

Lake Findley

2021 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

Carter Smith
Executive Director

Craig Bonds
Director, Inland Fisheries

July 31, 2022



Contents

Contents	i
Survey and Management Summary	1
Introduction	2
Reservoir Description	2
Angler Access.....	2
Management History	2
Methods.....	4
Results and Discussion.....	4
Fisheries Management Plan for Lake Findley, Texas.....	6
Objective-Based Sampling Plan and Schedule (2022-2026).....	7
Literature Cited.....	9
Figures and Oatmeal.....	10
Water Level	10
Reservoir Characteristics	10
Boat Ramp Characteristics.....	11
Harvest Regulations	11
Stocking History.....	12
Objective-Based Sampling Plan for 2021-2022	13
Structural Habitat Survey.....	14
Aquatic Vegetation Survey	14
Gizzard Shad.....	15
Bluegill	16
Blue Catfish	17
Channel Catfish.....	18
Largemouth Bass	19
White Crappie.....	21
Black Crappie	22
Proposed Sampling Schedule	23
APPENDIX A – Catch rates for all species from all gear types	24
APPENDIX B – Map of sampling locations.....	25
APPENDIX C – 2021 Distribution map of aquatic vegetation.....	26

Survey and Management Summary

Fish populations in Lake Findley were surveyed in 2021 using spring and fall electrofishing, spring gill netting, fall trap netting and in 2022 using spring gill netting. Historical data are presented with the 2021-2022 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 Findley is a 247-acre impoundment located on Chiltipin Creek, in the San Fernando Creek Basin, located in Jim Wells County (Table 1). It receives water from Chiltipin Creek and from Corpus Christi Reservoir via pipeline. Primary uses included water supply and recreation. Shoreline access is adequate within the park area and the west side of the reservoir; however, boat access has always been inadequate. The unimproved boat ramp is located on the lower west side of the reservoir but can only accommodate small vessels when ample water is available (Table 2). There is a 15-horsepower outboard maximum limit on the reservoir. The reservoir is shallow with substrate comprised of small rock, clay, sand, and silt. Littoral habitat at the time of sampling consisted of native aquatic vegetation, fallen timber, and rip rap.

Management History: Important sport fish species include Largemouth Bass and Channel Catfish. Previously, Palmetto Bass were a focal point of this fishery, in which stockings occurred periodically from 1997 to 2015. In February of 2013, TPWD staff were no longer permitted on the waterbody due to the water controlling authorities enforcing a reservoir-wide horsepower restriction (City of Alice Code of Ordinances Section 62-147) and thus, fisheries management activities were suspended. In 2020, the local water controlling authority (City of Alice) reached out to TPWD staff to assist with the reservoir's vegetation overgrowth. A new partnership was established, and city officials waived the outboard restriction for only TPWD-operated vessels. Several objective-based fisheries surveys have since been conducted including a vegetation survey that confirmed an overgrowth of coontail and water stargrass. Triploid Grass Carp were stocked 2021 and 2022 to help manage aquatic vegetation. Many retired adult Channel Catfish broodfish were also stocked from the A.E. Wood State Fish Hatchery.

Fish Community

- **Prey species:** Gizzard Shad and Bluegill were the primary forage species for sport fish populations. Gizzard Shad and Bluegill abundance increased substantially relative to 2012. Population size structure for Gizzard Shad and Bluegill were suitable to support sport fish populations.
- **Catfishes:** Blue Catfish were present in the reservoir in low abundance. Channel Catfish have historically been the predominant catfish species; however, none were collected in the 2021 or 2022 gill net surveys.
- **Largemouth Bass:** Largemouth Bass were abundant and had increased substantially since the 2012 report. Several legal-size (≥ 14 inches) fish were collected in both fall and spring electrofishing surveys, and size structure indices indicated a balanced population. Growth was very good; mean age at legal length was 2.0 years.
- **Crappies:** Both Black Crappie and White Crappie were present in the reservoir. Black Crappie were the predominant crappie species collected and most fish were sub-legal (≤ 10 inches).

Management Strategies: Continue managing fish populations under current regulations. Continue electrofishing and gill netting to monitor population abundance of Largemouth Bass, forage species, and Channel Catfish. Continue to work with the city on nuisance vegetation control and monitor submerged vegetation every two years to monitor the effectiveness of Triploid Grass Carp stockings.

Introduction

This document is a summary of fisheries data collected from Lake Findley from 2021-2022. 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 were collected, this report deals primarily with major sport fishes and important prey species. Historical data are presented with the 2021-2022 data for comparison.

Reservoir Description

Lake Findley is a 247-acre impoundment constructed in 1965 on Chiltipin Creek, in the San Fernando Creek Basin. It is located in Jim Wells County approximately 1 mile north of Alice, Texas and is operated and controlled by the City of Alice. Primary water uses include water supply and recreation. Habitat at time of sampling consisted of native submerged vegetation, fallen timber, and rip rap. Native aquatic plants present were coontail and water stargrass. Emergent (pickerel weed) and floating-leaf species (spatterdock) were also present. A barrier was installed at the canal/reservoir interface to prevent fish from entering the canal during pumping periods as anoxic water conditions can occur. There have been no reported fish kills since the installation of this barrier. Historically, water level fluctuations were extreme and frequent, however over recent years these extreme fluctuations have been more intermittent (Figure 1).

Angler Access

Shoreline access is excellent and there is one fishing pier. Boat access is limited to one unimproved/earthen boat ramp located on the west side of the reservoir. The boat ramp can only accommodate small vessels due to the limited accessibility and shallow water. Dredging the launch area would improve boater accessibility. A horsepower restriction is set on this reservoir and outboard motors greater than 15-horsepower are prohibited (Code of Ordinances Section 62-147).

Management History

Previous management strategies and actions: Management strategies and actions from the previous survey report (Findeisen and Binion 2013) included:

1. In February of 2013, City of Alice officials enforced a code of ordinance (Section 62-147) that restricted the use of outboard motors greater than 15-horsepower. Enforcing this code resulted in cessation of resource sampling by TPWD staff. Later attempts to resolve the matter with the City Manager were, at the time, unsuccessful.

Action: Access restrictions justified removing Lake Findley from our 4-year sampling rotation. In recent years, the City of Alice has been working with a local non-profit group (Alice Green Alliance) to improve the overall conditions at Lake Findley. In 2020, TPWD renewed its partnership with the City of Alice and developed a new partnership with the Alice Green Alliance. TPWD staff were informed of an amendment (Ordinance No. 1964) to their original ordinance code (Section 62-147) waiving the horsepower restriction permitting only TPWD vessels unfettered access to the reservoir. Fisheries management activities and surveying resumed on Lake Findley in 2021. District staff provided invasive species prevention and ShareLunker signage to the City of Alice and city officials posted these signs at two access locations.

Harvest regulation history: Historically, harvest of sport fishes in Lake Findley has been managed with statewide harvest regulations (Table 3).

Stocking history: Lake Findley has been stocked with numerous species including Black Crappie, Channel Catfish, Palmetto Bass, Largemouth Bass, and Triploid Grass Carp. The most recent stockings

(adult Channel Catfish and Triploid Grass Carp) occurred in 2021 and 2022. A complete stocking history is presented in Table 4.

Vegetation/habitat management history: Aquatic vegetation prior to 1998 was limited to one dense, mixed stand of bulrush and cattail and a variety of spikerushes along the shoreline. Beginning in the summer of 1998, TPWD oversaw the implementation of a native vegetation establishment project at Lake Findley, as mitigation from a 1996 fish kill. Native plants (N=1,000) including water stargrass, pickerel weed, bull tongue, arrowhead, white water lily, and spatterdock were planted and by 2002 all introduced native vegetation had established. Low water levels in 2003 were detrimental to the water stargrass abundance, however the remaining planted species flourished. In 2021, the Corpus Christi Fisheries Management District was requested by the City of Alice to survey the reservoir for overabundant vegetation (water stargrass) that had established and recommend treatment. A vegetation survey had shown that coontail was the dominant vegetation. The City of Alice were opposed to using aquatic safe herbicides, due to the reservoir's primary role being water supply. As such, a biological control option was utilized. Triploid Grass Carp (50% of recommended quantity, N = 1,056) were stocked in June of 2021 and the remaining 50% (N = 1,057) were stocked in May 2022 in hopes to reduce the overabundance of plants. Vegetation will be monitored as needed to determine the biological control's effectiveness.

Water transfer: Lake Findley is primarily used for municipal water supply for the City of Alice, recreation, and to a lesser extent, flood control. Lake Findley receives water from Chiltipin Creek and two pipelines (20" and 30" diameter pipe) from Corpus Christi Reservoir.

Methods

Surveys were conducted to achieve survey and sampling objectives in accordance with the objective-based sampling (OBS) plan for Lake Findley (TPWD unpublished). Primary components of the OBS plan are listed in Table 5. All survey sites were randomly selected (excluding trap netting), and all surveys were conducted according to the Fishery Assessment Procedures (TPWD, Inland Fisheries Division, unpublished manual revised 2017).

Electrofishing – Largemouth Bass, sunfishes, and Gizzard Shad were collected by electrofishing (1 hour at 12, 5-min stations). Catch per unit effort (CPUE) for electrofishing was recorded as the number of fish caught per hour (fish/h) of actual electrofishing. Ages for Largemouth Bass were determined using otoliths from 13 randomly selected fish (range 13.0 to 14.9 inches). Map of sampling locations are presented in Appendix B.

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

Gill netting – Blue and Channel Catfish were collected by gill netting (5 net nights at 5 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 CPUE statistics.

Habitat – A structural habitat survey was conducted in 2008. Vegetation surveys were conducted in 2008, 2012, and 2021 to monitor native and non-native vegetation distribution and surface coverage.

Water level – Source for water level data was the City of Alice Water Department (Figure 1).

Results and Discussion

Habitat: Shoreline habitat consisted of natural shoreline (sand/mud bank), eroded bank in Chiltipin Creek, and rip rap along the dam (Table 6). In 2021, the native vegetation surface coverage was 85.5-acres (34.6%) of the reservoir's surface area, this far exceeds the 1.7% coverage previously reported in year 2012 (Table 7). Primary vegetation was comprised of coontail. The overgrowth of vegetation has led to concerns from the controlling authority (i.e., water quality) and local Alice's Green Alliance. Further, the abundance of vegetation has restricted recreational access and fishable locations. Over the last two years (2021-2022), triploid grass carp were stocked at a rate of 8.5 fish per acre to reduce increasing coverage of coontail. Coontail is consumed by grass carp (Swanson and Bergersen 1988), but not highly preferred (Leslie et al. 1987). The city's desire for vegetation control without herbicide as an option limits the selection to this biological option. The balance of vegetation control with triploid grass carp is experimental, many factors can ultimately lead to success or failure of vegetation control including food preference, stocking rates, and variable water parameters. We are hopeful we strike a balance of between user and constituent needs and vegetation control that does not denude the reservoir of beneficial fish habitat but limits the unrestrained overgrowth of coontail, impeding recreational access.

Prey species: Total electrofishing CPUE of Gizzard Shad was considerably higher in 2021 (330.0/h) compared to the 2012 survey (148.0/h); Figure 2. Index of Vulnerability (IOV) for Gizzard Shad was excellent, indicating that 98% of Gizzard Shad were available to existing predators; this was similar to IOV estimates in previous years (Figure 2). Total electrofishing CPUE of Bluegill in 2021 (125.0/h) was higher than total CPUE from surveys in 2012 (44.0/h) and 2008 (39.0/h), and size structure continued to be dominated by small individuals (Figure 3).

Catfishes: Blue Catfish gill net catch rate was 1.0/nn in 2022, which was much higher than the historical mean (0.3/nn; N = 12; range = 0.0 – 2.4). Even though, encounters of Blue Catfish are rare. Relative weights of quality-size (20 inches) Blue Catfish varied (range: 86 – 106) in 2022 with no discernable trends evident based on size (Figure 4).

No Channel Catfish were collected in either the 2021 or 2022 gill net surveys (Figure 5). Historically Lake Findley has supported a self-sustaining Channel Catfish population. (Mean CPUE = 2.2/nn; N = 12; range = 0.0 – 8.4).

Largemouth Bass: Total electrofishing catch rate of Largemouth Bass was 58.0/h in 2021, a considerable improvement in Largemouth Bass abundance since 2012. The stock-length (8 inches) catch rate was 34.0/h in 2021, considerably higher than the 0.0/h observed in 2008 and 2012. Size structure was balanced (PSD = 53; Figure 6) and comprised a wide size range of fish. Body condition was excellent (relative weight above 100) for nearly all size classes of fish and growth was considered excellent and fish reached legal length (14 inches) in 2.0 years. Spring electrofishing total and stock-length catch rates were 41.0/h and 33.0/h, respectively and size structure was excellent (PSD = 64; Figure 7).

Crappies: The trap net catch rate of White Crappie was 2.0/nn in 2021, considerably higher than in 2012 (0.3/nn) and similar to 2008 (2.6/nn; Figure 8). The 2021 White Crappie catch rate was substantially lower than the historical mean (20.0/nn; N = 11; range = 0.3 – 42.8/nn) for the waterbody. The Black Crappie catch rate was 7.0/nn in 2021, higher than in 2012 (2.1/nn) and 2008 (0.0/nn; Figure 9). The majority of crappies collected in 2021 were less than the legal length (10 inches), suggesting few fish were available for angler harvest.

Fisheries Management Plan for Lake Findley, Texas

Prepared – July 2022

ISSUE 1: Aquatic vegetation within the reservoir increased in total coverage in 2021, expanding to 85.5 acres (34.6%), a substantial increase since the last recorded survey in 2012 (4.2 acres; 1.7%), creating impediments to recreational access. The vegetation expansion raised concerns for the controlling authority (City of Alice) and Alice's Green Alliance, a local non-profit organization. In 2021, the City of Alice reached out to the district office for suggestions on how to manage the water stargrass. District staff met with the city and discussed numerous treatment options. A vegetation survey later showed that coontail was the primary vegetation within the reservoir. The city's preferred treatment option was to utilize triploid Grass Carp (2,114 fish) as a biological control to help reduce the vegetation coverage. In June 2021, 1,056 triploid Grass Carp were stocked as the first stage of a two-phase stocking process. The second stage followed in May 2022 with another stocking of 1,057 triploid Grass Carp. A statement from the district was given to local press (Alice Echo News) discussing the utility of triploid Grass Carp; however, there are concerns that the shallow depths of the reservoir and stable water levels may perpetuate vegetation expansion.

MANAGEMENT STRATEGIES

1. Conduct biennial vegetation surveys to monitor nuisance vegetation expansion.
2. Collaborate with our city partners on an Integrated Pest Management (IPM) plan to reduce nuisance vegetation overgrowth that limits recreational access.

ISSUE 2: No Channel Catfish were collected in either the 2021 or 2022 gill net surveys. However, past surveys indicate that Lake Findley has supported a sustainable population of Channel Catfish (mean CPUE = 2.5/nn (N = 9; range = 0.6 – 8.4) and anecdotal reports of anglers targeting catfish have been frequently observed during routine surveys. The district stocked 87 retired Channel Catfish broodfish in 2021.

MANAGEMENT STRATEGIES

1. Work with local partners on securing a small-scale fish habitat project grant to install spawning structures for Channel Catfish broodfish, thereby increasing spawning habitat to maximize natural recruitment in hopes to reestablish a self-sustaining population.
2. Continue monitoring the Channel Catfish population in Lake Findley with routine gill net sampling.

ISSUE 3: Many invasive species threaten aquatic habitats and organisms in Texas and can adversely affect the state ecologically, environmentally, and economically. For example, zebra mussels can multiply rapidly and attach themselves to any available hard structure, restricting water flow in pipes, fouling swimming beaches, and plugging engine cooling systems. Giant salvinia and other invasive vegetation species can form dense mats, interfering with recreational activities like fishing, boating, skiing, and swimming. The financial costs of controlling and/or eradicating these types of invasive species are significant. Additionally, the potential for invasive species to spread to other river drainages and reservoirs via watercraft and other means is a serious threat to all public waters of the state.

MANAGEMENT STRATEGIES

1. Cooperate with 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.

Objective-Based Sampling Plan and Schedule (2022-2026)

Sport fish, forage fish, and other important fishes

Sport fish in Lake Findley include Largemouth Bass, Blue Catfish, Channel Catfish, Flathead Catfish, White Crappie, and Black Crappie. Important forage species include Gizzard Shad and Bluegill Sunfish. Proposed sampling schedule to meet the following OBS Plan can be found in Table 8.

Low-density fisheries

Blue Catfish: Blue Catfish are present in the reservoir in low abundance. Since 1988, the mean gillnet catch rate was 0.3/nn ($N = 12$; $SD = 0.7$; range: 0.0 – 2.4/nn). Only seventeen Blue Catfish have been captured in 12 gillnet surveys. Due to low and intermittent capture rates, only presence/absence will be reported with gill net surveys.

Flathead Catfish: Flathead Catfish are present in the reservoir but only in low abundances. Since 1988, only one Flathead Catfish has been captured and the mean gillnet catch rate was 0.02/nn ($N = 12$; $SD = < 0.1$; range: 0.0 – 0.2/nn). Due to rare occurrence, only presence/absence will be reported with gill net surveys.

Crappies: White Crappie and Black Crappie are both present in the reservoir with White Crappie being the predominant species. Historical catch rates of White Crappie from trap nets at random stations across sampling periods was 20.0/nn ($N = 11$; $SD = 15.1$; range 0.3 – 42.8/nn). Mean Black Crappie catch rates were 9.8/nn ($N = 11$; $SD = 9.8$; range 0.0 – 30.8) across the same time period. Since 2008, catch rates have been greatly reduced for both White Crappie 1.6/nn ($N = 3$; $SD = 1.9$) and Black Crappie 3.6/nn ($N = 3$; $SD = 3.6$). Due to the minimal captures in recent years, trap netting will be discontinued from future use and presence/absence will be reported with gill net and electrofishing surveys.

Survey objectives, fisheries metrics, and sampling objectives

Channel Catfish: Channel Catfish have historically been the predominant catfish species in Lake Findley. Past gill net catch rates have been moderate with a mean catch rate of 2.2/nn. The last twelve surveys have rarely met objectives for variance or sample size to accurately monitor major changes in

size structure or body condition of Channel Catfish. The relative standard error (RSE) values for total catch rate (CPUE) have been reported ≤ 25 only twice and no survey has yielded more than 50 stock-size Channel Catfish. With the recent stocking of 87 adult Channel Catfish, an opportunity still exists to enhance the population and re-establish a self-sustaining population. Gill nets will continue to be our primary catfish sampling gear used to monitor trends in population abundance. A minimum of five gill nets set at randomly 5 selected stations will be used to survey Channel Catfish every four years to monitor species presence/absence and continue collection of historically comparable trend data.

Largemouth Bass: Largemouth Bass is currently the most abundant sport fish in Lake Findley. Historical catch rates of Largemouth Bass have varied and is likely attributed to the availability of suitable habitat (i.e., submersed aquatic vegetation) in recent years. The fall-collected electrofishing mean CPUE for Largemouth Bass from 1988 to present was 23.1/h ($N = 12$; standard deviation = 22.6; range: 0.0 – 62.0/h). Mean stock-size catch rate for the same time frame was 13.6/h ($N = 12$; SD = 15.0; range: 0.0 – 40.0/h). Spring-collected electrofishing mean catch rate (CPUE) from select years (e.g., 1996, 2010 and 2021) was 23.5/h ($N = 3$; SD = 21.1; range 0.0 – 41.0). Biennial collection of trend data with fall electrofishing will be sufficient to monitor abundance and potentially detect large-scale changes in population dynamics (relative abundance, size structure, body condition, and age and growth) that may warrant further investigation and more intensive sampling. With annual catch varying greatly from year to year, spring electrofishing surveys are deemed unnecessary. A minimum of 12 randomly selected electrofishing sites will be sampled in fall seasons of 2023 and 2025 to monitor population metrics. The desired level of precision is RSE ≤ 25 for CPUE-S. Further, Category-two age and growth analysis [i.e., mean age at legal length (14 in), N = minimum of 13 fish between 13.0 – 14.9 in] will be conducted every four years to assess any changes in growth to the minimum length limit.

Gizzard Shad and Bluegill: Gizzard Shad and Bluegill are the primary forage at Lake Findley. Continuation of sampling, as per Largemouth Bass above, will allow 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 (Gizzard Shad IOV; 50 fish minimum and Bluegill PSD; 50 stock-size fish minimum at 12 randomly selected 5-minute stations) and relative abundance estimates (Bluegill CPUE-Total; RSE < 25 , anticipated effort is 12 stations based on historical data). The objective of attaining an RSE ≤ 25 will only be set for Bluegill as Gizzard Shad CPUE-Total RSE's fluctuate substantially.

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Figures and Tables

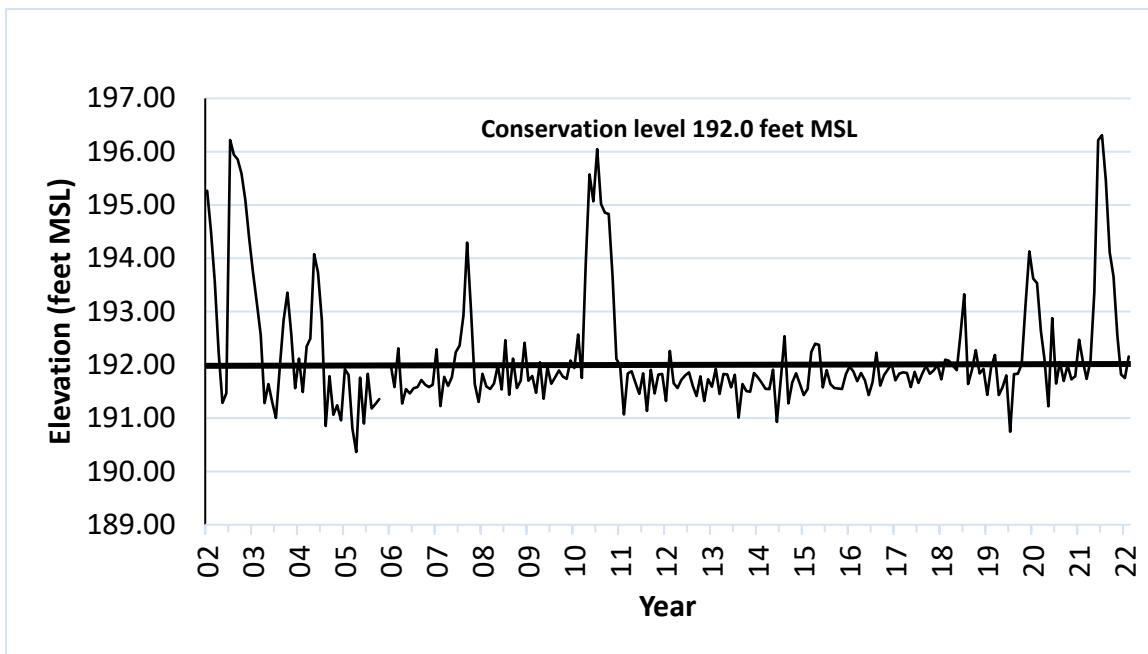


Figure 1. Quarterly water level elevations in feet above mean sea level (MSL) recorded for Lake Findley, Texas, January 2002 through February 2022. Water level elevation data from November 2005 through December 2005 not available.

Table 1. Characteristics of Lake Findley, Texas.

Characteristic	Description
Year constructed	1965
Controlling authority	City of Alice
County	Jim Wells
Reservoir type	Tributary
Shoreline Development Index	1.7
Conductivity	1227 $\mu\text{S}/\text{cm}$

Table 2. Boat ramp characteristics for Lake Findley, Texas, August 2021. Reservoir elevation at time of survey was 194 feet above mean sea level.

Boat ramp	Latitude Longitude (dd)	Public	Parking capacity (N)	Elevation at end of boat ramp (ft)	Condition
West Side	27.788469 -98.07016	Y	8	190	Unimproved and shallow; small boats only

Table 3. Harvest regulations for Lake Findley, Texas.

Species	Bag limit	Length limit
Gar, Alligator	1 ^a	none
Catfish: Channel and Blue Catfish, their hybrids and subspecies	25 ^b (in any combination)	none ^b
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

^a Mandatory harvest reporting required for all harvested Alligator Gar (reporting available through the My Texas Hunt Harvest app or at <https://apps.tpwd.state.tx.us/huntharvest/home.faces>)

^b Only 10 fish for Channel and Blue Catfish, their hybrids and subspecies can be ≥ 20" in total length.

Table 4. Stocking history of Lake Findley, Texas. FRY = fry; FGL = fingerling; ADL = adults.

Species	Year	Number	Size
Channel Catfish	1968	1,500	FGL
	1971	2,000	FGL
	1991	7,005	FGL
	1995	64,312	FRY
	1997	7,744	FGL
	1998	7,195	FGL
	1999	7,235	FGL
	2000	7,200	FGL
	2001	7,217	FGL
	2021	87	ADL
		<u>111,549</u>	
Palmetto Bass	1997	4,647	FGL
	1998	4,536	FGL
	2009	3,008	FGL
	2011	1,840	FGL
	2014	1,978	FGL
	2015	5,816	FGL
		<u>21,825</u>	
Sunshine Bass	2014	<u>3,504</u>	FGL
	Total	<u>3,504</u>	
Largemouth Bass	1966	24,640	FGL
	1968	<u>6,000</u>	FGL
	Total	<u>30,650</u>	
Florida Largemouth Bass	1996	<u>70,079</u>	FGL
	Total	<u>70,079</u>	
Black Crappie	1966	<u>4,000</u>	FGL
	Total	<u>4,000</u>	
Triploid Grass Carp	2021	1,059	ADL
	2022	<u>1,057</u>	ADL
	Total	<u>2,116</u>	

Table 5. Objective-based sampling plan components for Lake Findley, Texas 2021–2022.

Gear/target species	Survey objective	Metrics	Sampling objective
<i>Electrofishing</i>			
Largemouth Bass	Abundance	CPUE–Stock	RSE–Stock ≤ 25
	Size structure	PSD, length frequency	N ≥ 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
<i>Gill netting</i>			
Blue Catfish	Abundance	CPUE–stock	exploratory
	Size structure	PSD, length frequency	
Channel Catfish	Abundance	CPUE–stock	exploratory
	Size structure	PSD, length frequency	
<i>Trap netting</i>			
Crappie	Abundance	CPUE–stock	exploratory
	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 Findley, Texas, 2008. Shoreline habitat type units are in miles.

Habitat type	Estimate	Percent of total
Bulkhead	<0.1 miles	0.4
Natural	10.2 miles	97.1
Rip-rap	0.3 miles	2.5

Table 7. Survey of aquatic vegetation, Lake Findley, Texas, 2008, 2012, and 2021. Surface area (acres) is listed with percent of total reservoir surface area in parentheses.

Vegetation	2008	2012	2021
Native submersed	0.2 (0.1)	0.2 (0.1)	81.9 (33.1)
Native floating-leaved	1.9 (0.8)	2.3 (0.9)	2.0 (0.8)
Native emergent	1.9 (0.8)	1.7 (0.7)	1.6 (0.7)

Gizzard Shad

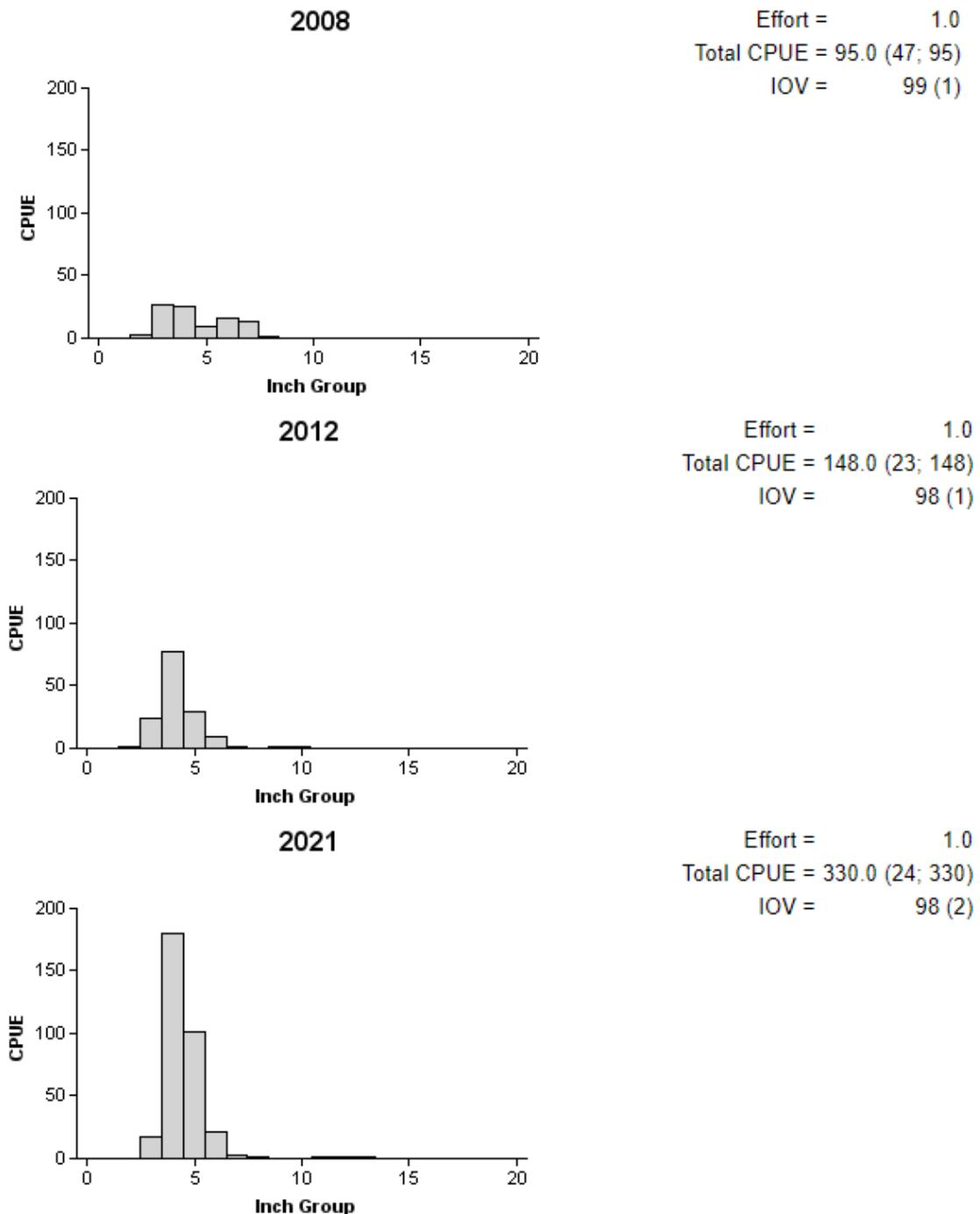


Figure 2. Number of Gizzard Shad caught per hour (CPUE) and population indices (RSE and N for CPUE and SE for IOV are in parentheses) for fall electrofishing surveys, Lake Findley, Texas, 2008, 2012, and 2021.

Bluegill

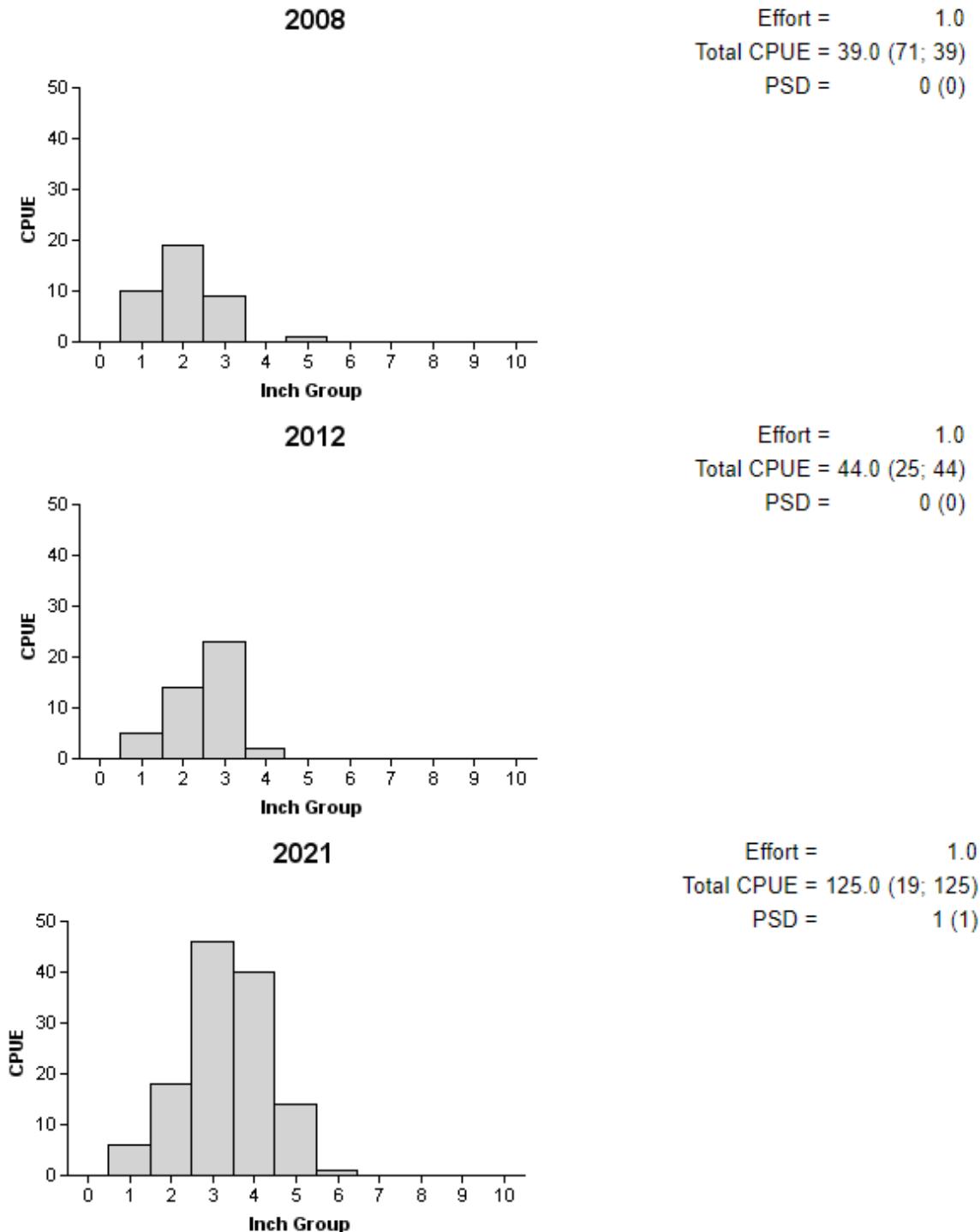
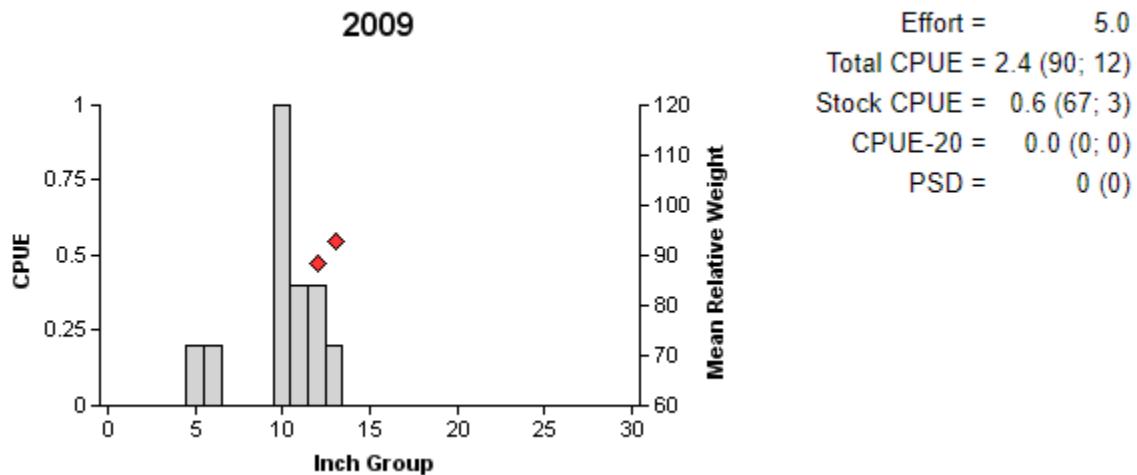


Figure 3. Number of Bluegill caught per hour (CPUE) and population indices (RSE and N for CPUE and SE for size structure are in parentheses) for fall electrofishing surveys, Lake Findley, Texas, 2008, 2012, and 2021.

Blue Catfish



No Blue Catfish collected during the 2021 survey.

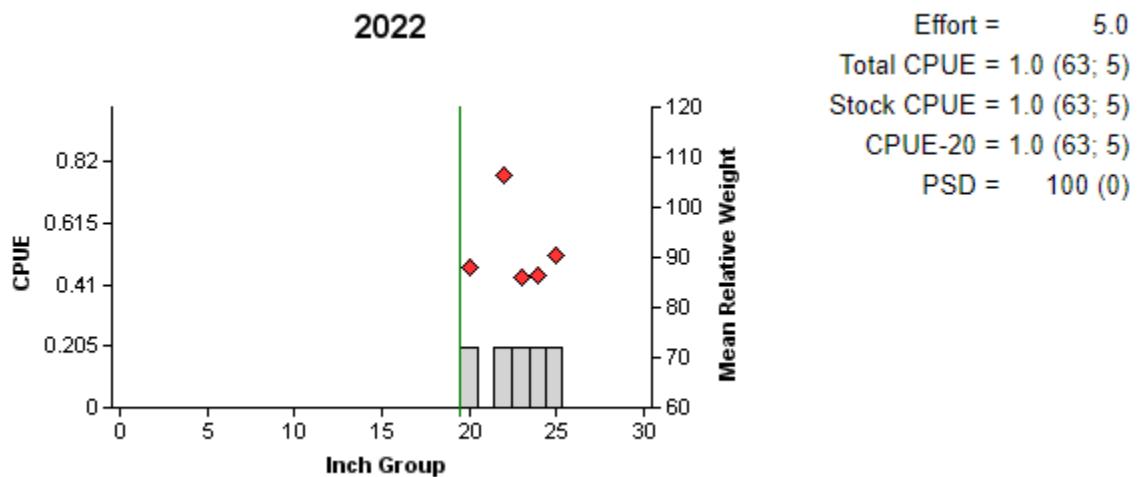
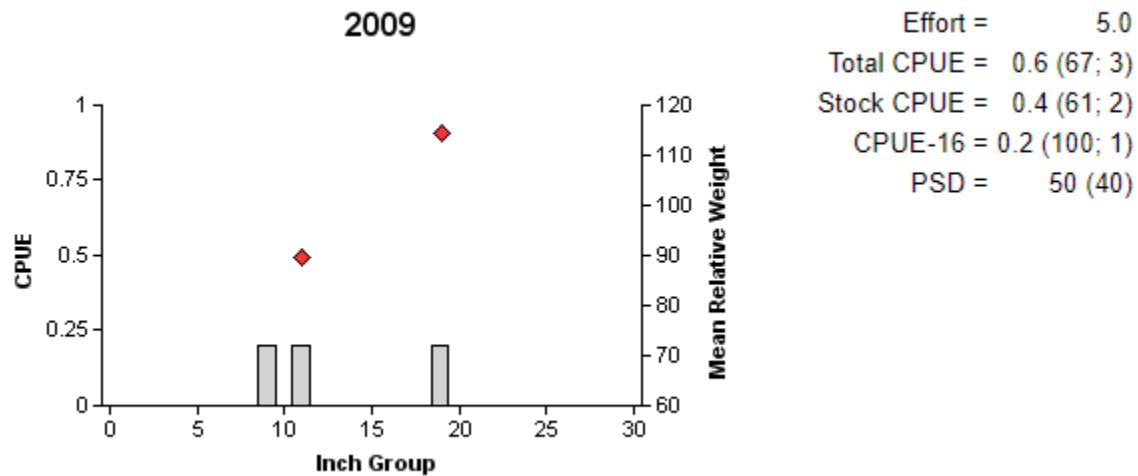


Figure 4. Number of Blue Catfish caught per net night (CPUE), mean relative weight (diamonds), and population indices (RSE and N for CPUE and SE for size structure are in parentheses) for spring gill net surveys, Lake Findley, Texas, 2009, 2021, and 2022.

Channel Catfish



No Channel Catfish collected during the 2021 survey.

No Channel Catfish collected during the 2022 survey.

Figure 5. Number of Channel Catfish caught per net night (CPUE), mean relative weight (diamonds), and population indices (RSE and N for CPUE and SE for size structure are in parentheses) for spring gill net surveys, Lake Findley, Texas, 2009, 2021, and 2022.

Largemouth Bass

No Largemouth Bass collected during the 2008 survey.

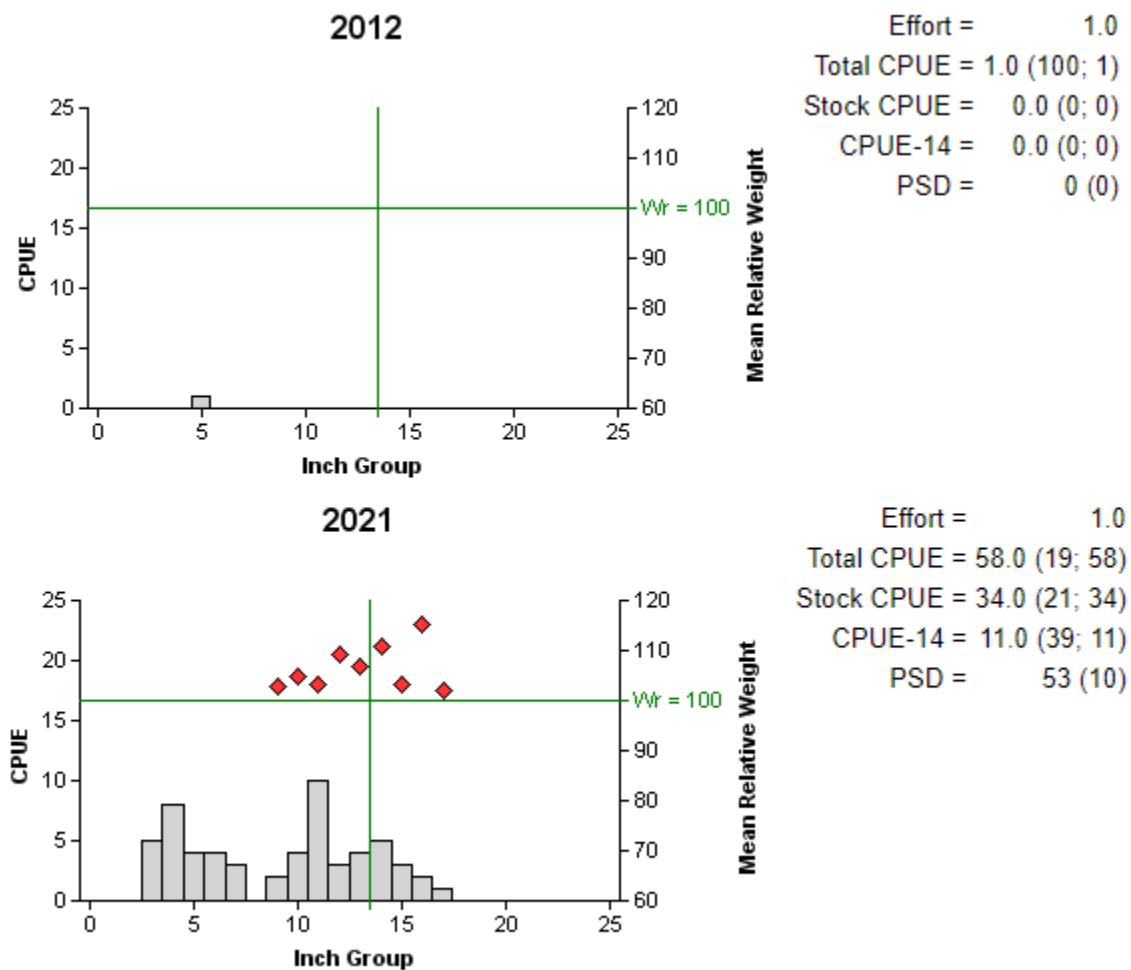


Figure 6. Number of Largemouth Bass caught per hour (CPUE, bars), mean relative weight (diamonds), and population indices (RSE and N for CPUE and SE for size structure are in parentheses) for fall electrofishing surveys, Lake Findley, Texas, 2008, 2012, and 2021.

Largemouth Bass

No Largemouth Bass collected during the 2010 survey.

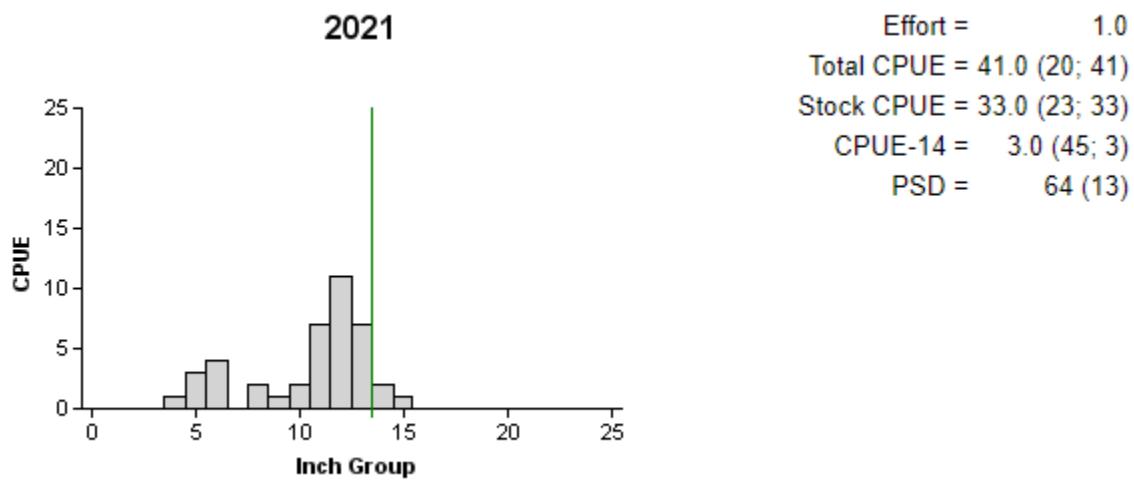


Figure 7. Number of Largemouth Bass caught per hour (CPUE, bars) and population indices (RSE and N for CPUE and SE for size structure are in parentheses) for spring electrofishing surveys, Lake Findley, Texas, 2010, and 2021.

White Crappie

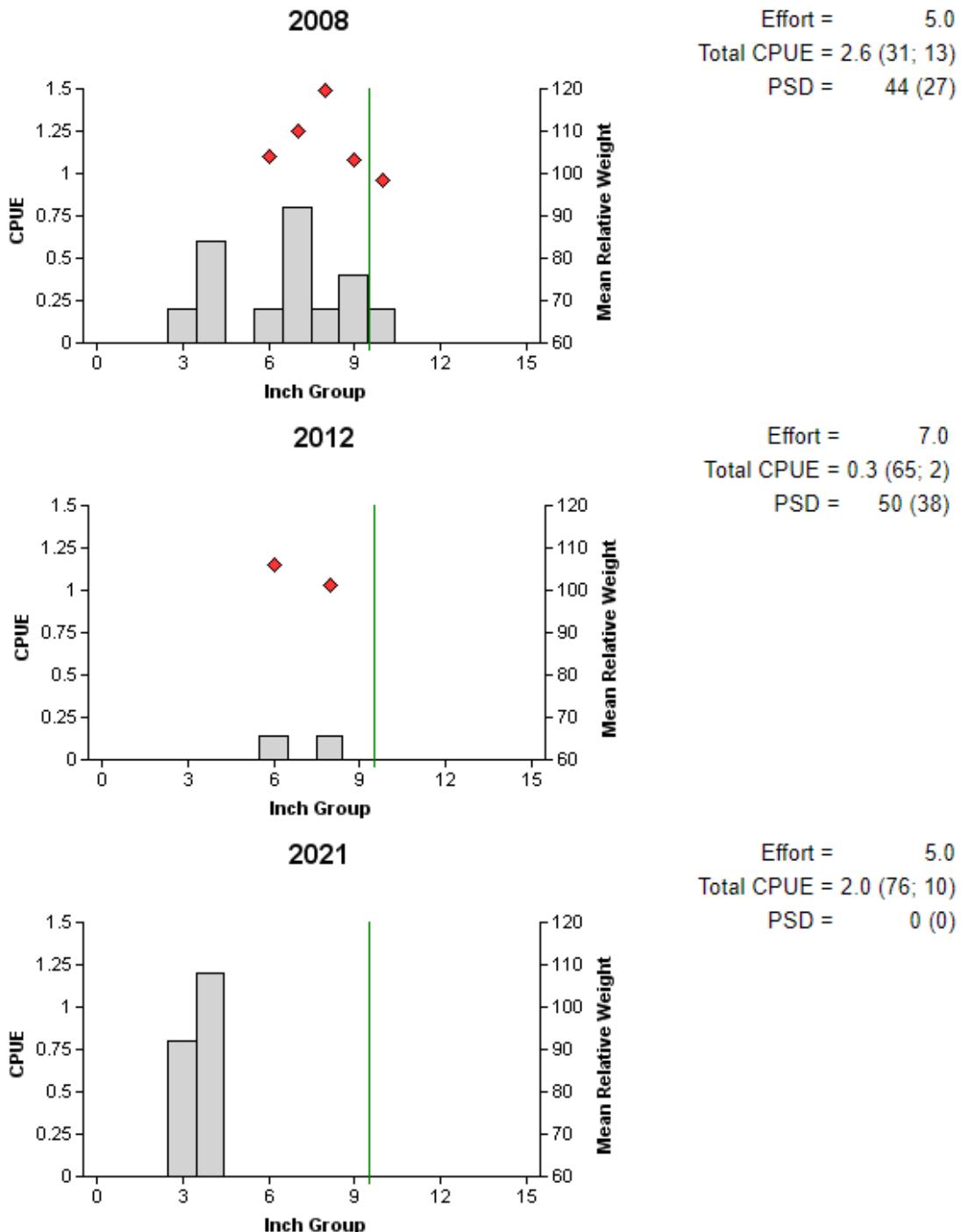


Figure 8. Number of White Crappie caught per net night (CPUE, bars), mean relative weight (diamonds), and population indices (RSE and N for CPUE and SE for size structure are in parentheses) for fall trap netting surveys, Lake Findley, Texas, 2008, 2012, and 2021. Vertical line indicates minimum length limit.

Black Crappie

No Black Crappie collected during the 2008 survey.

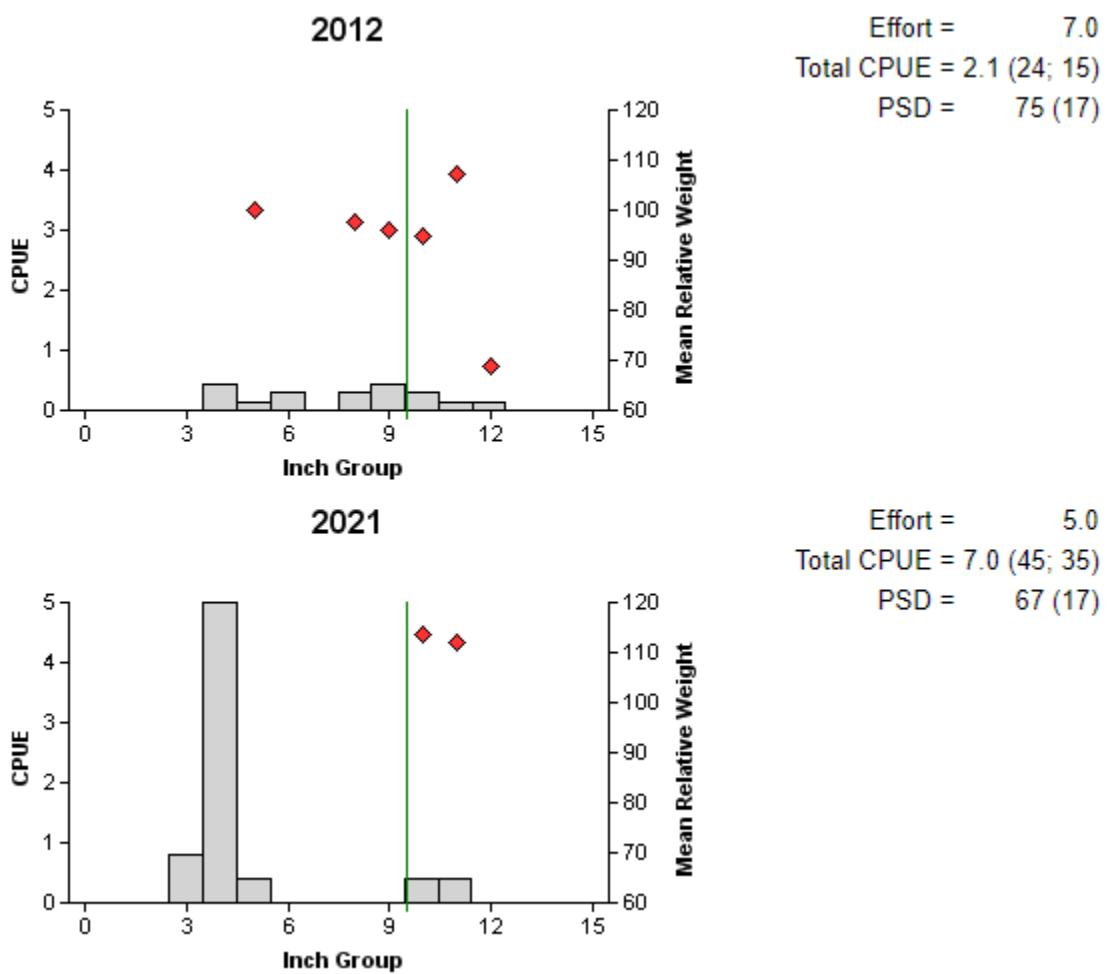


Figure 9. Number of Black Crappie caught per net night (CPUE, bars), mean relative weight (diamonds), and population indices (RSE and N for CPUE and SE for size structure are in parentheses) for fall trap netting surveys, Lake Findley, Texas, 2008, 2012, and 2021. Vertical line indicates minimum length limit.

Proposed Sampling Schedule

Table 8. Proposed sampling schedule for Lake Findley, Texas. Survey period is June through May. Gill netting surveys are conducted in the spring, while electrofishing surveys are conducted in the fall.

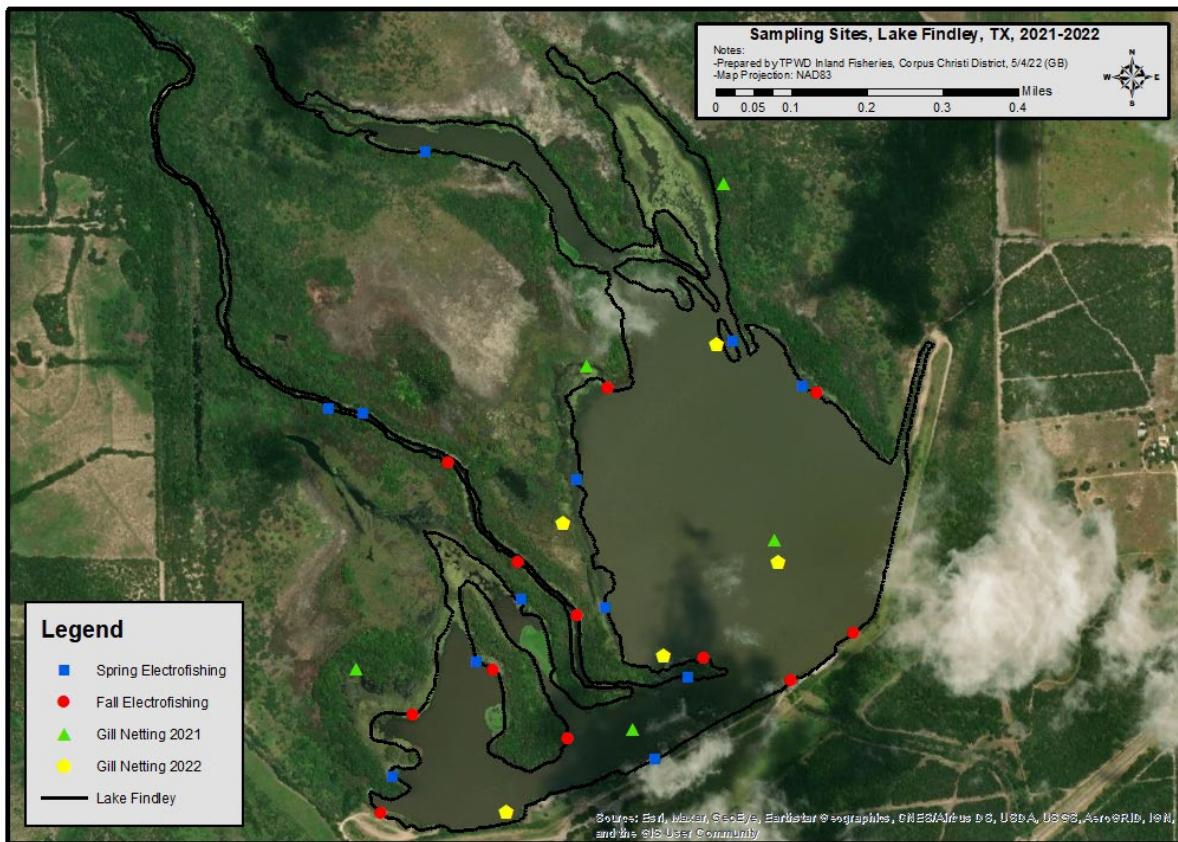
	Survey year			
	2022-2023	2023-2024	2024-2025	2025-2026
Angler Access				X
Vegetation		X		X
Structural Habitat				X
Electrofishing – Fall		X		X
Gill netting				X
Report				X

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

Number (N) and catch rate (CPUE) (RSE in parentheses) of all species collected from all gear types from Lake Findley, Texas, 2021-2022. Sampling effort was 5 net nights for gill netting, 5 net nights for trap netting, and 1 hour for electrofishing.

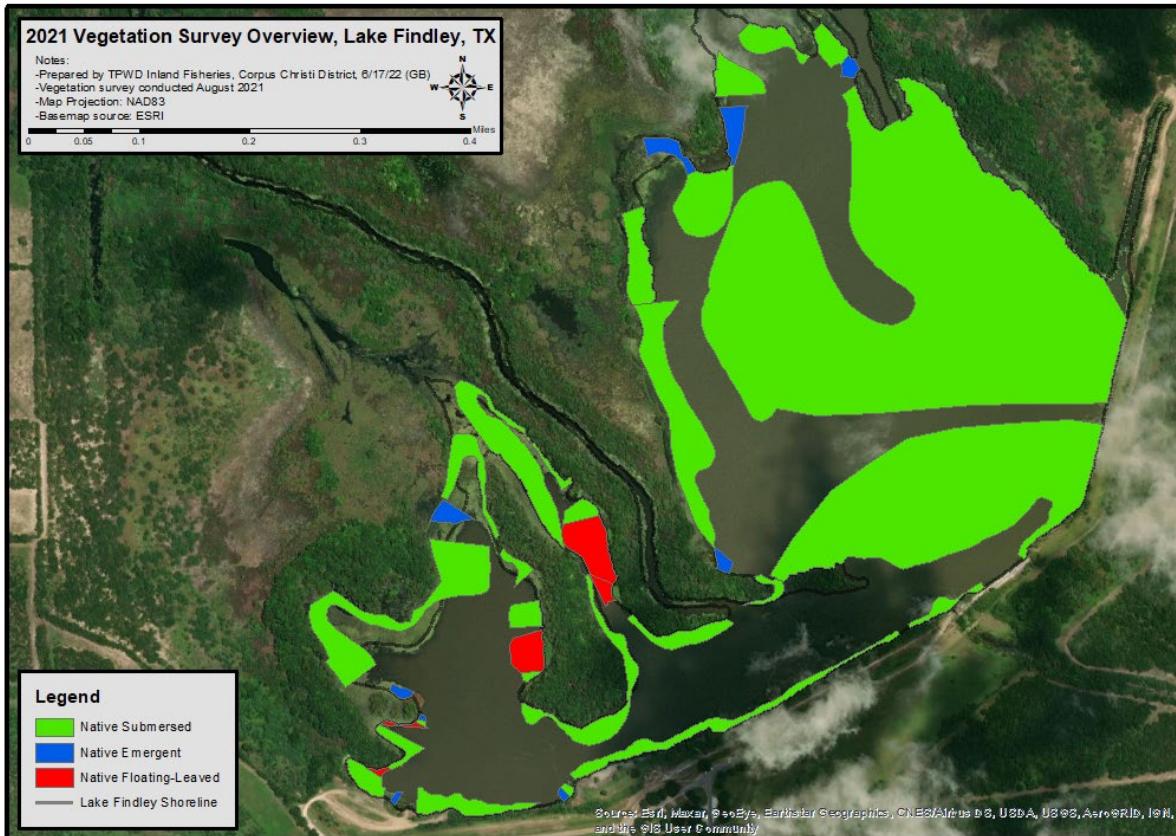
Species	Gill Netting		Trap Netting		Electrofishing	
	N	CPUE	N	CPUE	N	CPUE
Spotted Gar	32	6.4 (36)	9	1.8 (87)		
Longnose Gar			1	0.2 (100)		
Alligator Gar	9	1.8 (67)	1	0.2 (100)		
Gizzard Shad	50	10.0 (10)	15	3.0 (28)	330	330.0 (24)
Common Carp	12	2.4 (81)				
Smallmouth Buffalo	55	11.0 (26)				
Blue Catfish	5	1.0 (63)				
Warmouth			13	2.6 (82)		
Bluegill	21	4.2 (42)	725	145.0 (47)	125	125.0 (19)
Redear Sunfish			1	0.2 (100)	1	1.0 (100)
Largemouth Bass	11	2.2 (65)			58	58.0 (19)
White Crappie			10	2.0 (76)		
Black Crappie	10	2.0 (63)	35	7.0 (45)		
Freshwater Drum	30	6.0 (5)				
Grass Carp			1	0.2 (100)		

APPENDIX B – Map of sampling locations



Location of sampling sites, Lake Findley, Texas, 2021-2022.

APPENDIX C – 2021 Distribution map of aquatic vegetation





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