Sheldon Lake

2023 Fisheries Management Survey Report

PERFORMANCE REPORT

As Required by

FEDERAL AID IN SPORT FISH RESTORATION ACT

TEXAS

FEDERAL AID PROJECT F-221-M-5

INLAND FISHERIES DIVISION MONITORING AND MANAGEMENT PROGRAM

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Survey and Management Summary

Fish populations in Sheldon Lake were surveyed in 2023 and 2024 using electrofishing. Historical data are presented with the 2023-2024 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: Sheldon Lake is an 893-acre reservoir in Sheldon Lake State Park on Carpenters Bayou, a tributary of the San Jacinto River, in Harris County, Texas. The reservoir has a drainage area of 19 square miles and a shoreline length of 13.1 miles, including the islands. The reservoir has a mean depth of 3 feet and a maximum depth of 10 feet. Sheldon Lake was acquired by TPWD in 1952 for use as a waterfowl sanctuary and public fishing site. It is a highly productive coastal wetland ecosystem that hosts a diverse community of vegetation, fish, and wildlife species that attract anglers, boaters, and wildlife viewers from across the state.

Management History: Sheldon Lake has been managed for diverse fisheries – such as Bowfin and the occasional Grass Pickerel – and traditional fisheries like Largemouth Bass and panfish. However, excess vegetation has regularly caused access issues and much of the management history of Sheldon Lake focuses on reducing exotic vegetation and maintaining a balanced ecosystem that is accessible to visitors. The reservoir lies within Sheldon Lake State Park and many management decisions and actions are a cooperative effort with state park staff and the Aquatic Habitat Enhancement (AHE) team.

Fish Community

- **Prey species:** Gizzard Shad, Bluegill, and Redear Sunfish were present in the reservoir. Gizzard Shad were large and unavailable to existing predators. Small-bodied Bluegill and Redear Sunfish were common and available as prey. Large Redear Sunfish were also observed, providing a possible target for panfish anglers.
- **Catfishes:** Blue Catfish and Channel Catfish are only present in Sheldon Reservoir as a put-grow-and-take fishery from occasional stockings of surplus fish. Blue Catfish fingerlings were last stocked in 2015, and no catfish of either species was collected during 2019 or 2023 electrofishing surveys.
- **Largemouth Bass:** Largemouth Bass were present with individuals available for harvest. Fish were in good condition. Florida Largemouth Bass genetic influence has held steady since 2004, with 60-70% Florida influence. The lake-record Largemouth Bass, caught in 2018, was 11.16 lbs. and 25.00 inches.
- **Crappies:** Both Black Crappie and White Crappie were present in 2019, but only Black Crappie were collected in 2023.

Management Strategies: The primary challenge at Sheldon Lake is aquatic vegetation management. Aquatic nuisance species surveys will be conducted annually, herbicide treatments performed as necessary to improve angler access, and efforts to inform the public about the negative impacts of aquatic invasive species and preventive measures will continue. Will continue to explore funding opportunities for angler access improvements in cooperation with State Parks and Infrastructure divisions. Electrofishing and angler access surveys will be conducted every four years.

Introduction

This document is a summary of fisheries data collected from Sheldon Lake in 2023 and 2024. 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 2023-2024 data for comparison.

Reservoir Description

Sheldon Lake is an 893-acre reservoir on Carpenters Bayou, a tributary of the San Jacinto River, in Harris County, Texas, lying within the Sheldon Wildlife Management Area and Sheldon Lake State Park. In 1952, TPWD acquired the property as a waterfowl sanctuary and public fishing site and is therefore managed for both waterfowl and fish species. Sheldon Lake is a highly productive wetland ecosystem with large, established cypress trees, a variety of aquatic and riparian plant species, and hosts a diverse community of fish and wildlife species that attract anglers, boaters, and wildlife viewers from across the state. The reservoir has a drainage area of 19.0 square miles, a shoreline length of 13.1 miles, and a Shoreline Development Index of 2.7. The reservoir has a mean depth of 3 feet and a maximum depth of 10 feet. Rainfall in the watershed averages 42.6 inches per year. Sheldon Lake is found within the Gulf Coast Plains Land Resource Area with Lake Charles/Benard Association (clay) soil types. Land uses around the reservoir are primarily industrial and residential. Other descriptive characteristics for Sheldon Lake are presented in Table 1.

Angler Access

Sheldon Lake has one boat ramp (Table 2). The ramp is steep and has inadequate parking. Plans are underway to replace the ramp when funding is available. Public shoreline access is good for bank fishing; however, all existing fishing piers are in disrepair, and many have been closed to the public for safety reasons and are being dismantled or rebuilt.

Management History

Previous management strategies and actions: Management strategies and actions from the previous survey report (Best & Ragan-Harbison 2020) included:

1. Conduct Aquatic Nuisance Species (ANS) annual surveys, coordinate with Aquatic Habitat Enhancement (AHE) team for necessary treatments and provide public education about the threat of invasive species in Texas.

   Action: ANS surveys were conducted annually to monitor giant salvinia, water hyacinth, and other ANS species. The AHE team treated nuisance vegetation through salvinia weevil releases and 23 herbicide applications in 2020-2024.

2. Work with State Parks and Infrastructure staffs to develop better access infrastructure.

   Action: No action was taken due to funding limitations

3. Request 9-inch Channel Catfish and stock surplus Channel Catfish and Blue Catfish when available for a put, grow, and take fishery. Install catfish spawning structures to encourage natural reproduction and recruitment.

   Action: Advanced fingerling (9”) Channel Catfish or surplus Blue and Channel Catfish were not requested for Sheldon Lake. Spawning structures were not added to the reservoir due to dense vegetation.

Harvest regulation history: Sheldon Lake falls completely within Sheldon Lake State Park and was therefore managed as a Community Fishing Lake (CFL) until September 2023. Sheldon Lake is now

managed under statewide regulations except for catfish and gear type. For Blue and Channel Catfish, minimum length limit is 14 inches and combined daily bag limit is 15 fish. Fishing is by pole and line only and anglers may use no more than two poles while fishing. Being within a state park, no fishing license is required. Current regulations are presented in Table 3.

Stocking history: The most recent stockings at Sheldon Lake include Blue Catfish in 2015, Florida Largemouth Bass in 2015, 2019, and 2020, and Lone Star Bass in 2022. The complete stocking history is presented in Table 4.

Vegetation/habitat management history: Sheldon Lake has natural woody and brushy shoreline habitat with a highly productive mixed aquatic plant community of both native and non-native species. Hydrilla, giant salvinia, and water hyacinth have all been problematic at times and continue to impede access. From 2020-2023 the AHE team used a variety of herbicides to treat water hyacinth, giant salvinia, and alligator weed over 23 treatments. Annual treatment summaries may be found in Appendix C. Regular herbicide treatments have been successful in recent years and will require ongoing, regular treatment to control nuisance species and maintain recreational angler access.

Water transfer: Sheldon Lake serves as wildlife habitat and as a State Park recreational lake. Very rarely is there any discharge from the reservoir. If any discharge occurs during flood events, the water enters the Houston area bayou drainage system leading to the Houston Ship Channel. Currently no interbasin transfer exists.

Methods

Surveys were conducted to achieve survey and sampling objectives in accordance with the objective-based sampling (OBS) plan for Sheldon Lake (Best & Ragan-Harbison 2020). 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 2022).

Common names of fishes and their hybrids in this report are used following Page et al. (2023) with an exception for Largemouth Bass. While we recognize recent changes to black bass names, Texas reservoirs contain a mix of Florida Bass, Largemouth Bass, and their intergrade offspring. Therefore, Largemouth Bass is used in this report for simplicity as well as consistency with previous reports.

Electrofishing – Largemouth Bass, sunfishes, Gizzard Shad, and Threadfin Shad were collected by fall daytime electrofishing (1 hour at 12, 5-min stations). Largemouth Bass were also collected with a spring bass-only daytime electrofishing survey (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. Electrofishing in 2023 was conducted using a Smith-Root Apex electrofisher, while previous surveys used GPP 5.0 electrofisher. Age-at-length analysis for Largemouth Bass were determined using otoliths from 13 randomly selected fish (range 13.0 to 14.9 inches) from the spring bass-only survey (Category II; TPWD, Inland Fisheries Division, unpublished manual revised 2022).

Genetics – Genetic analysis of Largemouth Bass was conducted according to the Fishery Assessment Procedures (TPWD, Inland Fisheries Division, unpublished manual revised 2022). Micro-satellite DNA analysis was used to determine genetic composition of individual fish since 2005. Electrophoresis analysis was used prior to 2005.

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 Neumann et al. (2012). Index of Vulnerability (IOV) was calculated for Gizzard Shad (DiCenzo et al. 1996). Standard error (SE) was calculated for structural indices and IOV. Relative standard error (RSE = 100 X SE of the estimate/estimate) was calculated for all CPUE statistics.

Habitat – Exotic vegetation surveys were conducted annually to monitor expansion of exotic vegetation, and a complete vegetation survey was conducted in 2023. Vegetation was assessed with the digital shapefile method (TPWD, Inland Fisheries Division, unpublished manual revised 2022).

Results and Discussion

Habitat: Structural shoreline habitat has not changed in recent years and consisted primarily of nondescript, natural shoreline with overhanging brush (Table 6). Native and exotic vegetation were present in mixed communities and covered more than 87% of the reservoir's surface (780.0 surface acres native, 444.0 surface acres non-native, Table 6) and water level was approximately 1.5ft low at the time of survey. Vegetation community changes seasonally at Sheldon Lake, with lotus peaking in late summer and native submerged species such as coontail peaking in early to mid-fall before migrating waterfowl arrive, at which point submerged vegetation greatly exceeds what is considered to be beneficial for Largemouth Bass recruitment (Durocher et al. 1984). Between 2020 and summer of 2024, the AHE team treated 599 acres of exotic vegetation over 25 treatments with a variety of herbicides with the goal of maintaining open boat lanes (Appendix C).

Prey species: Electrofishing catch rate of Gizzard Shad was consistently low over the past few surveys (ranging from 3.0/h to 16.0/h, Figure 1), likely due to the abundant vegetation, favoring cover-seeking prey species, in the reservoir. Index of Vulnerability (IOV) for Gizzard Shad also continued to be very poor, indicating that no small-bodied Gizzard Shad were available to predators. Similar to Gizzard Shad, total CPUE of Bluegill is also consistently low (15.0/h to 27/h, Figure 2), and size structure continued to

be dominated by small individuals. However, Redear Sunfish abundance (CPUE, range = 81.5-135.0/h), body condition for individuals greater than 4 inches in length (W_r, range = 88.4-94.0), and size structure (PSD, range = 7-22) have all continued to improve over the past three surveys with a higher percentage of preferred length individuals (PSD-P, range = 0-6) available in the population during the 2023 survey than in previous years (Figure 3).

Largemouth Bass: Total Largemouth Bass electrofishing CPUE in 2023 was 64.0/h, a decrease from the 2019 catch rate (99.0/h), but higher than the 2015 catch rate (58.5/h, Figure 4). The 2023 and 2019 surveys were both conducted when abundant submerged vegetation in the reservoir made it difficult to effectively electrofish, limiting sites to the lower end near the boat ramp and deeper water. Therefore, district staff conducted an exploratory spring bass-only electrofishing survey in 2024 to gain additional data on Largemouth Bass. During the spring bass-only survey, low dissolved oxygen was discovered in the upper portion of the reservoir, requiring the remaining randomly selected sites to be shifted down reservoir until adequate D.O. was located. Total CPUE for the spring survey was low (55.0/h), but more stock-sized and legal-sized individuals were collected than in the fall (Figure 4 and Figure 5). Body condition in the fall of 2023 and spring of 2024 was good (Wr > 90) for nearly all size classes of fish collected. Florida Largemouth Bass influence was 68% and has remained relatively constant since 2004 with a range from 60% to 68% (Table 8). One pure Florida genotype was present in the 2023 sample. Due to inadequate numbers of appropriately sized fish in the fall survey, growth of Largemouth Bass in Sheldon Lake was assessed from fish captured during the spring survey. Growth was moderate to slow; average age at 14 inches (13.8 to 14.7 inches) was 2.9 years (N = 13; range = 1 – 6 years, Figure 6).

Crappies: Trap netting was removed in 2015 under the OBS sampling protocol; however, persistence of Black Crappie were documented in the electrofishing survey (Appendix A).

Fisheries Management Plan for Sheldon Lake, Texas

Prepared – July 2024

ISSUE 1: Boating angler access at Sheldon Lake frequently becomes restricted due to heavy infestations of vegetation. The reservoir's shallow depth and dual purpose of both waterfowl sanctuary and recreational fishery creates a unique challenge for managing vegetation in a way that provides habitat for various avian species, yet enough open water for Largemouth Bass recruitment.

MANAGEMENT STRATEGY

1. Along with the support of the AHE Program, continue to manage problematic plant species with appropriate herbicide. Ensure shoreline access to deep water remains open to anglers along the levees. Create boat lanes and large areas clear of both native and invasive vegetation to improved boat access to the flats in the northern portion of the reservoir.
2. Discuss the potential for stocking Triploid Grass Carp in the reservoir with State Park Management.

ISSUE 2: Shoreline access is currently limited to vegetated banks. Current fishing pier infrastructure is unsafe and roped off to prevent public access, but anglers continue to use the structures to gain access for fishing.

MANAGEMENT STRATEGY

1. Continue to work with TPWD State Parks and Infrastructure staffs to secure funding for and develop better access infrastructure, including a new boat ramp, new and repaired fishing piers, and dredging boat lanes to improve boating access.

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. Educate the public about invasive species through the use of media and the internet.
3. Make a speaking point about invasive species when presenting to constituent and user groups.
4. Keep track of (i.e., map) existing and future interbasin water transfers to facilitate potential invasive species responses.

Objective-Based Sampling Plan and Schedule (2024–2028)

Sport fish, forage fish, and other important fishes

Sport fishes in Sheldon Lake include Largemouth Bass, Blue Catfish, and Channel Catfish and known important forage species include Bluegill and Redear Sunfish.

Negligible fisheries

Catfish: Blue Catfish and Channel Catfish are present in Sheldon Reservoir as a put-grow-take fishery. High levels of submersed aquatic vegetation make angling for catfish difficult and limit the effectiveness of gill nets for surveys. From 2005-2013 total gillnet CPUE for Channel Catfish ranged from 0.4-2.4/nn and total CPUE for Blue Catfish ranged from 0-1.4/nn.

Crappie: White Crappie and Black Crappie have been present in Sheldon Reservoir in the past, but population abundance is extremely low and high levels of vegetation renders trap nets ineffective. Presence and absence of crappie species will be noted during electrofishing surveys in the fall of 2027.

Survey objectives, fisheries metrics, and sampling objectives

Largemouth Bass: Largemouth Bass are believed to be the most popular sport fish in Sheldon Reservoir based on reports from State Park staff and social media posts by self-identified Sheldon Reservoir anglers. The popularity and reputation for quality Largemouth Bass fishing at this reservoir warrant sampling time and effort. Trend data on CPUE, size structure, and body condition have been collected every two to four years since 1986 with fall electrofishing.

Largemouth Bass will be surveyed with fall daytime electrofishing every four years to continue trend monitoring of CPUE, size structure, and body condition. Due to reservoir depth and occasionally high levels of invasive vegetation, site accessibility can be limited; therefore, 12 randomly selected 5-min electrofishing stations will be sampled in the fall of 2027 to compare with historical data. The fall survey will be conducted in late September - early October or early December to avoid when coontail is most dense. In 2026 and 2028, spring bass-only electrofishing surveys will be conducted at 12, randomly selected 5-minute stations to better understand the dynamics of the Largemouth Bass fishery. While conducting spring surveys, water quality will be collected at each of the 12 randomly selected stations to monitor dissolved oxygen across the reservoir. Electrofishing will be conducted during daytime for improved safety and efficiency on this very shallow and heavily vegetated reservoir.

Largemouth Bass age and growth will be determined using otoliths from 13 fish between 13.0 and 14.9 inches in length to determine the age at which they become available for legal harvest.

Prey Species: Bluegill and Redear Sunfish are the primary forage fish at Sheldon Reservoir and historic data has documented quality sized fish of both species large enough to provide sport fishing opportunities. Continuation of sampling, as per Largemouth Bass above, will allow for monitoring of large-scale changes in Bluegill and Redear Sunfish relative abundance and size. Threadfin Shad are uncommon in Sheldon Reservoir and Gizzard Shad are not abundant; sampling effort for Largemouth Bass will be sufficient to determine presence or absence of Threadfin Shad and determine a CPUE and IOV for Gizzard Shad.

Largemouth Bass body condition will be used to provide additional information on forage abundance and vulnerability.

Habitat and Vegetation: Sheldon Lake is highly productive with multiple native and exotic species of vegetation. Nuisance aquatic vegetation has created access issues numerous times in its history. Exotic vegetation surveys will be conducted annually to monitor abundance of exotic aquatic vegetation, guide treatment methods, and monitor access that may impact angling on the reservoir. The entire vegetation community and structural habitat will be surveyed once every four years to monitor native aquatic plant

species and the vegetation community. During the 2024 spring electrofishing survey, several stations in the upper end of the reservoir had low dissolved oxygen; therefore, dissolved oxygen will be measured at multiple locations during each vegetation and electrofishing survey to gain a better understanding of the oxygen demand within this lake.

Complete sampling schedule can be found in Table 9.

Literature Cited

Best, A., and N. Ragan-Harbison. 2020. Sheldon Lake Reservoir, 2019 fisheries management survey report. Texas Parks and Wildlife Department, Federal Aid Report F-221-M-4, Austin.

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.

Durocher, P. P., W. C. Provine, and J. E. Kraai. 1984. Relationship between abundance of Largemouth Bass and submerged vegetation in Texas reservoirs. North American Journal of Fisheries Management 4:84-88.

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.

Neumann, R. M., C. S. Guy, and D. W. Willis. 2012. Length, weight, and associated indices. Pages 637-676 in A. V. Zale, D. L. Parrish, and T. M. Sutton, editors. Fisheries techniques, 3rd edition. American Fisheries Society, Bethesda, Maryland.

Page, L. M., K. E. Bemis, T. E. Dowling, H. S. Espinosa-Perez, L. T. Findley, C. R. Gilbert, K. E. Hartel, R. N. Lea, N. E. Mandrak, M. A. Neighbors, J. J. Schmitter-Soto, and H. J. Walker, Jr. 2023. Common and scientific names of fishes from the United States, Canada, and Mexico. American Fisheries Society, Special Publication 37, Bethesda, Maryland.

Tables and Figures

Table 1. Characteristics of Sheldon Lake, Texas.

Characteristic	Description
Year constructed	1943
Controlling authority	Texas Parks and Wildlife Department
County	Harris
Reservoir type	State Park Reservoir
Shoreline Development Index	2.7
Conductivity	762 µS/cm

Table 2. Boat ramp characteristics for Sheldon Lake, Texas, August 2023. Reservoir elevation at time of survey was 49 feet above mean sea level.

Boat ramp	Latitude Longitude (dd)	Public	Parking capacity (N)	Elevation at end of boat ramp (ft)	Condition
Pineland Road	29.868455 95.168196	Y	10	45	Steep ramp, parking lanes not marked

Table 3. Harvest regulations for Sheldon Lake, Texas.

Species	Bag limit	Length limit
Catfish: Channel and Blue Catfish, their hybrids and subspecies	15	14-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] Daily bag for Largemouth Bass, Spotted Bass, and Guadalupe Bass = 5 fish in any combination.

Table 4. Stocking history of Sheldon Lake, Texas. FRY = fry, FGL = fingerling; AFGL = advanced fingerling; UNK = unknown.

Species	Year	Number	Size
Black Crappie	1972	51,000	UNK
Blue Catfish	1972	4,800	UNK
	1978	46,360	UNK
	1983	89	UNK
	2015	102,640	FGL
	Total	153,889	
Channel Catfish	1972	12,500	AFGL
	1976	34,640	AFGL
	1978	90,654	AFGL
	1984	78,432	FGL
	1990	12,261	FGL
	2004	1,968	AFGL
	2005	17,908	AFGL
	Total	248,363	
Flathead Catfish	1972	1,015	UNK
	1983	25	UNK
	Total	1,040	
Florida Largemouth Bass	1978	120,000	FRY
	1983	52,344	FRY
	2015	123,045	FGL
	2019	15,623	FGL
	2020	21,158	FGL
	Total	332,170	
Green Sunfish x Redear Sunfish	1972	80,000	UNK
	1976	24,365	UNK
	1978	70,300	UNK
	Total	174,665	
Largemouth Bass	1972	73,000	UNK
	1983	15,569	UNK
	Total	88,569	
Lone Star Bass[a]	2022	13,024	FGL
Red Drum	1976	246	UNK
Redear Sunfish	1983	107,800	UNK
Warmouth	1972	41,600	UNK

[a] Lone Star Bass are 2nd generation offspring of pure Florida strain ShareLunker Largemouth Bass that have proven to be able to grow to ≥ 13 pounds.

Table 5. Objective-based sampling plan components for Sheldon Lake, Texas 2023–2024.

Gear/target species	Survey objective	Metrics	Sampling objective
Electrofishing			
Largemouth Bass	Abundance	CPUE–Stock	RSE-Stock ≤ 25
	Size structure	PSD, length frequency	N ≥ 50 stock
	Age-and-growth	Age at 14 inches	N = 13, 13.0 – 14.9 inches
	Condition	W_r	10 fish/inch group (max)
	Genetics	% FLMB	N = 30, any age
Sunfish (Bluegill and Redear Sunfish) [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
Crappie	Presence/Absence	CPUE	N ≥ 1
Blue Catfish	Presence/Absence	CPUE	N ≥ 1
Channel Catfish	Presence/Absence	CPUE	N ≥ 1

[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, Sheldon Lake, Texas, 2019. Shoreline habitat type units are in miles and standing timber is acres.

Habitat type	Estimate	% of total
Asphalt or Concrete[a]	0.33 miles	2.5
Natural Shoreline	12.77	97.5

[a] Asphalt and concrete with natural slope.

Table 7. Survey of aquatic vegetation, Sheldon Lake, Texas, 2020–2023. Surface area (acres) is listed with percent of total reservoir surface area in parentheses.

Vegetation	2020	2021	2022	2023
Native submersed				48.0 (5.4)
Native floating-leaved				0.6 (<0.1)
Native emergent				731.4 (81.9)
Non-native				
Giant salvinia (Tier II)*	770.0 (62.7)	175.3 (14.3)	<0.1 (<0.1)	423.63 (47.4)**
Water hyacinth (Tier II)*	159.9 (13.0)	172.9 (14.1)	0.1 (<0.1)	
Hydrilla (Tier II)*	683.0 (55.6)	<0.1 (<0.1)	122.0 (9.9)	19.3 (1.6)
Thalia (Tier III)*	<0.1 (<0.1)	<0.1 (<0.1)	<0.1 (<0.1)	0.2 (<0.1)
Asian Marshweed (Tier III)*	0 (0)	0 (0)	0 (0)	0.5 (<0.1)
Parrot Feather (Tier III)*	0 (0)	5.0 (0.4)	0 (0)	0 (0)
Milfoil (Tier III)*	0 (0)	<0.1 (<0.1)	0 (0)	0 (0)

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

** For 2023, water hyacinth and giant salvinia are grouped.

Gizzard Shad

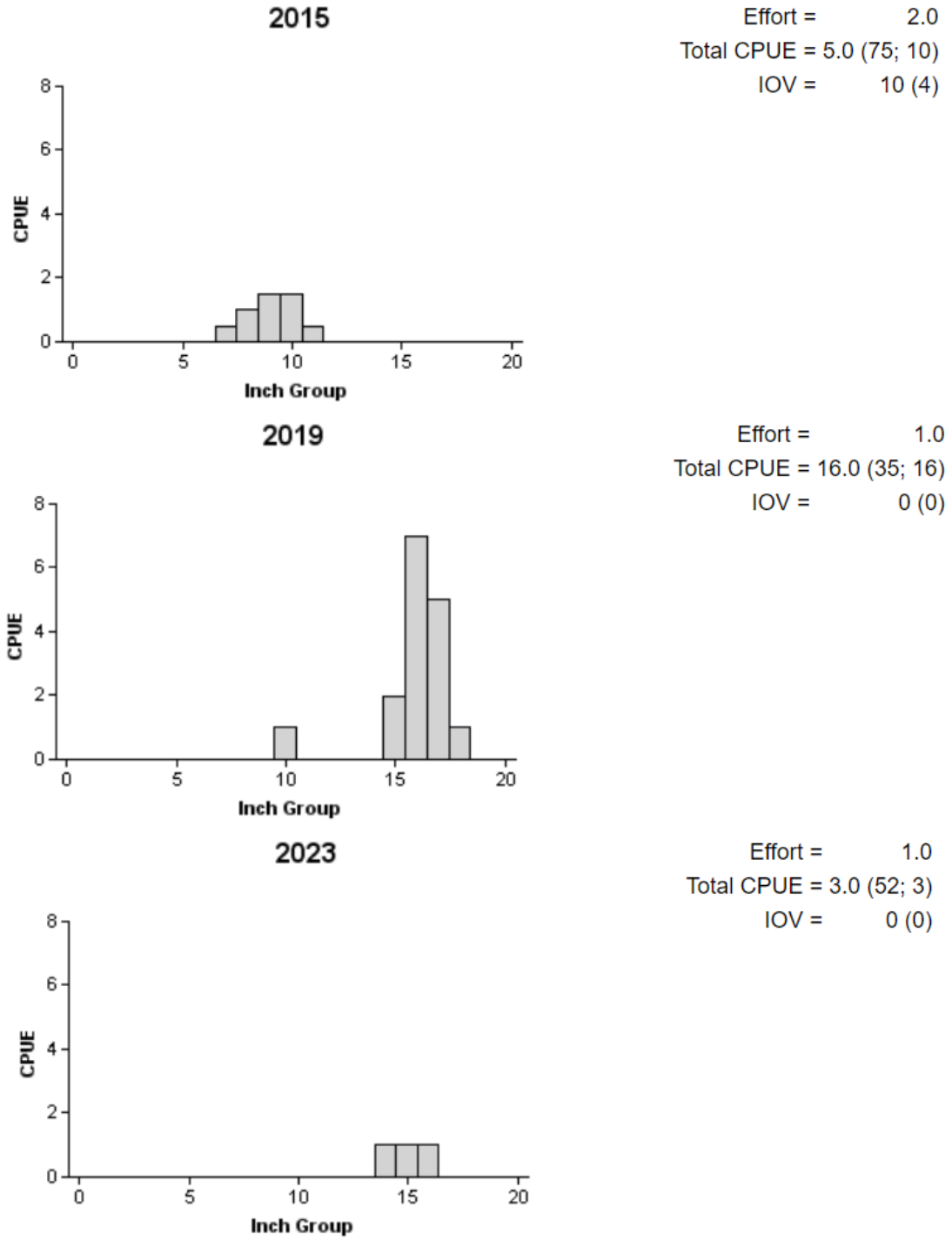


Figure 1. Number of Gizzard Shad caught per hour (CPUE) and population indices (RSE and N for CPUE and SE for IOV are in parentheses) for fall electrofishing surveys, Sheldon Lake, Texas, 2015, 2019, and 2023.

Bluegill

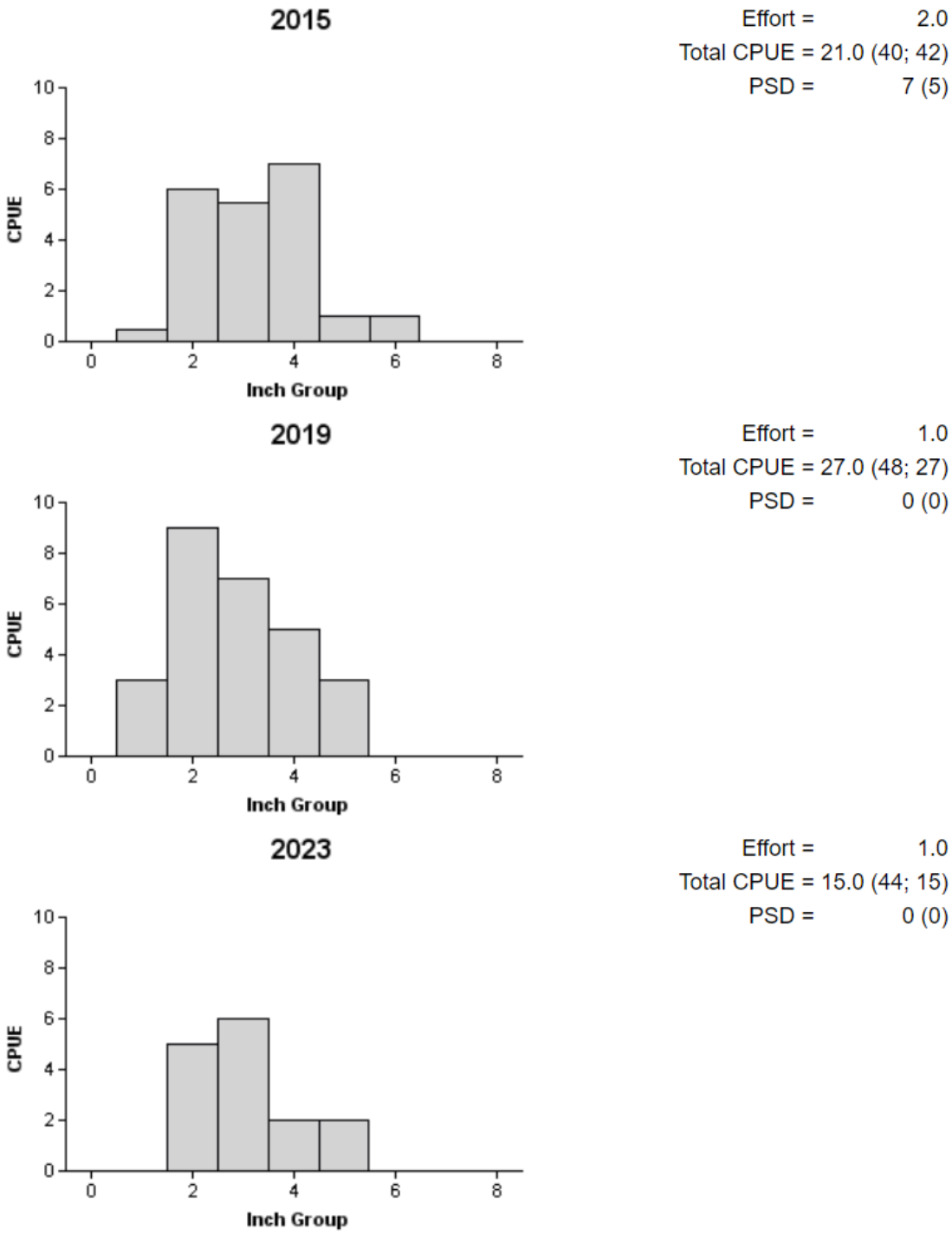
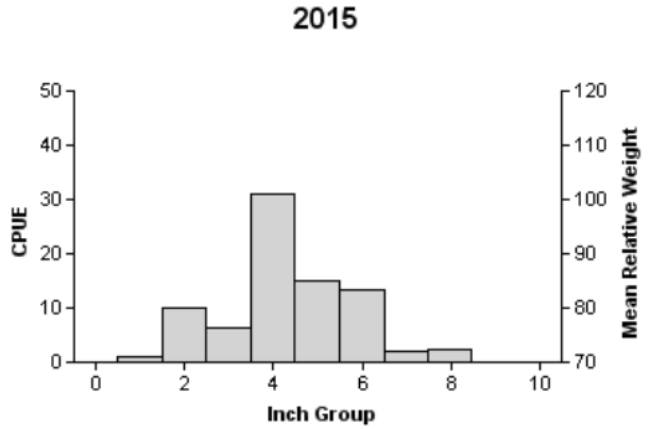
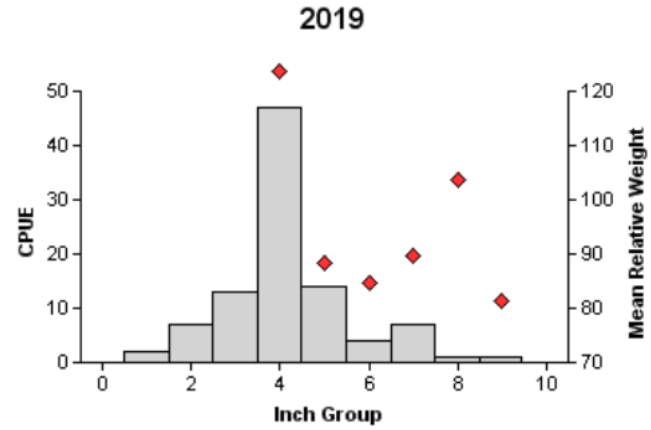


Figure 2. Number of Bluegill caught per hour (CPUE) and population indices (RSE and N for CPUE and SE for size structure are in parentheses) for fall electrofishing surveys, Sheldon Lake, Texas, 2015, 2019, and 2023.

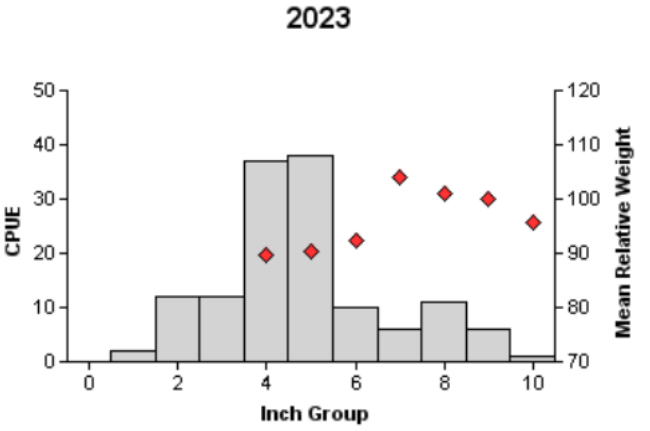
Redear Sunfish



Effort = 2.0
Total CPUE = 81.5 (13; 163)
Stock CPUE = 64.0 (16; 128)
PSD = 7 (3)
PSD-P = 0 (0)



Effort = 1.0
Total CPUE = 96.0 (36; 96)
Stock CPUE = 74.0 (39; 74)
PSD = 12 (4)
PSD-P = 1 (1)



Effort = 1.0
Total CPUE = 135.0 (19; 135)
Stock CPUE = 109.0 (18; 109)
PSD = 22 (6)
PSD-P = 6 (2)

Figure 3. Number of Redear Sunfish caught per hour (CPUE), mean relative weight (diamonds), and population indices (RSE and N for CPUE and SE for size structure are in parentheses) for fall electrofishing surveys, Sheldon Lake, Texas, 2015, 2019, and 2023.

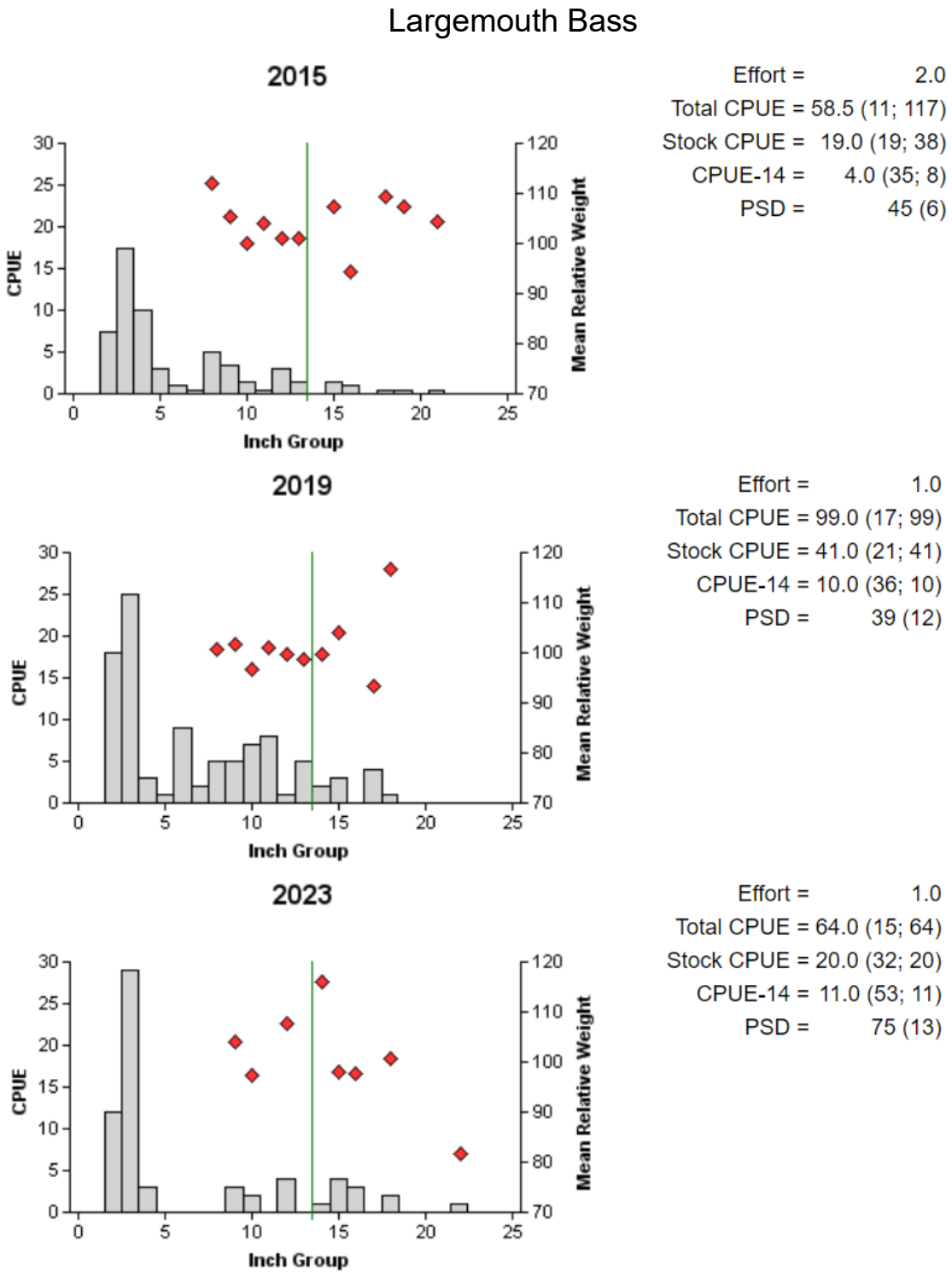


Figure 4. Number of Largemouth Bass caught per hour (CPUE, bars), mean relative weight (diamonds), and population indices (RSE and N for CPUE and SE for size structure are in parentheses) for fall electrofishing surveys, Sheldon Lake, Texas, 2015, 2019, and 2023.

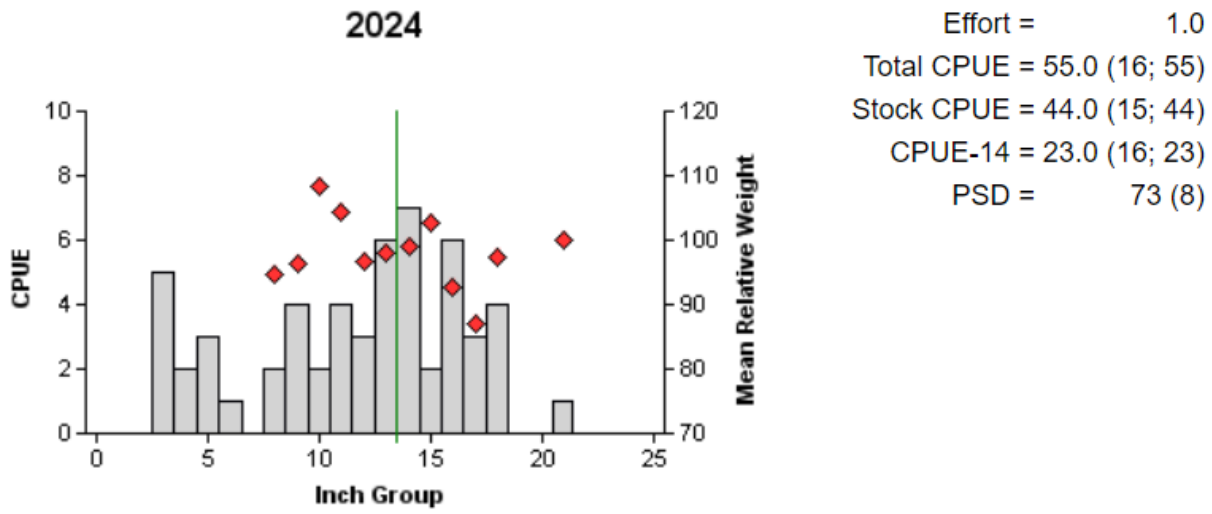


Figure 5. Number of Largemouth Bass caught per hour (CPUE, bars), mean relative weight (diamonds), and population indices (RSE and N for CPUE and SE for size structure are in parentheses) for spring bass-only electrofishing survey, Sheldon Lake, Texas, 2024.

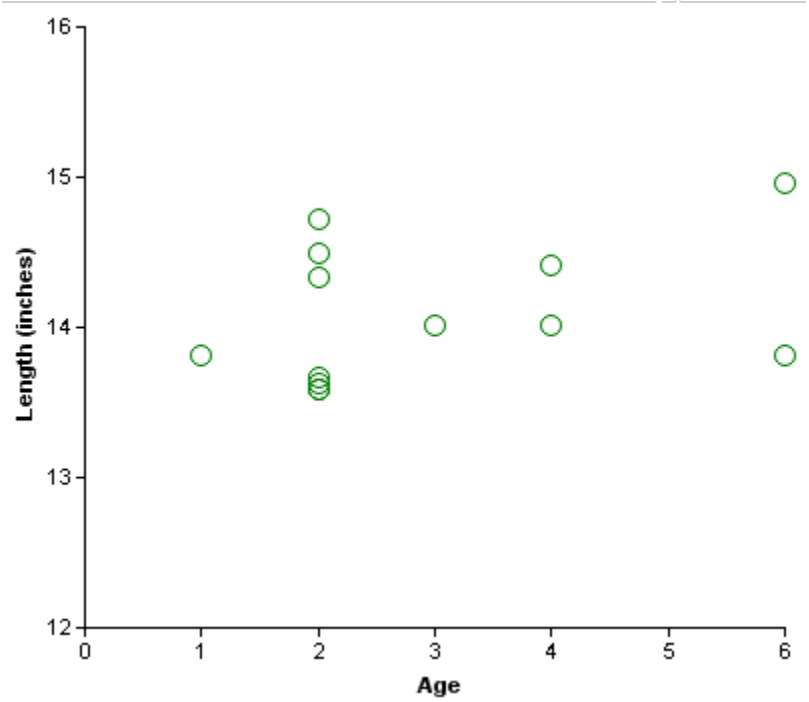


Figure 6. Length at age for Largemouth Bass collected from electrofishing at Sheldon Lake, Texas, March 2024.

Table 8. Results of genetic analysis of Largemouth Bass collected by fall electrofishing, Sheldon Lake, Texas, 2004, 2012, 2015, 2019, and 2023. FLMB = Florida Largemouth Bass, NLMB = Northern Largemouth Bass, Intergrade = hybrid between a FLMB and a NLMB. Genetic composition was determined by electrophoresis prior to 2005 and with micro-satellite DNA analysis since 2005.

		Number of fish				
Year	Sample size	FLMB	Intergrade	NLMB	% FLMB alleles	% FLMB
2004	50	8	42	0	65.0	16.0
2012	30	1	29	0	60.0	3.3
2015	30	1	29	0	68.0	3.3
2019	30	0	30	0	64.0	0
2023	30	1	29	0	68.0	3.3

Proposed Sampling Schedule

Table 9. Proposed sampling schedule for Sheldon Lake, Texas. Survey period is June through May. Standard electrofishing surveys are conducted in the fall and bass-only electrofishing surveys in the spring.

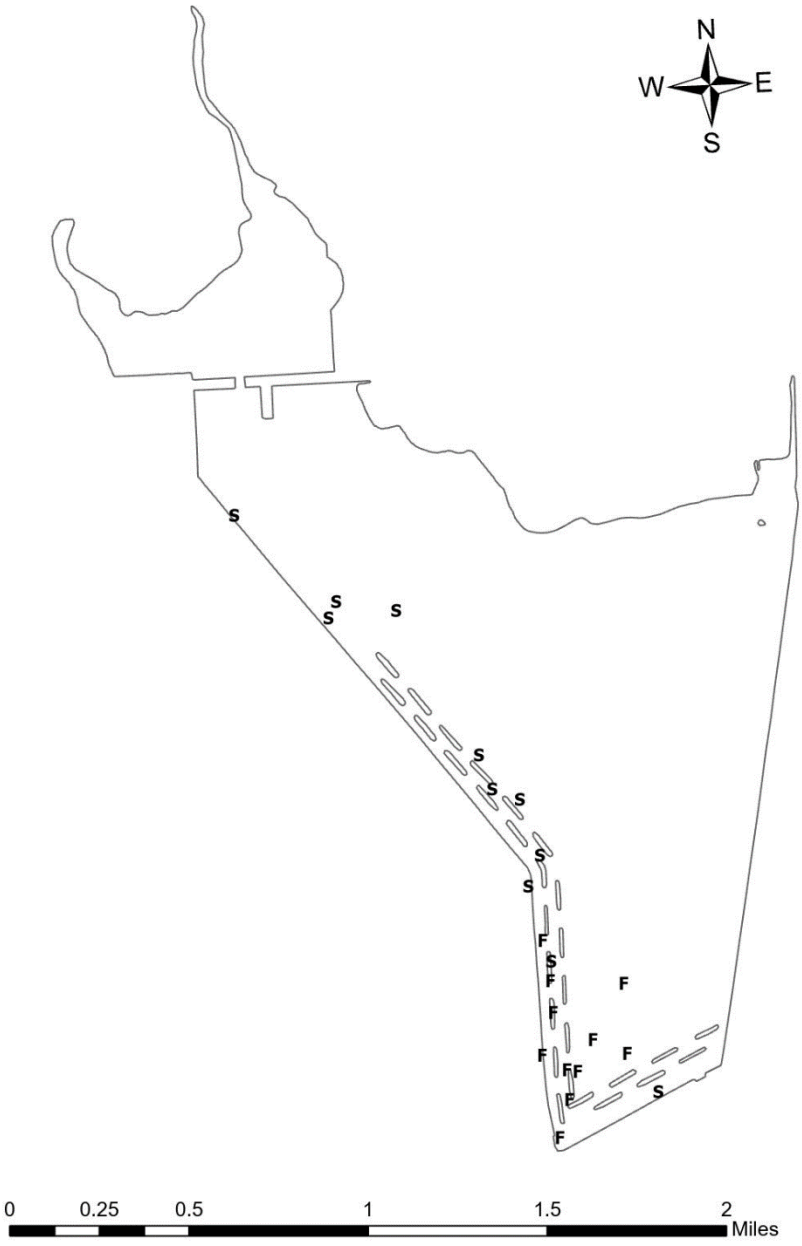
	Survey year			
	2024-2025	2025-2026	2026-2027	2027-2028
Angler Access				X
Vegetation	X	X	X	X
Fall electrofishing – Daytime				X
Spring bass-only electrofishing – Daytime		X		X
Report				X

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 Sheldon Lake, Texas, 2023. Sampling effort was 1 hour for electrofishing.

Species	Fall Electrofishing		Spring Electrofishing	
	N	CPUE	N	CPUE
Spotted Gar	4	4 (77)		
Bowfin	1	1 (100)		
Gizzard Shad	3	3 (52)		
Pirate Perch	1	1 (100)		
Bluegill	15	15 (44)		
Redear Sunfish	135	135 (19)		
Largemouth Bass	64	64 (15)	55	55 (16)
Black Crappie	14	14 (52)		

APPENDIX B – Map of sampling locations



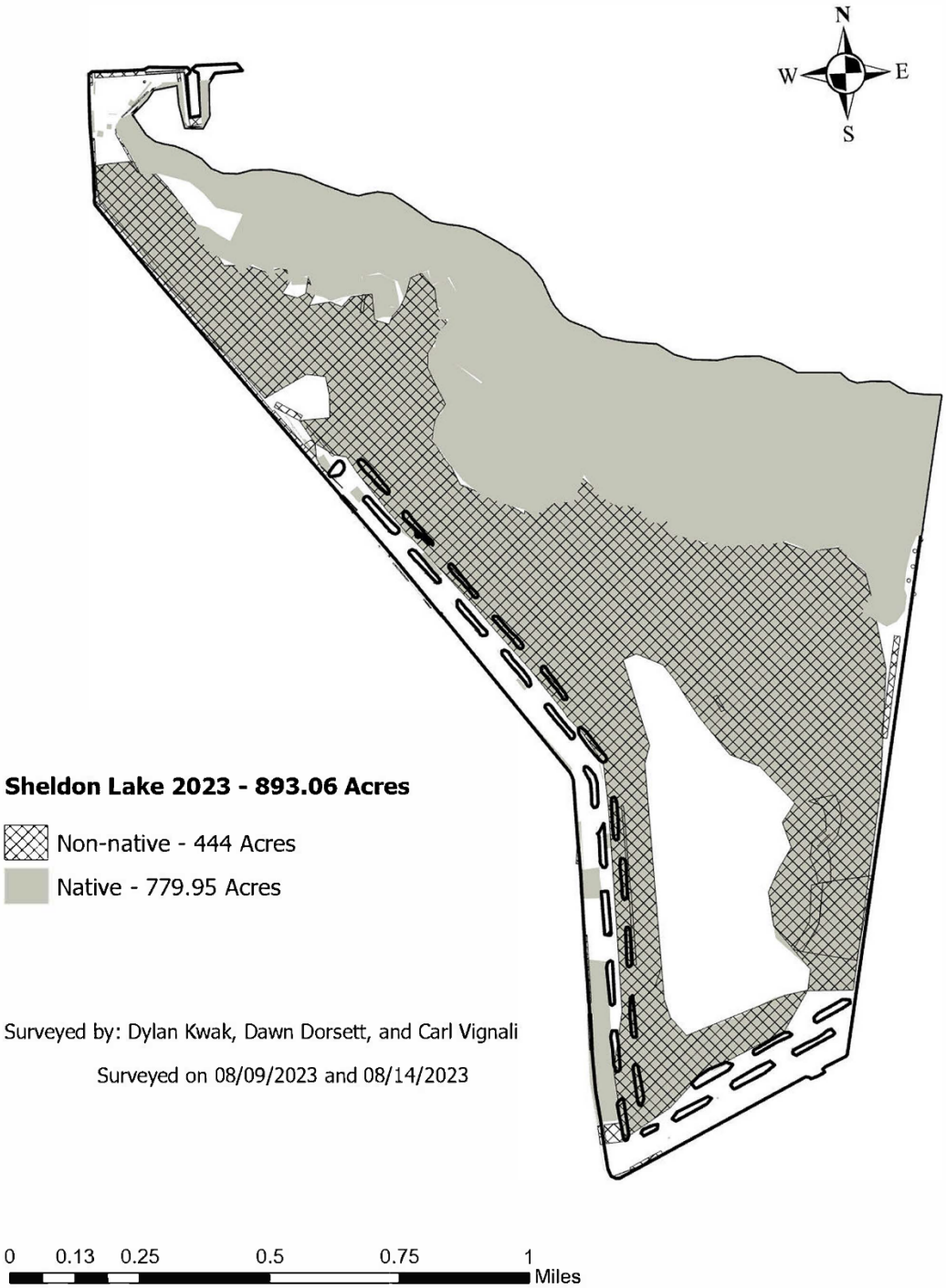
Location of sampling sites, Sheldon Lake, Texas, 2023-2024. Fall and spring electrofishing stations are indicated by F and S, respectively. Water level was 1.5 feet low during fall survey, and near full pool at time of spring sampling.

APPENDIX C – Summary of vegetation treatment efforts

Annual (January 1 – December 31) summary of recent treatment efforts to control nuisance non-native vegetation on Sheldon Reservoir.

Year	Non-Native Target Species	Treatment	Number of Treatments	Total Treatment Area
2020	Giant salvinia, water hyacinth	Tribune/Clipper, Roundup Custom/Clipper, Rodeo/Clipper, ProcellaCOR, Rodeo/Semera, Roundup Custom/Semera	8	253 acres
2021	Giant salvinia, water hyacinth	Roundup Custom/Semera, Cinco/Semera, Roundup Custon/Cinco/Semera, Galleon SC	6	137 acres
2022	Giant salvinia, water hyacinth	Cinco/Semera, Galleon SC/Semera, Roundup Custom/Semera	6	75 Acres
2023	Giant salvinia, water hyacinth	De-Amine 4, Weedar 64, Roundup Custom/Semera	5	134 Acres

APPENDIX D – Vegetation survey map and photos



Results of vegetation survey, Sheldon Lake, Texas, 2023-2024. Updated map uses waterbody outline from the Texas Water Development Board, which more accurately portrays areas of the reservoir that are regularly inundated. Water level was approximately 1.5 feet low during fall survey.

09.20.22 – Photo taken during exotic vegetation survey in eastern portion of Sheldon Lake, looking north. Tree line on right is the eastern levee.

08.14.2023 – Photo taken during full vegetation survey, upper end of the reservoir.

08.14.2023 – Water hyacinth and giant salvinia among American lotus and cypress trees, upper reservoir.

08.14.2023 – Various species present in the northeast corner of Sheldon Lake.

08.14.2023 – American lotus pictured in lower end of Sheldon Lake.

11.15.2023 – American lotus pictured in lower end of Sheldon Lake during fall electrofishing survey.

11.15.2023 – Coontail seen topped out in lower end during fall electrofishing survey. Boat ramp in background for reference.

11.15.2023 – Coontail pictured just under water surface in lower end during fall electrofishing survey. All previously open water areas during August vegetation survey were full of coontail, limiting survey effectiveness.

12.06.2023 – Lower end of reservoir, looking along southern levee towards east side of reservoir. Most lotus has fallen out, coontail has been shredded by migrating waterfowl.

12.06.2023 – Looking at reservoir dam, water is approximately 1-1.5ft. low. Dam would need grates across the top to prevent Grass Carp escape for Triploid Grass Carp to be a viable option for vegetation management.

12.06.2023 – Mid reservoir, looking towards the northeast corner. Little to no vegetation at the surface mid reservoir. Waterfowl flying across the water between the airboat and cypress trees.

12.06.2023 – Upper end of reservoir where vegetation is most dense and depths are shallowest.

12.06.2023 – Garrett Road bridge crossing over Carpenters Bayou. Picture taken from Sheldon Lake looking northwest.

12.06.2023 – Pictured is the upper end of Sheldon Lake just south of the kayak/canoe access off of Garrett Road, and just outside of the Water Development Board's reservoir outline where the reservoir turns into marsh. Standing water is covered with thick giant salvinia mats that have sedges growing on top.

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