# Whitney Reservoir

# 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 Whitney Reservoir were surveyed in 2023 using electrofishing, and in 2024 using gill netting. Anglers were surveyed from March 2023 through May 2023 with a creel survey. 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:** Whitney Reservoir is a 23,200-acre impoundment of the Brazos River, in Bosque and Hill Counties. Water level has varied from 8.4 feet below conservation pool (approximately 524.6 feet above mean sea level (MSL)) to 13.3 feet above conservation pool (approximately 546.3 feet above MSL) since January 2020. Water levels were nearly 9' low during the 2023 electrofishing survey and slightly above conservation pool during the 2024 series of gill netting surveys. Habitat at time of sampling was dominated by natural and rock shoreline, rock bluff, with a few piers and boat docks. Aquatic vegetation was either absent or dry due to the reservoir water level when the survey was conducted.

**Management History**: Important sport fish include catfishes, Striped Bass, White Bass, and Largemouth Bass. All have been impacted by periodic toxic golden alga blooms since 2001; however, Golden alga has not been an issue during the four years covered by this report. Sport fish have always been managed with statewide regulations. The statewide regulation for Blue and Channel Catfish changed on September 1, 2021; the current regulations are in this report. Management efforts focusing on aquatic invasive species (AIS) (e.g., ensuring appropriate signage at access points, educating marina owners and constituents) have been ongoing for over a decade. Other management efforts have focused on creating freshwater reefs in appropriate areas, consisting of artificial habitat like Georgia structures, PVC cubes and commercially available Mossback structures. Eighty-eight artificial structures have been placed into six freshwater reef locations since 2021. Recent management efforts have consisted of monitoring the Striped Bass recruitment, AIS education, habitat enhancement, and rebuilding the black bass populations through stockings.

#### **Fish Community**

- **Prey species:** Collected prey species included Gizzard Shad, Threadfin Shad, Bluegill, Longear Sunfish, Redbreast Sunfish, and Green Sunfish. Catch rates for all prey species were below historical averages. Only about one-half of all Gizzard Shad were available as prey to sport fish.
- **Catfishes:** Collected catfishes included Blue Catfish, Channel Catfish and Flathead Catfish. The Blue Catfish population structure, although less dense than previous surveys, remained good and individuals had excellent body condition. The Channel Catfish population structure was depressed from the previous survey, but individuals still had good to excellent body condition. Flathead Catfish were collected in average numbers.
- **Temperate basses:** Collected temperate bass included White Bass and Striped Bass. White Bass were observed in low numbers, yet Striped Bass were abundant. Body condition for both species was good to excellent for most length classes.
- **Black Bass:** Collected black bass included Largemouth Bass and Smallmouth Bass. Catch rates for both species were below historical averages. Low water level and poor sampling conditions likely contributed to low catch rates. Body condition was good to excellent for Largemouth Bass, and Florida Bass genetic influence remains good at 64%. Only one Smallmouth Bass was observed in the sample.
- **Crappie:** Crappie were not sampled during 2023-2024 however, nearly six percent of the angling effort reported in the spring 2023 angler creel was directed at the group. Black Crappie were harvested nearly twice as often as White Crappie according to the survey.

**Management Strategies**: Continue managing sport fishes at Whitney Reservoir with statewide regulations. Continue annual monitoring for golden algae from November through April. Conduct

additional electrofishing and gill netting surveys in fall 2025 and spring 2026, angler access, vegetation, and electrofishing surveys in late-summer and fall 2027, and trap netting and gill netting surveys in late winter and spring 2028. Conduct a year-long creel survey from June 1, 2025, through May 31, 2026. Request annual stockings of Striped Bass at 15 fingerlings/acre. Continue annual requests for Smallmouth Bass stockings and request additional Lonestar Bass stockings during two of the next four years. Perform additional habitat enhancements in cooperation with interested partners and continue working to inform the public about the negative impacts of AIS.

### Introduction

This document is a summary of fisheries data collected from Whitney Reservoir from 2023-2024. 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**

Whitney Reservoir is a 23,200-acre impoundment of the Brazos River in Bosque and Hill counties and was completed in 1951. It is owned and operated by the United States Army Corps of Engineers (USACE) and primary water uses include power generation, flood control, and recreation. The reservoir has a drainage area of 17,656 square miles, a storage capacity of 627,100 acre-feet, and a shoreline length of 225 miles at the conservation pool of 533 feet above mean sea level (MSL). Whitney Reservoir is eutrophic with a TSI *chl-a* of 56.18 (Texas Commission on Environmental Quality 2022). Habitat at time of sampling was dominated by natural and rock shoreline, rock bluff, with a few piers and boat docks. Aquatic vegetation was either absent or dry due to low reservoir water level when the survey was conducted. Water level has varied from 8.4 feet below conservation pool (approximately 524.6 feet above MSL) to 13.3 feet above conservation pool (approximately 546.3 feet above MSL) since January 2020. Water levels were nearly 9' low during the 2023 electrofishing survey and slightly above conservation pool during the 2024 series of gill netting surveys (March 26, 2024, through April 20, 2024; Figure 1). Other descriptive characteristics for Whitney Reservoir are in Table 1.

### Angler Access

Whitney Reservoir has 23 public boat ramps including several marina boat ramps (Table 2). Much of Whitney Reservoir's shoreline is accessible to anglers through USACE and other publicly owned property; however, convenient shoreline access is limited to the public boat ramp and camping areas.

### Management History

**Previous management strategies and actions:** Management strategies and actions from the previous survey report (Tibbs and Baird 2020) included:

1. Continue requesting Smallmouth Bass for stocking on an annual basis. If conditions are suitable for natural recruitment in Belton, elevate Whitney above Belton on the priority list.

**Action:** Smallmouth Bass have been requested annually for Whitney since the last report. Smallmouth Bass were stocked in 2020 (30,309 fingerlings), 2021 (70,927 fingerlings and 97 adult brooders), 2022 (114,140 fingerlings and 88 adult brooders), 2023 (200,822 fingerlings and 9,230 fry), and 2024 (236,000 fingerlings).

2. Complete a creel survey in 2023-2024 to quantify angling pressure and success, as well as basic information on the economic impacts of anglers fishing Whitney reservoir.

**Action:** A spring quarter, access point creel was conducted in 2023 and these data are included in this report.

3. Collect a practical effort age sample from Striped Bass in 2024 to compare year-class strength to stocking information to evaluate natural recruitment as well as recruitment of traditional fry and fingerling stockings.

**Action:** A category III age and growth study was conducted in spring 2024 and these data are included in this report.

4. Cooperate with the USACE to maintain appropriate AIS signage at access points. Maintain contact with marina owners about AIS, and provide them with posters, literature, etc. so that they can continue to educate their customers. Make a speaking point about AIS when presenting to constituent and user groups. Keep track of (i.e., map) existing and future interbasin water transfers to facilitate potential AIS responses.

Action: Aquatic invasive species signage was posted at all Whitney access points during summer 2013 and have been replaced as needed ever since. District biologists have made a speaking point about AIS, how to prevent their spread, and potential effects on Whitney Reservoir while speaking to anglers over the past several years. Interbasin water transfers are updated as needed.

**Harvest regulation history:** All sport fishes are currently managed with statewide regulations. The statewide regulation for Blue and Channel Catfish changed on September 1, 2021, and now the regulation is no minimum length limit; daily bag of 25 (in any combination – only 10 can be 20 inches or greater in length). The current harvest regulations are listed in Table 3.

**Stocking history:** Whitney receives annual stockings of Striped Bass fingerlings or fry because they rarely reproduce naturally in the reservoir. The Smallmouth Bass population is currently a low-density one that can't naturally reproduce enough fingerlings to grow or expand the population, and so the maximum number of Smallmouth Bass (589,000 fingerlings) are requested annually. Largemouth Bass normally reproduce well in Whitney, with the exception of drought and/or high-water years. Whitney received 167,241 Striped Bass fingerlings, 236,568 Lone Star Bass fingerlings, and 141,948 Smallmouth Bass fingerlings in spring 2024. Lone Star Bass are  $2^{nd}$  generation offspring of pure Florida strain ShareLunker Largemouth Bass that have proven to be able to grow to  $\geq$  13 pounds – and this is the first time they have been stocked into Whitney. Additional Lone Star Bass stockings are planned over the next four years. The complete stocking history is in Table 4.

**Vegetation/habitat management history:** Invasive aquatic vegetation has never been an issue in Whitney Reservoir. The size of the reservoir and fluctuating water levels makes any attempt to improve habitat very difficult beyond deploying fish attractors. six freshwater reefs were placed in 2021, consisting of 16 PVC cubes, 16 PVC Crappie condos, 26 Georgia structures, and 30 Mossback structures.

**Water transfer:** There are currently no major raw water intake stations on the reservoir. However, the Brazos River Authority has water rights and a contract with the USACE to use approximately 50,000 acrefeet of water per year from the reservoir. Currently, this water is released through the dam to meet water supply needs downstream. There is also a proposal to install a raw water intake station on Whitney Reservoir to be used by the city of Cleburne for municipal purposes. If constructed, the City of Cleburne could withdraw up to 10,000 acrefeet of water per year from the lake. This volume of water is relatively small in comparison to the size of Whitney Reservoir and represents only about six inches of depth when the lake is full.

**Reservoir capacity:** Whitney Reservoir was impounded in 1951. A US Army Corps of Engineers resurvey conducted in 1959 calculated the reservoir's capacity at conservation pool (533 feet above MSL) to be 627,100 acre-feet with a surface area of 23,560 acres. A volumetric survey was conducted by the Texas Water Development Board (TWDB) on Whitney in 2005. This survey found a volume of 554,203 acre-feet and a surface area of 23,200 acres at conservation pool elevation. The difference between the two surveys suggests an 11.6% decrease in volume and 1.4% decrease in surface area.

### Methods

Surveys were conducted to achieve survey and sampling objectives in accordance with the objectivebased sampling (OBS) plan for Whitney Reservoir (Tibbs and Baird 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 nighttime electrofishing (1.7 hour at 20, 5-min stations) in 2023. 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 7.5 electrofisher.

**Gill netting** – White Bass, Striped Bass, Blue Catfish, and Channel Catfish were collected by gill netting (15 net nights at 15 stations) in 2024. Catch per unit effort for gill netting was recorded as the number of fish caught per net night (fish/nn). A category III age and growth sample (200 stock-length fish up to 5 fish per centimeter group) was also collected for Striped Bass which required fifteen additional, biologist-selected gill net stations (30 net nights at 30 stations) to collect. A subsample of the stock-length and longer Striped Bass were aged (up to 5 fish per centimeter group; n= 76).

**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.

**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 and creel statistics.

**Creel survey** – A spring quarter access-point creel survey was conducted from March 2023 through May 2023. Angler interviews were conducted on 13 weekend days and 11 weekdays to assess angler use and fish catch/harvest statistics in accordance with the Fishery Assessment Procedures (TPWD, Inland Fisheries Division, unpublished manual revised 2022). This creel was designed to quantify angling pressure and success, as well as basic information on the economic impacts of anglers fishing Whitney reservoir. Caution should be used expanding these results to other quarters since the spring quarter is generally a higher-use period.

**Golden alga** – Water samples were collected monthly from November through May, every year and tested for the presence of golden alga and toxicity by the A. E. Wood Laboratory in San Marcos.

**Habitat** – The 2011 structural habitat survey was conducted according to Tibbs and Baird (2012). The 2023 vegetation survey was conducted using an adaptation of the point method (TPWD, Inland Fisheries Division, unpublished manual revised 2022). Points were randomly generated on the shoreline and averaged a minimum of one point per shoreline mile. Aquatic vegetation has always been found close to the shore in Whitney Reservoir, so stratifying the random points to exclude deep-water areas increased precision and resulted in better data.

Water level – Source for water level data was the United States Geological Survey (USGS 2024).

### **Results and Discussion**

**Habitat:** The last structural habitat survey estimated 78.5 miles (54.9%) of natural shoreline, 41.8 miles (29.3%) of rock shoreline, 21.2 miles (14.9%) of rock bluff, and 1.2 miles (0.9%) of bulk headed shoreline (Tibbs and Baird 2012). Littoral zone habitat in summer 2023 was dominated by natural shoreline and terrestrial vegetation (100% or 236 of 236 randomly selected shoreline points). No aquatic vegetation was observed during the survey.

**Creel:** The total fishing effort for Whitney Reservoir during the 2023 spring quarter period was 80,393 hours with total directed expenditures of \$85,668 (Table 6). Directed fishing effort by anglers was highest for Largemouth and Smallmouth Bass, tournament and non-tournament anglers combined (34.8%), followed by White Bass (21.8%), Striped Bass (21.1%), catfishes (8.2%), anything (6.6%) and crappies (5.8%; Table 7). Largemouth Bass tournament anglers comprised half of the Largemouth Bass angler effort. Catch-and-release was common among Largemouth Bass anglers, with 89% of legal-length fish being returned to the water. Striped Bass anglers spent 17,003 hours of directed effort fishing for stripers during this spring quarter, with a directed effort of 0.7 h/acre, a total harvest of 0.7 fish/acre and 43% of legal stripers released. Similar statistics were found for White Bass anglers who spent 17,522 hours chasing whites, a directed effort of 0.8 h/acre, a total harvest of 0.7 fish/acre and 67% of legal whites released. Directed effort per acre and harvest per acre statistics for catfishes were less than half those for the temperate basses, and the majority of catfish caught were Blues.

**Prey species:** Gizzard Shad and Threadfin Shad catch rates were 50.4/h and 37.8/h, respectively, and well below their historical averages (Figure 2; Appendices A and B). The IOV for Gizzard Shad was poor, indicating that only 46% of Gizzard Shad were available to existing predators; this was much lower than IOV estimates in previous years. Total CPUE of Gizzard Shad was considerably lower in 2023 compared to 2019 and 2015 (Figure 2). Other forage species collected were Bluegill (19.2/h), Longear Sunfish (3.6/h), and Redbreast Sunfish (1.2/h; Figure 3; Appendices A and B). Sunfish often reach preferred size classes in Whitney Reservoir, yet numbers for every species are currently depressed.

**Catfishes:** Blue Catfish were collected at a rate of 3.0 fish/nn, which is higher than the historical average (Figure 4; Appendices A and B). The OBS goal for Blue Catfish, general monitoring to collect size structure (PSD and length-frequency;  $N \ge 50$  stock) data, was nearly achieved with 45 stock-length individuals (Table 5; Figure 4). The 2024 PSD value was similar to that of 2020 and 2016, reflecting a similar population structure with higher proportions of fish below quality length (20 inches) in the population (Figure 4). Relative weight (Wr), or body condition, was excellent for most length classes. Directed fishing effort was low at 0.3/h as was harvest at 0.3/h (Table 8). Only 6.3% of legal-length Blue Catfish were released. Harvested fish ranged in length from 12 to 24 inches (Figure 5).

Channel Catfish were collected at a rate of 0.8 fish/nn, which is well below the historical average for the species (Figure 6; Appendices A and B). The OBS goal for Channel Catfish, general monitoring to collect size structure (PSD and length-frequency;  $N \ge 50$  stock) data, was not achieved with only 12 stock-length individuals collected. The PSD value in 2024 (67) was higher than that of 2020 (46) and reflects a somewhat balanced population although depressed. Few Channel Catfish reached the preferred length category. Relative weight (Wr), or body condition, was good to excellent (Figure 6). Directed fishing effort was low at 0.3/h as was harvest at 0.3/h (Table 9). Only a single harvested fish was observed during the creel; a 23-inch individual (Figure 7).

**Temperate Bass:** White Bass were collected at a rate of 1.0 fish/nn, which is a decrease from the previous two surveys and well below the historical average (Figure 8; Appendices A and B). The OBS goal for White Bass, general monitoring to collect size structure (PSD and length-frequency;  $N \ge 50$  stock) data, was not achieved with only 15 stock-length individuals collected. All observed individuals were of legal-length. Relative weight (Wr), or body condition, as good to excellent (Figure 8). Directed fishing effort, catch per hour, and total estimated harvest for White Bass was 17,522 h, 2.4 fish/h, and 16,061 fish, respectively (Figure 9; Table 10). Sixty-seven percent of legal-length White Bass were released (Table 10). Harvested fish ranged in length from 10 to 16 inches (Figure 9).

Striped Bass were collected at a rate of 5.1 fish/nn, lower than the previous two surveys yet higher than the historical average (Figure 10; Appendices A and B). The OBS goal for Striped Bass, general monitoring to collect size structure (PSD and length-frequency;  $N \ge 50$  stock) data, was achieved with 72 stock-length individuals collected. Size structure was poor (PSD 17) and favored smaller individuals (Figure 10). Relative weight (Wr), or body condition, was excellent for most length classes and individuals reached the legal length limit of 18 inches by age three (Figure 11). Directed fishing effort, catch per hour, and total estimated harvest for Striped Bass was 17,003 h, 1.4 fish/h, and 16,958 fish, respectively (Table 11 Figure 12). Harvested fish ranged in length from 15 to 24 inches indicating some illegal take, yet 43% of legal fish were released (Figure 12).

A category III age and growth survey was conducted in spring 2024 to compare Striped Bass year-class strength with stocking information to evaluate natural recruitment as well as recruitment of traditional fry and fingerling stockings. Both fry and fingerlings were stocked in 2017 and 2021, fry were stocked in 2018, fingerlings were stocked in 2019, 2022 and 2023, and no Striped Bass were stocked in 2020 (Table 4). Given this stocking scheme, comparisons can be made between the 2018 fry-only stocking, the 2019, 2022 and 2020 where there were no Striped Bass stockings.

One hundred and forty individuals were collected from 30 gill net sets (15 initial sets and 15 Biologistselected sets) and a subsample were aged using otoliths. Length classes ranged from 10 to 27 inches, and one hundred and thirty-four individuals were stock-length or longer. Of the 134 stock-length fish, 76 were aged (5 fish per centimeter group; nine, centimeter groups filled; Figure 11).

The oldest cohort observed was age-5, so no fish were collected from stockings occurring prior to 2019, including the 2018 stocking of over one million fry. Dominant year classes were observed for 2019 (n= 21; fingerlings only stocked), 2021 (n= 36; fry and fingerlings stocked), and 2023 (n=17; fingerlings only stocked; Figure 11). The 2023-year class was comprised of age-1 fish and was expected to be strong. The 2019 cohort was very successful based on a stocking of 191,848 fingerlings. The 2021 cohort was also very successful, based on a stocking of 330,739 fingerlings and 468,325 fry. No year classes were observed for 2020, indicating no natural recruitment that year. It's unknown whether natural recruitment contributed to the large year classes observed in 2019 or 2021. Additional fry-only and fingerling-only stockings are needed, along with an additional category III age and growth survey, to further evaluate recruitment from traditional fry and fingerling stockings in Whitney Reservoir. Natural recruitment will always be difficult to evaluate since it requires years where Striped Bass stockings don't occur.

**Black Bass:** Largemouth Bass were collected at 31.2 fish/h, less than one-half of the historical average (Figure 13; Appendices A and B). Drought and poor sampling conditions in 2023 (i.e., water level at 9' below conservation pool) likely contributed to low catch rates of Largemouth Bass in this survey. The OBS goal for this species, general monitoring to collect abundance (CPUE – Total; RSE  $\leq$  25) data, was not achieved with an RSE value of 27 (Figure 13). The population structure is balanced (PSD = 63), yet the population density is low compared to the previous two surveys and historical records. A few individuals made it to the preferred length category (15-inches), but none were observed in the memorable (20-inch) length category (Figure 13). Relative weight (Wr), or body condition, was excellent for all length classes (Figure 13). Directed fishing effort, catch per hour, and total estimated harvest for Largemouth Bass (tournament and non-tournament fish combined) was 13,438 h, 0.6 fish/h, and 3,736 fish, respectively (Table 12; Figure 13). Harvested fish ranged from 14 to 23 inches, and 89% of legal fish were released (Table 12; Figure 14). Florida Largemouth Bass influence remains good at 64% (Table 13). Anglers have reported six Lunker Class Largemouth Bass from Whitney since the last report, and these individuals ranged from 8.18 to 9.50 pounds.

**Crappie:** White and Black Crappie were consistently collected with early winter trap netting through 1999 but have not been a part of contemporary surveys (Appendix B). According to the 2023 spring quarter creel, 5.8% of the angling effort was directed at crappies (Table 7). Directed fishing effort and catch per hour for crappies was 4,643 h and 0.1 fish/h (Table 14). Total estimated harvest for White and Black Crappie was 287 and 575 fish respectively in spring 2023 (Table 14; Figure 15). Harvested fish ranged

from 12 to 14 inches for White Crappie and 10 to 13 inches for Black Crappie, and approximately 10% of legal fish were released (Table 14; Figure 15).

### **Fisheries Management Plan for Whitney Reservoir, Texas**

Prepared – July 2024

**ISSUE 1:** The Smallmouth Bass fishery in Whitney Reservoir is dependent on stocking. Golden alga has abated over the past several years, and hatchery production has improved, yet reports of Smallmouth Bass being caught by anglers are still few and far between. Management research recently found natural recruitment of Smallmouth in Belton to be sufficient to maintain the fishery most years with stable water levels near conservation pool. In the past, Belton has been high on the stocking list since it was an important broodfish source. With this information, that status could change in years when water levels would promote natural recruitment in Belton.

#### MANAGEMENT STRATEGY

- 1. Continue requesting Smallmouth Bass fingerling stockings at 25 fish/acre (580,000), supplemental fry and/or broodfish on an annual basis. If conditions are suitable for natural recruitment in Belton, elevate Whitney above Belton on the stocking priority list.
- **ISSUE 2:** Largemouth Bass numbers have declined in recent years, from a historical high in 2015 (254 fish/h) to near an all-time low (31 fish/h) in 2023. Although low water level in 2023 (9' low) and poor sampling conditions certainly contributed to low catch rates, anecdotal information from black bass anglers seems to confirm the depressed population.

#### MANAGEMENT STRATEGIES

- 1. Conduct an additional electrofishing survey prior to fall 2027 and a standard electrofishing survey in fall 2027 to closely monitor Largemouth Bass population structure and trends.
- 2. Conduct a year-long angler creel survey which will be used to evaluate angler effort, success, preferences, and economic impact beginning June 1, 2025.
- 3. Place additional structure (freshwater reefs) in appropriate areas of the reservoir with the help of constituent and angler groups, to improve habitat for black basses and sunfishes.
- **ISSUE 3:** Largemouth Bass were last stocked into Whitney in 2004 at 25 fish/acre. Although bass typically spawn very well naturally, Largemouth Bass numbers have declined in recent years in Whitney. Two-hundred thirty-six thousand Lone Star Bass were stocked in May 2024.

#### MANAGEMENT STRATEGIES

- Request Lone Star Bass fingerlings, which are 2<sup>nd</sup> generation offspring of pure Florida strain ShareLunker Largemouth Bass ≥ 13 pounds, at a rate of 1,000/km shoreline, two additional years before the next report.
- **ISSUE 4:** Striped Bass gill net catch rates were near all-time highs between 2016 and 2023. Conversations with concerned anglers during the 2023 creel, as well as anecdotal information from social media posts, seem to confirm the high Striped Bass densities throughout the reservoir. The 2022-2023 drought and low reservoir water level accentuated the problem which is thought to be due to a combination of factors: natural spawning within the Brazos River mainstem between Whitney and Granbury, immigration of fingerlings from Granbury, over-stocking of fry and fingerlings in Whitney during 2017 and 2018, and/or better than normal conditions for fingerling recruitment and growth during these years. In response, stocking rates were lowered from 15 fish/acre (the

historical average) to 9 fish/acre in 2022, 5 fish/acre in 2023 and 7 fish/acre in 2024. Water levels have since rebounded.

#### MANAGEMENT STRATEGIES

- 1. Conduct an additional gill net survey in spring 2026 to closely monitor Striped Bass population structure and trends.
- 2. Request Striped Bass fingerlings at 15 fish/acre annually for the next four years.
- 3. Monitor the forage base during any additional electrofishing surveys between now and fall 2027.
- **ISSUE 5:** Many AIS 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 AIS 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 AIS through social media and the internet.
- 3. Make a speaking point about AIS when presenting to constituent and user groups.
- Keep track of (i.e., map) existing and future interbasin water transfers to facilitate potential AIS responses.

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

Sport fish, forage fish, and other important fishes

Sport fishes in Whitney Reservoir include Largemouth Bass, Striped Bass, White Bass, Channel Catfish, and Blue Catfish. Important forage fish species include Gizzard Shad, Threadfin Shad, Bluegill, Redear and Longear Sunfish. Other less common prey species include Warmouth and Redbreast Sunfish.

Sport fishes with low-density populations

Smallmouth Bass, Spotted Bass, Flathead Catfish, White and Black Crappie occur in very low abundance in Whitney Reservoir and are generally caught incidentally to other targeted species. We will continue collecting and reporting data for these species and upgrade their status if appropriate.

Survey objectives, fisheries metrics, and sampling objectives

**Fall Electrofishing:** These surveys will be used to evaluate Largemouth and Smallmouth Bass, Bluegill, Redear Sunfish, Redbreast, Longear Sunfish, Gizzard Shad and Threadfin Shad populations. A minimum of 24 randomly-selected 5-min electrofishing stations will be sampled at night during fall, once prior to 2027, and again during fall 2027. Black Bass and sunfish species will be monitored using abundance (CPUE-Stock), size structure (PSD and length frequency), and condition (mean relative weight) as metrics to make comparisons with historical and future data sets. Target precision for CPUE-Stock will be an RSE-Stock  $\leq$  25 and target sample size for size structure will be N  $\geq$  50 stock, allowing us to calculate proportional size distributions with 80% confidence. Black Bass body condition will be determined by measuring and weighing at least 5 fish per represented inch group  $\geq$  stock-length. A genetic sample of 30 randomly selected Largemouth Bass will be collected in 2027 to access stocking success and/or Florida Bass influence within the population. Index of vulnerability (IOV) will be calculated for Gizzard Shad to assess the relative proportion of individuals in the population suitable as prey for sport fish.

**Late winter trap netting:** This survey will be used to evaluate White and Black Crappie in Whitney Reservoir. Crappies were last sampled with trap nets in 2005 but have not been sampled with the traditional gear since. The goal of the 2028 survey would be to conduct an exploratory survey for these species. Fifteen randomly selected trap netting stations will be sampled overnight during late winter 2028.

**Spring Gill Netting:** This survey will be used to evaluate Striped Bass, White Bass, Blue Catfish, and Channel Catfish. A minimum of 15 randomly selected gill netting stations will be sampled in spring 2026 and 2028. All four species will be monitored using abundance (CPUE-Stock), size structure (PSD and length frequency), and condition (mean relative weight) as metrics to make comparisons with historical and future data sets. Target precision for CPUE-Stock will be an RSE-Stock  $\leq$  25 and target sample size for size structure will be N  $\geq$  50 stock, allowing us to calculate proportional size distributions with 80% confidence. Body condition will be determined by measuring and weighing at least 5 fish per represented inch group  $\geq$  stock-length for each species. If the goal for a species isn't attained in 15 randomly selected stations, and catch rates indicated that collecting the proposed number of fish is reasonable, sampling will continue at random stations until targets are reached.

**Angler Creel:** This survey will be used to evaluate angler effort, success, preferences, and economic impact from June1, 2025 through May 31, 2026. The purpose would be to document angler responses to recent changes in the fishery and help determine possible future efforts.

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### **Tables and Figures**



Lake or reservoir water surface elevation above NGVD 1929, feet — Recorded

Data approval period Approved Provisional

Median: - 2001 - 2023

-- Conservation Pool Elevation: 533 ft

Figure 1. Daily water level elevations in feet above MSL recorded for Whitney Reservoir, Texas, January 1, 2020, through June 1, 2024. The figure is from the United States Geological Survey (USGS) website. NGVD 1929 refers to the National Geodetic Vertical Datum of 1929. The vertical dashed line represents the lowest water elevation during the period (524.65 above MSL), the horizontal dashed line indicates Conservation pool (533.0 above MSL), the thick line represents daily water level elevations, and the thin line represents median water elevations during the period. Sampling times for vegetation (V), electrofishing (EF) and gill netting (GN) are noted.

Table 1.	Characteristics	of Whitney	Reservoir,	Texas.
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Characteristic	Description
Year Constructed	1951
Controlling authority	U.S. Army Corps of Engineers
Counties	Bosque and Hill
Reservoir type	Mainstem
Shoreline Development Index	10.5
Conductivity	1,800 umhos/cm

Table 2. Boat ramp characteristics for Whitney Reservoir, Texas, September 2023. Reservoir elevation at time of survey was 525.2 feet above mean sea level (7.8' below conservation pool). Parking capacity numbers are spaces for trucks with boat trailers.

Boat ramp	Latitude Longitude (dd)	Parking capacity (N)	Condition
Ham Creek Park	32.17212/-97.48740	28/0	Good
Kimball Bend Park	32.12149/-97.49361	38/0	Good
Nolan River Park	32.09584/-97.45181	6/4	Fair
Plowman Creek Park	32.06656/-97.49241	18/0	Good
Lakeside Park	32.02402/-97.49062	12/0	Fair
Steele Creek Park (N)	32.00980/-97.44907	16/0	Good
Steele Creek Park (S)	32.00232/-97.45099	12/0	Good
White Bluff Park	32.01299/-97.41491	20/26	Good
Cedar Creek Park	31.98830/-97.37279	20/0	Good
Juniper Cove Park	31.98597/-97.37005	24/10	Fair
Serenity Cove Ramp	31.97377/-97.37463	6/0	Fair
McCown Valley Park	31.94879/-97.40074	48/0	Good
Cedron Creek Park	31.96025/-97.41684	20/0	Good
Long Branch Ramp	31.90623/-97.41938	8/0	Fair
FM1630 Ramp	31.88259/-97.39296	18/0	Good
Uncle Gus' Marina	31.87524/-97.40196	6/0	Fair
Cliffview Resort Ramp	31.85714/-97.38667	12/0	Fair
Lofers Bend Park Day Use	31.87364/-97.36716	74/0	Good
Lofers Bend Park West	31.88261/-97.37188	10/0	Good
Lofers Bend East	31.88934/-97.35715	10/0	Good
Walling Bend	31.89919/-97.39574	10/0	Good
Harbor Master Marina	31.88697/-97.35855	6/0	Fair
Lake Whitney State Park	31.92361/-97.37323	15/0	Good

Table 3. Harvest regulations for Whitney Reservoir, Texas.

Species	Bag Limit	Minimum-Maximum Length (inches)
Catfish: Channel Catfish, Blue Catfish their hybrids and subspecies <sup>1</sup>	25 (only 10 ≥ 20 inches)	No minimum
Catfish: Flathead	5	18 – inch minimum
Bass: White	25	10 – inch minimum
Striped Bass	5	18 – inch minimum
Bass: Largemouth and Smallmouth	5 (any combination)	14 – inch minimum
Bass: Spotted, Guadalupe and hybrids <sup>2</sup>	5 (any combination)	No minimum
Crappie: White, Black and hybrids	25 (any combination)	10 – inch minimum

<sup>1</sup>The Blue and Channel Catfish regulation is no minimum length limit; daily bag of 25 (in any combination – no more than 10 can be 20 inches or greater in length).

<sup>2</sup> Daily bag for Largemouth Bass, Smallmouth, Spotted Bass, and Guadalupe Bass = 5 fish in any combination.

Table 4. Stocking history for Whitney Reservoir, Texas. Life stages are fry (FRY), fingerlings (FGL), advanced fingerlings (AFGL), adults (ADL) and unknown (UNK). Life stages for each species are defined as having a mean length that falls within the given length range. For each year and life stage the species mean total length (Mean TL; in) is given. For years where there were multiple stocking events for a particular species and life stage the mean TL is an average for all stocking events combined.

Species	Year	Number	Life Stage	Mean TL (in)
Blue Catfish	1966	8,000	UNK	0.0
	Total	8,000		
Bluegill	2005	13,747	AFGL	2.1
	Total	13,747		
Channel Catfish	1970	61,000	AFGL	7.9
	Total	61,000		
Florida Largemouth Bass	1985	204,099	FGL	2.0
	1986	151,900	FRY	1.0
	2003	760,159	FGL	1.5
	2004	589,978	FGL	1.7
	Total	1,706,136		
Largemouth Bass	1966	280,000	UNK	0.0
	1968	250,000	UNK	0.0
	1969	350,000	FRY	0.7
	1971	220,000	UNK	0.0
	Total	1,100,000		
Smallmouth Bass	1983	65,400	UNK	0.0
	1984	235,505	FGL	2.0
	1985	162,976	FGL	2.0
	1985	39,167	FRY	1.0
	1986	24,435	FGL	2.0
	1986	124,700	FRY	1.0
	1992	29,253	FGL	1.3

Table 4. Stocking history for Whitney Reservoir, Texas. Life stages are fry (FRY), fingerlings (FGL), advanced fingerlings (AFGL), adults (ADL) and unknown (UNK). Life stages for each species are defined as having a mean length that falls within the given length range. For each year and life stage the species mean total length (Mean TL; in) is given. For years where there were multiple stocking events for a particular species and life stage the mean TL is an average for all stocking events combined.

Species	Year	Number	Life Stage	Mean TL (in)
Smallmouth Bass	1994	262,402	FGL	1.2
	1995	40,670	FGL	1.3
	1996	333,282	FGL	1.3
	1997	714,665	FGL	1.2
	1998	353,100	FGL	1.2
	1999	351,302	FGL	1.3
	2000	589,849	FGL	1.4
	2004	5,609	FGL	1.9
	2010	73,644	FGL	1.6
	2011	134,722	FGL	1.5
	2020	30,309	FGL	1.8
	2021	97	ADL	16.5
	2021	70,927	FGL	1.8
	2022	88	ADL	16.5
	2022	102,890	FGL	1.7
	2022	11,250	FRY	0.3
	2023	200,822	FGL	1.7
	2023	9,230	FRY	0.3
	Total	3,966,294		
Striped Bass	1973	267,711	FGL	1.7
	1974	229,291	FGL	1.7
	1975	17,090	UNK	0.0
	1976	232,123	UNK	0.0
	1984	351,581	FGL	2.0

Table 4. Stocking history for Whitney Reservoir, Texas. Life stages are fry (FRY), fingerlings (FGL), advanced fingerlings (AFGL), adults (ADL) and unknown (UNK). Life stages for each species are defined as having a mean length that falls within the given length range. For each year and life stage the species mean total length (Mean TL; in) is given. For years where there were multiple stocking events for a particular species and life stage the mean TL is an average for all stocking events combined.

Species	Year	Number	Life Stage	Mean TL (in)
Striped Bass	1985	172,115	FRY	1.0
	1986	354,130	FGL	1.7
	1987	121,525	FGL	2.0
	1987	237,232	FRY	1.0
	1988	235,900	FRY	1.0
	1989	235,923	FGL	1.2
	1990	240,219	FGL	1.4
	1991	331,827	FGL	1.3
	1992	123,161	FGL	1.2
	1994	448,490	FGL	1.2
	1995	237,566	FGL	1.2
	1996	113,057	FGL	1.3
	1997	235,226	FGL	1.2
	1998	145,768	FGL	1.3
	1999	236,400	FGL	1.5
	2000	476,600	FGL	1.5
	2001	1,400,000	FRY	0.8
	2002	353,587	FGL	1.6
	2003	223,892	FGL	1.7
	2004	84,184	FGL	1.5
	2005	332,999	FGL	1.7
	2006	322,532	FGL	1.9
	2007	495,015	FGL	1.6
	2008	332,262	FGL	1.8

Table 4. Stocking history for Whitney Reservoir, Texas. Life stages are fry (FRY), fingerlings (FGL), advanced fingerlings (AFGL), adults (ADL) and unknown (UNK). Life stages for each species are defined as having a mean length that falls within the given length range. For each year and life stage the species mean total length (Mean TL; in) is given. For years where there were multiple stocking events for a particular species and life stage the mean TL is an average for all stocking events combined.

Species	Year	Number	Life Stage	Mean TL (in)
Striped Bass	2009	543,846	FGL	1.8
	2010	148,055	FGL	1.7
	2010	415,763	FRY	0.2
	2013	237,052	FGL	1.6
	2013	614,994	FRY	0.2
	2014	380,641	FGL	1.5
	2015	325,028	FGL	1.7
	2016	103,841	FGL	1.5
	2017	340,316	FGL	1.7
	2017	688,065	FRY	0.2
	2018	1,006,185	FRY	0.2
	2019	191,848	FGL	1.6
	2021	330,739	FGL	1.7
	2021	468,325	FRY	0.2
	2022	207,722	FGL	1.5
	2023	120,281	FGL	1.7
	2024	169,541	FGL	1.5
	Total	14,879,648		

Gear/target species	Survey objective	Metrics	Sampling objective
Electrofishing			
Largemouth Bass	Abundance	CPUE–Stock	RSE-Stock ≤ 25
	Condition	Wr	10 fish/inch group (max)
	Genetics	% FLMB	N = 30, any age
Bluegill <sup>a</sup>	Exploratory	Presence/Absence	Practical effort
Longear <sup>a</sup>	Exploratory	Presence/Absence	Practical effort
Redear <sup>a</sup>	Exploratory	Presence/Absence	Practical effort
Gizzard Shad <sup>a</sup>	Exploratory	Presence/Absence	Practical effort
	Prey availability	IOV	N ≥ 50
Gill netting			
Channel Catfish	Size structure	PSD, length frequency	N ≥ 50 stock
	Condition	Wr	10 fish/inch group (max)
Blue Catfish	Size structure	PSD, length frequency	N ≥ 50 stock
	Condition	Wr	10 fish/inch group (max)
Hybrid Striped Bass	Size structure	PSD, length frequency	N ≥ 50 stock
	Condition	Wr	10 fish/inch group (max)
White Bass	Size Structure	PSD, length frequency	N ≥ 50 stock
	Condition	Wr	10 fish/inch group (max)

Table 5. Objective-based sampling plan components for Whitney Reservoir, Texas 2023–2024.

<sup>a</sup> Since the primary forage species objectives are exploratory, no target precision or target sampling sizes will be sought; additional sampling will not be necessary beyond that which is done for Largemouth Bass.

Table 6. Total fishing effort (h) for all species and total directed expenditures at Whitney Reservoir, Texas, 2023. Survey period was from March 2023 through May 2023. Relative standard error is in parentheses.

Creel statistic	2023
Total fishing effort	80,393 (29)
Total directed expenditures	\$85,668 (50)

Table 7. Percent directed angler effort by species for Whitney Reservoir, Texas, 2023. Survey period was from March 2023 through May 2023.

Species	2023
catfishes	8.2
White Bass	21.8
Striped Bass	21.1
Black bass	34.8
crappies	5.8
Anything	6.6





Effort =	1.7
Total CPUE =	400.8 (28; 668)
Stock CPUE =	76.2 (41; 127)
IOV =	81 (9)



Effort =	1.9
Total CPUE =	127.8 (33; 245)
Stock CPUE =	12 (33; 23)
IOV =	92 (3)

1.7

50.4 (20; 84)

28.2 (28; 47)

46 (10)



Figure 2. Number of Gizzard Shad caught per hour (CPUE, bars) and population indices (RSE and N for CPUE and SE for IOV in parentheses) for fall electrofishing surveys, Whitney Reservoir, Texas, 2015, 2019, and 2023.

# Bluegill



Effort =	1.7
Total CPUE =	319.8 (22; 533)
Stock CPUE =	295.2 (23; 492)
PSD =	16 (2)



Effort =	1.9
Total CPUE =	193 (24; 370)
Stock CPUE =	190.4 (24; 365)
PSD =	19 (4)



Figure 3. Number of Bluegill caught per hour (CPUE, bars) and population indices (RSE and N for CPUE and SE for size structure in parentheses) for fall electrofishing surveys, Whitney Reservoir, Texas, 2015, 2019, and 2023.



Figure 4. Number of Blue Catfish caught per net night (CPUE, bars), mean relative weights (squares) and population indices (RSE and N for CPUE and SE for size structure in parentheses) for spring gill net surveys, Whitney Reservoir, Texas, 2016, 2020, and 2024. Horizontal line represents mean relative weight of 100. The minimum length limit (vertical line) for Blue Catfish was 12-inches during 2016 and 2020; there was none after September 1, 2021.

Table 8. Creel survey statistics for Blue Catfish at Whitney Reservoir, Texas, from March 2023 through May 2023. Directed effort, directed effort per hour and total catch per hour is for anglers targeting catfishes (Blue and Channel Catfish combined) while total harvest and harvest per acre are estimates for Blue Catfish harvested by all anglers. Relative standard errors (RSE) are in parentheses.

Creel survey statistic	Year	
	2023	
Surface area (acres)	23,200	
Directed effort (h)	7385 (39)	
Directed effort/acre	0.3 (39)	
Total catch per hour	0.3 (75)	
Total harvest	5,892 (51)	
Harvest/acre	0.3 (51)	
Percent legal released	6.3	



oth frequency of harvested Blue Catfish observed during creel surveys

Figure 5. Length frequency of harvested Blue Catfish observed during creel surveys at Whitney Reservoir, Texas, March through May 2023, all anglers combined. N is the number of harvested Blue Catfish observed during creel surveys, and TH is the total estimated harvest for the creel period.



Figure 6. Number of Channel Catfish caught per net night (CPUE, bars), mean relative weights (squares) and population indices (RSE and N for CPUE and SE for size structure in parentheses) for spring gill net surveys, Whitney Reservoir, Texas, 2016, 2020, and 2024. Horizontal line represents mean relative weight of 100. The minimum length limit (vertical line) for Channel Catfish was 12-inches during 2016 and 2020; there was none after September 1, 2021.

Table 9. Creel survey statistics for Channel Catfish at Whitney Reservoir, Texas, from March 2023 through May 2023. Directed effort, directed effort per hour and total catch per hour is for anglers targeting catfishes (Blue and Channel Catfish combined) while total harvest and harvest per acre are estimates for Channel Catfish harvested by all anglers. Relative standard errors (RSE) are in parentheses.

Creel survey statistic	Year	
	2023	
Surface area (acres)	23,200	
Directed effort (h)	7385 (39)	
Directed effort/acre	0.3 (39)	
Total catch per hour	0.3 (75)	
Total harvest	72 (2329)	
Harvest/acre	0.003	
Percent legal released	0.0	



Figure 7. Length frequency of harvested Channel Catfish observed during creel surveys at Whitney Reservoir, Texas, March through May 2023, all anglers combined. 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, bars), mean relative weight (squares), and population indices (RSE and N for CPUE and SE for size structure in parentheses) for spring gill netting surveys, Whitney Reservoir, Texas, 2016, 2020, and 2024. Horizontal line represents mean relative weight of 100. The minimum length limit (vertical line) for White Bass was 10-inches for all three survey periods.

Table 10. Creel survey statistics for White Bass at Whitney Reservoir, Texas, from March 2023 through May 2023. Total catch per hour is for anglers targeting White Bass and total harvest is the estimated number of White Bass harvested by all anglers. Relative standard errors (RSE) are in parentheses.

Creel survey statistic	Year	
	2023	
Surface area (acres)	23,200	
Directed effort (h)	17,522 (31.5)	
Directed effort/acre	0.8 (31.5)	
Total catch per hour	2.4 (32.5)	
Total harvest	16,061 (36.8)	
Harvest/acre	0.7 (36.8)	
Percent legal released	67	



Figure 9. Length frequency of harvested White Bass observed during creel surveys at Whitney Reservoir, Texas, March through May 2023, all anglers combined. 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. Number of Striped Bass caught per net night (CPUE, bars), mean relative weight (squares), and population indices (RSE and N for CPUE and SE for size structure in parentheses) for spring gill netting surveys, Whitney Reservoir, Texas, 2016, 2020, and 2024. Horizontal line represents mean relative weight of 100. The minimum length limit (vertical line) for Striped Bass was 18-inches for all three survey periods.



Figure 11. Length at age for Striped Bass (n = 76) collected by gill netting, Whitney Reservoir, Texas, 2024. All individuals were stock-length or greater.

Table 11. Creel survey statistics for Striped Bass at Whitney Reservoir, Texas, from March 2023 through May 2023. Total catch per hour is for anglers targeting Striped Bass and total harvest is the estimated number of Striped Bass harvested by all anglers. Relative standard errors (RSE) are in parentheses.

Creel survey statistic	Year	
	2023	
Surface area (acres)	23,200	
Directed effort (h)	17,003 (32.8)	
Directed effort/acre	0.7 (32.8)	
Total catch per hour	1.4 (21.9)	
Total harvest	16,958 (34.2)	
Harvest/acre	0.7	
Percent legal released	43	



Figure 12. Length frequency of harvested Striped Bass observed during creel surveys at Whitney Reservoir, Texas, March through May 2023, all anglers combined. N is the number of harvested Striped Bass observed during creel surveys, and TH is the total estimated harvest for the creel period.





Figure 13. Number of Largemouth Bass caught per hour (CPUE, bars), mean relative weights (squares) and population indices (RSE and N for CPUE and SE for size structure in parentheses) for fall electrofishing surveys, Whitney Reservoir, Texas, 2015, 2019, and 2023. Horizontal line represents mean relative weight of 100. The minimum length limit (vertical line) for Largemouth Bass was 14-inches for all three survey periods.

Table 12. Creel survey statistics for Largemouth Bass at Whitney Reservoir, Texas, from March 2023 through May 2023. The black bass grouping was not used in these calculations. Percent legal released is Largemouth Bass released by non-tournament anglers. Relative standard errors (RSE) are in parentheses.

Creel survey statistic	Year	
	2023	
Surface area (acres)	23,200	
Directed effort tour	13,438 (34)	
Directed effort non-tour	12,981 (34)	
Directed effort/acre	1.2 (31)	
Total catch per hour	0.6 (16)	
Total harvest tour	3305 (75)	
Total harvest non-tour	431 (170)	
Harvest/acre	0.2 (52)	
Percent legal released	89	



■ 2023 N= 52; TH = 3,736

Figure 14. Length frequency of harvested Largemouth Bass observed during creel surveys at Whitney Reservoir, Texas, March through May 2023, all anglers combined. N is the number of harvested Largemouth Bass observed during creel surveys, and TH is the total estimated harvest for the creel period.

Table 13. Results of genetic analysis of Largemouth Bass collected by fall electrofishing, Whitney Reservoir, Texas, 2005, 2007, 2015, 2019, and 2023. FLMB = Florida Largemouth Bass, NLMB = Northern Largemouth Bass, Intergrade = hybrid between a FLMB and a NLMB. Genetic composition was determined with micro-satellite DNA analysis.

		Number of Fish				
Year	Sample size	FLMB	Intergrade	NLMB	% FLMB alleles	% FLMB
2005	26	1	25	0	49	4
2007	30	0	29	1	49	0
2015	30	3	26	1	66	10
2019	30	0	30	0	61	0
2023	30	1	29	0	64	3

### Crappie

Table 14. Creel survey statistics for crappies at Whitney Reservoir, Texas, from March 2023 through May 2023. Total catch per hour is for anglers targeting crappies and total harvest is the estimated number of crappies harvested by all anglers by species. Relative standard errors (RSE) are in parentheses.

Creel survey statistic	Year	
oreer survey statistic	2023	
Surface area (acres)	23,200	
Directed effort	4,643 (45)	
Directed effort/acre	0.2 (45)	
Total catch per hour	0.1 (41)	
Total harvest (White)	287 (520)	
Total harvest (Black)	575 (311)	
Harvest/acre (White)	0.01 (520)	
Harvest/acre (Black)	0.02 (311)	
Percent legal released	10	



Figure 15. Length frequency of harvested crappies observed during creel surveys at Whitney Reservoir, Texas, March through May 2023, all anglers combined. White Crappie (WT) and Black Crappie (BLK); N is the number of harvested crappies observed during creel surveys, and TH is the total estimated harvest for the creel period.

# Proposed Sampling Schedule

Table 15. Proposed sampling schedule for Whitney Reservoir, Texas. Survey period is June through May. Gill net surveys are conducted in the spring while electrofishing surveys are conducted in the fall. Scheduled surveys are denoted by X.

	Survey year					
	2024-2025	2025-2026	2026-2027	2027-2028		
Angler Access				Х		
Vegetation				Х		
Electrofishing – Fall		Х		Х		
Electrofishing – Spring						
Trap netting				Х		
Gill netting			Х	Х		
Creel Survey		Х				
Report				Х		

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

Number (N), relative standard error (RSE), and catch per unit effort (CPUE) of all target species collected from all gear types from Whitney Reservoir, Texas, 2023-2024. Sampling effort was 15 net nights for gill netting, and 1.7 h for electrofishing.

	Gill Netting		Electrofishing	
Species	N/RSE	CPUE	N/RSE	CPUE
Gizzard Shad			84/20	50.4
Threadfin Shad			63/36	37.8
Blue Catfish	45/18	3.0		
Channel Catfish	12/33	0.8		
Flathead Catfish	2/68	0.1		
White Bass	15/28	1.0		
Striped Bass	77/39	5.1		
Bluegill			32/30	19.2
Longear Sunfish			6/49	3.6
Redbreast Sunfish			2/69	1.2
Green Sunfish			3/100	1.8
Warmouth			1/100	0.6
Largemouth Bass			52/26	31.2
Smallmouth Bass			1/100	0.6
White Crappie	3/72	0.2		

# **APPENDIX B – Historical catch rates for targeted species**

Catch rates (CPUE) of targeted species by gear type for standard surveys on Whitney Reservoir, Texas, 1990 to present. Surveys prior to 1996 utilized biologist-selected stations while those after 1996 utilized randomly selected stations. Electrofishing stations were conducted with a 5.0 Smith-Root GPP (Gas Powered Pulsator) until 2010, a 7.5 Smith-Root GPP from 2010 to 2019, and a Smith-Root Apex unit thereafter. Asterisk denotes collection by a non-standard gear.

	Electionshing							
Year	Gizzard	Threadfin	Bluegill	Redear	Longear	Green	Warmouth	Redbreast
1990	47.0	2.5	25.5	3.5	10.5	0	4.0	8.5
1991	19.5	1.5	26.0	0.5	8.0	0.5	2.0	1.5
1992	10.0	0.0	45.5	0.5	14.5	3.0	2.0	0.0
1993	69.0	2.0	30.0	2.0	5.5	1.5	0.0	18.0
1994	38.5	5.5	125.5	1.5	31.5	8.0	1.0	66.0
1995	206.5	87.5	252.0	5.5	22.0	3.5	8.5	45.5
1996	180.0	7.5	16.5	3.5	15.0	3.5	0.5	14.0
1997	62.0	12.0	74.5	1.0	2.5	1.0	0.5	30.0
1998	61.5	15.5	168.5	1.0	1.5	4.5	0.0	74.5
1999	11.0	14.0	43.0	1.5	6.0	9.0	1.0	22.0
2001	281.5	198.5	382.0	3.0	54.5	27.0	10.0	107.5
2003	149.5	15.0	179.0	0.5	8.0	25.0	0.5	13.5
2005	36.5	30.0	64.0	5.0	6.5	0.0	2.5	1.0
2007	144.0	130.5	139.5	36.0	9.0	4.0	0.0	0.0
2009	183.0	39.5	158.5	13.0	15.0	4.5	1.5	7.0
2011	101.0	49.5	133.5	12.5	8.0	0.5	0.5	1.0
2015	400.8	90.0	319.8	18.6	48.0	18.6	5.4	15.0
2019	127.8	51.6	193.0	4.7	9.9	4.2	1.0	9.9
2023	54.0	37.8	19.2	0.0	3.6	1.8	0.6	1.2
Avg.	115.0	41.6	126.1	6.0	14.7	6.3	2.2	23.0

Electrofishing

# **APPENDIX B Continued**

	Electrofishing					
Year	Largemouth	Smallmouth	Spotted			
1990	28.5	2.0	5.0			
1991	14.5	0.0	1.5			
1992	23.0	0.0	0.0			
1993	50.5	3.0	14.0			
1994	49.5	2.0	16.5			
1995	119.5	16.5	13.0			
1996	15.5	10.0	3.0			
1997	56.5	12.5	3.5			
1998	100.0	25.5	12.5			
1999	35.0	4.0	6.0			
2001	85.0	1.0	2.5			
2003	49.0	0.5	2.5			
2005	25.5	0.0	0.5			
2007	113.0	0.0	0.0			
2009	40.0	0.5	0.0			
2011	75.0	1.0	0.0			
2015	253.8	0.0	8.4			
2019	181.6	0.0	0.5			
2023	31.2	0.6	0.0			
Avg.	70.9	4.2	4.7			

# **APPENDIX B Continued**

	Gill nets					Trap	nets
Year	Blue	Channel	Flathead	White	Striped	White	Black
1990	1.3	4.4	0	15.0	5.2	13.1	0
1991	0.6	3.0	0.1	14.6	9.3	7.7	0.5
1992	0.8	2.6	0	4.3	6.9	32.9	0.7
1993	0.5	4.3	0.1	11.1	6.3	9.9	0
1994	1.3	1.2	0	5.1	7.9	4.8	0.1
1995	1.3	1.1	0	5.5	3.2	11.3	0
1996	1.6	1.7	0	7.5	4.7	0.8	0.1
1997	2.3	0.8	0.2	1.6	3.5	10.8	0
1998	1.4	1.6	0.1	1.9	2.1	28.4	0.4
1999	1.2	1.5	0.3	0.5	2.5	3.9	0.2
2000	1.5	1.3	0.3	4.1	1.8	-	-
2001	1.9	3.9	0.1	2.4	1.1	-	-
2002	0.9	3.1	0.7	0.7	2.3	-	-
2003	0.6	4.7	0.2	1.0	0.6	1.9	0.2
2004	1.1	2.1	0.1	1.1	1.5	-	-
2005	-	-	-	-	-	13.5	0.1
2006	0.3	4.6	0.1	4.0	1.5	-	-
2008	0.4	8.9	0	7.4	1.4	-	-
2010	1	6.1	0.1	6.5	5.5	-	-
2012	3.1	2.2	0.1	3.4	1.5	-	-
2014	3.3	3.3	0	6.3	1.7	-	-
2016	2.5	4.6	0	9.9	6.6	-	-
2020	6.8	4.7	0	8.1	8.6	-	-
2024	3.0	0.8	0.1	1.0	5.1	-	-
Avg.	1.7	3.2	0.1	5.3	4.0	11.6	0.2



# **APPENDIX C – Map of sampling locations**

Location of sampling sites, Whitney Reservoir, Texas, 2023-2024. Electrofishing, gill netting, and Biologist-selected gill netting stations are indicated by E, G, and asterisks respectively. Water level was 9' low during the fall 2023 electrofishing survey, and slightly above conservation pool during the spring 2024 gill net surveys.



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