O.H. Ivie Reservoir

2021 Fisheries Management Survey Report

PERFORMANCE REPORT

As Required by

FEDERAL AID IN SPORT FISH RESTORATION ACT

TEXAS

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INLAND FISHERIES DIVISION MONITORING AND MANAGEMENT PROGRAM

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Survey and Management Summary

Fish populations in O.H. Ivie Reservoir were surveyed in 2018, 2019, 2020 and 2021 using electrofishing and in 2022 using gill netting. Anglers were surveyed from June 2019 through May 2020 and from March 2022 through May 2022 using a creel survey. Historical data are presented with the 2021-2022 data for comparison. This report summarizes the results of the surveys and contains a management plan for the reservoir based on those findings.

Reservoir Description: At conservation pool, O.H. Ivie Reservoir is a 19,149-acre impoundment and is located on the Colorado and Concho Rivers in Concho, Runnels, and Coleman counties, Texas, approximately 55 miles east of San Angelo. Water level fluctuations are common; the reservoir elevation has ranged from 8 to 49 feet below conservation pool from 2000 to 2022. In 2022, the reservoir surface area was approx. 12,000 acres. Habitat features consisted of standing timber, rocks, native submersed vegetation, and flooded saltcedar.

Management History: Fish harvest is regulated according to the standard statewide restrictions, except for Largemouth Bass. In most years since 2001, an electrofishing survey or creel survey was conducted to evaluate the effectiveness of the 2001 Largemouth Bass length limit change. The harvest regulation changed from an 18-inch minimum length limit (MLL) and 5-fish daily bag limit (DBL) to a 5-fish DBL, 2 of which may be <18 inches and no MLL. In 2015, the 18-inch MLL on Smallmouth Bass was removed and replaced with statewide regulations. A variety of fish species have been stocked in the reservoir including Threadfin Shad; Bluegill; Channel, Blue and Flathead Catfishes; Florida Largemouth Bass; Smallmouth Bass; White Crappie; and Walleye. Walleye stockings were discontinued after failing to produce a fishery.

Fish Community

- **Prey species:** Threadfin Shad were not collected in 2021, but historically have been present in low abundance. The abundance of Gizzard Shad was slightly below long-term averages, and few Gizzard Shad were available as prey to most sport fish. Electrofishing catch of Bluegill has increased over the past three surveys.
- **Catfishes:** The Blue and Channel Catfish populations continued to display low gill net catch rate, but a good portion of the catch were sizes preferred by anglers with 42% of Blue Catfish and 48% of Channel Catfish sampled exceeding 18 inches. Flathead Catfish were not sampled in gill nets in 2022 but are known to be present in the reservoir.
- **White Bass:** White Bass abundance was down in 2022 compared to previous years. White Bass were highly sought-after during the 2019-2020 creel period with 19,317 angler hours and 8,367 harvested.
- **Largemouth Bass:** O.H. Ivie has developed into the most productive trophy bass fishery in the country over the past few years. The reservoir produced 30 trophy bass over 13 lbs. in 2021 and 2022 combined. Angler effort for Largemouth Bass was very high as directed effort for Largemouth Bass in spring 2022 was nearly double the long-term average. Growth was adequate with bass reaching 18 inches in 4.2 years in 2020. Size structure showed improvement as the strong year-class from 2019 continues to grow into larger size classes. The genetic composition was 84% Florida bass alleles, while 27% of bass sampled were pure Florida strain Largemouth Bass.
- **White Crappie:** Crappie anglers spent 9,864 hours fishing for crappie during the 2019-2020 creel period. Catch rate and harvest was down compared to previous surveys.

Management Strategies: Continue to stock Florida Largemouth Bass annually contingent upon adequate water levels and habitat. Vegetation surveys will be conducted in 2022, 2023, 2024 and 2025 to survey hydrilla coverage. An access survey will be conducted in 2025. Conduct a year-long creel survey in 2025-2026.

Introduction

This document is a summary of fisheries data collected from O.H. Ivie Reservoir from 2018-2022. The purpose of the document is to provide fisheries information and make management recommendations to protect and improve the sport fishery. While information on other fishes was collected, this report deals primarily with major sport fishes and important prey species. Historical data are presented with the 2018-2022 data for comparison.

Reservoir Description

At conservation pool, O.H. Ivie Reservoir is a 19,149-acre impoundment and was constructed in 1990 on the Colorado and Concho rivers. It is located in Concho, Runnels, and Coleman counties approximately 55 miles east of San Angelo and is operated and controlled by the Colorado River Municipal Water District (CRMWD). Primary water uses included municipal water supply and recreation. O.H. Ivie Reservoir was eutrophic with a mean TSI chl-*a* of 51.62 (Texas Commission on Environmental Quality 2020). Habitat at time of sampling consisted of rocks, native submersed vegetation, flooded timber, and saltcedar. O.H. Ivie has a history of severe water level fluctuations. The water level remained near conservation pool elevation from impoundment in 1990 through 1998 but has not reached conservation pool since. The reservoir reached an all-time low in May 2014 (49 feet below conservation pool, 10.7% capacity). Record rainfall in the fall 2018 through spring 2019 pushed the reservoir up 35.8 feet to 77% capacity. Zebra mussels (*Dreissena polymorpha*) were discovered in O.H. Ivie Reservoir in March 2019 and by July 2020 was designated as infested. Other descriptive characteristics for O.H. Ivie Reservoir are in Table 1.

Angler Access

Boat access consisted of four public boat ramps and several private boat ramps. Additional boat ramp characteristics are in Table 2. Shoreline fishing access is limited to CRMWD parks.

Management History

Previous management strategies and actions: Management strategies and actions from the previous survey report (Wright 2018) included:

1. Monitor the Largemouth Bass population and prey species with annual fall electrofishing surveys from 2018-2021. Continue to request Florida Largemouth Bass stockings, pending adequate water levels and habitat, to enhance year-class strength and improve Florida genetics within the population. Collect Largemouth Bass genetics in 2021. Collect angler effort, catch rates, and harvest information during a full year creel survey from June 2019 to May 2020.

   Action: All electrofishing and creel surveys were conducted as planned. Genetics were taken in 2021. Florida strain Largemouth Bass were stocked annually from 2018-2021.

2. Discontinue trap netting in O.H. Ivie Reservoir due to poor catch rates. Monitor the crappie populations through creel surveys. Collect angler effort, catch rate, and harvest information during a full year creel survey from June 2019 to May 2020.

   Action: No trap netting was conducted since 2018. Crappie populations was assessed with a creel survey from June 2019 to May 2020 and April 2021 to June 2021.

3. Add O.H. Ivie to the list of reservoirs to monitor for golden alga cell counts and toxicity. Collect water samples in December and March annually to monitor for the present of golden alga.

   Action: O.H. Ivie was monitored for golden alga in 2017, 2018, and 2020. No golden alga fish kills have been documented since 2017.

4. Cooperate with the CRMWD to post signage, educate the public about invasive species, and track existing and future inter-basin water transfers to facilitate potential invasive species responses.

   Action: Following discovery of zebra mussels in 2019, provided signage to the CRMWD that was posted at all boat ramps indicating the infestation of zebra mussels at O.H. Ivie Reservoir. Clean, drain, and dry stencils were installed at all CRMWD boat ramps. Multiple local television interviews were conducted regarding the zebra mussel infestation and potential impacts for O.H. Ivie Reservoir.

Harvest regulation history: Except for Largemouth Bass and Smallmouth Bass, all sport fishes have been historically managed with statewide regulations. From 1990 to 2001, Largemouth Bass were managed with an 18-inch minimum length limit (MLL). The MLL was changed in 2001 to no length limit, but only two <18 inches could be kept per day. The latter was implemented to alleviate stockpiling and improve growth of Largemouth Bass measuring 14 to 18 inches. Smallmouth Bass were managed with an 18-inch MLL from 1990 to 2015. The special Smallmouth Bass regulation was removed in 2015 and are currently managed with statewide regulations. Current regulations are in Table 3.

Stocking history: The majority of Florida Largemouth Bass stockings were conducted between 1989 and 2001 and between 2010 and 2021 (Table 4). ShareLunker Largemouth Bass fingerlings were stocked from 2010 to 2012 and 2020 to 2022. Threadfin Shad; Blue, Channel, and Flathead Catfish; Bluegill; Smallmouth Bass; and White Crappie were introduced in 1990. Walleye were stocked 3 times from 1991 to 1994 but failed to produce a fishery. The complete stocking history is in Table 4.

Vegetation/habitat management history: Historically, O.H. Ivie Reservoir has supported a mix of aquatic vegetation species. From 2004 to 2021, native submersed vegetation ranged from 3.4 to 24.7% surface area coverage, however, no native vegetation was observed in 2012 or 2013 due to low water levels. Hydrilla was first discovered in O.H. Ivie Reservoir in 1997 and from 1999 to 2011 hydrilla coverage ranged from 400 to 3733 acres (average ~2300 acres, 21% surface area). Since 2012 hydrilla abundance has been low or non-existent due to fluctuating water levels. In 2017 and 2021 limited patches of hydrilla < 1 acre were documented. Historically, no attempts have been made to control this invasive species since fluctuating water levels have kept it within an acceptable amount of coverage in most years, and it has never caused any boater access issues.

Water transfer: O.H. Ivie Reservoir is primarily used for municipal water supply for the cities of Midland, San Angelo, and Abilene, Texas as well as several smaller communities. CRMWD is the controlling authority and supplier to these municipalities. Two permanent pump stations move water to the cities' treatment plants via pipeline. No interbasin water transfers are known to occur.

Methods

Surveys were conducted to achieve survey and sampling objectives in accordance with the objective-based sampling (OBS) plan for O.H. Ivie Reservoir (Wright 2018). Primary components of the OBS plan are listed in Table 5. All survey sites (Appendix B) were randomly selected, and all surveys were conducted according to the Fishery Assessment Procedures (TPWD, Inland Fisheries Division, unpublished manual revised 2017).

Electrofishing – Largemouth Bass, sunfishes, and Gizzard Shad were collected by electrofishing (2 hour at 24, 5-min stations) in the fall of 2018, 2019, 2020, and 2021. In addition, a Largemouth Bass-only survey was conducted in the fall of 2020 (1.2 hours at 4 stations) to collect additional bass for age and growth analysis. Catch per unit effort (CPUE) for electrofishing was recorded as the number of fish caught per hour (fish/h) of actual electrofishing.

Gill netting – Blue Catfish, Channel Catfish, Flathead Catfish, and White Bass were collected by gill netting (10 net nights at 10 stations) in spring 2020. Gill netting was stopped after 10 nets due to poor catch rates. CPUE for gill netting was recorded as the number of fish caught per net night (fish/nn).

Genetics – Genetic analysis of Largemouth Bass in fall 2021 was conducted according to the Fishery Assessment Procedures (TPWD, Inland Fisheries Division, unpublished manual revised 2017). Micro-satellite DNA analysis was used to determine genetic composition of individual fish 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 Anderson and Neumann (1996). Index of Vulnerability (IOV) was calculated for Gizzard Shad (DiCenzo et al. 1996). Standard error (SE) was calculated for structural indices and IOV. Relative standard error (RSE = 100 X SE of the estimate/estimate) was calculated for all CPUE and creel statistics.

Creel survey – An access-point creel survey was conducted from June 2019 through May 2020 and from March 2022 through May 2022. Angler interviews were conducted on 5 weekend days and 4 weekdays per quarter to assess angler use and fish catch/harvest statistics in accordance with the Fishery Assessment Procedures (TPWD, Inland Fisheries Division, unpublished manual revised 2017).

Habitat – Vegetation surveys were conducted in 2018–2021 to monitor for hydrilla. Habitat was assessed with the digital shapefile method (TPWD, Inland Fisheries Division, unpublished manual revised 2017).

Water level – Source for water level data was the United States Geological Survey (USGS 2022).

Results and Discussion

Habitat: A structural habitat survey was last conducted in 2009 (Farooqi et al. 2010) and no significant human alterations have been made to the shoreline since that survey. Due to significant water level increases in 2018, flooded terrestrial habitat was highly abundant and estimated to cover over 50% of the reservoir. Native submersed vegetation, primarily Illinois pondweed and sago pondweed, covered 2.4% of the reservoir's surface area in 2021 (Table 6). Trace amounts of Hydrilla was found in 2021 and had not been observed since the 2017 survey. Hydrilla surface area coverage averaged 22% from 1999 to 2010, but only trace amounts have been observed since.

Creel: During the 2019-2020 creel survey directed fishing effort by anglers was highest for Largemouth Bass (62.9%), followed by anglers fishing for White Bass (14.5%) and Catfish (11.6%) (Table 7). Total fishing effort for all species and direct expenditures at O.H. Ivie Reservoir have varied over the past four surveys and differences were primarily due to fluctuating water levels (Table 8). During the spring creel survey in 2022, Largemouth bass accounted for 86.7% of all angler effort, followed by anglers fishing for

anything (6.2%) and Catfish (4.4%). Total angler expenditures were $1,237,161 during the 2019-2020 creel survey period (Table 8).

During the spring 2022 creel survey, total angler effort was 107,400 hours and expenditures were $2,146,923. In spring 2022, 85.7% of angler effort was directed towards Largemouth Bass. Analysis of past creel data for O.H. Ivie indicates approximately 59.8% of angler effort and 52.1% of angler expenditures occur during the spring quarter. Extrapolated for the full year, would be approximately 179,599 angler hours and $4,119,983 in expenditures. These estimates are significantly higher than the long-term averages for angler effort and expenditures of 112,099 hours and $1,296,993, respectively.

Analysis of angler ZIP code data shows that anglers are willing to travel long distances to visit this trophy Largemouth Bass fishery. The mean angler travel distance was 171.8 miles in the spring of 2022, which was significantly higher than 107.7 miles during the 2019/2020 creel survey period. In spring 2022, anglers who traveled over 200 miles made up 19.9% of all anglers interviewed, significantly up from 8.3% in 2019-2020. In spring 2022, out-of-state anglers accounted for 10.1% of all anglers interviewed, more than double the 4.8% observed in 2019-2020.

Prey species: No Threadfin Shad were collected in 2021 but have historically been present in the reservoir in low abundance. Electrofishing catch rates of Gizzard Shad were 126.5/h in 2021, which was down slightly from 141.5/h in 2020, 223.5/h in 2019, but higher than 98.5/h in 2018 (Figure 2). Index of Vulnerability for Gizzard Shad was very low in 2021 and 2020 (IOV = 1). This was likely due to most small Gizzard Shad being heavily preyed upon by the abundant 2019 Largemouth Bass year-class. Total CPUE of Bluegill in 2021 was 109.0/h and has generally increased over the past four survey (Figure 3). Increases in Bluegill abundance is likely related to expansion of submerged aquatic vegetation. Bluegill size structure has varied over the past four surveys ranging from a PSD of 10-45 (Figure 3).

Catfish: The gill net catch rate of Blue Catfish was low at 1.2/nn in 2022, which was similar to 2018 (1.9 fish/nn), but lower than 2014 (5.4 fish/nn; Figure 4). Blue Catfish up to 35 inches were observed in the 2022 gill net survey and fish condition was generally good with relative weights from 90-120 for most length groups. An estimated 709 Blue Catfish were harvested during the 2019-2020 creel period and ranged from 13 to 38 inches in length. Eighty-eight percent of all harvested Blue Catfish were caught by passive gear anglers.

The gill net catch rate of Channel Catfish was 2.1/nn in 2022, a slight increase from previous surveys, but still low (Figure 5). Channel Catfish up to 25 inches were observed in the gill net survey and fish condition was good with relative weights above 100 for most length groups. An estimated 449 Channel Catfish were harvested during the 2019-2020 creel period and ranged from 15 to 23 inches in length. Sixty-nine percent of all harvested Channel Catfish were caught by passive gear anglers.

A total of over 15,000 hours of fishing effort was directed towards catfish species with an estimated harvest of 1,253 fish (Table 9). Standard creel surveys fail to capture nighttime passive gear anglers; anecdotal evidence suggests catfish harvest is much higher than the creel data would indicate. Additionally, due to extensive amounts of flooded terrestrial habitat steep rocky bluffs, conditions for sampling with gill nets are not optimal and the low overall catch rates of Blue and Channel Catfish are likely not representative of the true abundance of catfish in O.H. Ivie Reservoir.

White Bass: The gill net catch rate of White Bass was 1.4/nn in 2022, down significantly from 6.2/nn in 2018 and 8.0/nn in 2014 (Figure 8). Objectives to collect 50 stock size White Bass were not met due to unexpectedly low catch rates in 2022 and gill netting was stopped after 10 net nights. Condition of White Bass was poor in 2022 with relative weights from 65-85 (Figure 8). A lack of small Gizzard Shad (IOV = 1) is the likely cause of the poor condition observed in the White Bass population. During the 2019-2020 creel period, White Bass fishing was excellent. Directed fishing effort, catch per hour, and total harvest for White Bass was 19,317 h, 1.9 fish/h, and 8,367 fish, respectively (Table 10). Approximately 56% of the legal-sized White Bass were released and release rates were similar to past creel surveys. The relatively high legal release rate may be due in part to anglers releasing White Bass from 10-12 inches in favor of

larger individuals. The estimated harvest in 2019-2020 was nearly 2-3 times greater than previous surveys (Table 10).

Largemouth Bass: The electrofishing catch rate of stock-length Largemouth Bass was 47.0/h in 2021, which was much lower than 168.0/h in 2020, but higher than 29.5/h in 2019 and 11.0/h in 2018 (Figure 10). A strong year-class was produced in 2019 which was evident in the 2020 electrofishing sample as high catch rates bass from 8-9 inches (103.5/h) were observed and was over 5 times higher than any other survey going back to 1996. As the strong year-class from 2019 grows into larger length groups, size structure (PSD-P) has improved, increasing from 5 to 14 over the past three surveys (Figure 10). Growth of Largemouth Bass in O.H. Ivie Reservoir was good in 2020; average age at 14 and 18 inches was 2.5 years and 4.2 years (Appendix C). Body condition in 2021 was poor with relative weights under 90 for nearly all size classes of fish (Figure 10). A lack of small Gizzard Shad (IOV = 1) is the likely cause of the poor condition observed in the Largemouth Bass population. Florida Largemouth Bass influence has remained relatively constant over the past three surveys as Florida alleles have ranged from 76 to 86% and Florida genotype has ranged from 17 to 27% (Table 12).

During the 2019-2020 creel period, directed fishing effort, catch per hour, and total harvest for Largemouth Bass was 83,503 h, 0.86 fish/h, and 337 fish, respectively, from June 2019 through May 2020 (Table 11). This level of angler effort was similar to the long-term historical average for angler effort of 89,428 h for Largemouth Bass. Over the past four creel surveys legal release of Largemouth Bass ranged from 93 to 99% (Table 11). Harvest of Largemouth Bass was very low over the past four surveys with an average harvest of less than 0.1 bass per acre. Harvested fish ranged in length from 8 to 15 inches in 2019-2020, however, harvest has commonly ranged from 12-20 inches over the past four surveys (Figure 11). Tournament anglers weighed-in and released an estimated 3,955 Largemouth Bass in 2019-2020.

A spring only creel was conducted in 2022 to capture the level of fishing effort during the unprecedented run of trophy bass being caught in O.H. Ivie. Directed fishing effort, catch per hour, and total harvest for Largemouth Bass was 92,033 h, 0.36 fish/h, and 367 fish, respectively. The 92,033 hours targeted at Largemouth Bass for the spring quarter was nearly double the long-term average of 48,159 h (Appendix D). Analysis of past full-year creel surveys on O.H. Ivie from 2000-2020 indicates that, on average, 54.8% of all yearly directed effort for Largemouth Bass occurs during the spring quarter. Extrapolated for the full year, the 2022 creel data estimate for directed effort was 167,943 h for Largemouth Bass, which would be the second highest estimate on record for O.H. Ivie Reservoir, and nearly double the long-term average of 88,813 h (Appendix D).

Over the past two years, no other reservoir has produced more Legacy-Class ShareLunkers (13lb or larger) than O.H. Ivie Reservoir (15 each in 2021 and 2022). Since the ShareLunker program was expanded in 2018, O.H. Ivie has accounted for 6.8% of all ShareLunker entries over 8 lb. and 40.0% of all ShareLunker entries over 13 lb. statewide. Over the past 5 years the three biggest ShareLunker entries have all come from O.H. Ivie Reservoir: 17.06 lb. (Brody Davis 2/24/2022, #7 all-time largest Largemouth Bass in Texas), 16.4 lb. (Joe McKay 2/19/2021, #17 all-time largest Largemouth Bass in Texas), and 16.1 lb. (Kyle Hall 3/1/2022, #21 all-time largest Largemouth Bass in Texas). Since O.H. Ivie Reservoir was impounded in 1990, a total of 57 Largemouth Bass over 13 lb. from the reservoir have been submitted to the ShareLunker Program, which accounts for 8.9% of all-time entries over 13 lb.

Historically, the Largemouth Bass population suffered from slow growth resulting from an overabundance of similarly sized, small-bodied fish competing for limited resources (Appendix C). However, since 2005 growth rates have been adequate and the most recent growth survey in 2020 indicated growth has remained relatively unchanged since 2005. The special regulation for Largemouth Bass (no minimum length limit, 5 fish daily bag, of which only 2 can be under 18 inches) was implemented in 2001 to increase harvest on small bass, reduce intraspecific competition and improve growth rates. However, harvest rates of Largemouth Bass have been low over the past four creel surveys (Table 11). Consistent with the published literature of increasing rates of legal release over time among bass anglers, the harvest per acre at O.H. Ivie has declined approximately 70% from 2002 to 2020 (Myers et al. 2008,

Isermann et al. 2013). Even at its highest point, harvest rates never exceeded 0.21 bass/acre. Thus, it's difficult to make the case that the improvements in bass growth rates since 2005 have been due to angler harvest.

Due to the semi-arid climate of West Texas, large water level fluctuations are common on O.H. Ivie Reservoir. During years of significant precipitation, large increases in water level result in an increase in acreage, flooded terrestrial habitat, and reservoir productivity (i.e., new lake effect). These water level changes have a significant impact on the production of bass over 13 lbs. Significant water level rises in 2005 (14+ feet) and 2007 (13+ feet) resulted in a total of 20 ShareLunker Legacy Class (13 lb or larger, donated for selective breeding program) entries from 2010-2012. A historic water level rise in 2018 (35+ feet) resulted in 32 ShareLunker Legacy and Legend Class (13 lb or larger, not donated for selective breeding program) entries from 2019-2022. The significantly larger water level rise in 2018 was also associated with an overall larger mean weight in the ShareLunker entries. The average weight of Legacy ShareLunkers entered from 2010-2012 was 13.6 lbs. while the average weight from the 2019-2022 entries was 14.3 lbs. Since the reservoir reached conservation pool in 1992, there have only been four occasions in which the reservoir has risen over 10 feet and each time significant catches of bass over 13 lbs. have followed 2-5 years afterwards. It is likely that these patterns will continue into the future as the reservoir water level fluctuates through periods of drought and intermittent years of heavy rainfall.

Crappie: Directed effort for Crappie was 9,684 h during the 2019-2020 creel period, which was higher than previous surveys (Table 13). Total harvest and catch per hour were down significantly from past surveys with only 1,486 estimated crappies harvested and a catch rate of 0.19 fish/h. Percent legal release was high in 2019-2020 as 52% of all legal-size crappie were released. Typically, legal release rates for crappie are less than 10% in O.H. Ivie. Low catch rates may be partially attributed to the 30+ foot water level rise in 2018 which drastically changed the structural habitat layout of the reservoir and caused the crappie to spread out into new areas. Anglers reported difficulty locating crappie during the creel period in 2019-2020 following the water level rise. Nearly equal numbers of Black and White Crappie were harvested by anglers, which differed from past surveys where White Crappie were the predominant species harvested. Size of harvested White Crappie in 2010 to 2020 ranged from 10 to 16 inches in total length (Figure 13).

Fisheries Management Plan for O.H. Ivie Reservoir, Texas

Prepared – July 2022

ISSUE 1: Over the past two years, O.H. Ivie has been the most productive trophy (> 8 lb.) Largemouth Bass fishery in the country and is the most important reservoir in the San Angelo District. From 2018 through 2022, 26 legacy, 6 legend, 38 elite, and 50 lunker class Largemouth Bass have been entered into the ShareLunker Program, including a new lake record of 17.06 lb. which was the 7th largest bass ever recorded in Texas. Continued efforts to monitor the population through electrofishing and creel surveys are needed to maintain up to date population information. Stockings of Lone Star Bass is needed to maintain trophy potential.

MANAGEMENT STRATEGIES

1. Stock Lone Star Bass annually at a rate of 1,000/km of shoreline, contingent upon adequate water level and available habitat.
2. Monitor Largemouth Bass population metrics with annual fall night-time electrofishing surveys.
3. Conduct a full-year access creel survey from June 1, 2025, through May 31, 2026, to estimate angler effort, catch rates, and harvest rates.
4. Continue to promote the TPWD ShareLunker program and provide support for Elm Creek and Concho Park Marina's to make it as easy as possible for anglers to submit their catches and allow us to collect genetic information on trophy bass.

ISSUE 2: Zebra Mussels were first discovered in O.H. Ivie Reservoir in the spring 2019 and by summer 2020 was infested. Zebra mussels have since spread to every area of the reservoir. Continued fisheries population sampling is needed to monitor for any potential large-scale changes due to the presence of zebra mussels and increased water clarity.

MANAGEMENT STRATEGIES

1. Continue to monitor fisheries resources with annual fall electrofishing, and with gill netting and a creel survey every 4 years to monitor for large-scale changes to fish populations.
2. Continue to work with the CRMWD to maintain signage at boat ramps.

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 CRMWD to post appropriate signage at access points around the reservoir.
2. Contact and educate marina owners about invasive species, and provide them with posters, literature, etc. so that they can in turn educate their customers.
3. Educate the public about invasive species through the use of media and the internet.
4. Make a speaking point about invasive species when presenting to constituent and user groups.
5. Keep track of (i.e., map) existing and future inter-basin water transfers to facilitate potential invasive species responses.

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

Sport fish, forage fish, and other important fishes

Primary sport fishes in O.H. Ivie Reservoir include Largemouth Bass, Channel and Blue Catfish, Black and White Crappie, and White Bass. Known important forage species include Bluegill and Gizzard and Threadfin Shad.

Low-density fisheries

Smallmouth Bass: Smallmouth Bass are present in O.H. Ivie Reservoir, but electrofishing catch rates have been very low (< 2.0/h) and no directed angling effort has ever been documented. Sampling directed for Smallmouth Bass is not warranted, but fish encountered during sampling for other species will be recorded.

Survey objectives, fisheries metrics, and sampling objectives

Largemouth Bass: From 2006 to 2022 percent directed angler effort has ranged from 65.8% to 85.7% making them the most popular sportfish in the reservoir. O.H. Ivie has a history of producing ShareLunker bass and warrants significant sampling effort. Trend data on CPUE, size structure, and body condition have been collected annually from 2015-2021 with fall night-time electrofishing. The San Angelo management office will continue to sample annually in this reservoir with fall night electrofishing which will allow for determination of any large-scale changes in the Largemouth Bass population that may spur further investigation. Survey data from 2009 to 2021 indicates 16-50 stations would be needed to collect 50 stock size fish, while 12-30 stations would be needed to achieve an RSE ≤25 with 80% confidence. Sampling objectives for O.H. Ivie Reservoir are to collect 50 stock size fish and achieve a CPUE-Stock RSE ≤25. A minimum of 24 randomly selected 5-min electrofishing sites will be sampled in fall annually from 2022 to 2025. Exclusive of the original 24 random stations, another 12 random stations will be determined in the event some extra sampling is necessary to meet sample size and RSE requirements. A maximum of 36 stations will be sampled. Relative weight of Largemouth Bass ≥ 8 inches will be determined from their length/weight data. A genetic sample of 30 fish will be collected during electrofishing in 2025. A creel survey in 2025-2026 will collect angler effort, catch rate, and harvest information.

Crappie: Black and White Crappie are both present in O.H. Ivie Reservoir. From 2006 to 2022, percent directed angler effort ranged from 1.6% to 10.1%. From 2003 to 2017, total trap net catch rates ranged from 1.8 to 10.1 fish/nn. Trap netting has been ineffective at collecting adequate numbers of crappie to assess trends in size structure or abundance. Trap netting was discontinued in O.H. Ivie Reservoir after 2017, however, information on angler effort, catch rate, and harvest information for crappie will be collected during a creel survey in 2025-2026.

White Bass: White Bass are present in the reservoir and from 2006 to 2020, percent directed angler effort ranged from 1.2% to 14.5% making them the third most sought-after species in the reservoir. Gill net data from 2002 to 2022 indicate 13-66 stations would be needed to achieve an RSE ≤25, while 9-36 gill net stations would be needed to collect at least 50 stock size fish. Objectives for White Bass will be to collect 50 stock size fish to estimate size structure. Fifteen gill net nights will be set in spring 2026, but no additional sets will be made if objectives are not met in 15 nets. Relative weight of White Bass ≥ 5 inches will be determined from their length/weight data.

Catfish: Blue, Channel, and Flathead Catfish are all present in O.H. Ivie Reservoir. Collectively, catfish are the fourth most sought after species in the reservoir, ranging from 0.5 to 11.6% of the directed effort from 2006 to 2020. Several guide services targeting catfish operate on O.H. Ivie Reservoir and social media posts indicate large Blue and Flathead Catfish are caught regularly. However, gill nets have been ineffective at collecting sufficient numbers of fish for estimates of size structure and relative abundance. Past low-frequency electrofishing efforts have also been ineffective at collecting sufficient numbers of Blue and Flathead Catfish. The amount of sampling effort needed to achieve objectives for size structure and relative abundance is not reasonable. The sampling effort for White Bass, 15 gill net nights, will be sufficient to collect length and weight data on all catfish species encountered. However, no extra effort will be made to collect catfish species. Data on angler effort catch, and harvest will be collected during the 2025-2026 creel survey.

Forage: Sunfish, Gizzard Shad, and Threadfin Shad are important forage fish in O.H. Ivie Reservoir. From 2004 to 2021 total catch rates of Bluegill have ranged from 59.0 fish/h to 269.0 fish/h while Gizzard Shad have ranged from 66.0 fish/h to 269.3 fish/h. Threadfin Shad are present in low abundance. Continuation of sampling, as per Largemouth Bass above, will allow for monitoring of large-scale changes in Bluegill and Gizzard Shad relative abundance and size structure. Sampling effort based on achieving sampling objectives for Largemouth Bass should result in sufficient numbers of Bluegill for size structure estimation (PSD; 50 fish minimum with 80% confidence) and relative abundance estimates (RSE < 25 of CPUE-Total). At the sampling effort needed to achieve sampling objectives for Largemouth Bass, the expected RSE for CPUE-T is < 20. If the target for Bluegill sampling is not attained, no additional effort will be expended to achieve an RSE≤25 for CPUE of Bluegill.

Literature Cited

Anderson, R. O., and R. M. Neumann. 1996. Length, weight, and associated structural indices. Pages 447-482 in B. R. Murphy and D. W. Willis, editors. Fisheries techniques, 2nd edition. American Fisheries Society, Bethesda, Maryland.

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

Farooqi, M., M. K. Scott, and C. Bonds. 2010. Statewide freshwater fisheries monitoring and management program survey report for O.H. Ivie Reservoir, 2009. Texas Parks and Wildlife Department. Federal Aid Report F-30-R-35. Austin.

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.

Isermann, D. A., J. B. Maxwell, and M. C. McInerny. 2013. Temporal and Regional Trends in Black Bass Release Rates in Minnesota. North American Journal of Fisheries Management 33:344–350.

Myers, R., J. Taylor, M. Allen, and T. F. Bonvechio. 2008. Temporal Trends in Voluntary Release of Largemouth Bass. North American Journal of Fisheries Management28:428–433.

Texas Commission on Environmental Quality. 2020. Trophic classification of Texas reservoirs. 2020 Texas Integrated Report for Clean Water Act Sections 305(b) and 303(d), Austin. 15 pp.

United States Geological Society (USGS). 2022. National water information system: Web interface. Available: http://waterdata.usgs.gov/tx/nwis (April 2022).

Wright, L. D. 2018. O.H. Ivie Reservoir, 2017 Fisheries Management Survey Report. Texas Parks and Wildlife Department. Federal Aid Report F-221-M-3. Austin.

Tables and Figures

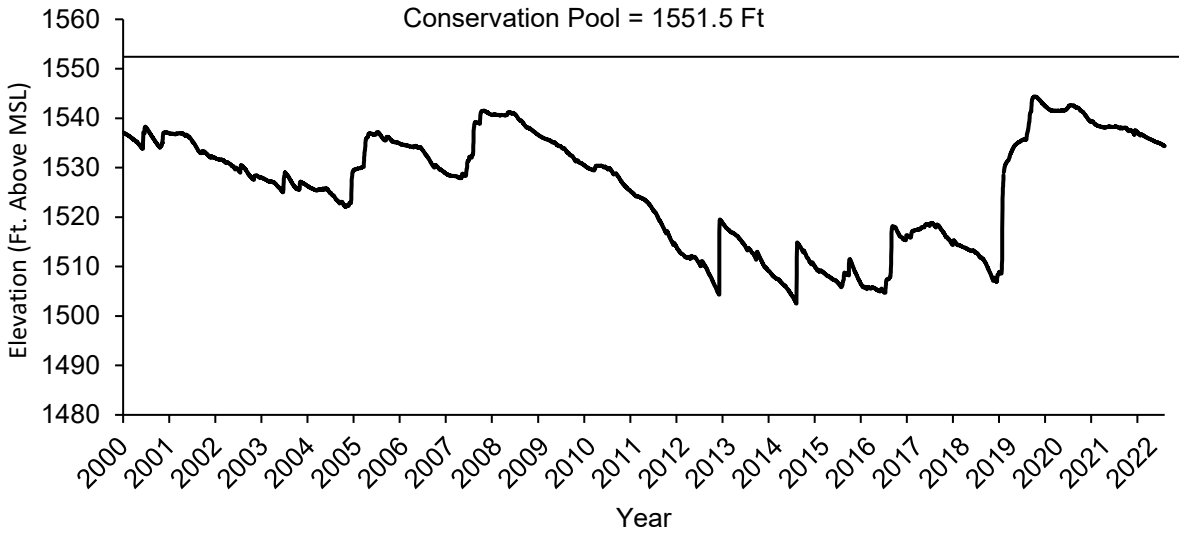


Figure 1. Water level elevations in feet above mean sea level (MSL) recorded for O.H. Ivie Reservoir, Texas.

Table 1. Characteristics of O.H. Ivie Reservoir, Texas.

Characteristic	Description
Year constructed	1990
Controlling authority	Colorado River Municipal Water District (CRMWD)
Counties	Concho, Runnels, and Coleman
Reservoir type	Mainstem on the Colorado River
Shoreline Development Index	10.6
Conductivity	1,100 – 1,400 µS/cm

Table 2. Boat ramp characteristics for O.H. Ivie Reservoir, Texas, April 2022. Reservoir elevation at time of survey was 1,535 feet above mean sea level.

Boat ramp	Latitude Longitude (dd)	Public	Parking capacity (N)	Elevation at end of boat ramp (ft)	Condition
Kennedy	31.53118 -99.64046	Y	110	1,500	Excellent, no access issues
Concho (west)	31.55526 -99.71170	Y	110	1,505	Excellent, no access issues
Concho (southwest)	31.55405 -99.71131	Y	(shared with Concho west)	1,530	Excellent, no access issues
Padgitt	31.57672 -99.67858	Y	85	1,504	Excellent, no access issues

Table 3. Harvest regulations for O.H. Ivie Reservoir, Texas.

Species	Bag limit	Length limit
Catfish: Channel and Blue Catfish, their hybrids and subspecies	25 (in any combination, only 10 may be > 20 inches)	None
Catfish, Flathead	5	18-inch minimum
Bass, White	25	10-inch minimum
Bass, Smallmouth	5	14-inch minimum
Bass, Largemouth	5 (only 2 may be < 18 inches)	None
Crappie: White and Black Crappie, their hybrids and subspecies	25 (in any combination)	10-inch minimum

Table 4. Stocking history of O.H. Ivie Reservoir, Texas. FRY = fry; FGL = fingerling; ADL = adults.

Species	Year	Number	Size
Threadfin Shad	1990	300	ADL
Coppernose Bluegill	1990	332,548	FGL
Bluegill	1991	103,335	FGL
	2016	59,482	FGL
	Species Total	162,817	
Blue Catfish	1990	194,510	FGL
	1991	192,381	FGL
	Species Total	386,891	
Channel Catfish	1990	195,561	FGL
	1991	194,875	FGL
	1996	250	ADL
	1999	250	ADL
	Species Total	390,936	
Flathead Catfish	1990	3,013	FRY
Smallmouth Bass	1990	120,802	FGL
Florida Largemouth Bass	1989	3,610	FGL
	1990	495,845	FRY
	1991	1,920,593	FGL
	1991	633	ADL
	1992	50	ADL
	1999	31,496	FGL
	1999	250	ADL
	2001	19,968	FGL
	2010	267,201	FGL
	2014	383,483	FGL
	2016	193,113	FGL
	2017	185,701	FGL
	2018	182,999	FGL
	2019	389,210	FGL
	2020	117,377	FGL
	2021	120,516	FGL
	Species Total	3,815,267	

Table 4. Stocking history. Continued.

Species	Year	Number	Size

ShareLunker Largemouth Bass	2010	8,143	FGL
	2011	34,064	FGL
	2012	3,271	FGL
	2020	4,828	FGL
	2021	77,316	FGL
	2022	52,292	FGL
	Species Total	179,914	
White Crappie	1990	122,638	FGL
	1991	183,661	FGL
	Species Total	306,299	
Walleye	1991	2,495,000	FRY
	1992	860,000	FRY
	1994	400,000	FRY
	Species Total	3,755,000	

Table 5. Objective-based sampling plan components for O.H. Ivie Reservoir, Texas 2018–2022.

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
	Condition	W_r	10 fish/inch group (max)
	Genetics	% FLMB	N = 30, any age
Bluegill [a]	Abundance	CPUE–Total	RSE ≤ 25
	Size structure	PSD, length frequency	N ≥ 50
Gizzard Shad [a]	Abundance	CPUE–Total	RSE ≤ 25
	Size structure	Length frequency	N ≥ 50
	Prey availability	IOV	N ≥ 50
Gill netting			
Blue Catfish	Abundance	CPUE–stock	Practical effort
	Size structure	length frequency	Practical effort
Channel Catfish	Abundance	CPUE–stock	Practical effort
	Size structure	length frequency	Practical effort
Flathead Catfish	Abundance	CPUE–stock	Practical effort
	Size structure	length frequency	Practical effort
White Bass	Abundance	CPUE–stock	RSE-Stock ≤ 25
	Size structure	length frequency	N ≥ 50

[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 aquatic vegetation, O.H. Ivie Reservoir, Texas, 2018–2021. Surface area (acres) is listed with percent of total reservoir surface area in parentheses.

Vegetation	2018	2019	2020	2021
Reservoir Surface Area	4,290	15,381	14,194	13,225
Native submersed				318.0 (2.4)
Native floating-leaved				0.0 (NA)
Native emergent				0.0 (NA)
Non-native				
Hydrilla (Tier I)*	0.0	0.0	0.0	< 1.0

*Tier I is immediate Response, Tier III is Watch Status

Table 7. Percent directed angler effort by species for O.H. Ivie Reservoir, Texas, 2010–2020. Survey periods were from 1 June through 31 May.

Species	2010/2011	2011/2012	2012/2013	2019/2020
Catfishes	5.3	4.5	4.5	11.6
White Bass	3.9	3.3	5.3	14.5
Sunfishes	1.0	0.1	0.1	0.4
Largemouth Bass	77.8	85.0	68.9	62.9
Crappies	5.2	1.6	10.1	7.3
Anything	6.8	5.6	11.2	3.2

Table 8. Total fishing effort (h) for all species and total directed expenditures at O.H. Ivie Reservoir, Texas, 2010-2020. Survey periods were from 1 June through 31 May. Relative standard error is in parentheses.

Creel statistic	2010/2011	2011/2012	2012/2013	2019/2020
Total fishing effort	149,842 (15)	74,337(15)	68,633 (22)	133,062 (34)
Total directed expenditures	$1,583,538 (21)	$949,276 (25)	$712,220 (33)	$1,237,161 (37)

Gizzard Shad

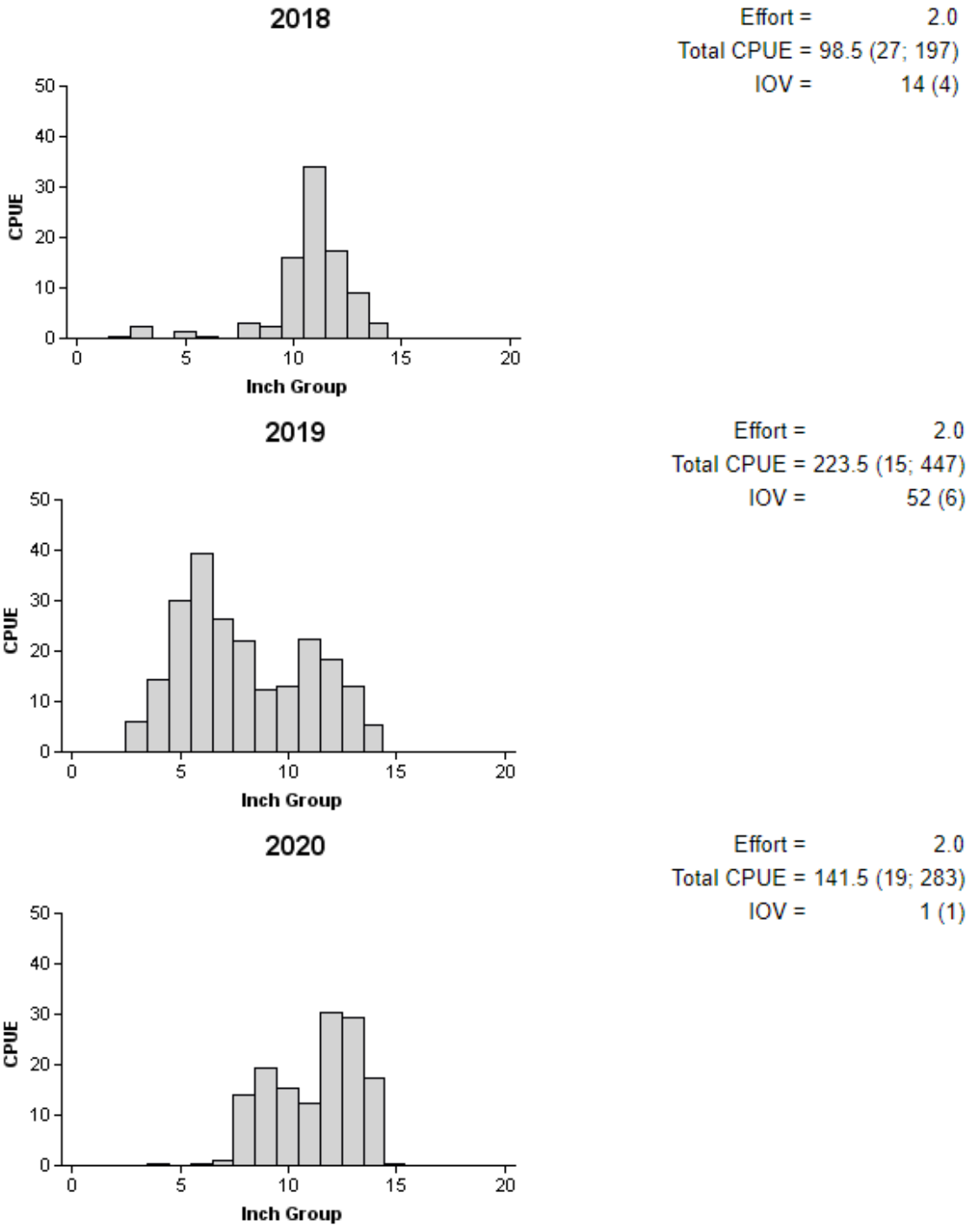
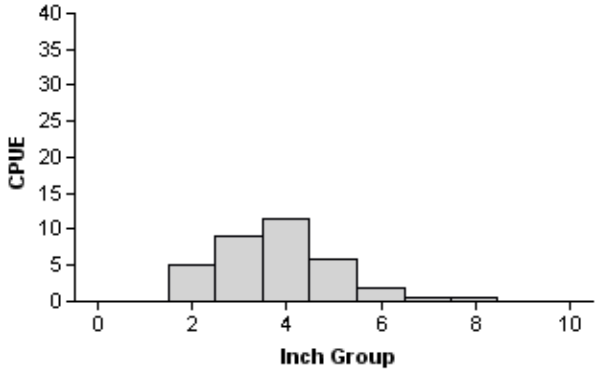


Figure 2. Number of Gizzard Shad caught per hour (CPUE) and population indices (RSE and N for CPUE and SE for IOV are in parentheses) for fall electrofishing surveys, O.H. Ivie Reservoir, Texas, 2018, 2019, and 2020.

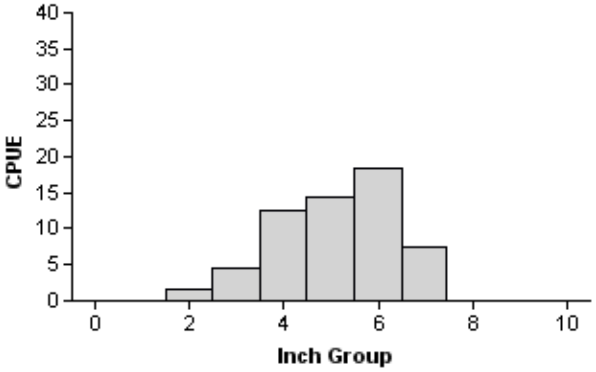
Bluegill

2018



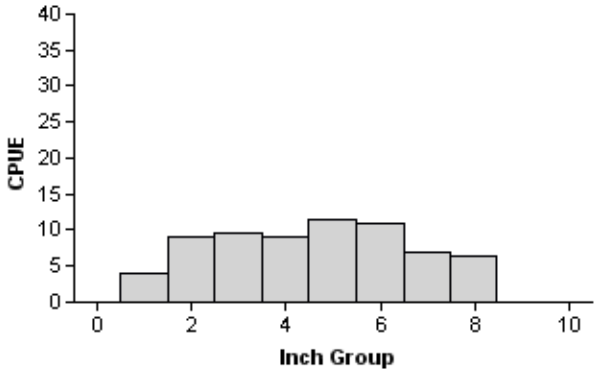
Effort = 2.0
Total CPUE = 34.5 (32; 69)
Stock CPUE = 29.5 (31; 59)
PSD = 10 (3)

2019

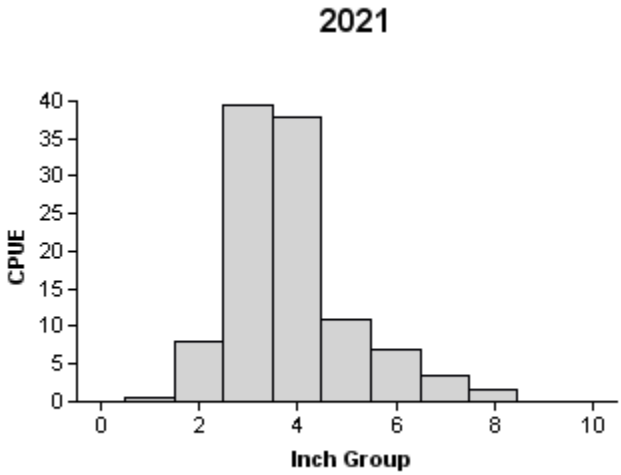


Effort = 2.0
Total CPUE = 59.0 (35; 118)
Stock CPUE = 57.5 (35; 115)
PSD = 45 (10)

2020



Effort = 2.0
Total CPUE = 67.5 (25; 135)
Stock CPUE = 54.5 (24; 109)
PSD = 45 (7)



Effort = 2.0
Total CPUE = 109.0 (24; 218)
Stock CPUE = 100.5 (25; 201)
PSD = 12 (3)

Figure 3. Number of Bluegill caught per hour (CPUE) and population indices (RSE and N for CPUE and SE for size structure are in parentheses) for fall electrofishing surveys, O.H. Ivie Reservoir, Texas, 2018, 2019, and 2020.

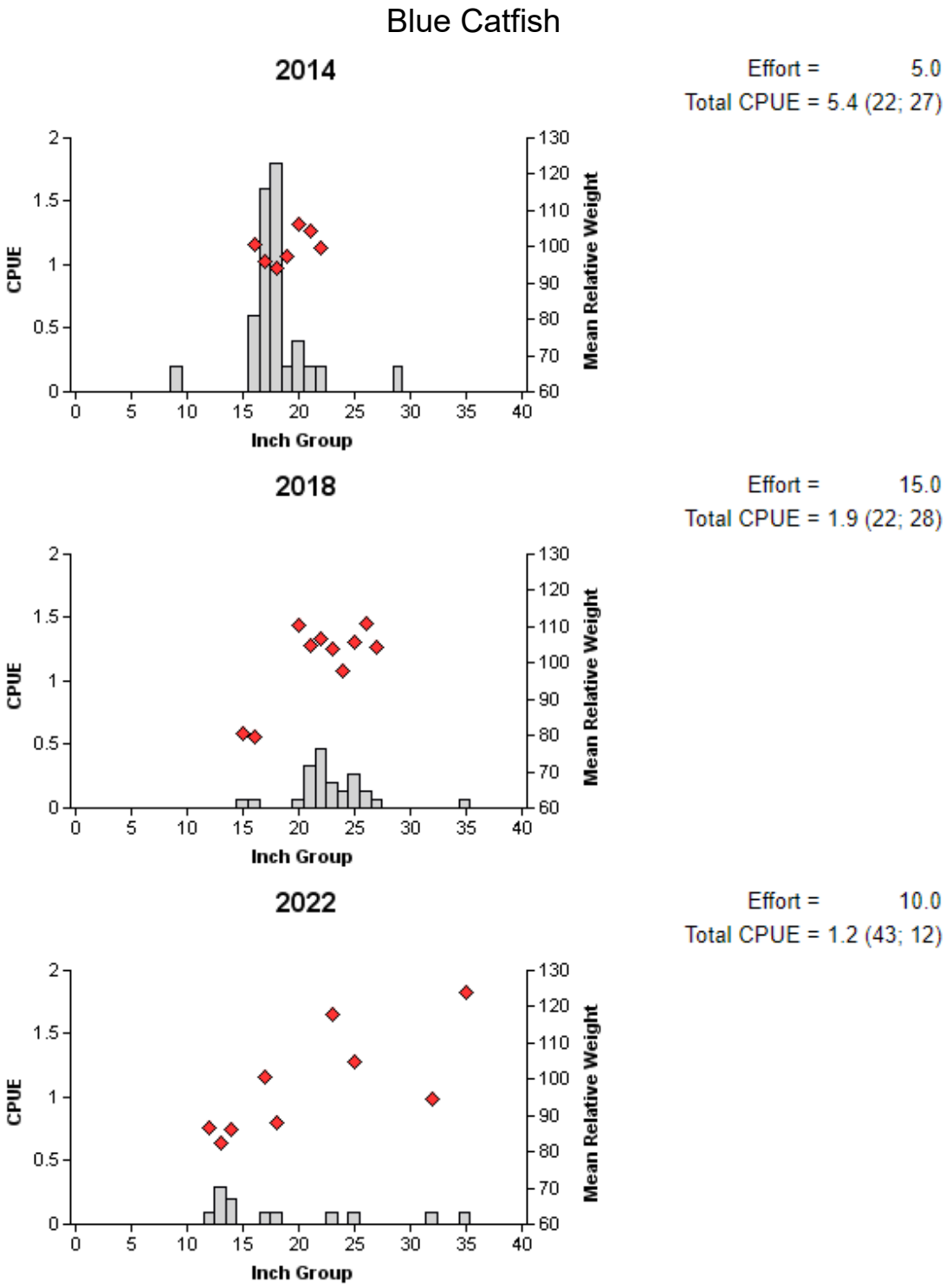


Figure 4. Number of Blue Catfish caught per net night (CPUE, bars), mean relative weight (diamonds), and population indices (RSE and N for CPUE are in parentheses) for spring gill net surveys, O.H. Ivie Reservoir, Texas, 2014, 2018, and 2022. Vertical green line represents the length limit demarcation.

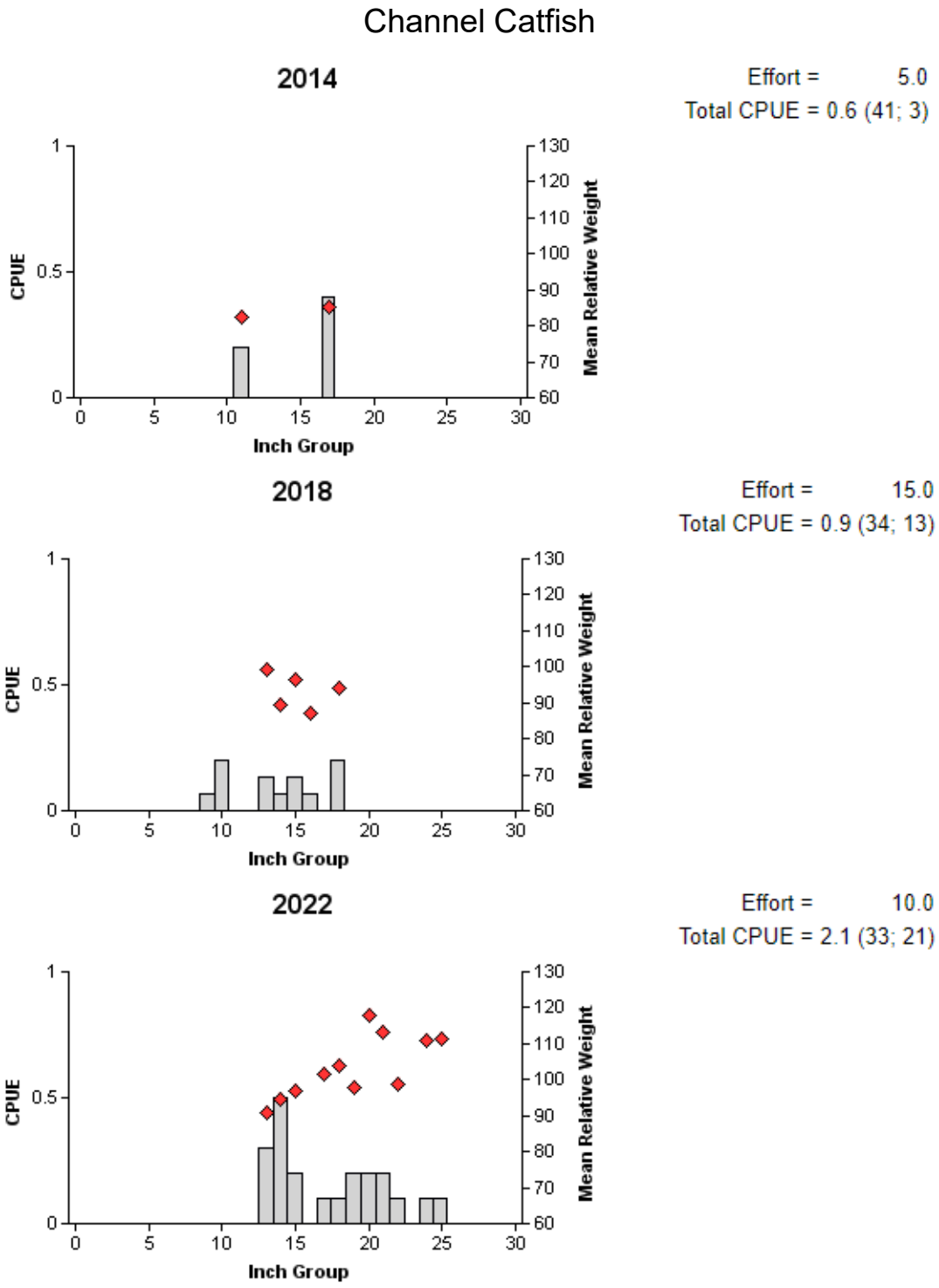


Figure 5. Number of Channel Catfish caught per net night (CPUE, bars), mean relative weight (diamonds), and population indices (RSE and N for CPUE are in parentheses) for spring gill net surveys, O.H. Ivie Reservoir, Texas, 2014, 2018, and 2022.

Table 9. Creel survey statistics for catfish species at O.H. Ivie Reservoir, Texas, from June 2010 through May 2011, June 2011 through May 2012, June 2012 through May 2013, and June 2019 through May 2020. Total catch per hour is for anglers targeting catfish species and total harvest is the estimated number of catfish harvested by all anglers. Relative standard errors (RSE) are in parentheses.

Creel survey statistic	Year			
	2010/2011	2011/2012	2012/2013	2019/2020
Surface area (acres)	8,966	5,579	5,469	15,381
Directed effort (h)	7,995 (25)	3,314 (34)	3,000 (36)	15,478 (37)
Directed effort/acre	0.89 (25)	0.59 (34)	0.55 (36)	1.00 (37)
Total catch per hour	0.43 (52)	0.56 (50)	0.51 (112)	0.17 (55)
Total harvest	1,734 (65)	1,275 (63)	1,936 (15)	1,253 (123)
Blue Catfish	113 (284)	81 (298)	0	710 (83)
Channel Catfish	1,608 (37)	1,194 (47)	1,936 (15)	449 (106)
Flathead Catfish	19 (1186)	0	0	94 (500)
Harvest/acre	0.19 (65)	0.23 (63)	0.35 (15)	0.08 (123)
Percent legal released	6	14	11	11

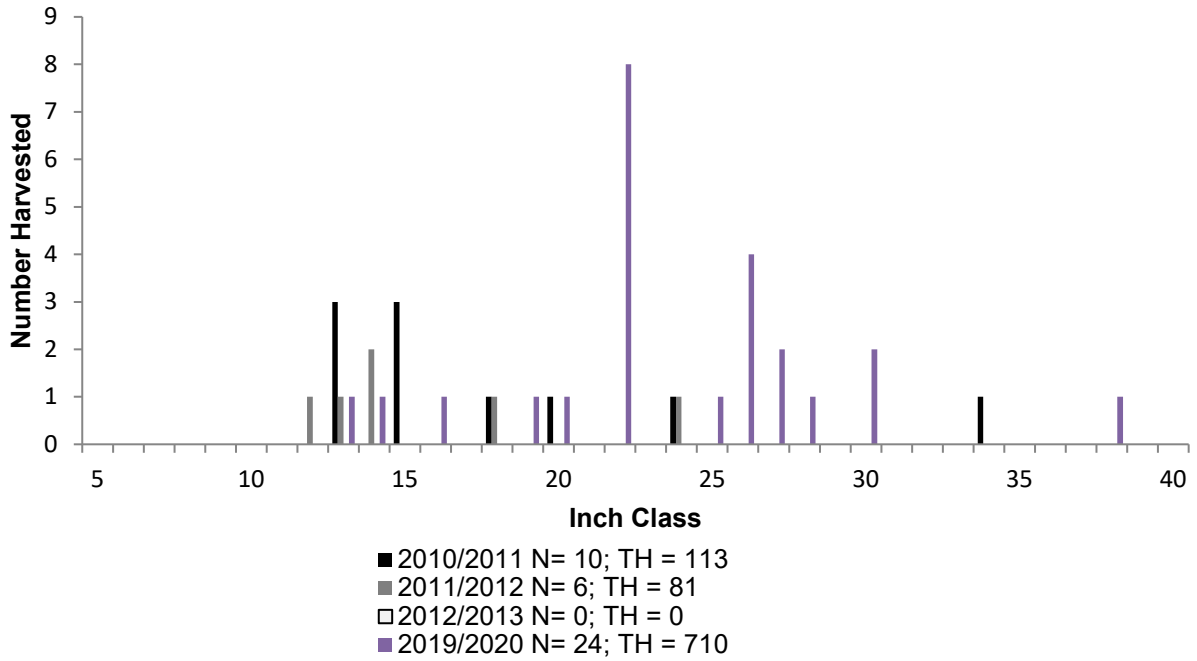


Figure 6. Length frequency of harvested Blue Catfish observed during creel surveys at O.H. Ivie Reservoir, Texas, June 2010 through May 2020, all anglers combined. N is the number of harvested Blue Catfish observed during creel surveys, and TH is the total estimated harvest for the creel period.

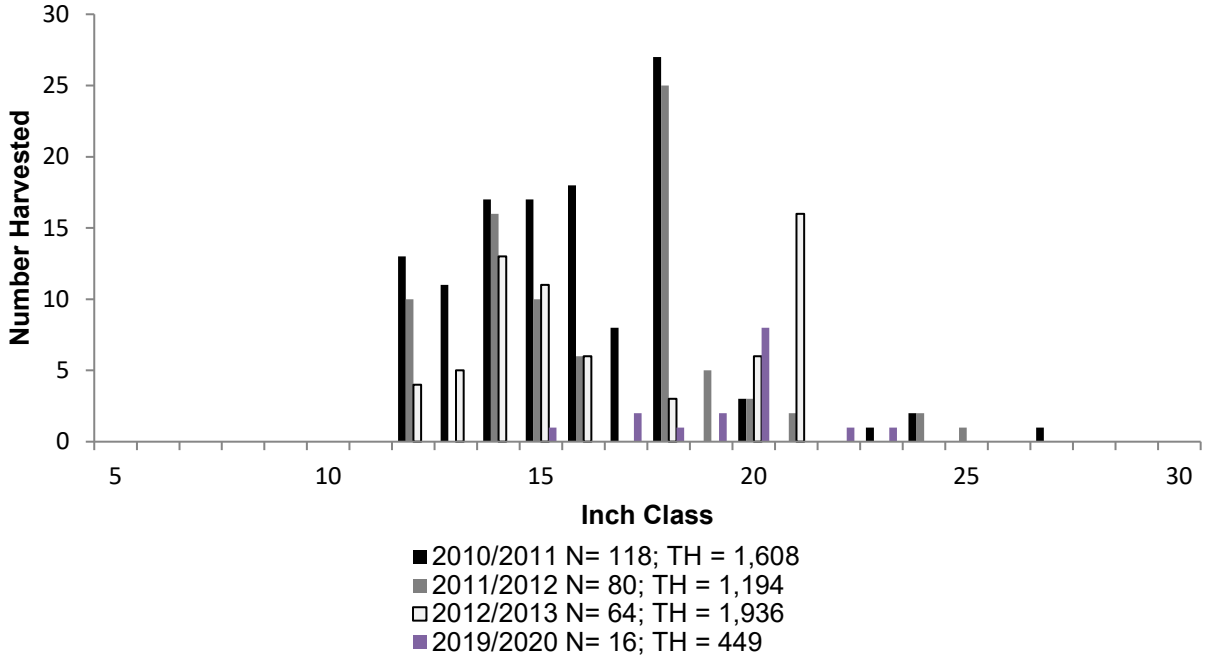


Figure 7. Length frequency of harvested Channel Catfish observed during creel surveys at O.H. Ivie Reservoir, Texas, June 2010 through May 2020, all anglers combined. N is the number of harvested Channel Catfish observed during creel surveys, and TH is the total estimated harvest for the creel period.

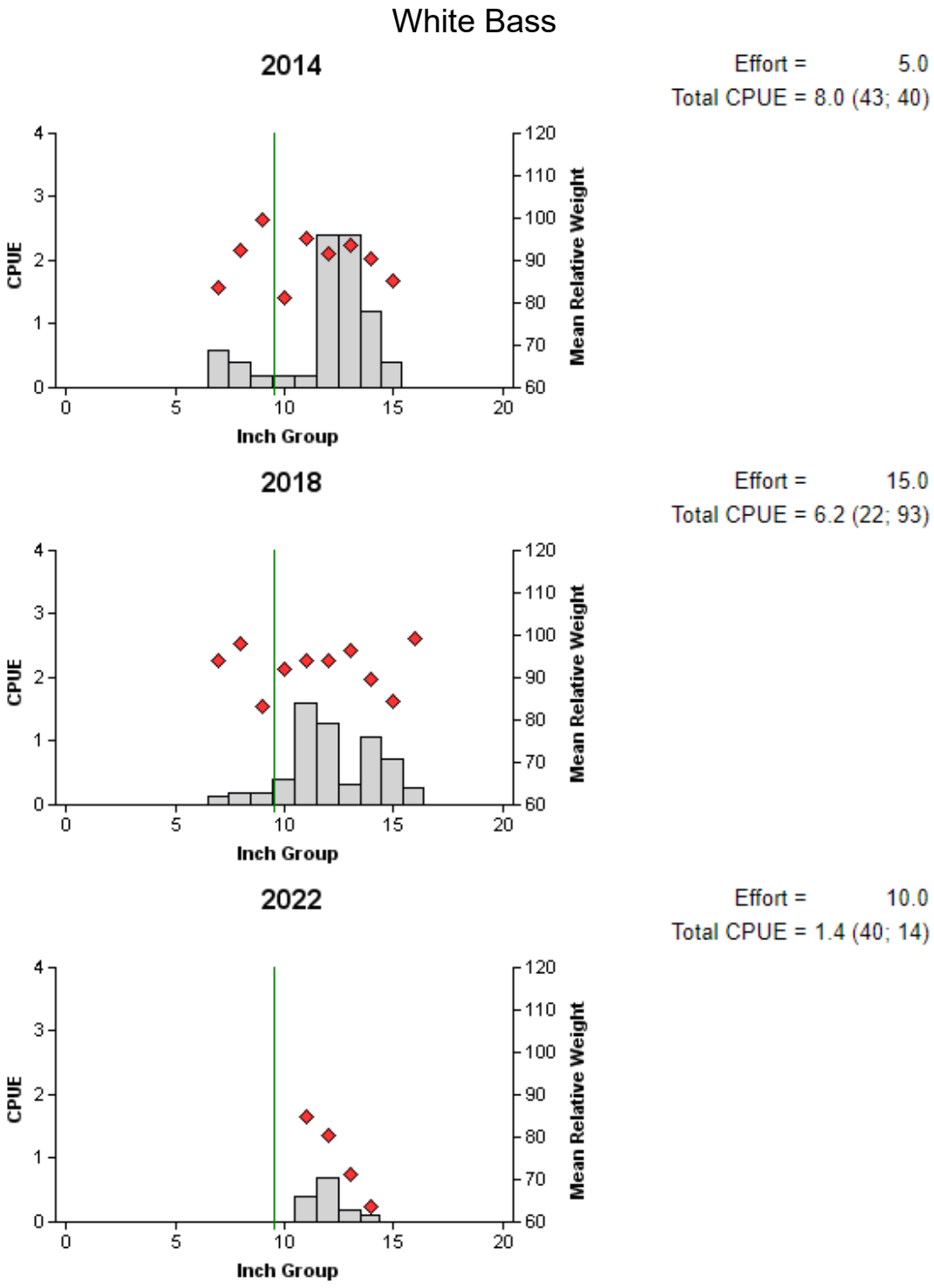


Figure 8. Number of White Bass caught per net night (CPUE, bars), mean relative weight (diamonds), and population indices (RSE and N for CPUE are in parentheses) for spring gill net surveys, O.H. Ivie Reservoir, Texas, 2014, 2018, and 2022. Vertical line indicates the minimum length limit.

Table 10. Creel survey statistics for White Bass at O.H. Ivie Reservoir, Texas, from June 2010 through May 2011, June 2011 through May 2012, June 2012 through May 2013, and June 2019 through May 2020. 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			
	2010/2011	2011/2012	2012/2013	2019/2020
Surface area (acres)	8,966	5,579	5,469	15,381
Directed effort (h)	5,845 (29)	2,452 (38)	3,636 (40)	19,317 (46)
Directed effort/acre	0.65 (29)	0.44 (38)	0.66 (40)	1.26 (46)
Total catch per hour	0.76 (80)	1.29 (28)	1.75 (67)	1.90 (30)
Total harvest	2,866 (34)	2,506 (39)	3,133 (45)	8,367 (53)
Harvest/acre	0.32 (34)	0.45 (39)	0.57 (45)	0.54 (53)
Percent legal released	44	37	55	56

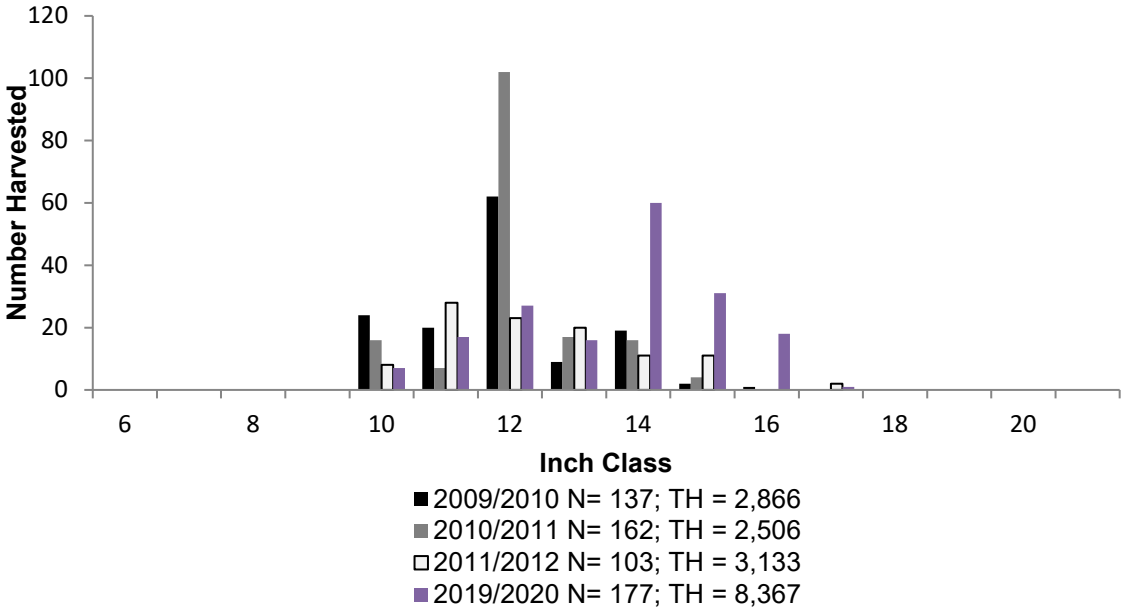
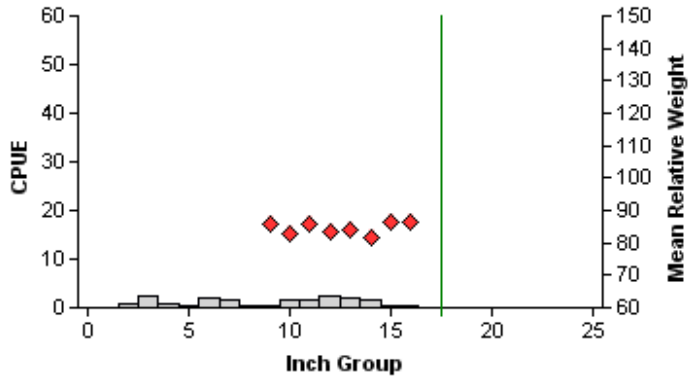


Figure 9. Length frequency of harvested White Bass observed during creel surveys at O.H. Ivie Reservoir, Texas, June 2010 through May 2020, all anglers combined. N is the number of harvested White Bass observed during creel surveys, and TH is the total estimated harvest for the creel period.

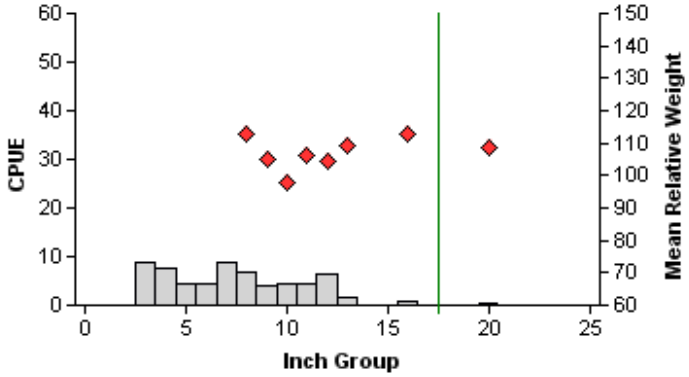
Largemouth Bass

2018



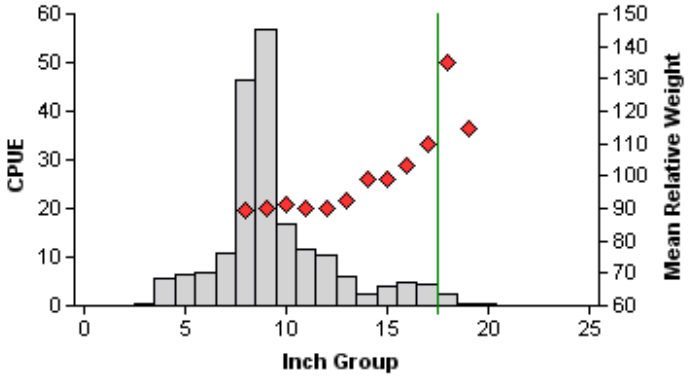
Effort =	2.0
Total CPUE =	19.5 (30; 39)
Stock CPUE =	11.0 (37; 22)
CPUE-18 =	0.0 (0; 0)
PSD =	64 (9)
PSD-P =	9 (6)
PSD-M =	0 (0)

2019



Effort =	2.0
Total CPUE =	64.0 (22; 128)
Stock CPUE =	29.5 (21; 59)
CPUE-18 =	0.5 (100; 1)
PSD =	32 (7)
PSD-P =	5 (3)
PSD-M =	2 (2)

2020



Effort =	2.0
Total CPUE =	198.5 (17; 397)
Stock CPUE =	168.0 (17; 336)
CPUE-18 =	4.5 (35; 9)
PSD =	21 (5)
PSD-P =	10 (2)
PSD-M =	0 (0)

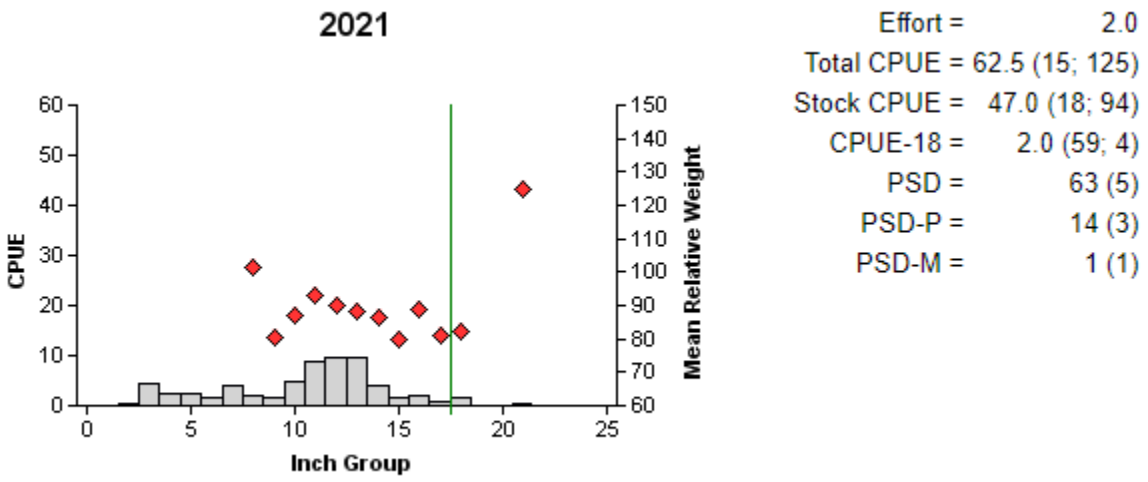


Figure 10. Number of Largemouth Bass caught per hour (CPUE, bars), mean relative weight (diamonds), and population indices (RSE and N for CPUE and SE for size structure are in parentheses) for fall electrofishing surveys, O.H. Ivie Reservoir, Texas, 2018, 2019, and 2020. Vertical line represents the length limit demarcation.

Table 11. Creel survey statistics for Largemouth Bass at O.H. Ivie Reservoir, Texas, from June 2010 through May 2020. Catch rate is for all anglers targeting Largemouth Bass. Harvest is partitioned by the estimated number of fish harvested by non-tournament anglers and the number of fish retained by tournament anglers for weigh-in and release. The estimated number of fish released by weight category is for anglers targeting Largemouth Bass. Relative standard errors (RSE) are in parentheses.

Statistic	2010/2011	2011/2012	2012/2013	2019/2020
Surface area (acres)	8,966	5,579	5,469	15,381
Directed angling effort (h)				
Tournament	25,408 (20)	32,860 (24)	15,486 (32)	29,883 (31)
Non-tournament	91,105 (16)	30,310 (21)	31,778 (21)	53,620 (39)
All black bass anglers combined	116,513 (17)	63,170 (23)	47,264 (23)	83,503 (36)
Angling effort/acre	13.0 (17)	11.3 (21)	8.6 (23)	5.4 (36)
Catch rate (number/h)	0.25 (13)	0.43 (12)	0.20 (15)	0.86 (17)
Non-tournament	0.27 (15)	0.25 (23)	0.21 (20)	0.84 (20)
Tournament	0.17 (23)	0.59 (12)	0.18 (18)	0.89 (19)
Harvest				
Non-tournament harvest	622 (31)	318 (73)	663 (48)	327 (61)
Harvest/acre	< 0.1 (31)	< 0.1 (73)	0.1 (48)	< 0.1 (61)
Tournament weigh-in and release	2,430 (36)	4,588 (41)	2,804 (63)	3,955 (48)
Release by weight				
<4.0 lbs	8,211 (45)	16,649 (48)	5,899 (75)	67,847 (62)
4.0-6.9 lbs	1,335 (52)	619 (65)	622 (85)	426 (123)
7.0-9.9 lbs	430 (65)	179 (91)	251 (82)	113 (166)
≥10.0 lbs	90 (78)	73 (111)	0 (NA)	0 (NA)
Percent legal released (non-tournament)	97	93	90	99

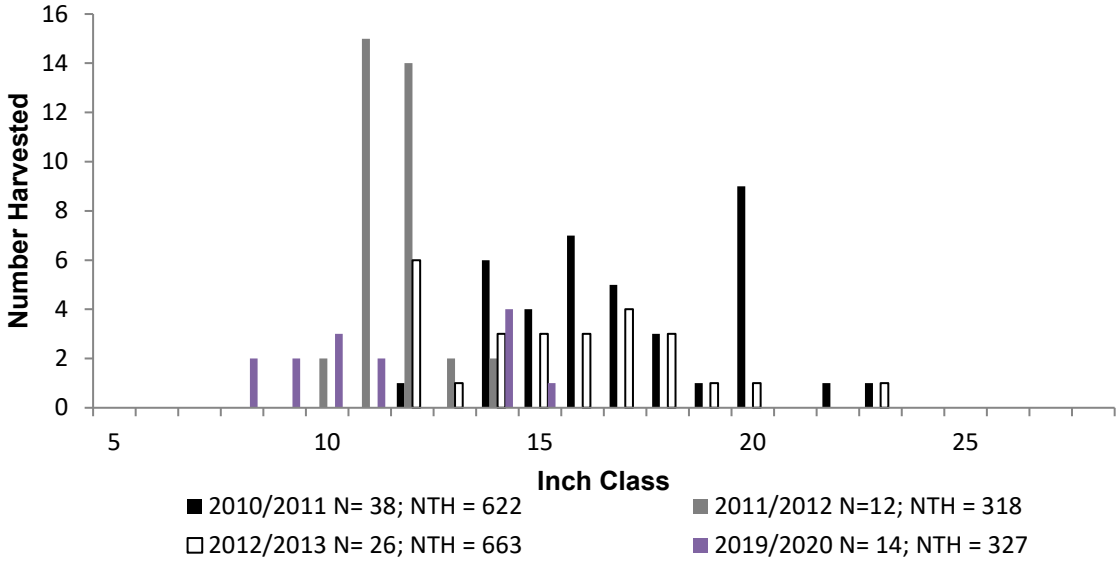


Figure 11. Length frequency of non-tournament harvested Largemouth Bass observed during creel surveys at O.H. Ivie Reservoir, Texas, June 2010 through May 2020, all anglers combined. N is the number of harvested Largemouth Bass observed during creel surveys, and NTH is the estimated non-tournament harvest for the creel period.

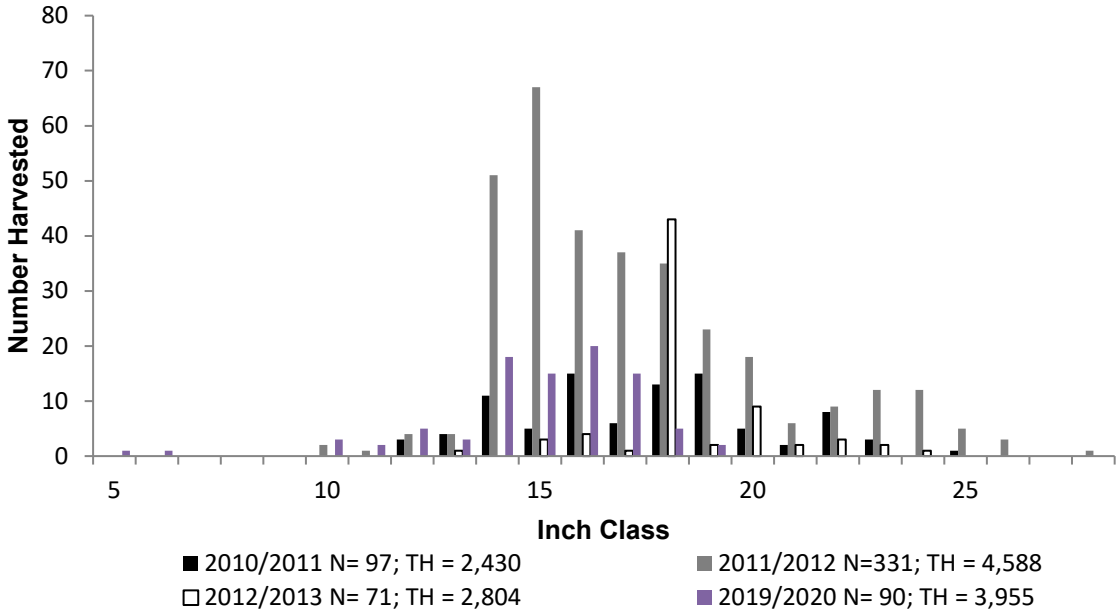


Figure 12. Length frequency of tournament harvested Largemouth Bass observed during creel surveys at O.H. Ivie Reservoir, Texas, June 2010 through May 2020, all anglers combined. N is the number of harvested Largemouth Bass observed during creel surveys, and TH is the estimated tournament harvest for the creel period

Table 12. Results of genetic analysis of Largemouth Bass collected by fall electrofishing, O.H. Ivie Reservoir, Texas, 2004, 2005, 2013, 2017, and 2021. 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	30	17	12	0	86	59
2005	95	23	72	0	76	24
2013	30	5	25	0	85	17
2017	30	5	24	1	76	17
2021	30	8	22	0	84	27

Crappie

Table 13. Creel survey statistics for White Crappie at O.H. Ivie Reservoir, Texas, from June 2010 through May 2011, June 2011 through May 2012, June 2012 through May 2013, and June 2019 through May 2020. Total catch per hour is for anglers targeting Crappie and total harvest is the estimated number of Crappie harvested by all anglers. Relative standard errors (RSE) are in parentheses.

Creel Survey Statistic	Year			
	2010/2011	2011/2012	2012/2013	2019/2020
Surface area (acres)	8,966	5,579	5,469	15,381
Directed effort (h)	7,785 (25)	1,160.25 (49)	6,941 (36)	9,684 (36)
Directed effort/acre	0.87 (25)	0.21 (49)	1.27 (36)	0.63 (36)
Total catch per hour	0.93 (22)	0.63 (41)	0.84 (33)	0.19 (119)
Total harvest	2326 (47)	668 (70)	4,504 (44)	1,486 (100)
White Crappie	2298 (36)	668 (70)	4,504 (44)	730 (93)
Black Crappie	28 (978)	NA	NA	756 (107)
Harvest/acre	0.26 (47)	0.12 (70)	0.82 (44)	0.10 (100)
Percent legal released	6	9	8	51

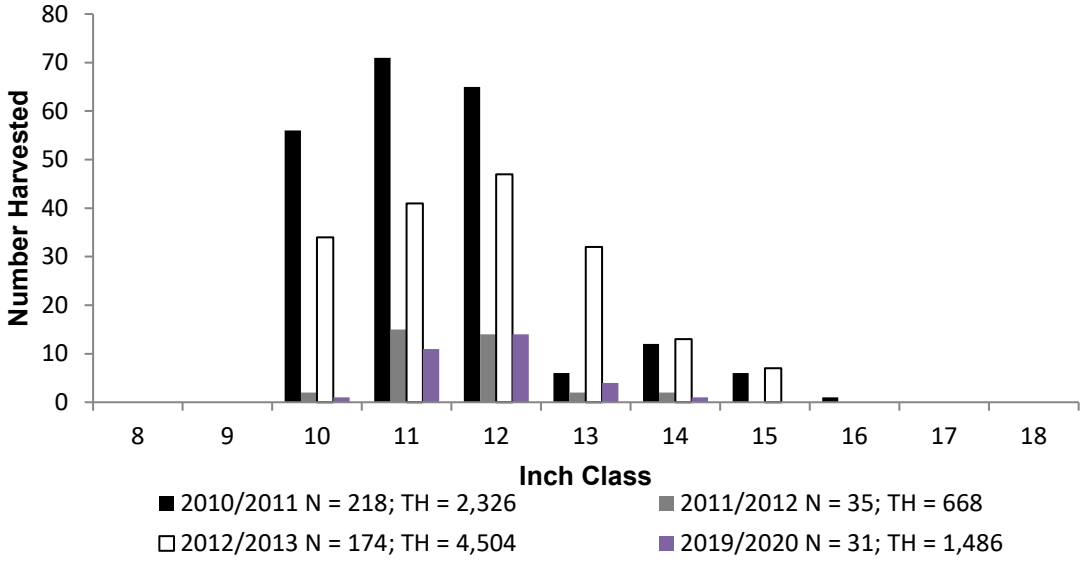


Figure 13. Length frequency of harvested Crappie (Black and White Combined) observed during creel surveys at O.H. Ivie Reservoir, Texas, June 2010 through May 2020, all anglers combined. N is the number of harvested Crappie observed during creel surveys, and TH is the total estimated harvest for the creel period.

Proposed Sampling Schedule

Table 14. Proposed sampling schedule for O.H. Ivie Reservoir, Texas. Survey period is June through May. Gill netting surveys are conducted in the spring, while electrofishing surveys are conducted in the fall.

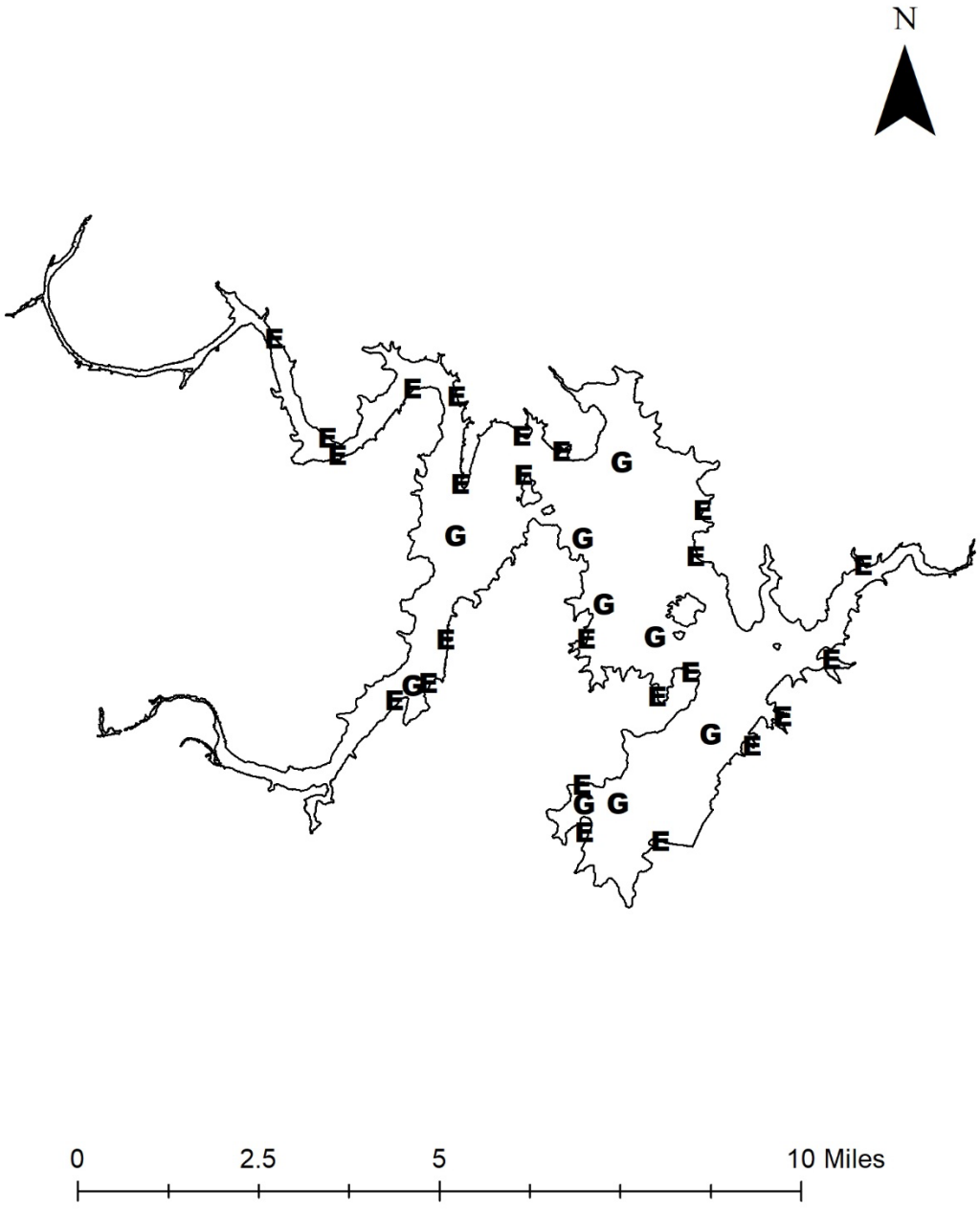
	Survey year			
	2022-2023	2023-2024	2024-2025	2025-2026
Angler Access				X
Structural Habitat				X
Vegetation	X	X	X	X
Electrofishing – Fall	X	X	X	X
Gill netting				X
Creel survey				X
Report				X

Appendix A - Catch rates for all target species from all gear types

Number (N) and catch rate (CPUE; RSE in parentheses) of all target species collected from all gear types from O.H. Ivie Reservoir, Texas, 2021-2022. Sampling effort was 10 net nights for gill netting and 2 hours for electrofishing.

Species	Gill Netting		Electrofishing	
	N	CPUE	N	CPUE
Gizzard Shad			253	126.5 (20)
Blue Catfish	12	1.2 (43)		
Channel Catfish	21	2.1 (33)		
White Bass	14	1.4 (40)		
Green Sunfish			2	1.0 (100)
Warmouth			8	4.0 (39)
Bluegill			218	109.0 (24)
Longear Sunfish			10	5.0 (52)
Redear Sunfish			1	0.5 (100)
Largemouth Bass			125	62.5 (15)

Appendix B - Map of sampling locations



Location of sampling sites, O.H. Ivie Reservoir, Texas, 2021-2022. Gill net and electrofishing stations are indicated by G and E, respectively. Water level was approx. 17 feet below conservation pool at time of sampling.

Appendix C - Historical growth rates for Largemouth Bass

Mean age-at-length for Largemouth Bass (sexes combined) at 14, 16, and 18 inches and calculated Von Bertalanffy parameters (L-infinity – the asymptotic length, and K – the growth rate) collected during fall electrofishing surveys, O.H. Ivie Reservoir, Texas, 1996, 1999, 2000, 2001, 2002, 2004, 2005, 2009, and 2020.

Sample Year	Sample Size	Mean age at length			Von Bertalanffy Parameters	
		14 inches	16 inches	18 inches	L-Infinity	K-Coefficient
1996	99	2.9	4.2	8.7	18.2	- 0.503
1999	272	3.2	5.9	NA	16.5	- 0.585
2000	139	3.1	5.5	NA	16.7	- 0.587
2001	123	3.1	4.7	NA	17.7	- 0.498
2002	140	3.2	7.1	NA	16.2	- 0.639
2004	174	2.6	6.5	NA	16.1	- 0.805
2005	143	2.5	3.3	4.6	20.3	- 0.470
2009	206	2.5	3.1	3.8	25.4	- 0.320
2020	254	2.5	3.2	4.2	22.1	- 0.403

Appendix D - Historical creel data for Largemouth Bass

Year	Surface Acres	Total Effort	Tournament Effort	Effort Per Acre	Catch Per Hour	Total Harvest	Tournament Weight-in and release	Spring Quarter Only Total Effort	Spring Quarter Only Catch Per Hour
2021-2022*	12,287	*167,943*	*36,178*	13.7	0.39	*723*	*6,424*	92,033	0.39
2019-2020	15,381	83,503	29,883	5.4	0.86	328	3,956	51,402	1.00
2013-2014*	4,349	*34,721*	*13,393*	8.0	0.31	*375*	*3,242*	13,506	0.34
2012-2013	5,469	47,263	15,486	8.6	0.20	663	2,805	26,951	0.15
2011-2012	5,579	63,170	32,860	11.3	0.43	318	4,588	36,615	0.55
2010-2011	8,966	116,513	25,408	13.0	0.25	622	2,430	43,654	0.23
2009-2010	11,012	85,684	36,640	7.8	0.33	1,316	4,065	23,365	0.19
2008-2009	13,037	68,293	38,500	5.2	0.51	693	4,396	43,188	0.52
2007-2008	14,393	59,270	14,713	4.1	0.24	932	2,293	26,882	0.24
2006-2007	10,874	185,799	124,353	17.1	0.66	2,263	15,696	149,583	0.65
2005-2006	12,475	43,251	UNK	3.5	0.78	1,272	0	31,853	0.98
2004-2005	10,168	50,535	UNK	5.0	0.30	1,580	5,601	31,384	0.33
2003-2004	9,501	82,048	UNK	8.6	0.24	1,032	3,656	35,077	0.28
2002-2003	10,000	97,682	UNK	9.8	0.32	2,187	6,559	45,258	0.36
2001-2002	11,537	100,092	UNK	8.7	0.43	UNK	UNK	34,779	0.42
2000-2001	13,037	135,234	UNK	10.4	0.45	UNK	UNK	78,310	0.46
AVG	10,504	88,813	37,329	8.5	0.42	997	4,837	48,159	0.44

*****Data in italics (2021-2022 and 2013-2014) are extrapolated to a full-year estimate. Quarterly percentages of angler effort and harvest were estimated from previous full-year creel surveys and used to adjust estimates from partial creel surveys.

Appendix E - Historical averages for selected population metrics

Largemouth Bass – Fall Electrofishing

Metric	Mean (RSE)	Range	Inter-Quartile Range
CPUE-Total	72.7 (12)	17.0-198.5	49.5-79.9
CPUE-Stock	37.5 (18)	8.5-168.0	21.9-42.3
CPUE-18	2.1 (15)	0.0-5.5	0.9-2.5
PSD	55 (7)	21-86	47-65
PSD-P	22 (10)	5-43	13-30
PSD-M	3 (35)	0-24	1-3
Relative weight W_r	89.8 (2)	80.0-106.5	85.1-92.1

Gizzard Shad – Fall Electrofishing

Metric	Mean (RSE)	Range	Inter-Quartile Range
CPUE-Total	150.2 (9)	66.0-292.2	98.5-187.4
IOV	43 (13)	1-85	21-65

Threadfin Shad – Fall Electrofishing

Metric	Mean (RSE)	Range	Inter-Quartile Range
CPUE-Total	9.2 (16)	0.0-22.0	3.6-13.4

Bluegill – Fall Electrofishing

Metric	Mean (RSE)	Range	Inter-Quartile Range
CPUE-Total	113.0 (11)	31.5-269.0	70.7-157.4
PSD	27 (10)	10-52	17-32

Catfishes – Spring Gill Netting

Metric	Mean (RSE)	Range	Inter-Quartile Range
Blue CPUE-Total	1.3 (47)	0.1-5.4	0.4-1.4
Channel CPUE-Total	1.3 (20)	0.5-2.6	0.8-1.6
Flathead CPUE-Total	0.3 (29)	0.0-0.7	0.1-0.5

White Bass – Spring Gill Netting

Metric	Mean (RSE)	Range	Inter-Quartile Range
CPUE-Total	4.8 (16)	1.4-8.0	3.6-6.5
PSD	80 (6)	66-100	71-90
PSD-P	52 (13)	25-80	39-64

White Crappie – Fall Trap Netting

Metric	Mean (RSE)	Range	Inter-Quartile Range
CPUE-Total	4.7 (21)	1.8-10.7	2.3-6.7
CPUE-Stock	2.0 (21)	0.8-4.8	1.2-2.4

Note: Historical averages calculated since 1996. The number of surveys for each gear type was 22 for fall electrofishing, 9 for fall trap netting, and 8 for spring gill netting.

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