

PERFORMANCE REPORT

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FEDERAL AID PROJECT F-221-M-2

INLAND FISHERIES DIVISION MONITORING AND MANAGEMENT PROGRAM

2016 Fisheries Management Survey Report

Striker Reservoir

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SURVEY AND MANAGEMENT SUMMARY

Fish populations in Striker Reservoir were surveyed in 2016 using daytime electrofishing and in 2017 using tandem hoop nets. Historical data are presented with the 2016-2017 data for comparison where appropriate. This report summarizes the results of the surveys and contains a management plan for the reservoir based on those findings.

- * **Reservoir Description:** Striker Reservoir is an impoundment of Striker Creek, a tributary of the Angelina River in the Neches River Basin. The Angelina-Nacogdoches County Water Control and Improvement District is the controlling authority. Primary uses are flood control, condenser cooling for a steam-electric generating plant, and recreation. This reservoir has a surface area of 1,920 acres at conservation pool (293 feet MSL), a shoreline length of 13.7 miles, and an average depth of 15 feet. Water level fluctuates 1-3 feet annually. Two public boat ramps are available and bank access is adequate.
 - * **Management History:** Important sport fish include catfish, black bass, crappie, and White Bass. The management plan from the 2008 survey report included stocking Blue Catfish at 50 fish/acre in 2009 and 2010. Striker Reservoir has limited habitat which has resulted in reduced fish recruitment and angler catch. In 2010, brush piles were introduced to improve angler catch. Giant Salvinia was identified on the reservoir in fall 2012. Periodic herbicide treatments were initiated in 2014 and have continued to present. A treatment plan allowing property owners to remove and dispose of Salvinia mechanically was initiated in 2014. In 2015 a floating barrier was installed in early spring and Salvinia weevils were released in the fall. By 2016 the area of occupancy by Giant Salvinia was significantly reduced.
 - * **Fish Community**
 - **Prey species:** Historically, prey abundance has been relatively low. In 2016, Threadfin Shad abundance was higher than Gizzard Shad and few Gizzard Shad were suitable size as prey. Total electrofishing catch of sunfishes (Warmouth, Bluegill, Longear Sunfish, and Redear Sunfish) was higher than shad and most were of suitable size.
 - **Catfishes:** No Blue or Channel Catfish were collected in tandem hoop net samples but anecdotal information suggests catfish were still present.
 - **White Bass:** White Bass were observed during electrofishing but are not a target species so were not collected.
 - **Black basses:** Spotted Bass were collected but are unlikely to support a fishery. Largemouth Bass size distribution is within the target range for a balanced population but relative abundance is low and condition is poor.
- Management Strategies:** Continue assisting the controlling authority with Giant Salvinia management. Continue annual vegetation surveys. Conduct the next full sampling cycle and report in 2019-2020.

INTRODUCTION

This document is a summary of fisheries data collected from Striker Reservoir in 2016-2017. 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 2016-2017 data for comparison.

Reservoir Description

Striker Reservoir is a 1,920-acre impoundment constructed in 1957 on Striker Creek (Table 1). It is located in Rusk County approximately 15 miles east of Jacksonville and is operated and controlled by the Angelina-Nacogdoches Counties Water Control and Improvement District. Primary water uses include flood control, condenser cooling for a steam-electric generating plant, and recreation. Striker Reservoir is classified as eutrophic with a Carlson's Trophic State index of 45.2 (Texas Commission on Environmental Quality 2011); Conservation pool is at 293 feet MSL and water level fluctuates 1-3 feet annually (Figure 1); secchi visibility averages 2.5 feet. Habitat has historically consisted of standing timber, boat docks, riprap, and limited aquatic vegetation (Ashe and Driscoll 2008). The majority of the land surrounding the reservoir is used for agriculture, timber production, and residential development.

Angler Access

Striker Reservoir has one improved boat ramp at Lake Striker Marina, which was dredged and extended during low water levels in 2012. A second unimproved boat ramp is available on the north end of the reservoir. Additional boat ramp characteristics are in Table 2. Shoreline access is limited to the boat ramp areas and the courtesy dock located at Lake Striker Marina.

Management History

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

1. In coordination with the controlling authority, place brush piles throughout the reservoir to provide habitat and increase angler catch efficiency. Continue to recommend periodic drawdowns (3-5 feet) to increase littoral habitat (i.e., inundated terrestrial growth).
Action: Discovery of Giant Salvinia (*Salvinia Molesta*) in fall 2012 shifted priorities relating to habitat management; no additional brush piles were constructed and the controlling authority was not willing to manipulate water level.
2. Cooperate with the controlling authority to post appropriate signage at access points around the reservoir. Contact and educate marina owners about invasive species, and provide them with posters, literature, etc...Educate the public about invasive species through the use of media and the internet.
Action: Following discovery of Giant Salvinia the upper boat ramp was temporarily closed and signage was placed at both ramps advising of infestation. A management plan featuring physical containment, herbicide application, mechanical removal, and Salvinia weevil (*Cyrtobagous salviniae*) release was developed and implemented. District staff attended multiple public meetings with stakeholders and distributed outreach information. Controlling authority and local law enforcement personnel were informed regarding the threat posed by Giant Salvinia.

Harvest regulation history: Sport fishes in Striker Reservoir are currently managed with statewide regulations (Table 3). From 1994 to 1998, Largemouth Bass (*Micropterus salmoides*) were managed with a 14 to 18-inch slot-length limit in an attempt to reduce the number of smaller fish and provide protection for larger fish. The slot limit was evaluated and the population structure had not improved, so statewide regulations were reinstated in 1999.

Stocking history: Florida Largemouth Bass (*M. S. Floridanus*) fingerlings were stocked in 1976, 1995, and 1997 (440,186 total). Palmetto Bass (*Morone chrysops x saxatilis*) were stocked in 1998 and 1999 (73,238 total). Threadfin Shad were successfully introduced in 1974 and 1976. Blue Catfish (*Ictalurus furcatus*) were most recently stocked in 2009 and 2010 (191,690 total). The complete stocking history is shown in Table 4.

Vegetation/habitat management history: Striker Reservoir's submersed aquatic vegetation coverage has historically been limited (Table 6). The feasibility of conducting a fertilization program was assessed in 2006, but related costs and the amount of fertilizer needed were impractical. Water Willow (*Justicia Americana*) introductions were conducted in 2009 and 2012. In coordination with the controlling authority and the Lake Striker Homeowner Association, brush piles were deployed on several occasions to increase habitat and angler catch. As part of research exploring brush pile size and configuration, over 200 cedar trees (*Juniperus spp.*) were deployed in 2011. Giant Salvinia was first documented at the reservoir in fall 2012. In June 2014 an integrated management plan featuring containment, herbicide treatments, Salvinia weevil release, and mechanical removal was implemented. In August 2014, the upper boat ramp was temporarily closed to reduce the probability of Giant Salvinia being transferred to other water bodies and warning signage was erected. In October 2014, the first regular herbicide treatments were conducted. In November 2014, the controlling authority filed an Aquatic Vegetation Treatment Proposal for mechanical removal giving waterfront property owners the option of collecting and removing Giant Salvinia from their waterfront for proper disposal. In February 2015, a floating barrier (containment boom) was installed upstream from the upper boat ramp to minimize movement of Salvinia and facilitating herbicide treatment which ultimately allowed the boat ramp to be re-opened. In June 2015 Striker Reservoir was added to a list of reservoirs that could receive funding from the Rider 34 (Statewide Aquatic Vegetation and Invasive Species Management). This allowed district staff to initiate development of an Inter-local contract with the controlling authority to allow reimbursement of up to \$20,000 annually in herbicide treatments for FY 2016 and 2017; all prior costs were incurred by the controlling authority. In October 2015, approximately 370 lbs. of Giant Salvinia containing an estimated 21,000 adult Salvinia Weevils was distributed into the untreated area upstream of the boom. Using funding from Rider 34 herbicide treatments are expanded to the previously-untreated area upstream from the boom and continued during the growing season of 2016 and into 2017.

Water transfer: The controlling authority, the Angelina and Nacogdoches Water Control and Improvement District No. 1, sells water for industrial use to Luminant Energy, which operates a power plant on the western shore of the reservoir. The controlling authority also provides cooling water for Southern Company's biomass-fired power plant in Sacul, which is about 10 miles southeast of the reservoir. The City of Henderson also has an option for future water use. No inter-basin transfer of water is known to occur.

METHODS

Surveys were conducted to achieve survey and sampling objectives in accordance with the objective-based sampling (OBS) plan for Striker Reservoir (TPWD unpublished). Primary components 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 2015).

Electrofishing – Largemouth Bass, Sunfishes (*Lepomis spp.*), Gizzard Shad (*Dorsoma cepedianum*), and Threadfin Shad (*D. petenense*) were collected by electrofishing (1 hour at 12, 5-min stations). Due to the extreme turbidity sampling was conducted during daylight hours. Catch per unit effort (CPUE) for electrofishing was recorded as the number of fish caught per hour (fish/h) of actual electrofishing.

Tandem hoop nets – Channel Catfish (*Ictalurus punctatus*) were sampled using 5 tandem hoop-net series at 5 stations. Nets were baited with soap and deployed for 2-night soak durations. CPUE for tandem

hoop netting was recorded as the number of fish caught per tandem hoop net series (fish/series).

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.

Source for water level data was from the Angelina and Nacogdoches Counties Water Control and Improvement District No. 1. Trophic status was provided by Texas Commission on Environmental Quality, (2011).

RESULTS AND DISCUSSION

Habitat: A Littoral zone habitat survey was last conducted in 2008 and consisted primarily of standing timber and boat docks (Ashe and Driscoll 2009). Native aquatic vegetation in 2016 consisted primarily of emergent and floating-leaved species and occupied approximately 169 acres (Table 6). Buttonbush (*Cephalanthus occidentalis*), Giant Cutgrass (*Zizaniopsis miliacea*) and Spadardock (*Nuphar lutea*) were the most abundant species. Water Willow, was introduced in 2009 and 2012 (Ashe and Driscoll 2013), and has persisted but expansion is minimal. The submersed species Southern naiad (*Najas guadalupensis*) which occupied 95 acres in the 2012 survey was not detected in 2016. The aquatic invasive species (AIS) Giant Salvinia was detected in fall 2012. This species was likely introduced by boats and trailers using the 8-Ball boat ramp on the upper end of the reservoir. This species rapidly expanded and occupied 165 acres by summer 2014. A management plan implemented in 2014 successfully reduced coverage to 12 acres by 2016. Hydrilla (*Hydrilla verticillata*) was identified in trace amounts in 2012 but was not detected in 2016. Approximately 1 acre of Alligatorweed (*Alternanthera philoxeroides*) was detected in 2016 and this species is likely controlled as collateral damage from herbicides used to treat Giant Salvinia.

Prey species: Historically, prey abundance has been limited (Figures 2 and 4). Electrofishing catch rate of Threadfin Shad was 86.0/h in 2016 (Appendix A). Catch rate Gizzard Shad was low (9.0/h) and the percentage available as prey was also low (IOV=22) (Figure 3). Bluegill (*L. macrochirus*) was the most abundant sunfish species but catch rate was only 71.0/h; however, most were ≤ 4 inches in length and were available as prey (Figure 5). Other species available as prey included Longear Sunfish (*L. megalotis*), Warmouth (*L. gulosus*), and Redear Sunfish (*L. microlophus*) (Appendix A).

Catfishes: Previous surveys with gill nets indicated a low but stable Channel Catfish population (Ashe and Driscoll 2013). No Blue or Channel Catfish were collected in the baited tandem-hoop net sets in 2017. However, one dead Channel Catfish was observed during the survey. It is possible that setting tandem hoop nets later in the season (when water temperatures have increased) would improve sampling efficiency.

White Bass: White Bass were observed during electrofishing but are not a target species so they were not collected.

Black basses: Both Spotted Bass (*M. punctulatus*) and Largemouth Bass were documented in the electrofishing survey (Appendix A). Electrofishing catch rates of Spotted Bass were substantially higher in 2008 and 2012 with night sampling (Figure 6). Only five Spotted Bass were collected in 2016 (5.0/h) and, although PSD was 100 (Figure 7) and catch rates may have been reduced because of day electrofishing, it is unlikely that this species supports a significant fishery. Like Spotted Bass, Largemouth Bass electrofishing catch rates in 2008 and 2012, with night electrofishing was much higher than in 2016 with day electrofishing (Figures 8 and 9). Although electrofishing catch rate (11/h) was low (Figure 9), PSD (44) was in the target range of 40-70 (Guy et al. 2007). However, relative weight (W_r) was below 90 for all stock-sized specimens and is indicative of poor prey availability.

Fisheries management plan for Striker Reservoir, Texas

Prepared – July 2017.

ISSUE 1: Infestation by Giant Salvinia is the most important ecosystem level issue at Striker Reservoir and has the potential to disrupt fishery, residential, recreational, and commercial uses.

MANAGEMENT STRATEGIES

1. Continue annual Aquatic Nuisance Species surveys of Striker Reservoir with emphasis on Giant Salvinia.
3. Continue to assist the controlling authority in obtaining TPWD invasive species funding for chemical treatment of Giant Salvinia.
4. Continue to monitor the condition of the containment boom in the upper end of the reservoir to reduce the probability that Giant Salvinia will be transferred to other reservoirs.
5. Continue to assist the controlling authority in conducting outreach to reduce spread of Giant Salvinia with emphasis on Clean Drain Dry campaign materials.
6. Keep track of (i.e., map) existing and future inter-basin water transfers to facilitate potential invasive species responses.

ISSUE 2: Responsibility for management and monitoring of Striker Reservoir was transferred from the Jasper District to the Tyler South District in 2014. Maintaining the existing 4-year sampling schedule for Striker Reservoir puts it out of sync with existing Tyler South scheduled surveys.

MANAGEMENT STRATEGIES

1. Sample Striker Reservoir again in three years (2019-2020), to balance the District sampling load. If present turbid water conditions abate consider returning to night electrofishing during the next sampling cycle.
2. Consider setting tandem hoop nets during summer 2019 (rather than spring 2020) when literature suggests they may be more efficient.

2017-2020 Objective-Based Sampling Plan and Schedule

Sport fishes in Striker Reservoir include Channel Catfish, White Bass, Largemouth Bass and both Black and White Crappie. Forage species include sunfishes, and Threadfin and Gizzard Shad.

Low-density fisheries

White Bass have historically been very low in abundance and appear to be prey limited. Although this species may be caught opportunistically it is unlikely to be an important fishery. Blue Catfish were stocked in 2009 and 2010 but survival was never documented. Both Black and White Crappie have been historically present and are believed to provide a minor fishery but sampling has been inconsistent.

Survey objectives, fisheries metrics, and sampling objectives

Channel Catfish: Historically Channel Catfish have been monitored every four years with five multi-panel experimental design gill nets set randomly in spring. However, this sampling intensity has not provided estimates of CPUEs and PSD with the desired level of precision ($N > 50$, $RSE < 25$). CPUEs have ranged from 1.6/nn in 2009 to 4.4/nn in 2013 with RSE ranging from 51 to 27 respectively. Tandem hoop nets may provide the desired data on Channel Catfish (instantaneous estimate of relative abundance and baseline trend information) with lower overall effort. However, five baited hoop nets set in spring 2017 did not collect any Channel Catfish so comparison to historical surveys is impossible. TPWD Assessment Procedures (2014) suggest that nine tandem hoop net arrays set during summer could provide an instantaneous estimate of CPUE estimates with $RSE \leq 25$. Therefore, Striker Reservoir will be sampled with nine baited tandem hoop net sets in late spring/early summer 2019 to obtain an instantaneous estimate of relative abundance and provide a baseline for long-term trends for catch-per-unit-effort, size structure, and body condition (**this is the survey objective**). Because use of tandem hoop nets is still under evaluation at Striker Reservoir, there will be no specific sampling objectives, and goals will be reevaluated for and sampling past 2019.

Largemouth Bass: Striker Reservoir has historically provided a low quality Largemouth Bass fishery with poor size distribution. Electrofishing CPUE estimated during the last three nighttime surveys ranged from 24-114 and was dominated by fish < 14 inches in length. Electrofishing catch rates were highly variable. RSE of CPUE-S in the most recent survey in 2012 was 15 but the previous two surveys in 2008 and 2004 were 43 and 28 respectively. Because of extremely high turbidity in fall 2016 daytime electrofishing was substituted and CPUE was even lower (11/h). Neither nighttime nor daytime surveys have provided the desired > 50 stock sized specimens to adequately estimate relative abundance. Therefore, only largemouth bass population data (size structure, body condition, and growth) will be monitored in the fall of 2019 (**this is the survey objective**). Twelve, five-minute electrofishing stations will be randomly selected and sampled during nighttime hours. All specimens stock length and greater will be individually measured and weighed; remaining specimens will be counted by inch class. Length data will be used to describe proportional length frequency; weight data will be used to estimate W_r by inch-group (**this is the sample objective**). Although unlikely, up to 13 specimens 13.0-14.9 inches in length will be retained to estimate age at legal length (**this is the secondary sample objective**). If 13 specimens are not collected, no additional sampling will be conducted.

Sunfishes and shad: Threadfin Shad, and to a lesser extent, Gizzard Shad, are the primary forage species at Striker Reservoir. Relative abundance, size distribution, PSD, and IOV have been collected for Gizzard Shad every four years using nighttime electrofishing (12, 5-minute stations) have provided adequate estimates of relative abundance with $RSE < 25$. Over the previous three nighttime surveys

(2004, 2009, and 2013) Bluegill CPUE has ranged from 65/h in 2004 to only 37/h in 2013 and appears to be habitat dependent. RSE estimates have ranged from a high of 48 in 2009 to a low of 22 in 2013 but 50 stock –sized individuals have never been collected. Daytime sampling was conducted in fall 2016 and resulted in higher catch rates of Bluegill but lower catch rates of other forage species. Therefore, Sunfishes and Gizzard Shad will be sampled in fall 2019 using nighttime electrofishing to estimate relative abundance and size structure as measured by CPUE, PSD, and IOV (**this is the survey and sampling objective**). Sampling intensity and schedule will be the same as is proposed for Largemouth Bass.

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.
- Ashe, D., and T. Driscoll. 2009. Statewide freshwater fisheries monitoring and management program survey report for Striker Reservoir, 2008. Texas Parks and Wildlife Department, Federal Aid Report F-30-R-33, Austin.
- Ashe, D., and T. Driscoll. 2013. Statewide freshwater fisheries monitoring and management program survey report for Striker Reservoir, 2012. Texas Parks and Wildlife Department, Federal Aid Report F-221-M-3, Austin.
- DiCenzo, V. J., M. J. Maceina, and M. R. Stimpert. 1996. Relations between reservoir trophic state and gizzard shad population characteristics in Alabama reservoirs. North American Journal of Fisheries Management 16:888-895.
- 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.
- Texas Commission on Environmental Quality. 2011. Trophic Classification of Texas Reservoirs: 2010 Texas water quality inventory and 303 (d) list. 18 pp.

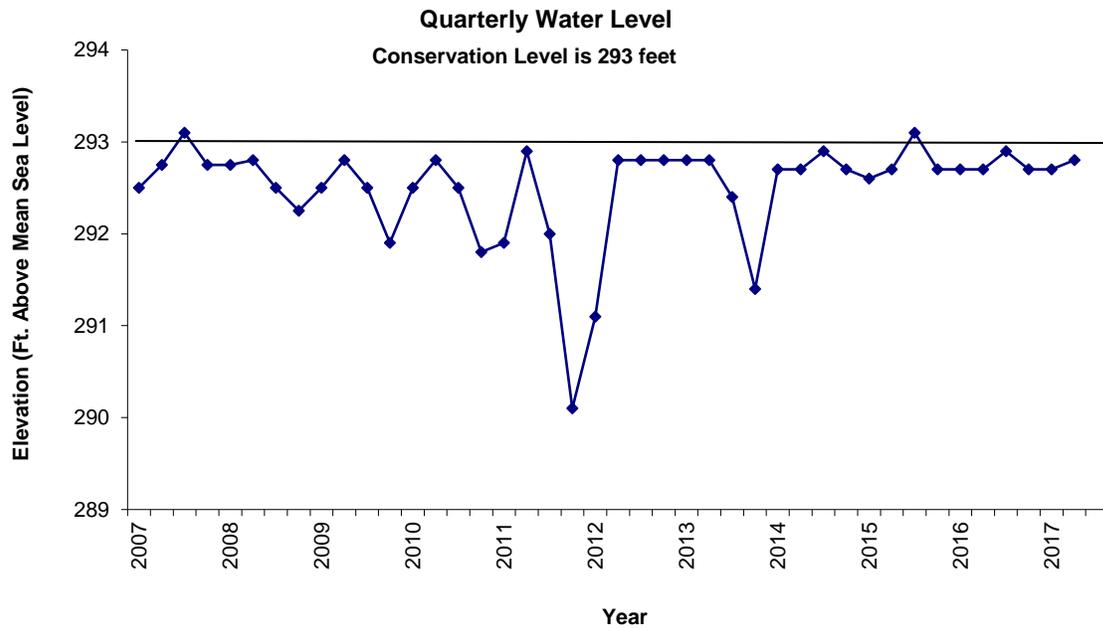


Figure 1. Quarterly water level elevations in feet above mean sea level (MSL) recorded for Striker Reservoir, Texas.

Table 1. Characteristics of Striker Reservoir, Texas.

| Characteristic | Description |
|-----------------------------------|--|
| Year constructed | 1957 |
| Controlling authority | Angelina and Nacogdoches Counties Water Control and Improvement District |
| County | Rusk |
| Reservoir type | Secondary Stream |
| Shoreline Development Index (SDI) | 2.2 |
| Mean depth | 15 feet |
| Size | 1,920 acres |
| Secchi visibility (range) | 1-3 feet |
| Conductivity | 200 umhos/cm |

Table 2. Boat ramp characteristics for Striker Reservoir, Texas, July 2016. Reservoir elevation at time of survey was 292.9 feet above mean sea level.

| Boat ramp | Latitude Longitude (dd) | Public | Parking capacity (N) | Elevation at end of boat ramp (ft) | Condition |
|---------------------|-------------------------------|--------|----------------------------|--|---|
| Lake Striker Marina | 31.940984 -94.975349 | Y | 30 | 290.0 | Condition is good with courtesy dock present |
| 8-Ball Ramp | 31.987375 -94.991658 | Y | 5 | 289.5 | Condition is poor and suitable for small boats only |

Table 3. Harvest regulations for Striker Reservoir, Texas.

| Species | Bag limit | Length limit |
|--|----------------------------|-----------------|
| Catfish: Channel and Blue Catfish, their hybrids and subspecies | 25 (in any combination) | 12-inch minimum |
| Catfish, Flathead | 5 | 18-inch minimum |
| Bass, White | 25 | 10-inch minimum |
| Bass, Largemouth | 5 ^a | 14-inch minimum |
| Bass, Spotted | 5 ^a | None |
| Crappie: White and Black Crappie, their hybrids and subspecies | 25 (in any combination) | 10-inch minimum |

^a Daily bag for largemouth and spotted bass = 5 fish in any combination.

Table 4. Stocking history of Striker Reservoir, Texas. FGL = fingerling; AFGL = advanced fingerling; ADL = adult; UNK = unknown.

| Species | Year | Number | Size |
|-------------------------|-------------|---------------|-------------|
| Blue Catfish | 2009 | 95,936 | FGL |
| | 2010 | 95,754 | FGL |
| | Total | 191,690 | |
| Channel Catfish | 1973 | 5,000 | UNK |
| | Total | 5,000 | |
| Florida Largemouth Bass | 1976 | 200,000 | FGL |
| | 1995 | 120,000 | FRY |
| | 1997 | 120,186 | FGL |
| | Total | 440,186 | |
| Palmetto Bass | 1979 | 80,000 | UNK |
| | 1998 | 49,023 | FGL |
| | 1999 | 24,215 | FGL |
| | Total | 153,238 | |
| Red Drum | 1975 | 18,435 | UNK |
| | Total | 18,435 | |
| Threadfin Shad | 1974 | 15,000 | ADL |
| | 1976 | 30,000 | ADL |
| | Total | 45,000 | |

Table 5. Objective-based sampling plan components for Striker Reservoir, Texas 2016 – 2017.

| Gear/target species | Survey objective | Metrics | Sampling objective |
|----------------------------|--|-----------------------|------------------------------|
| | For all target species monitor for large-scale changes in: | | |
| <i>Electrofishing</i> | | | |
| Largemouth Bass | Abundance | CPUE – stock | RSE-Stock ≤ 25 |
| | Size structure | PSD, length frequency | $N \geq 50$ stock |
| | Age-and-growth | Age at 14 inches | $N = 13, 13.0 - 14.9$ inches |
| | Condition | W_r | 10 fish/inch group (max) |
| Bluegill ^a | Abundance | CPUE – Total | RSE ≤ 25 |
| | Size structure | PSD, length frequency | $N \geq 50$ |
| Gizzard Shad ^a | Abundance | CPUE – Total | RSE ≤ 25 |
| | Prey availability | IOV | $N \geq 50$ |
| <i>Tandem hoop netting</i> | | | |
| Channel Catfish | Abundance | CPUE– stock | RSE-Stock ≤ 25 |
| | Size structure | | $N \geq 50$ stock |

^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, Striker Reservoir, Texas, 2012 and 2014-2016. Surface area (acres) is listed with percent of total reservoir surface area in parentheses.

| Vegetation | 2012 | 2014* | 2015* | 2016 |
|--------------------------|----------|-----------|-----------|-----------|
| Native Submersed | | | | |
| Southern Naiad | 95 (4.9) | | | |
| Native Floating-leaved | | | | |
| Spadderdock | 62 (3.2) | | | 46 (2.4) |
| Native Emergent | | | | |
| Common Reed | 21 (1.1) | | | |
| Button Bush | | | | 116 (6.0) |
| Giant Cutgrass | | | | 7 (0.4) |
| Water Willow | | | | Trace |
| Non-native | | | | |
| Giant Salvinia (Tier II) | | 165 (9.0) | 165 (9.0) | 12 (0.6) |
| Hydrilla (Tier III) | Trace | | | |
| Alligatorweed (Tier II) | | | | 1 (<0.1) |

* Aquatic nuisance species survey only.

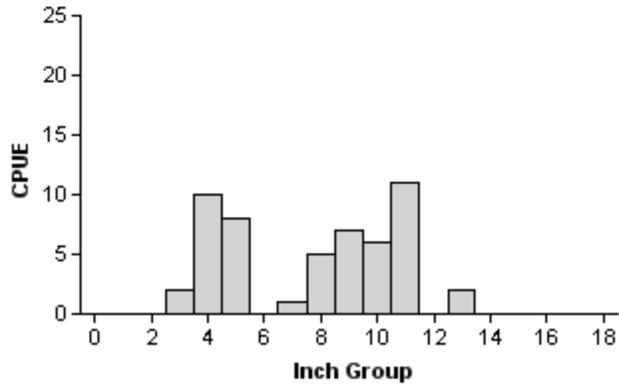
Gizzard Shad

2008

Effort = 1.0

Total CPUE = 52.0 (22; 52)

IOV = 40 (15)



2012

Effort = 1.0

Total CPUE = 61.0 (18; 61)

IOV = 74 (8)

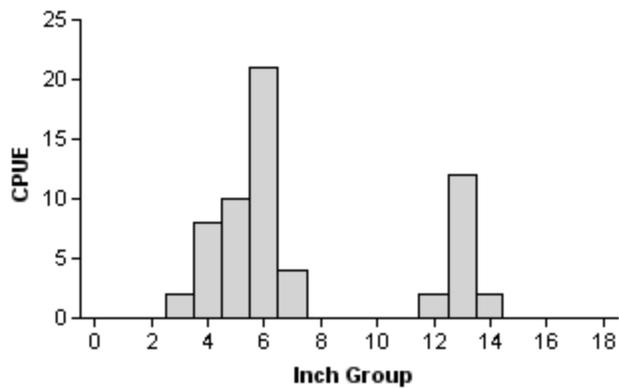


Figure 2. Number of Gizzard Shad caught per hour (CPUE, bars) and population indices (RSE and N for CPUE and SE for size structure are in parentheses) for fall nighttime electrofishing surveys, Striker Reservoir, Texas, 2008, and 2012.

Gizzard Shad

2016

Effort = 1.0

Total CPUE = 9.0 (33; 9)

IOV = 22 (11)

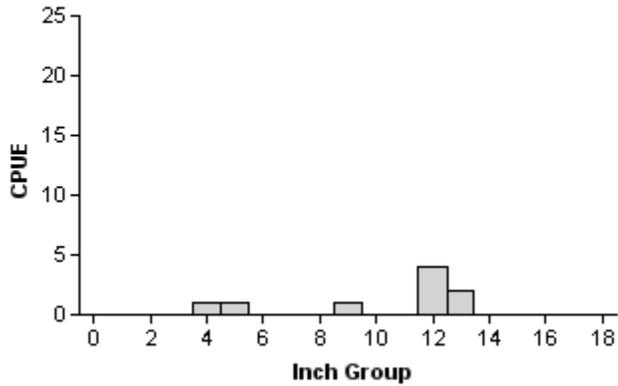
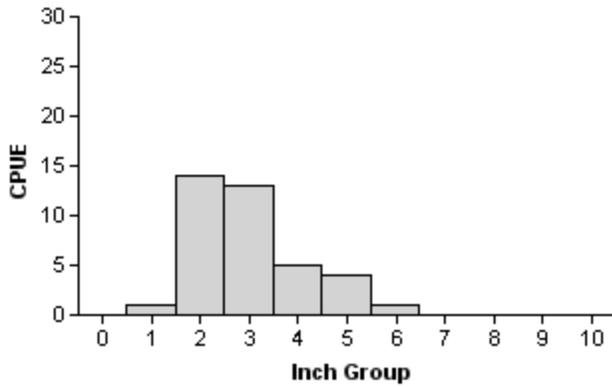


Figure 3. Number of Gizzard Shad caught per hour (CPUE, bars) and population indices (RSE and N for CPUE and SE for size structure are in parentheses) for fall daytime electrofishing surveys, Striker Reservoir, Texas, 2016.

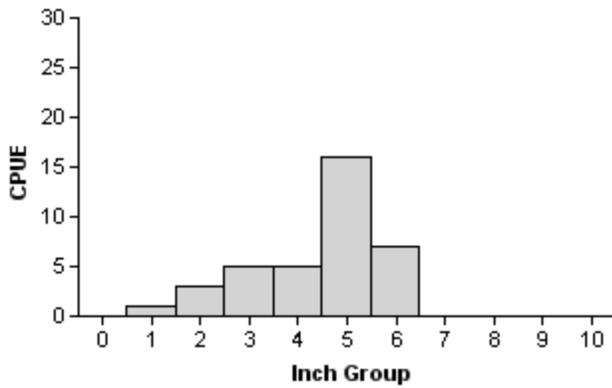
Bluegill

2008



Effort = 1.0
 Total CPUE = 38.0 (49; 38)
 Stock CPUE = 23.0 (43; 23)
 PSD = 4 (3)

2012



Effort = 1.0
 Total CPUE = 37.0 (19; 37)
 Stock CPUE = 33.0 (21; 33)
 PSD = 21 (9)

Figure 4. Number of Bluegill caught per hour (CPUE, bars) and population indices (RSE and N for CPUE and SE for size structure are in parentheses) for fall nighttime electrofishing surveys, Striker Reservoir, Texas, 2008, and 2012.

16
Bluegill

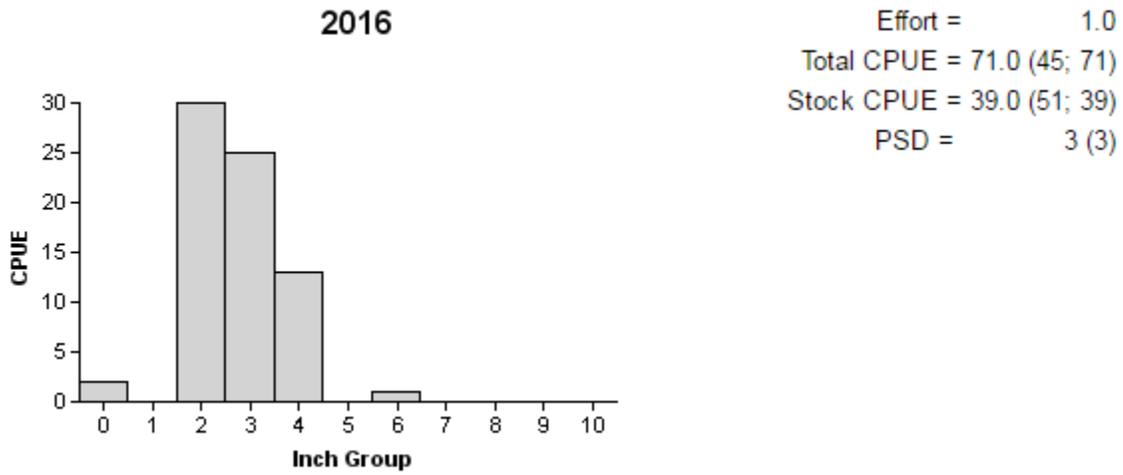


Figure 5. Number of Bluegill caught per hour (CPUE, bars) and population indices (RSE and N for CPUE and SE for size structure are in parentheses) for fall daytime electrofishing survey, Striker Reservoir, Texas, 2016.

17
Spotted Bass

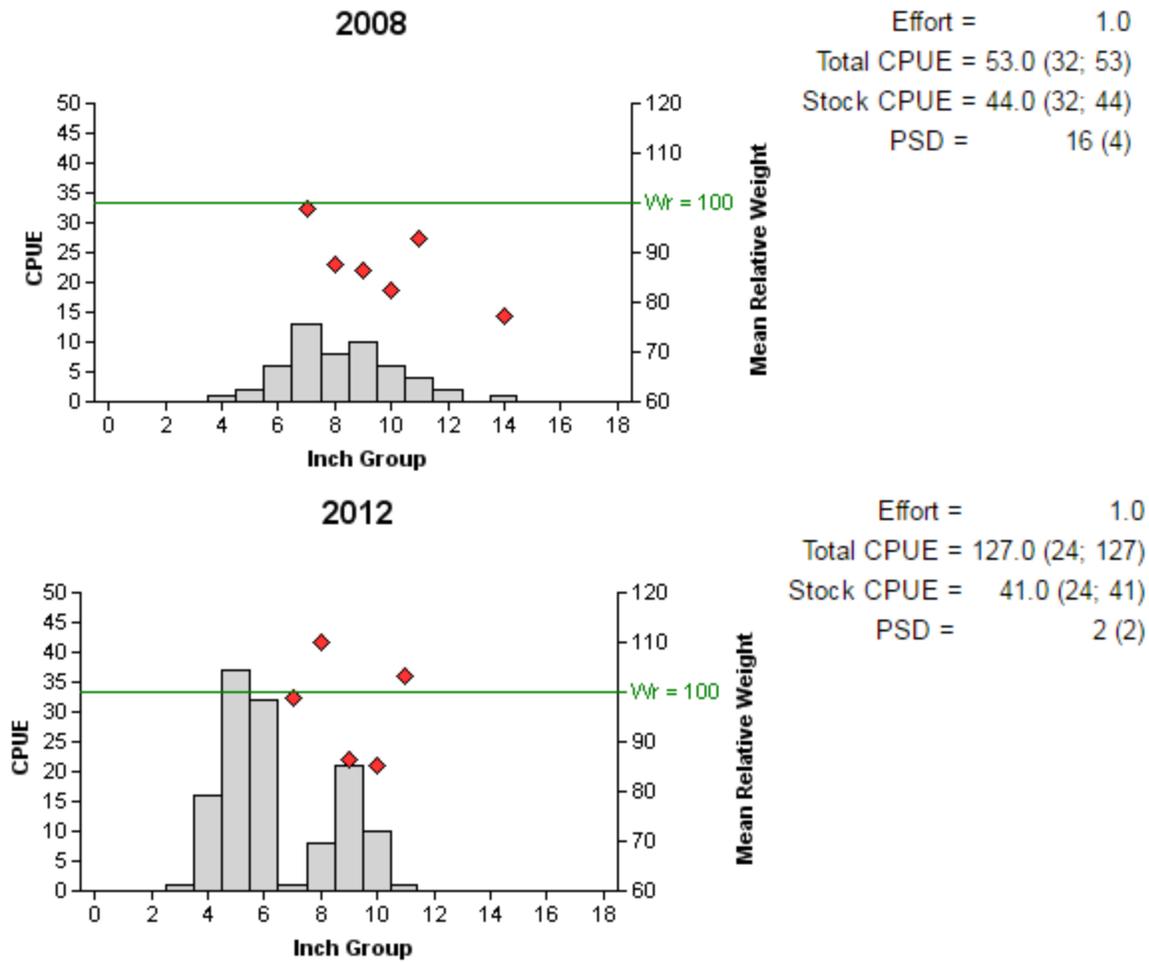


Figure 6. Number of Spotted Bass caught per hour (CPUE, bars), mean relative weight (diamonds), and population indices (RSE and N for CPUE and SE for size structure are in parentheses) for fall nighttime electrofishing surveys, Striker Reservoir, Texas, 2008 and 2012.

Spotted Bass

2016

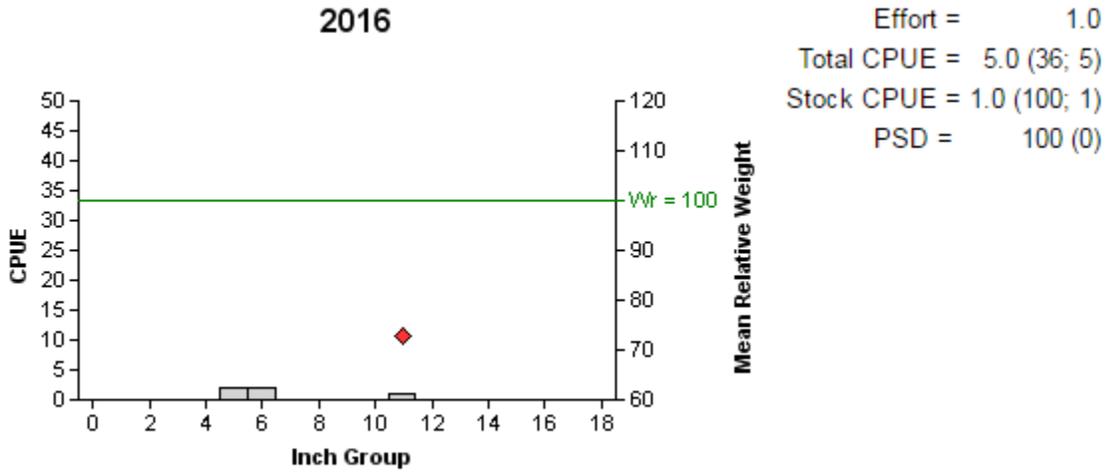


Figure 7. Number of Spotted Bass caught per hour (CPUE, bars), mean relative weight (diamonds), and population indices (RSE and N for CPUE and SE for size structure are in parentheses) for fall daytime electrofishing survey, Striker Reservoir, Texas, 2016.

Largemouth Bass

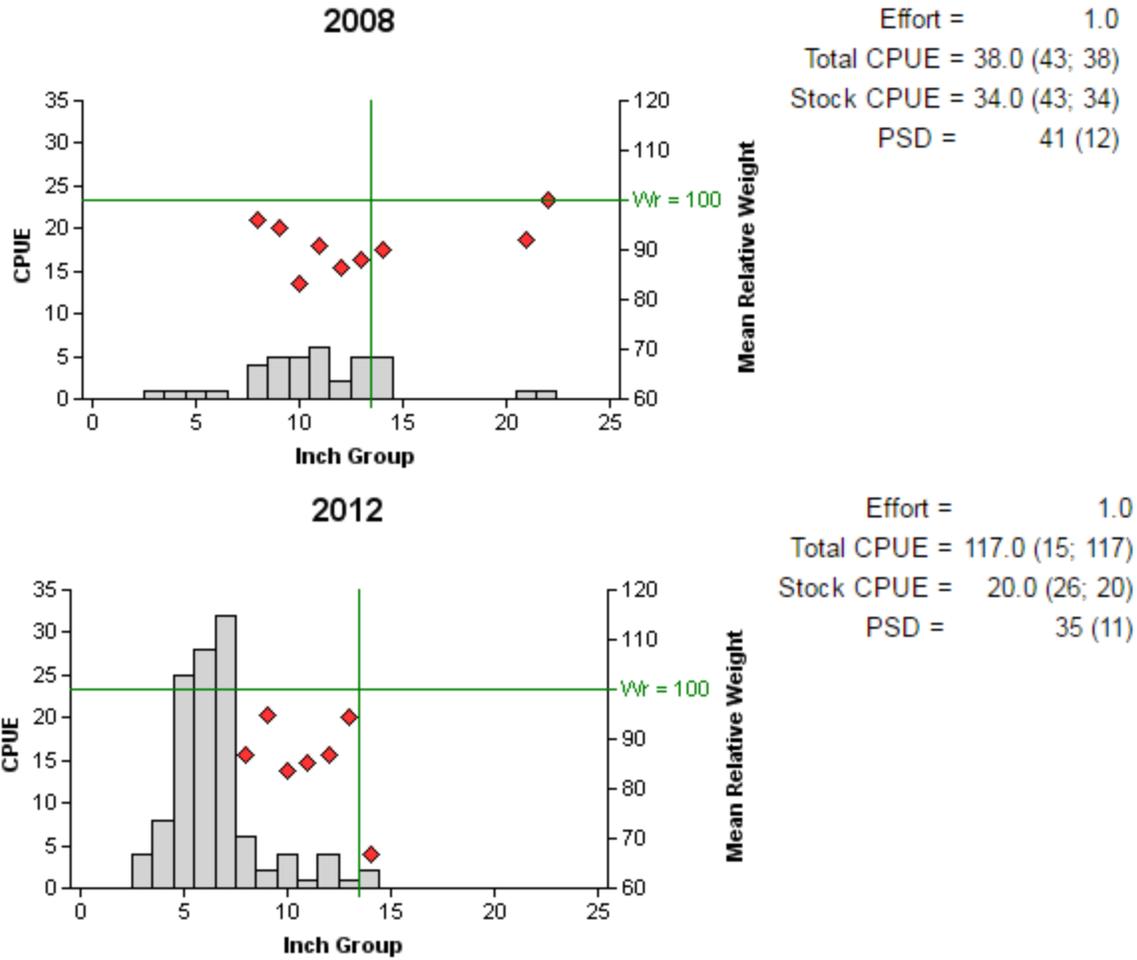


Figure 8. Number of Largemouth Bass caught per hour (CPUE, bars), mean relative weight (diamonds), and population indices (RSE and N for CPUE and SE for size structure are in parentheses) for fall nighttime electrofishing surveys, Striker Reservoir, Texas, 2008 and 2012. Vertical lines indicate minimum length limit at time of survey.

Largemouth Bass

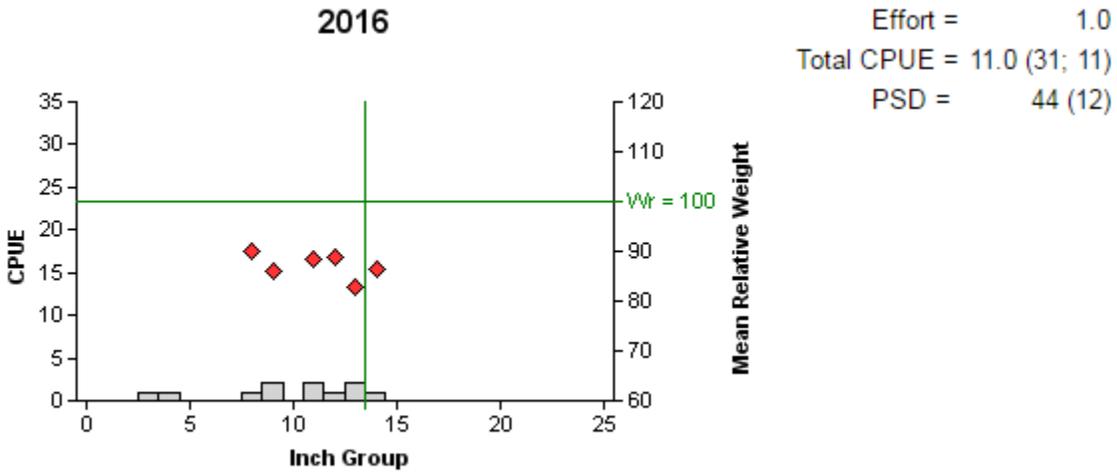


Figure 9. Number of Largemouth Bass caught per hour (CPUE, bars), mean relative weight (diamonds), and population indices (RSE and N for CPUE and SE for size structure are in parentheses) for fall daytime electrofishing survey, Striker Reservoir, Texas, 2016. Vertical line indicates minimum length limit at time of survey.

Table 7. Proposed sampling schedule for Striker Reservoir, Texas. Survey period is June through May. Hoop netting surveys are conducted in the summer, while standard electrofishing is conducted in the fall. Standard survey denoted by S additional surveys are denoted by A.

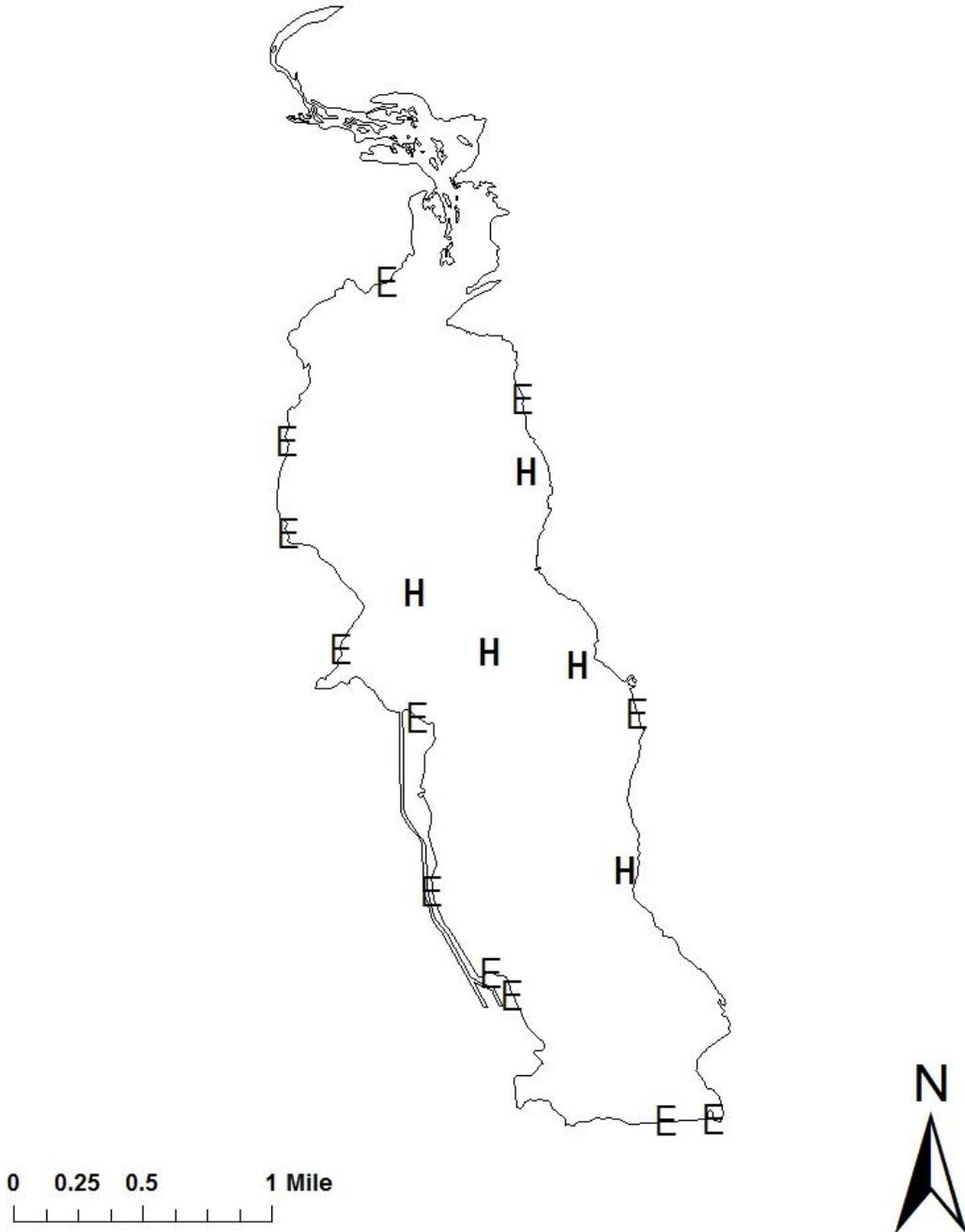
| Survey Year | Electrofishing | Hoop net | Access | Vegetation | Report |
|-------------|----------------|----------|--------|------------|--------|
| 2017-2018 | | | | A | |
| 2018-2019 | | | | A | |
| 2019-2020 | S | A | S | S | S |
| 2020-2021 | | | | A | |

Appendix A

Number (N) and catch rate (CPUE) of all target species collected from all gear types from Striker Reservoir, Texas, 2016-2017.

| Species | Electrofishing | | Hoop Netting | |
|-----------------|----------------|----|--------------|---|
| | CPUE | N | CPUE | N |
| Gizzard Shad | 9.0 | 9 | | |
| Threadfin Shad | 86.0 | 86 | | |
| Channel Catfish | | | 0.0 | 0 |
| Warmouth | 1.0 | 1 | | |
| Bluegill | 71.0 | 71 | | |
| Longear Sunfish | 39.0 | 39 | | |
| Redear Sunfish | 6.0 | 6 | | |
| Spotted Bass | 5.0 | 5 | | |
| Largemouth Bass | 11.0 | 11 | | |

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Appendix B



Location of sampling sites, Striker Reservoir, Texas, 2016-2017. Electrofishing stations and Hoop net arrays indicated by E and H. Water level was near full pool at time of sampling.