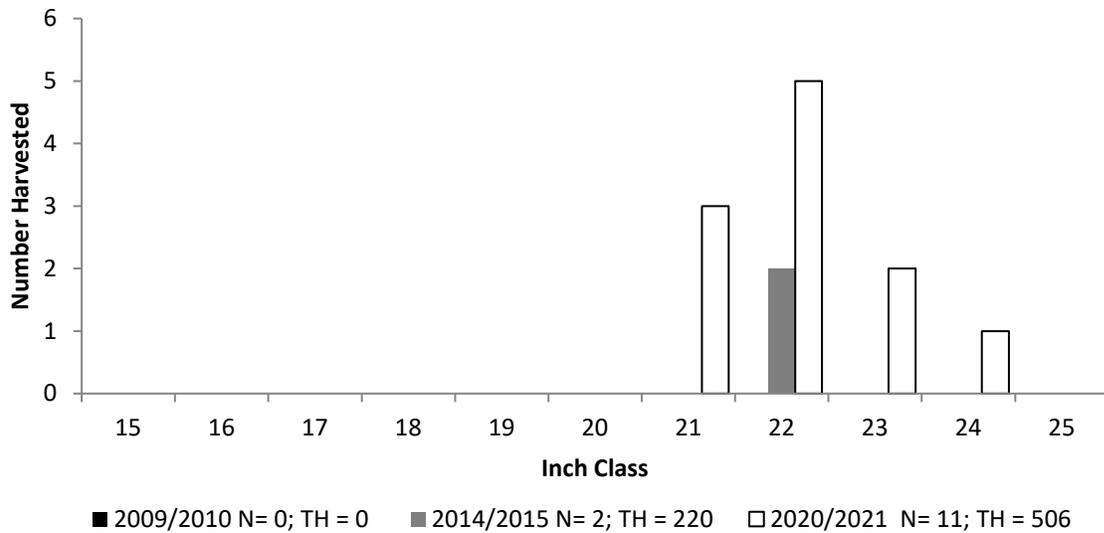


Figure 12. Length frequency of harvested Hybrid Striped Bass observed during creel surveys at Lake Somerville, Texas, all anglers combined. Creel periods were June 2009 through May 2010, March 2014 through February 2015, and June 2020 through May 2021. N is the number of harvested Hybrid Striped Bass observed during creel surveys, and TH is the total estimated harvest for the creel period.

Largemouth Bass

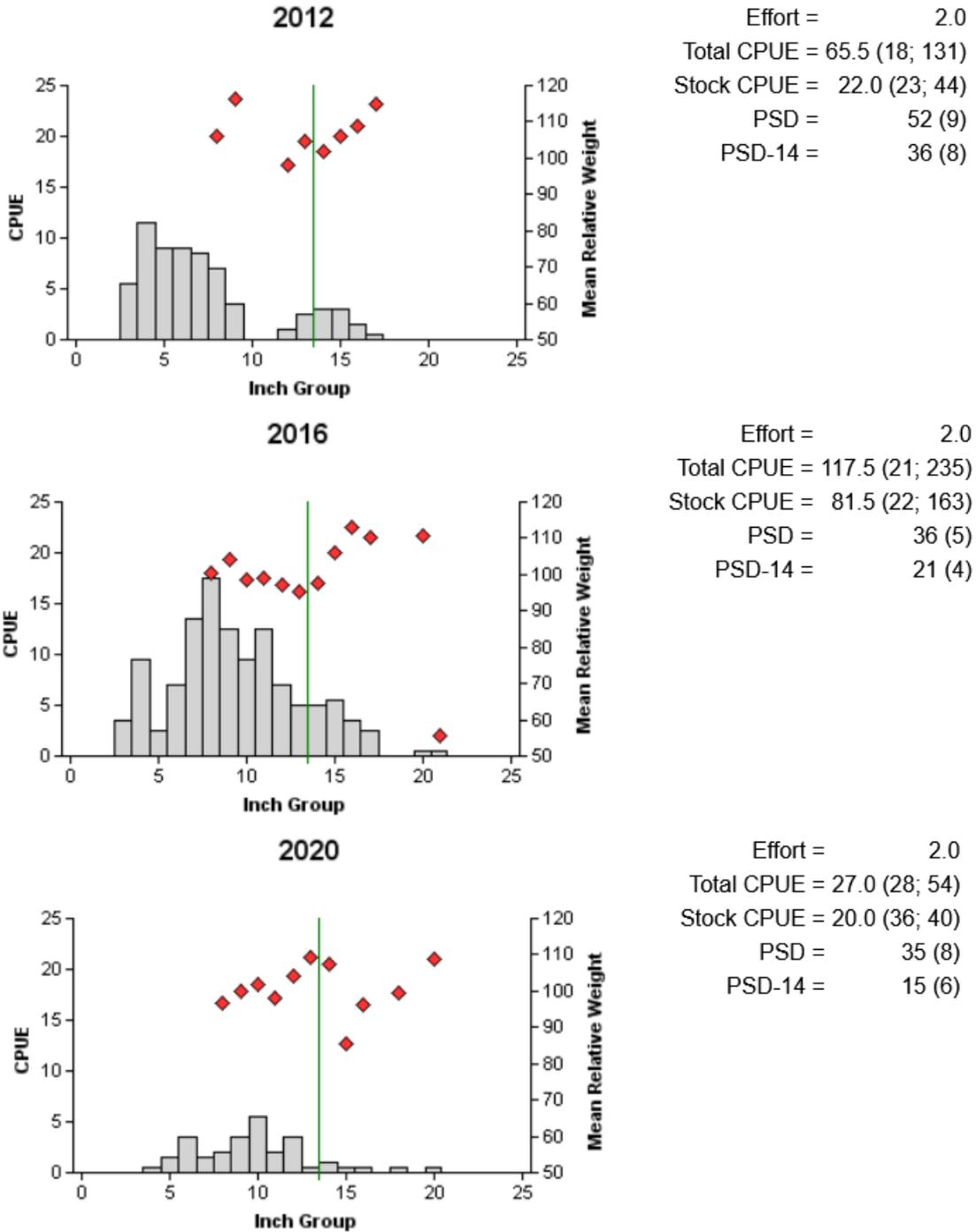


Figure 13. Number of Largemouth Bass caught per hour (CPUE, bars), mean relative weight (diamonds), and population indices (RSE and N for CPUE and SE for size structure are in parentheses) for fall electrofishing surveys, Lake Somerville, Texas, 2012, 2016, and 2020.

Table 13. Results of genetic analysis of Largemouth Bass collected by fall electrofishing, Lake Somerville, Texas. FLMB = Florida Largemouth Bass, NLMB = Northern Largemouth Bass, F1 = first generation hybrid between a FLMB and a NLMB, Fx = second or higher generation hybrid between a FLMB and a NLMB. Genetic composition was determined with micro-satellite DNA analysis.

Year	Sample size	Number of fish				% FLMB alleles	% pure FLMB
		FLMB	F1	Fx	NLMB		
2012	30	2.1	0.9	18.9	0	57 %	7 %
2020	30	0	0	23.1	3	55 %	0 %

Table 14. Creel survey statistics for Largemouth Bass at Lake Somerville, Texas, all anglers combined. Creel periods were June 2009 through May 2010, March 2014 through February 2015, and June 2020 through May 2021. Catch rate is for all anglers targeting Largemouth Bass. Harvest is partitioned by the estimated number of fish harvested by non-tournament anglers and the number of fish retained by tournament anglers for weigh-in and release. The estimated number of fish released by weight category is for anglers targeting Largemouth Bass. Percent legal released is the percentage of all legal-sized fish that were released by non-tournament anglers. Relative standard errors (RSE) are in parentheses.

Statistic	2009-2010	2014-2015	2020-2021
Surface area (acres)	11,456	11,456	11,456
Directed angling effort (h)			
Tournament	2,986.97 (35)	0 (0)	25,486.81 (23)
Non-tournament	12,497.55 (19)	29,970.48 (28)	36,308.06 (19)
All black bass anglers combined	15,484.52 (17)	29,970.48 (28)	61,776.88 (17)
Angling effort/acre	1.35 (17)	2.62 (28)	5.39 (17)
Catch rate (number/h)	0.28 (49)	0.06 (64)	0.39 (33)
Harvest			
Non-tournament harvest	395.32 (185)	329.71 (671)	605.58 (249)
Harvest/acre	0.03 (185)	0.03 (671)	0.05 (249)
Tournament weigh-in and release	1,028.81 (96)	0 (0)	3,434.10 (114)
Release by weight			
<4.0 lbs	N/A	5,356 (91.2)	19,094 (75)
4.0-6.9 lbs		0 (0)	632 (81)
7.0-9.9 lbs		0 (0)	135 (90)
≥10.0 lbs		0 (0)	0 (0)
Percent legal released (non-tournament)	26.1	68.0	91.8

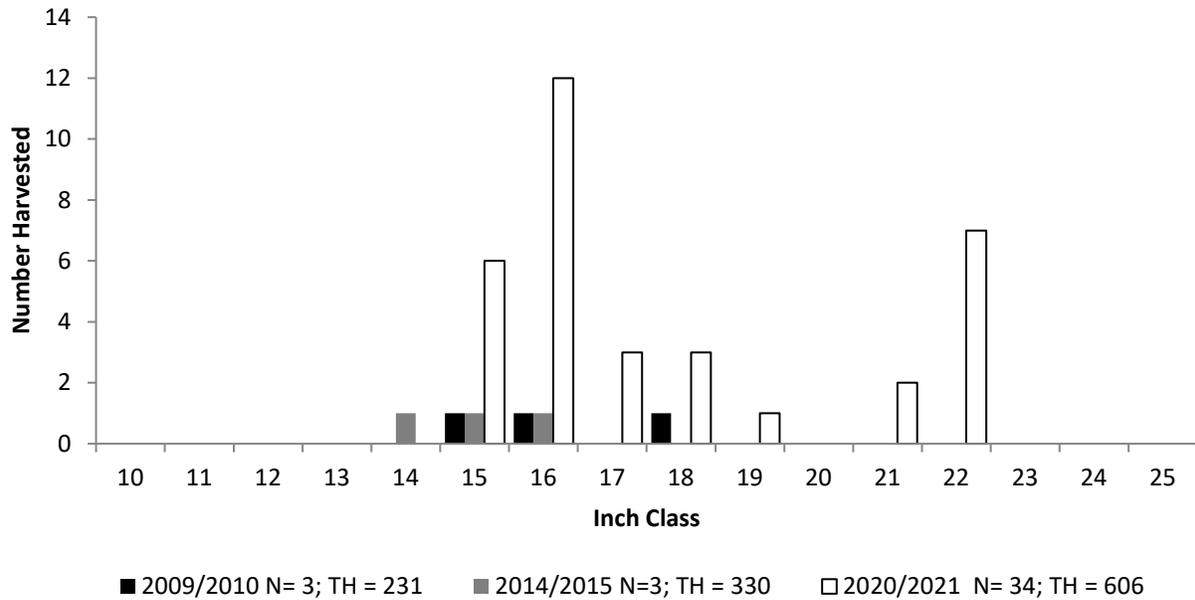


Figure 14. Length frequency of non-tournament harvested Largemouth Bass observed during creel surveys at Lake Somerville, Texas. Creel periods were June 2009 through May 2010, March 2014 through February 2015, and June 2020 through May 2021. N is the number of harvested Largemouth Bass observed during creel surveys, and TH is the total estimated harvest for the creel period.

Crappies

Table 15. Creel survey statistics for crappies at Lake Somerville, Texas, all anglers combined. Creel periods were June 2009 through May 2010, March 2014 through February 2015, and June 2020 through May 2021. Total catch per hour is for anglers targeting White Crappie and Black Crappie and total harvest is the estimated number of White Crappie and Black Crappie harvested by all anglers. Percent legal released is the percentage of all legal-sized fish that were released. Percent of catch released – undersized is the percentage of the catch that was released because it did not meet minimum length limit. Relative standard errors (RSE) are in parentheses.

Creel Survey Statistic	Year		
	2009-2010	2014-2015	2020-2021
Surface area (acres)	11,456	11,456	11,456
Directed effort (h)	9,369 (21)	7,928 (38)	137,977 (12)
Directed effort/acre	0.54 (24)	0.69 (38)	12.00 (12)
Total catch per hour	4.78 (63)	1.35 (40)	0.98 (59)
Total harvest			
White Crappie	11,143 (58)	9,010 (58)	48,701 (24)
Black Crappie	3,555 (47)	13,637 (65)	34,768 (29)
Harvest/acre			
White Crappie	0.97 (58)	0.79 (58)	4.25 (24)
Black Crappie	0.31 (47)	1.19 (65)	3.03 (29)
Percent legal released			
White Crappie	0.0	1.44	0.53
Black Crappie	0.0	0.0	1.22
Percent of catch released - undersized			
White Crappie	54.88	58.06	50.09
Black Crappie	70.48	53.24	44.66

White Crappie

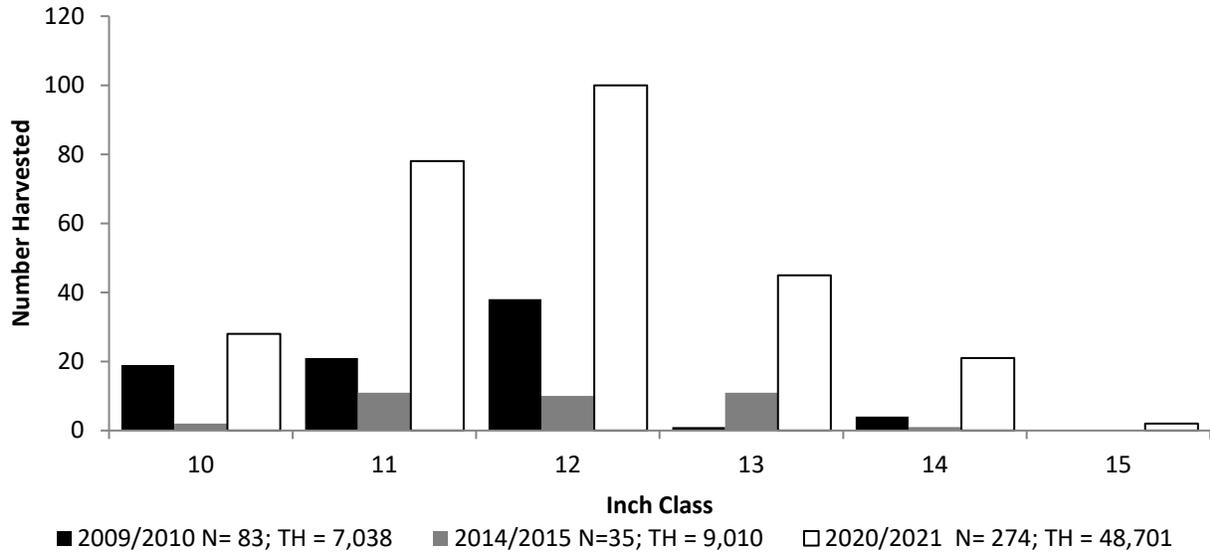


Figure 15. Length frequency of harvested White Crappie observed during creel surveys at Lake Somerville, Texas, all anglers combined. Creel periods were June 2009 through May 2010, March 2014 through February 2015, and June 2020 through May 2021. N is the number of harvested White Crappie observed during creel surveys, and TH is the total estimated harvest for the creel period.

Black Crappie

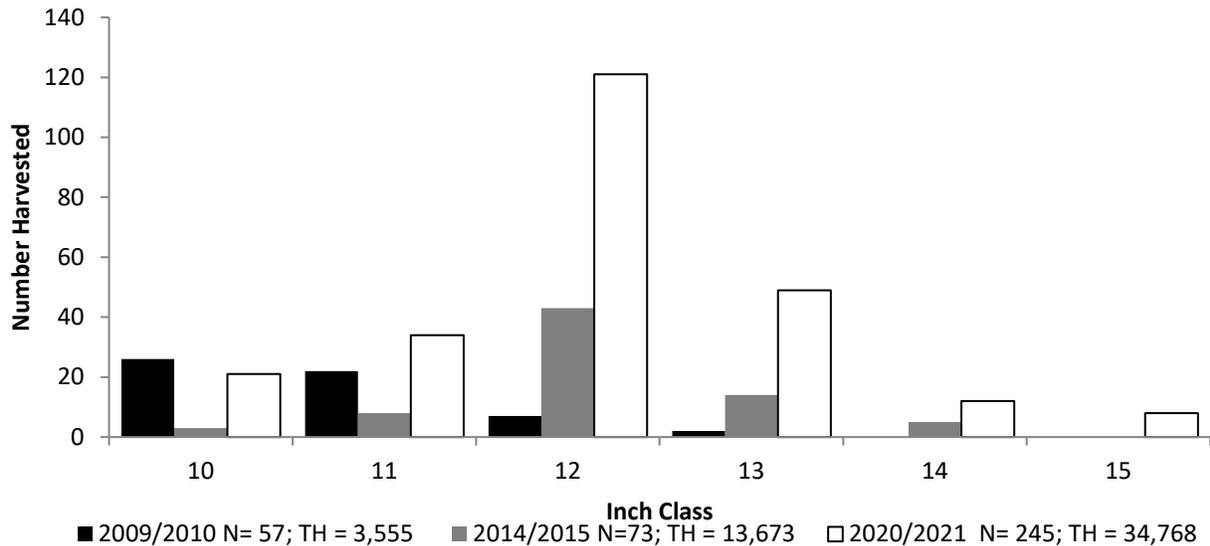


Figure 16. Length frequency of harvested Black Crappie observed during creel surveys Lake Somerville, Texas, all anglers combined. Creel periods were June 2009 through May 2010, March 2014 through February 2015, and June 2020 through May 2021. N is the number of harvested Black Crappie observed during creel surveys, and TH is the total estimated harvest for the creel period.

Proposed Sampling Schedule

Table 16. Proposed sampling schedule for Lake Somerville, Texas. Survey period is June 1 through May 31 of the following year. Gill netting surveys are conducted in the spring, while electrofishing surveys are conducted in the fall.

	Survey year			
	2021-2022	2022-2023	2023-2024	2024-2025
Angler Access				X
Structural Habitat				X *
Vegetation – Comprehensive				X
Vegetation – AIS	X	X	X	
Electrofishing – Fall		X		X
Gill netting				X
Creel survey				X
Report				X

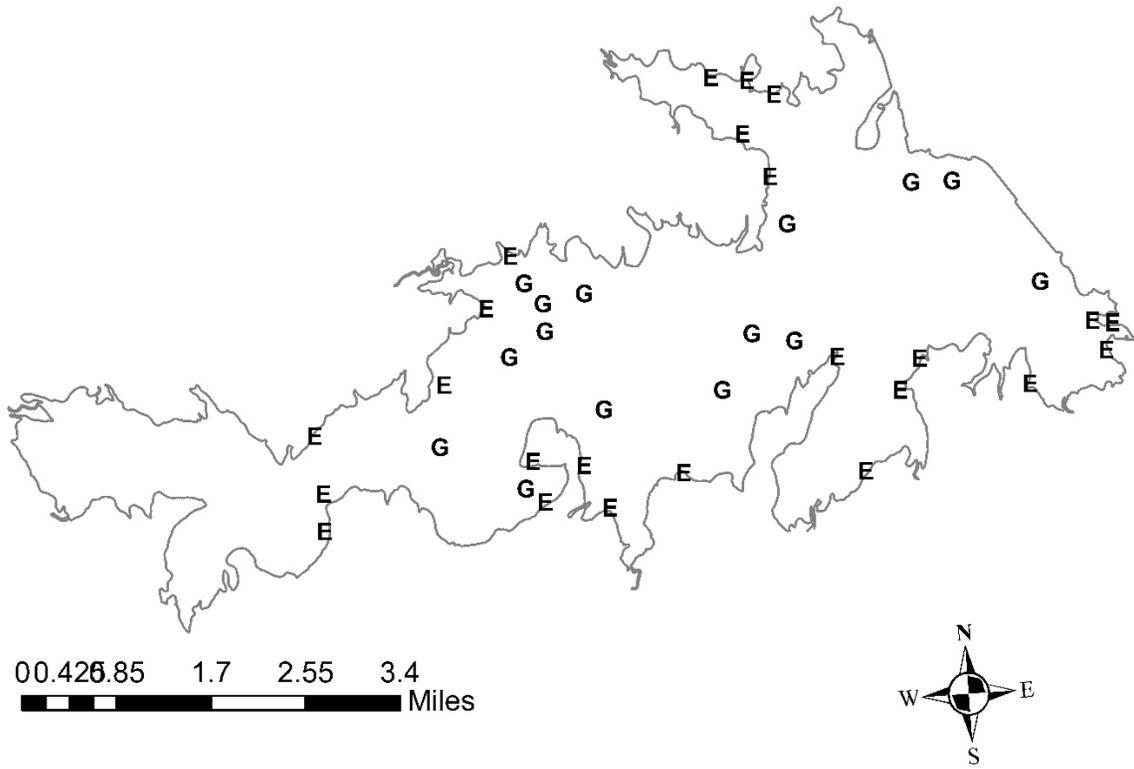
* A structural habitat survey will only be conducted if large changes in structural habitat are suspected.

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

Number (N) and catch rate (CPUE with RSE in parentheses) of all target species collected from all gear types from Lake Somerville, Texas, 2017-2021. Sampling effort was 15 net nights for gill netting and 2 hours for electrofishing.

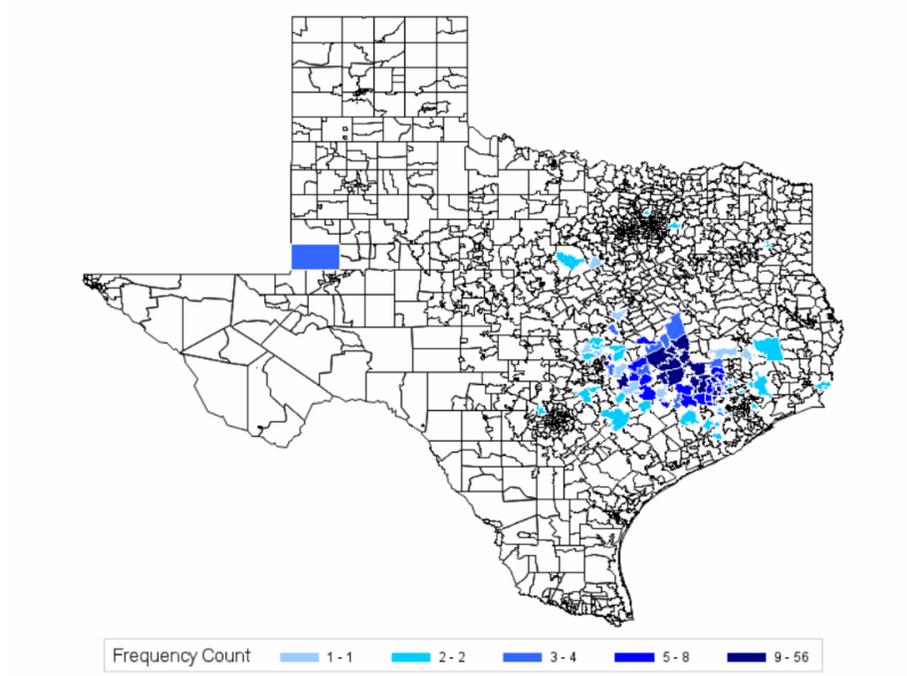
	Gillnetting						Electrofishing	
	<u>2017</u>		<u>2019</u>		<u>2021</u>		<u>2020</u>	
	N	CPUE	N	CPUE	N	CPUE	N	CPUE
Spotted Gar	31	2.07 (36)	6	0.40 (53)	10	0.67 (62)	1	0.50 (100)
Longnose Gar	2	0.13 (100)	-	-	2	0.13 (68)	-	-
Alligator Gar	9	0.60 (53)	-	-	-	-	-	-
Gizzard Shad	247	16.47 (10)	-	-	109	7.27 (46)	283	141.50 (22)
Threadfin Shad	-	-	-	-	-	-	1630	815.00 (15)
Common Carp	8	0.53 (88)	1	0.07 (100)	2	0.13 (68)	1	0.50 (100)
Golden Shiner	1	0.07 (100)	-	-	-	-	-	-
Bullhead Minnow	-	-	-	-	-	-	3	1.50 (55)
Pugnose Minnow	-	-	-	-	-	-	1	0.50 (100)
River Carpsucker	4	0.27 (100)	-	-	-	-	-	-
Smallmouth Buffalo	239	15.93 (9)	201	13.40 (10)	36	2.40 (33)	4	2.00 (47)
Blue Catfish	5	0.33 (38)	16	1.07 (28)	26	1.73 (18)	-	-
Channel Catfish	155	10.33 (9)	128	8.53 (13)	130	8.67 (14)	18	9.00 (42)
White Bass	190	12.67 (20)	45	3.00 (20)	165	11.00 (20)	-	-
Hybrid Striped Bass	5	0.33 (48)	5	0.33 (81)	59	3.93 (21)	-	-
Green Sunfish	-	-	-	-	-	-	1	0.50 (100)
Warmouth	-	-	-	-	-	-	3	1.50 (55)
Bluegill	32	2.13 (23)	-	-	-	-	279	139.50 (27)
Longear Sunfish	1	0.07 (100)	-	-	-	-	87	43.50 (24)
Redear Sunfish	-	-	-	-	-	-	2	1.00 (69)
Largemouth Bass	14	0.93 (35)	-	-	1	0.07 (100)	54	27.00 (28)
White Crappie	24	1.60 (24)	16	1.07 (25)	33	2.20 (36)	7	3.50 (38)
Black Crappie	27	1.80 (26)	25	1.67 (33)	17	1.13 (56)	1	0.50 (100)
Inland Silverside	-	-	-	-	-	-	46	23.00 (26)
Freshwater Drum	16	1.07 (54)	4	5.60 (816)	11	0.73 (41)	11	5.50 (49)

Appendix B – Map of sampling locations

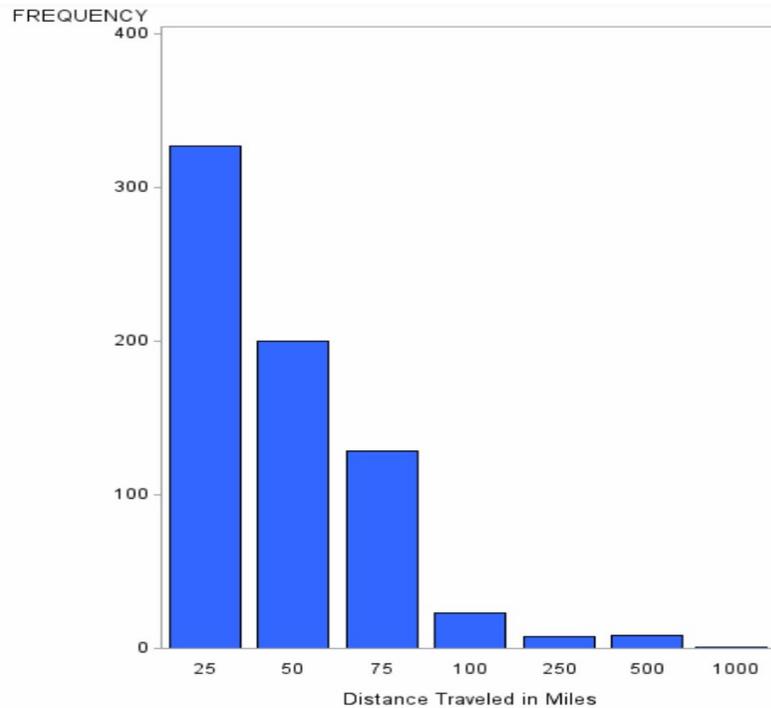


Location of sampling sites, Lake Somerville, Texas, 2020-2021. Gill net and electrofishing stations are indicated by G and E, respectively. Water level was two feet below pool at time of sampling.

Appendix C – Reporting of creel ZIP code data



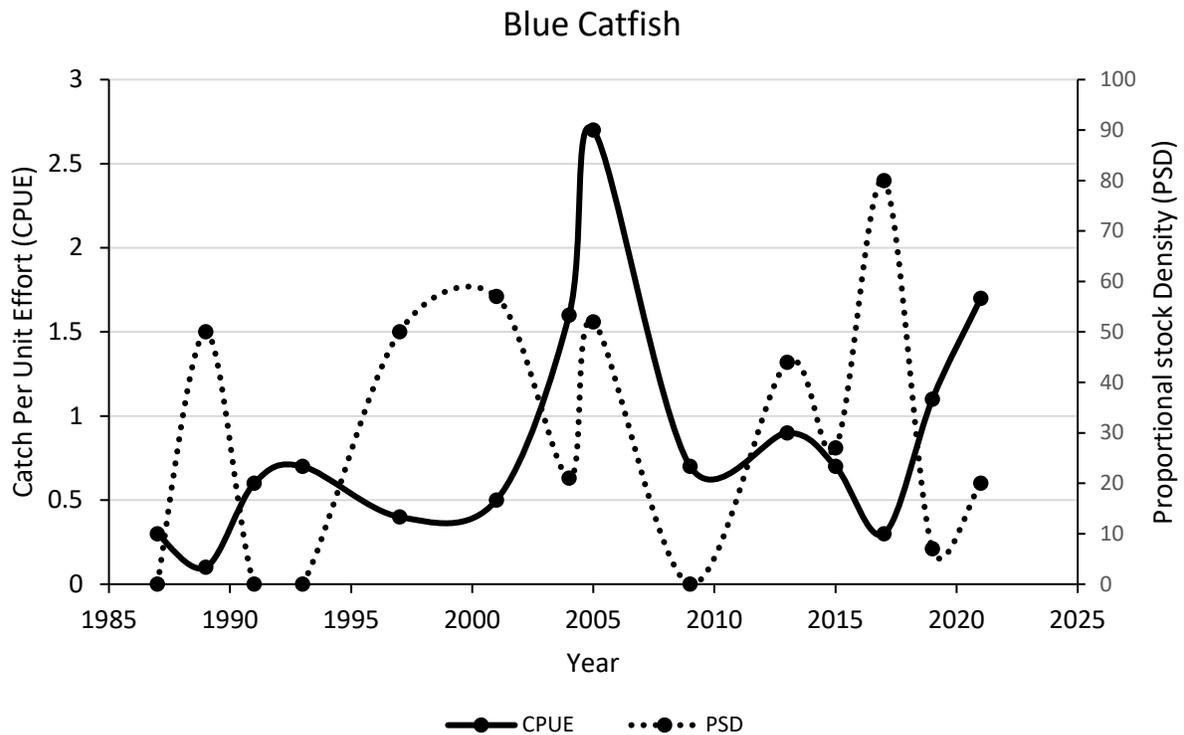
Location, by ZIP code, and frequency of anglers that were interviewed at Lake Somerville, Texas, during the June 2020 through May 2021 creel survey.



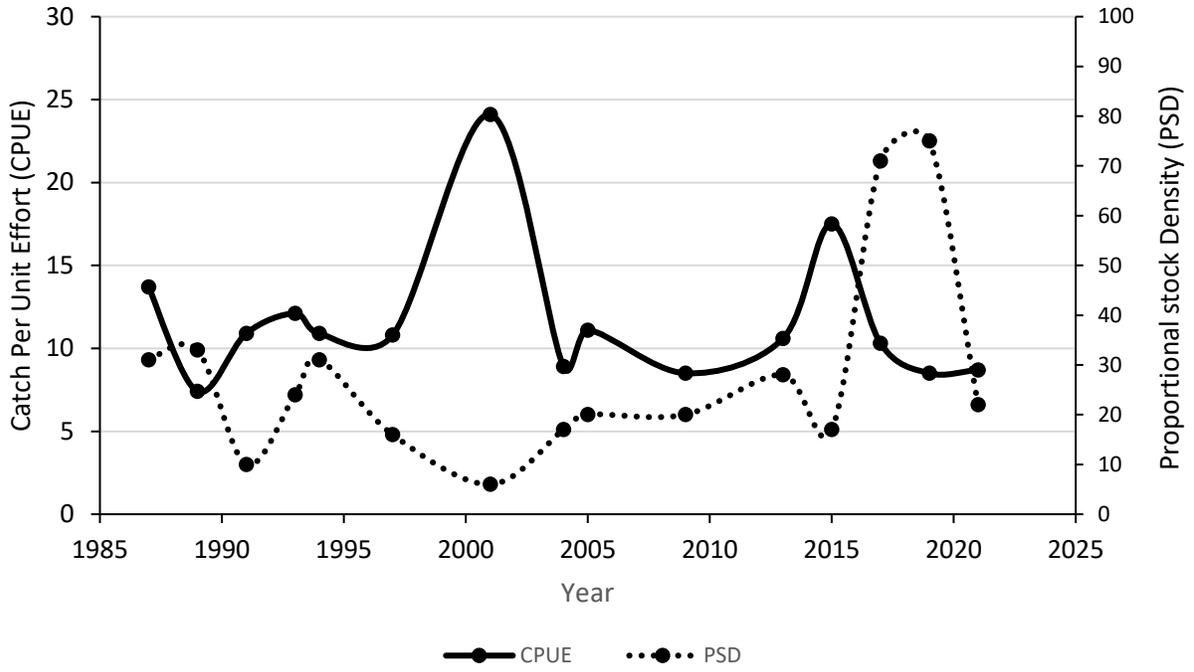
Frequency of anglers that traveled various distances (miles) to Lake Somerville, Texas, as determined from the June 2020 through May 2021 creel survey.

Appendix D – Historical Population Trends 1987-Present

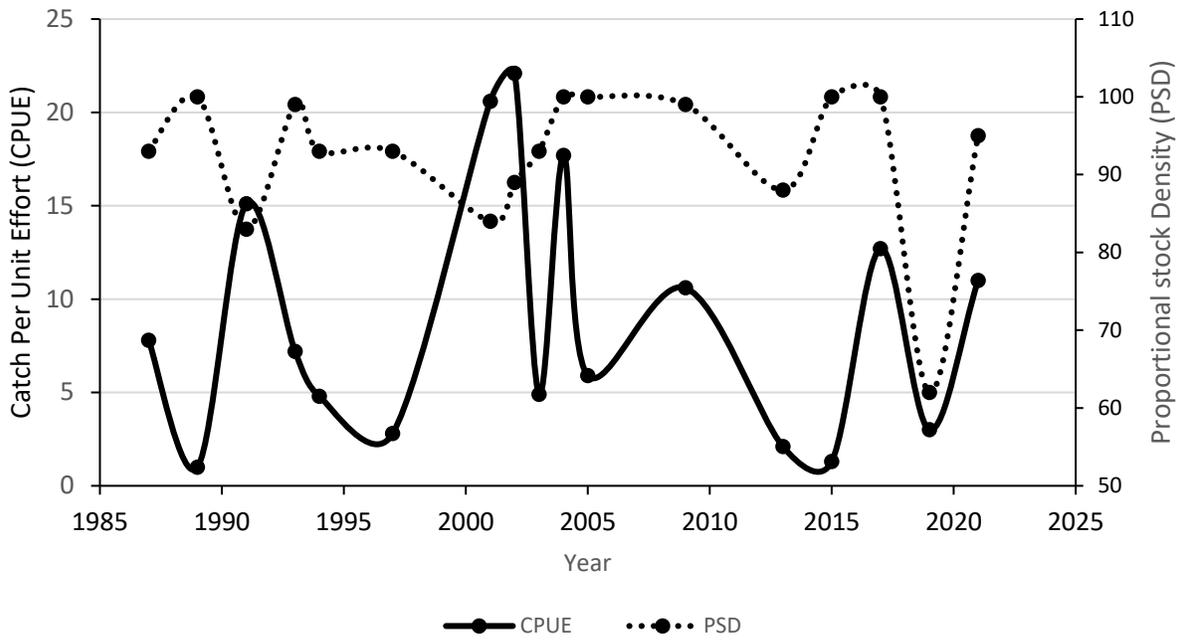
Catch rates (CPUE) and structural indices for Blue Catfish, Channel Catfish, White Bass, and Largemouth Bass from 1987 to present. Catch per unit effort (CPUE) is a metric describing relative abundance and may be compared between years for the same population, sampled with the equivalent methods. Proportional stock density (PSD) describes the distribution of sizes within a population; 0 indicates a population dominated by smaller individuals, and 100 indicates a population dominated by larger individuals.

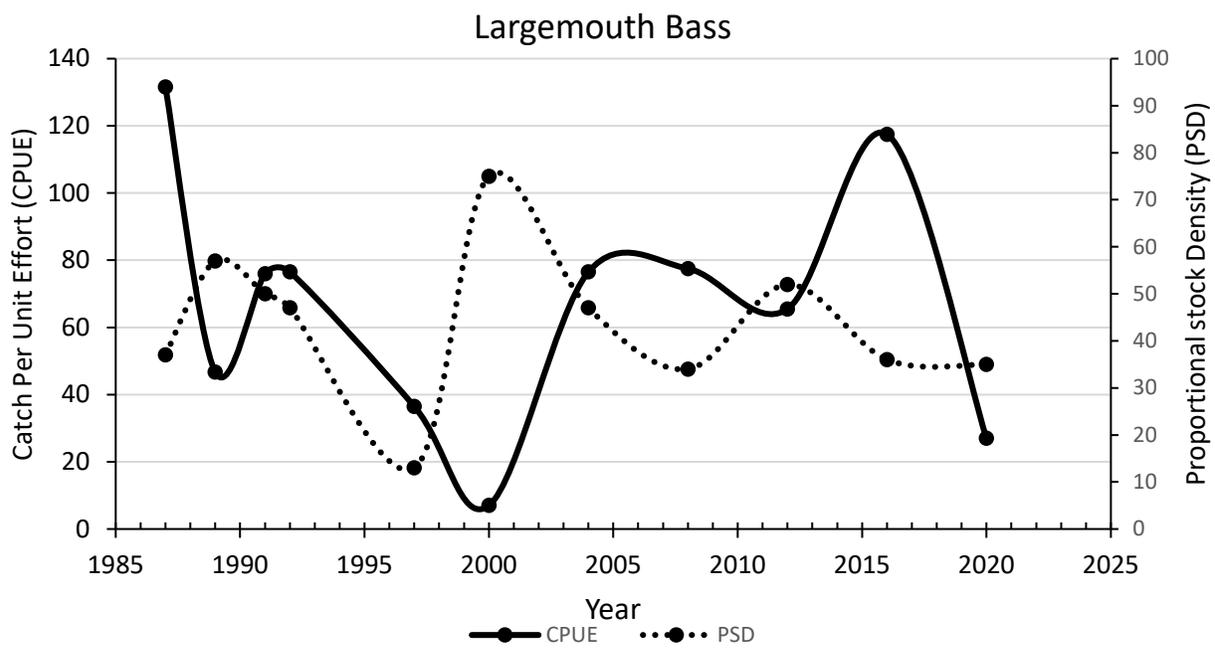


Channel Catfish



White Bass







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