

Placid Reservoir

2020 Fisheries Management Survey Report

PERFORMANCE REPORT

As Required by

FEDERAL AID IN SPORT FISH RESTORATION ACT

TEXAS

FEDERAL AID PROJECT F-221-M-4

INLAND FISHERIES DIVISION MONITORING AND MANAGEMENT PROGRAM

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Survey and Management Summary

Fish populations in Placid Reservoir were surveyed in 2018 using electrofishing, 2019 using gill netting and hoop netting, 2020 using electrofishing, and 2021 using gill netting and low frequency electrofishing. Historical data are presented with the 2017-2021 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: Placid Reservoir is a 214-acre impoundment located on the Guadalupe River in Guadalupe County, one-half mile southwest of Seguin. This small impoundment, constructed in 1928, is fed by the Guadalupe River watershed and used for water supply, hydroelectric generation, and recreation. Habitat features consisted of boat docks, piers, bulkhead, riprap, and several native aquatic species including spatterdock, water willow, and cattail.

Management History: Important sport fish include Largemouth Bass, Channel Catfish, Blue Catfish, Flathead Catfish and White Crappie. Florida Largemouth Bass were most recently stocked in 2017. Angler harvest of all sport fishes has been regulated per statewide size and bag limits. The management plan from the 2016 survey report included additional electrofishing in 2014 to maintain trend data on the Largemouth Bass population, monitoring for zebra mussels and planting native aquatic vegetation. Historically, nuisance aquatic vegetation has caused access and recreational problems, however herbicide and grass carp introductions have been used to manage excessive vegetative growth, as needed.

Fish Community

- **Prey species:** Gizzard Shad and Bluegill were the primary forage species for sport fish populations. Longear, Redbreast, and Redear sunfishes were also present. Gizzard Shad abundance increased while Bluegill abundance decreased relative to 2018. Population size structure for Gizzard Shad and Bluegill were suitable to support sport fish populations.
- **Catfishes:** Blue, Channel, and Flathead Catfish were each present in the reservoir and provided quality angling opportunities. Several large Flathead Catfish were collected, including several that measured ≥ 25 -inches. New waterbody records were established for Blue Catfish in 2018 with rod and reel (40.5 inches, 35.9 pounds); 2019 with jug line (42 inches, 39.7 pounds), and a new waterbody record for Flathead Catfish was submitted in 2017 (37.5 inches, 24.5 pounds).
- **Largemouth Bass:** Largemouth Bass abundance was good and similar over the study period. Catch rates in 2020 remained above the historical average. Several legal-size (≥ 14 inches) fish were collected, and size structure indices indicated a balanced population. Largemouth Bass growth was adequate (age at 14 inches total length was 2.5 years).
- **Crappies:** Both White Crappie and Black Crappie are present for anglers to target within the reservoir based on gill netting and electrofishing surveys.

Management Strategies: Continue to manage sport fish populations under existing harvest regulations. Continue to work with Guadalupe-Blanco River Authority (GBRA) on controlling water hyacinth, water lettuce and hydrilla and inform the public about the negative impacts of aquatic invasive species. Continue to provide GBRA with signage, make social media posts and press releases to educate and inform the public to help prevent the spread of zebra mussels and other invasive species to other waterbodies. Continue with electrofishing, gill netting and low frequency electrofishing to monitor population abundance of Largemouth Bass and catfishes.

Introduction

This document is a summary of fisheries data collected from Placid Reservoir from 2017-2021. 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 2017-2021 data for comparison.

Reservoir Description

Placid Reservoir is a 214-acre mainstream reservoir located in Guadalupe County, one-half mile southwest of Seguin, Texas, that is operated and controlled by the Guadalupe-Blanco River Authority (GBRA). It is part of the Guadalupe River Chain Lakes that also includes Dunlap, McQueeney, Meadow, H-4 and Wood reservoirs. Placid Reservoir was impounded in 1928 for hydroelectric generation, water supply, and recreation. Most of the shoreline is privately owned. Clay, sand, and silt are dominant substrate types in the middle and lower portions of the reservoir. Habitat at time of sampling included boat docks, piers, bulkheads, riprap, native aquatic vegetation, submerged timber, and overhanging terrestrial vegetation. Native aquatic plants present in 2020 were spatterdock, water willow and cattail (Appendix D). Non-native aquatic plants present included water hyacinth. Historically non-native vegetation, including water hyacinth, water lettuce, and hydrilla caused access problems for many years until aggressive chemical and biological controls were implemented. Zebra mussels, a non-native and often detrimental invasive species, were detected within the reservoir and the waterbody was classified as infested in March of 2021. While water level data was not available, water levels at the reservoir generally remained stable. Other descriptive characteristics for Placid Reservoir can be found in Table 1.

Angler Access

Placid Reservoir has one public boat ramp and several private boat ramps. The public boat ramp is located at the I-10 underpass just outside of the city of Seguin. Shoreline and handicap access is limited to the public boat ramp area. Additional boat ramp characteristics are in Table 2.

Management History

Previous management strategies and actions: Management strategies and actions from the previous survey report (McDonald and Binion 2017) included:

1. Monitor native vegetation that was planted in 2017.

Action: Plantings were monitored throughout the survey period. Unfortunately, the species planted (Illinois pondweed, pickerelweed, wild celery, and spike rush) did not establish. Further, some of the herbivore protective cages were removed by an unknown source. Other native vegetation species (e.g., water willow, spatterdock, cattail) propagated within most of these planting sites.

2. Deploy zebra mussel settlement samplers and distribute press releases to local media and promote the Clean, Drain, Dry program.

Action: Settlement samplers were deployed and monitored by GBRA. "Protect Our Lakes" signage was distributed to GBRA to assist in educating the public on the Clean, Drain, Dry campaign. Zebra mussels were observed within upstream Dunlap Reservoir in 2019 and Lake Placid Reservoir was subsequently classified infested in the spring of 2021. A press release announcing the Placid zebra mussel infestation was distributed to local and statewide media in March 2021.

3. Continue to monitor long-term changes in prey species, Largemouth Bass, and catfishes using electrofishing and gill netting. Evaluate use of low frequency electrofishing and baited tandem hoop net sampling as alternative sampling gears to evaluate trends in important catfish population metrics.

Action: Additional objective-based population monitoring surveys were conducted, as proposed. Further, baited tandem hoop nets and low frequency electrofishing were also utilized during the sampling period. Exploratory gears, such as baited hoop nets, confirmed that Channel Catfish abundance has remained low during our survey

evaluation period. Gill netting was determined as a better gauge for monitoring abundance and size structure of all catfishes, therefore baited hoop nets will be discontinued from the future sampling schedule. Exploratory low frequency electrofishing has shown some promise for monitoring the abundance of the Flathead Catfish fishery and will continue to be utilized until we have three surveys completed, afterwards we will assess its utility.

Harvest regulation history: Sport fish in Placid Reservoir are currently managed with statewide harvest regulations (Table 3).

Stocking history: Placid Reservoir has been stocked with numerous species including Channel Catfish, Blue Catfish, Largemouth Bass, White Crappie, Coppernose Bluegill, and Triploid Grass Carp. The most recent stocking (Florida Largemouth Bass) occurred in 2017. A complete stocking history is presented in Table 4.

Vegetation/habitat management history: Historically, non-native vegetation such as water hyacinth, water lettuce, and hydrilla has caused boater and angler access problems. In 1996, aggressive chemical and biological controls (Triploid Grass Carp) were implemented. Over the current survey period, non-native invasive vegetation did not negatively impact boat or angler access.

Water transfer: Placid Reservoir is primarily used for hydro-power generation and recreation. No significant transfer of water occurs at Placid Reservoir and no interbasin transfers exist.

Methods

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

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

Gill netting – Channel, Blue and Flathead Catfishes were collected by gill netting (10 net nights at 10 stations). CPUE for gill netting was recorded as the number of fish caught per net night (fish/nn). Map of sampling locations are presented in Appendix C.

Low frequency electrofishing – Blue and Flathead Catfishes were collected by low frequency electrofishing at 20 stations. The minimum duration of electrofishing at each station was 3 minutes. CPUE for electrofishing was recorded as the number of fish caught per hour (fish/h) of actual electrofishing. Map of sampling locations are presented in Appendix C.

Tandem hoop nets – Channel Catfish were collected 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).

Angler survey - An angler survey was developed to gauge and assess angler preferences and use patterns. Specifically, which reservoir they used most often, targeted fish species, and general satisfaction with the current regulations within the Guadalupe Chain Reservoirs system (Dunlap Reservoir, McQueeney Reservoir, Placid Reservoir, Meadow Reservoir, H-4 Reservoir, and Wood Reservoir). This survey was conducted in conjunction with our winter and spring quarter creel surveys of 2019 at Dunlap Reservoir. The angler survey ended after Dunlap Reservoir suffered a dam gate failure and was subsequently dewatered back to the river channel on May 14, 2019. Ninety-six anglers participated with the multiple-choice survey. Angler survey questions and results are included in Appendix E.

Statistics – Sampling statistics (CPUE for various length categories), structural indices [Proportional Size Distribution (PSD), terminology modified by Guy et al. 2007], and condition indices [relative weight (W_r)] were calculated for target fishes according to Anderson and Neumann (1996). Index of Vulnerability (IOV) was calculated for Gizzard Shad (DiCenzo et al. 1996). Standard error (SE) was calculated for structural indices and IOV. Relative standard error (RSE = 100 X SE of the estimate/estimate) was calculated for CPUE statistics.

Habitat – A structural habitat survey was conducted in 2008. Vegetation surveys were conducted in 2016–2020 to monitor native and non-native vegetation distribution and surface coverage.

Results and Discussion

Habitat: Shoreline habitat consisted primarily of bulkheads, boat docks, and natural shoreline (Table 6). In 2020, the native vegetation surface coverage was 2.3% of the reservoir's surface area, this is a slight improvement relative to the 2016 survey of 0.8% (Table 7).

Prey species: Electrofishing catch rates of Gizzard Shad and Bluegill were 241.0/h and 105.0/h, respectively. Index of Vulnerability (IOV) for Gizzard Shad was higher than previous surveys and indicated that 79% of Gizzard Shad were available to sport fish (Figure 1). The 2020 electrofishing catch rate for Bluegill (105.0/h) was consistent with the 2016 survey (92.0/h) but lower than 2018 (171.0/h)

(Figure 2). Size structure for Bluegill was adequate and most individuals collected were < 6-inches total length (TL) and available as forage to predator species (Figure 2). Other sunfishes, such as Longear, Redbreast and Redear made up a small component of the prey forage base (Appendix B). Overall, survey results indicated an adequate prey base for sport fish.

Catfishes: Blue Catfish gill net catch rates were 3.4/nn in 2021. Relative abundance was higher than previous years (Figure 3), however abundance remains low. Relative weights of stock-size (12 inches) Blue Catfish varied (range: 87 – 141) in 2021 with no discernible trends evident based on size (Figure 3). Low-frequency electrofishing catch rates of Blue Catfish was 11.0/h in 2021 compared to 4.0/h collected in 2017 (Figure 4), showing an increase in abundance, similarly to gill net data. This gear may show some promise in collecting smaller size classes (< 10 in.).

The Channel Catfish gill net catch rate in 2021 (2.9/nn) indicates a moderately abundant population with good size structure (Figure 5). Relative weights of stock-size (11 inches) Channel Catfish varied in 2019 (range: 87 – 135) and in 2021 (range: 79 – 109) and tended to improve with increased length. Baited hoop nets were unsuccessful in collecting Channel Catfish in 2017 and few (6.4/series) were collected in 2019 (Figure 6). Catch rates appeared to track between gears across sampling years, however gill nets were more successful at collecting Channel Catfish than hoop nets.

The Flathead Catfish gill net catch rate in 2021 (1.7/nn) were similar to 2019 (2.3/nn) and 2017 (1.0/nn; Figure 7) and indicates a low-density population. Relative weights of stock-size (14 inches) Flathead Catfish varied (range: 89 – 112) in 2021. Low frequency electrofishing catch rate of Flathead Catfish was 4.0/h in 2021 compared to 18.0/h reported for 2017 (Figure 8), suggesting that this gear may have some utility in representing population abundance, but is more successful at collecting smaller size classes (< 15 in.) than gill nets.

Largemouth Bass: The electrofishing catch rate of stock-length (8 inches) Largemouth Bass was 55.0/h in 2020, higher than the 45.0/h in 2018 (Figure 9). Size structure was balanced (PSD = 55; Figure 9) and most fish reached 14 inches in 2.5 years (N = 13; range = 2 – 3 years; Table 8). Body condition in 2020 was suitable (range: 85 – 106) for most size classes of stock-size Largemouth Bass with no discernable trends based on size. Florida Largemouth Bass influence has remained relatively constant since 2008 as Florida alleles ranged from 56.7% to 64.6% (Table 9). The 2019 angler survey indicated Largemouth Bass and all Black Bass species were the most sought sport fish species (84%) in the Guadalupe River Chain Reservoirs (Appendix E).

Crappies: Trap netting was discontinued after 2016 to collect crappies due to the low catch rates (historical mean = 3.1/nn; N = 9; range = 0.2 – 6.2/nn). Previous trap net surveys indicated White Crappie were more abundant than Black Crappie (McDonald and Binion 2017). Presence of White Crappie and Black Crappie was documented during the 2019 electrofishing and during the 2020 gill netting surveys (Appendix B).

Fisheries Management Plan for Placid Reservoir, Texas

Prepared – July 2021

ISSUE 1: Since the last report, the Largemouth Bass population has improved and new waterbody records have been recorded for both Blue and Flathead Catfishes, indicating excellent fishing opportunities for the public.

MANAGEMENT STRATEGIES

1. Write and distribute press releases to media outlets concerning angling opportunities available in this reservoir.

ISSUE 2: Placid Reservoir is valued for its quality Largemouth Bass population and Largemouth Bass represent the preferred sport fish species targeted by anglers in the Guadalupe Chain reservoirs. Further, anecdotal angler reports as well as the current waterbody record (12.62 pounds; 28.25" TL), indicate the reservoir produces trophy-size Largemouth Bass.

MANAGEMENT STRATEGY

1. When habitat conditions and water levels permit, request FLMB fingerlings annually for stocking to maintain a high-level Florida Bass genetic influence and thus maximize production potential of trophy fish.
2. Promote the ShareLunker program and monitor reservoir entries to the program.

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. In March of 2021, zebra mussels were discovered in Placid Reservoir, designating this reservoir as infested. Giant salvinia and other invasive vegetation species can form dense mats, interfering with recreational activities like fishing, boating, skiing, and swimming. The financial costs of controlling and/or eradicating these types of invasive species are significant. Additionally, the potential for invasive species to spread to other river drainages and reservoirs via watercraft and other means is a serious threat to all public waters of the state.

MANAGEMENT STRATEGIES

1. Cooperate with the controlling authority to post appropriate signage at access points around the reservoir.

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

Objective-Based Sampling Plan and Schedule (2017–2021)

Sport fish, forage fish, and other important fishes

Sport fish in Placid Reservoir include Blue Catfish, Channel Catfish, and Flathead Catfish, Largemouth Bass, and White Crappie. Important forage species include Gizzard Shad and Bluegill Sunfish.

Low-density fisheries

White Crappie: White Crappie are present in the reservoir; however, the catch rates of previous trap net surveys were low (historical mean CPUE = 3.1/nn; N = 9; standard deviation = 2.1; range: 0.2 – 6.2/nn). Due to minimal captures historically, trap netting will be discontinued from future use and presence/absence will be reported with gill net and electrofishing surveys.

Survey objectives, fisheries metrics, and sampling objectives

Channel Catfish: Channel Catfish are the predominant catfish species; however, abundance is low and highly variable historically. Since 1988, the mean gill net CPUE is 7.6/nn (N = 10, range: 1.4 – 17.6/nn) and mean CPUE-stock = 5.1/nn (N = 10, range: 1.3 – 11.0/nn). Trend data on CPUE, size structure, and body condition have been collected with spring gill netting at least every four years since 1993 (excluding 1997). Trend data will continue to be collected with spring gill netting every four years to detect large-scale changes in size structure (PSD and length frequency), relative abundance (CPUE-total and CPUE-stock), and condition (average W_r using lengths and weights). Ten randomly selected gill net sites will be sampled in spring of 2025 (Table 10). Due to the high variability in catch data among sampling sites (mean RSE-Total = 36.2 & RSE-Stock = 36.9), objectives of RSE for catch rates will not be set. Additionally, due to low catch rates, relative abundance sampling objectives for 50 Channel Catfish will not be set. We will attempt to collect a minimum of 50 total Channel Catfish for size structure estimation (PSD) w/RSE \leq 25). No additional effort beyond 10 gill net nights will be expended. Exploratory baited tandem hoop net surveys were conducted in years 2017 and 2019 (2-night duration) to assess the utility of baited tandem hoop nets for use as an alternative collection gear for this species. Hoop netting will be discontinued due to low collections of stock-sized fish in 2017 (N = 0) and in 2019 (N = 9).

Flathead Catfish: Flathead Catfish are present in the reservoir in low to moderate abundance. Since 1988, the mean gill net CPUE is 1.1/nn (N = 10, range: 0.0 – 3.0/nn). Trend data on CPUE, size structure, and body condition have been collected at least every four years since 1993 (excluding 1997) with spring gill netting. Based on the last gill net survey conducted in 2021, the population appears to be stable, but remains low. Collection of trend data every four years with spring gill netting will allow for determination of large-scale changes in size structure (PSD and length frequency), relative abundance (CPUE-total and CPUE-stock), and condition (average W_r using lengths and weights). Ten randomly selected gill net sites will be sampled in spring of 2025. Due to low catch rates, relative abundance sampling objectives for 50 Flathead Catfish will not be set. We will attempt to collect a minimum of 50 total Flathead Catfish for size structure estimation (PSD) w/RSE \leq 25). No additional effort beyond 10 gill net nights will be expended. Exploratory low frequency electrofishing (LFE) was conducted in 2017 to target Flathead Catfish, 18 fish were captured in one hour at 20 stations, and in 2021, 4 fish were captured, this gear shows some promise but additional evaluation needs to occur to standardize this gear. An LFE survey of 20 randomly selected 3-minute stations will be conducted in late-spring/summer 2025 to compare results of previous surveys (Table 10).

Blue Catfish: Blue Catfish are present, but historically abundance has been relatively low compared to Channel Catfish. Since 1988, the mean gill net CPUE is 1.8/nn (N = 10, standard deviation = 2.4, range: 0.0 – 7.8/nn). Trend data on CPUE, size structure, and body condition have been collected at least every four years since 1993 (excluding 1997) with spring gill netting. Based on the last gill net survey conducted in 2021, the population abundance appears to be low and variable. Collection of trend data

every four years with spring gill netting will allow for determination of large-scale changes in size structure (PSD and length frequency), relative abundance (CPUE-total and CPUE-stock), and condition (average W_r using lengths and weights). Ten randomly selected gill net sites will be sampled in spring of 2025. Due to low catch rates, relative abundance sampling objectives for Blue Catfish will not be set. We will attempt to collect a minimum of 50 total Blue Catfish for size structure estimation (PSD) w/RSE \leq 25). No additional effort beyond 10 gill net nights will be expended. Exploratory low frequency electrofishing (LFE) was conducted in 2017 to target Blue Catfish, but only 4 fish were captured in 20 stations, and in 2021, 11 fish were captured at 20 stations. An LFE survey of 20 randomly selected 3-minute stations will be conducted in late-spring/summer 2025 to compare results of previous surveys (Table 10).

Largemouth Bass: The objective-based sampling objective for Largemouth Bass ($N \geq 50$ of stock-sized fish) was attained (Table 5). Historically, Largemouth Bass have been present in the reservoir in moderate numbers. The mean historical total CPUE for Largemouth Bass is 52.9/h ($N = 13$; standard deviation = 23.3; range: 16.0 – 83.0/h) and mean stock-size CPUE is 36.0/h ($N = 13$; standard deviation = 16.6; range: 13.0 – 63.7/h). Catch rates of Largemouth Bass has remained high in recent years (2016 = 59.0/h, 2018 = 82.0/h and 2020 = 73.0/h) compared to previous years (2006 = 39.0/h, 2008 = 52.0, 2010 = 20.0/h). Trend data on CPUE, size structure, and body condition has been collected biennially since 2006 with fall electrofishing to monitor large-scale changes in the population. The collection of trend data with fall electrofishing will allow for determination of large-scale changes in size structure (PSD and length frequency), relative abundance (CPUE-total and CPUE-stock), and condition (average W_r using lengths and weights). A minimum of 12 randomly selected electrofishing sites will be sampled every two years (2022 and 2024) to collect 50 stock-size fish for PSD indices and relative weight. The desired level of precision is RSE \leq 25 for CPUE-S. Further, category 2 age-and-growth analysis [mean age at legal length (14 in), $N =$ minimum of 13 fish between 13.0 – 14.9 in] will be conducted every four years to assess any changes in growth to the minimum length limit. Genetic analyses will be conducted in 2024 to monitor changes in Florida Largemouth Bass introgression.

Shad and Bluegill: The objective-based objective for both Gizzard Shad ($N \geq 50$ fish) and Bluegill ($N \geq 50$ fish) were attained (Table 5). Gizzard Shad and Bluegill are the primary forage at Placid Reservoir. Like Largemouth Bass, trend data on CPUE and size structure of Gizzard Shad and Bluegill have been collected biennially since 2006 with fall electrofishing. Continuation of sampling, as per Largemouth Bass above, will allow for monitoring of large-scale changes in Gizzard Shad and Bluegill relative abundance and size structure. Sampling effort based on achieving sampling objectives for Largemouth Bass will result in sufficient numbers for size structure estimation (Gizzard Shad IOV; 50 fish minimum, Bluegill PSD; 50 fish minimum at 12 randomly selected stations with 90% confidence) and relative abundance estimates (Bluegill CPUE-Total; RSE < 25). No additional effort will be conducted beyond sampling effort conducted for Largemouth Bass data collection.

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Tables and Figures

Table 1. Characteristics of Placid Reservoir, Texas.

Characteristic	Description
Year constructed	1928
Controlling authority	Guadalupe-Blanco River Authority
County	Guadalupe
Reservoir type	Mainstem: Guadalupe River
Shoreline Development Index	5.27
Conductivity	395 – 414 $\mu\text{S/cm}$

Table 2. Boat ramp characteristics for Placid Reservoir, Texas, March 2021. Reservoir elevation at time of survey was 497 feet above mean sea level.

Boat ramp	Latitude Longitude (dd)	Public	Parking capacity (N)	Elevation at end of boat ramp (ft)	Condition
IH-10 underpass	29.566847 -98.023132	Y	12+	UNK	Excellent, no access issues

Table 3. Harvest regulations for Placid 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 and Guadalupe	5 ^a	None
Crappie: White and Black crappie, their hybrids, and subspecies	25 (in any combination)	10-inch minimum

^a Daily bag for Largemouth Bass, Spotted Bass, and Guadalupe Bass = 5 fish in any combination.

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

Year	Number	Size	Year	Number	Size
<u>Channel Catfish</u>			<u>White Crappie</u>		
1966	4,200	FGL	<u>1994</u>	<u>24,808</u>	FGL
1973	9,000	FGL	Species Total	24,808	
1995	6,261	FGL	<u>Coppernose Bluegill</u>		
1997	5,990	FGL	<u>1983</u>	<u>10,000</u>	FGL
<u>2005</u>	<u>20,806</u>	FGL	Species Total	10,000	
Species Total	46,257		<u>Blue Catfish</u>		
<u>Florida Largemouth Bass</u>			1995	40,541	FGL
1978	410	FGL	<u>1998</u>	<u>40,000</u>	FGL
1985	9,500	FGL	Species Total	80,541	
1993	1,461	FGL	<u>Triploid Grass Carp</u>		
1994	40,413	FGL	1995	*25	ADL
1994	141	ADL	<u>1996</u>	<u>*11</u>	ADL
2003	20,136	FGL	Species Total	36	
2003	119,487	FRY			
2005	20,396	FGL			
<u>2017</u>	<u>308,083</u>	FRY			
Species Total	520,027				

*Radio tagged.

Table 5. Objective-based sampling plan components for Placid Reservoir, Texas 2020–2021.

Gear/target species	Survey objective	Metrics	Sampling objective
<i>Electrofishing</i>	For all target species monitor for large-scale changes in:		
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	
	Size structure	PSD, length frequency	$N \geq 50$
Gizzard Shad ^a	Abundance	CPUE–Total	
	Size structure	PSD, length frequency	$N \geq 50$
	Prey availability	IOV	$N \geq 50$
<i>Gill netting</i>			
Blue Catfish	Abundance	CPUE-Stock	
	Size structure	PSD, length frequency	
	Condition	W_r	10 fish/inch group (max)
Channel Catfish	Abundance	CPUE-Stock	
	Size structure	PSD, length frequency	
	Condition	W_r	10 fish/inch group (max)
Flathead Catfish	Abundance	CPUE-Stock	
	Size structure	PSD, length frequency	
	Condition	W_r	10 fish/inch group (max)

Table 5. Continued. Objective-based sampling plan components for Placid Reservoir, Texas 2020 – 2021.

Gear/target species	Survey objective	Metrics	Sampling objective
<i>Low frequency electrofishing</i>	Exploratory use of alternative gear to monitor for large-scale changes in:		
Flathead Catfish	Abundance	CPUE-Stock	
	Size structure	PSD, length frequency	
Blue Catfish	Abundance	CPUE-Stock	
	Size structure	PSD, length frequency	

^a No additional effort will be expended to achieve an RSE ≤ 25 for CPUE of Bluegill and Gizzard Shad if not reached from designated Largemouth Bass sampling effort. Instead, Largemouth Bass body condition can provide information on forage abundance, vulnerability, or both relative to predator density.

Table 6. Survey of structural habitat types, Placid Reservoir, Texas, 2008. Shoreline habitat type units are reported as estimate in miles and percent of total shoreline.

Habitat type	Estimate	% of total
Bulkhead	7.8 miles	30.5
Bulkhead with boat docks	8.5 miles	33.2
Natural	9.2 miles	35.9
Rocky	0.1 miles	0.4

Table 7. Survey of aquatic vegetation, Placid Reservoir, Texas, 2008–2020. Surface area (acres) is listed with percent of total reservoir surface area in parentheses.

Vegetation	2008	2012	2016	2020
Native submersed				
Native floating-leaved	11.3 (5.3)	17.8 (7.2)	1.0 (0.5)	3.8 (1.8)
Native emergent	6.2 (2.9)	4.8 (1.9)	0.6 (0.3)	1.1 (0.5)
Non-native				
Water hyacinth (Tier III)*	<0.1(<0.1)		0.1 (<0.1)	1.0 (0.5)

*Tier III is Watch Status

Gizzard Shad

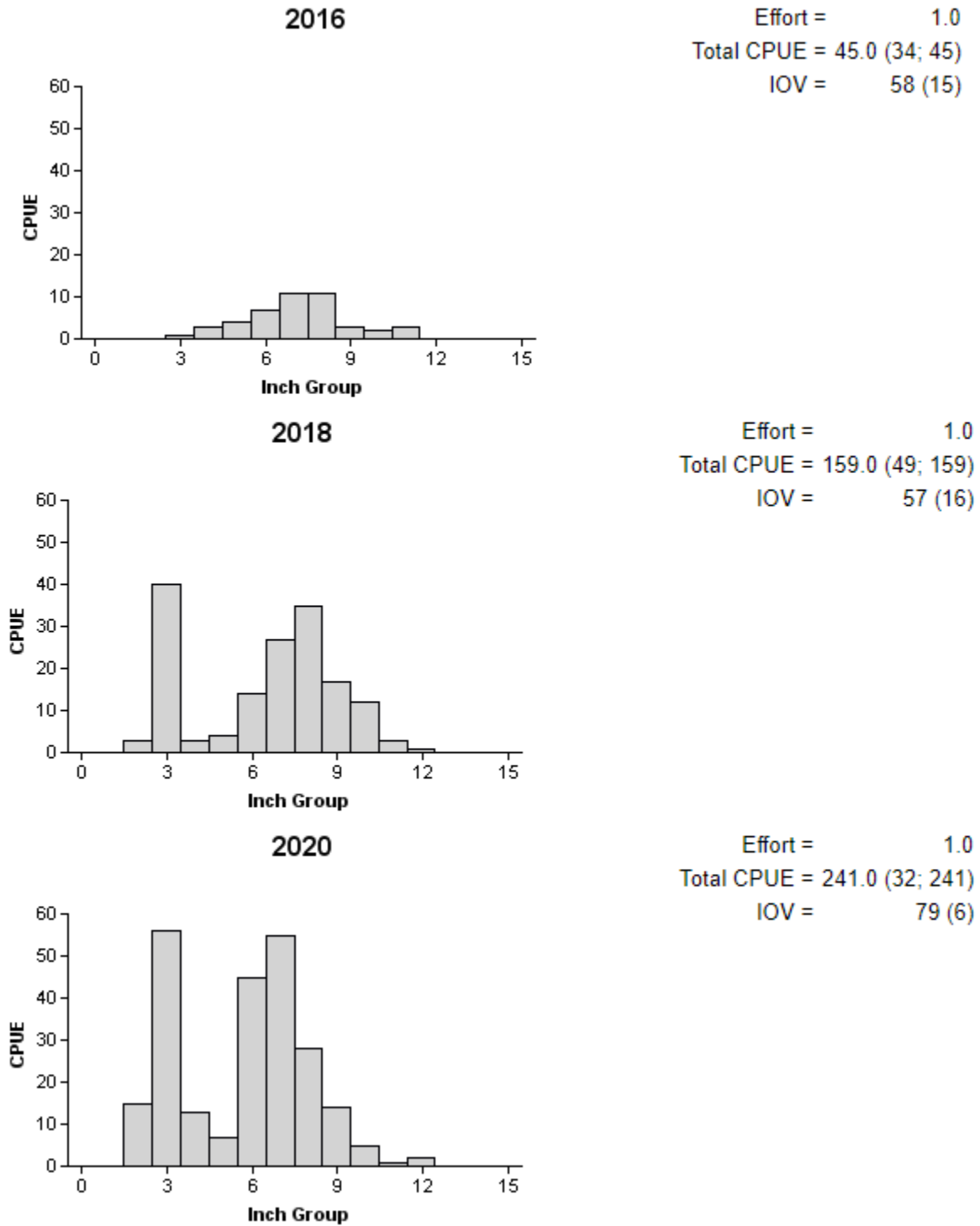


Figure 1. Number of Gizzard Shad caught per hour (CPUE) and population indices (RSE and N for CPUE and SE for IOV are in parentheses) for fall electrofishing surveys, Placid Reservoir, Texas, 2016, 2018, and 2020.

Bluegill

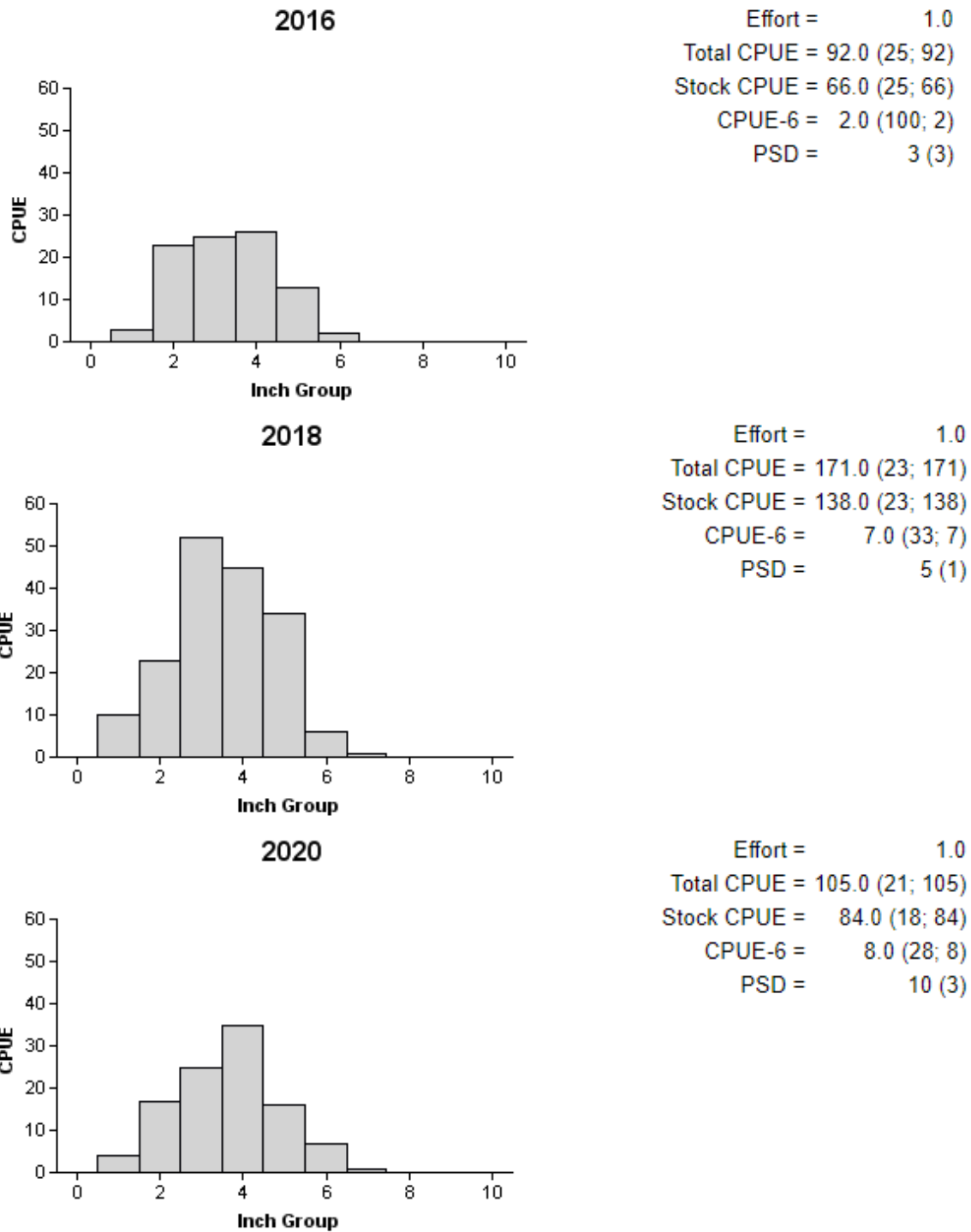


Figure 2. Number of Bluegill caught per hour (CPUE) and population indices (RSE and N for CPUE and SE for size structure are in parentheses) for fall electrofishing surveys, Placid Reservoir, Texas, 2016, 2018, and 2020.

Blue Catfish

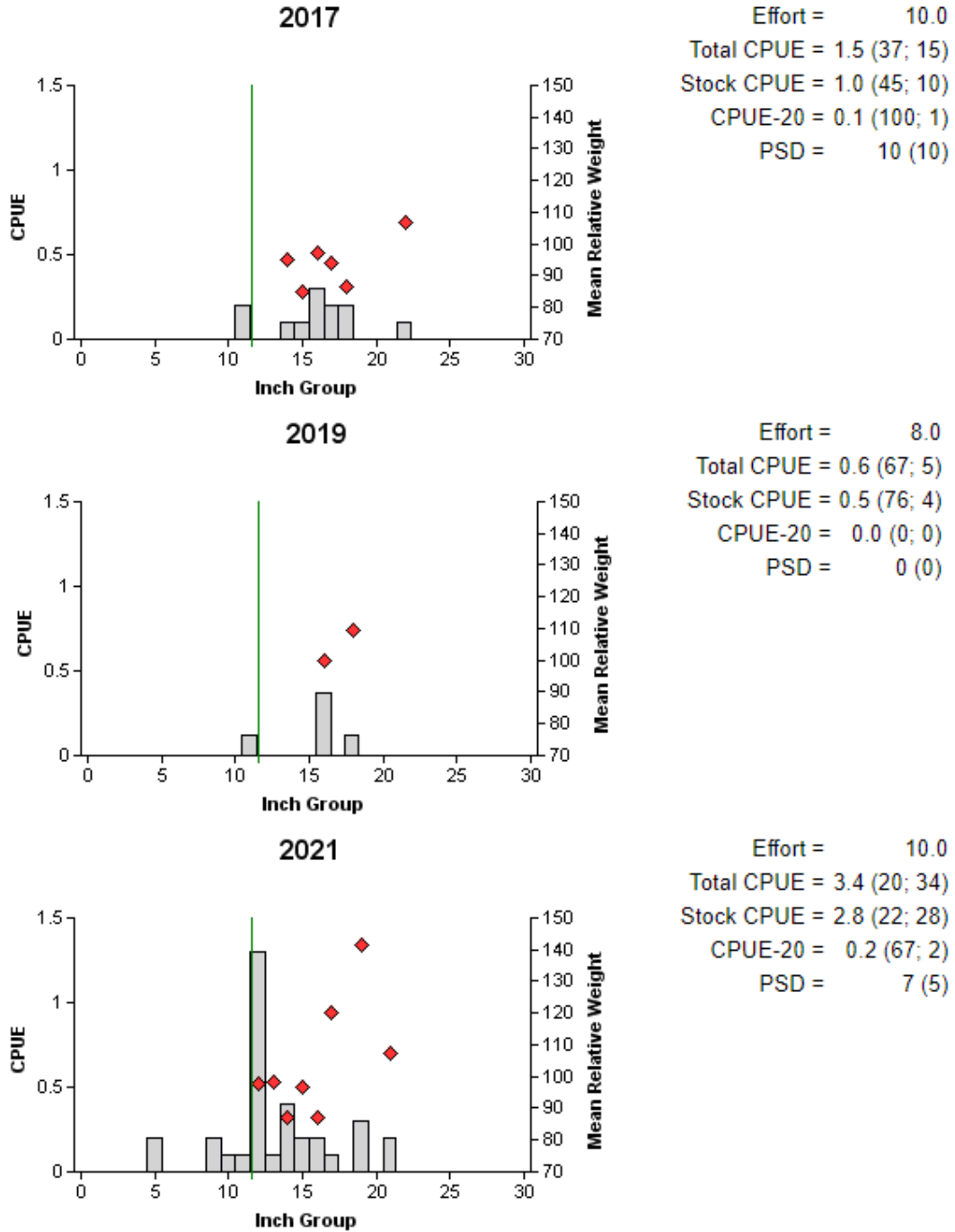


Figure 3. Number of Blue Catfish caught per net night (CPUE), mean relative weight (diamonds), and population indices (RSE and N for CPUE and SE for size structure are in parentheses) for spring gill net surveys, Placid Reservoir, Texas, 2017, 2019, and 2021. Vertical line indicates minimum length limit at time of survey.

Blue Catfish

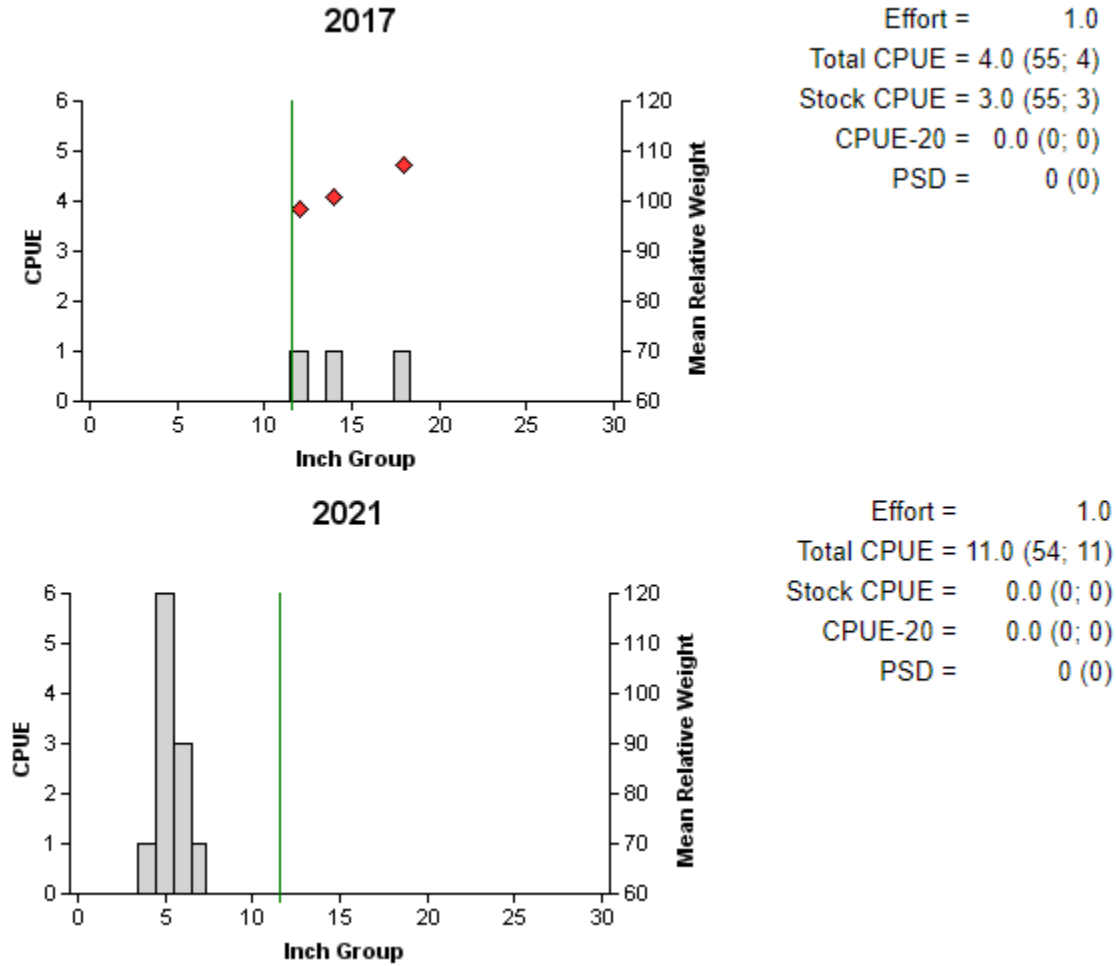


Figure 4. Number of Blue Catfish caught per hour (CPUE, bars), mean relative weight (diamonds), and population indices (RSE and N for CPUE and SE for size structure are in parentheses) for summer low frequency electrofishing surveys, Placid Reservoir, Texas, 2017 and 2021. Vertical line indicates minimum length limit at time of survey.

Channel Catfish

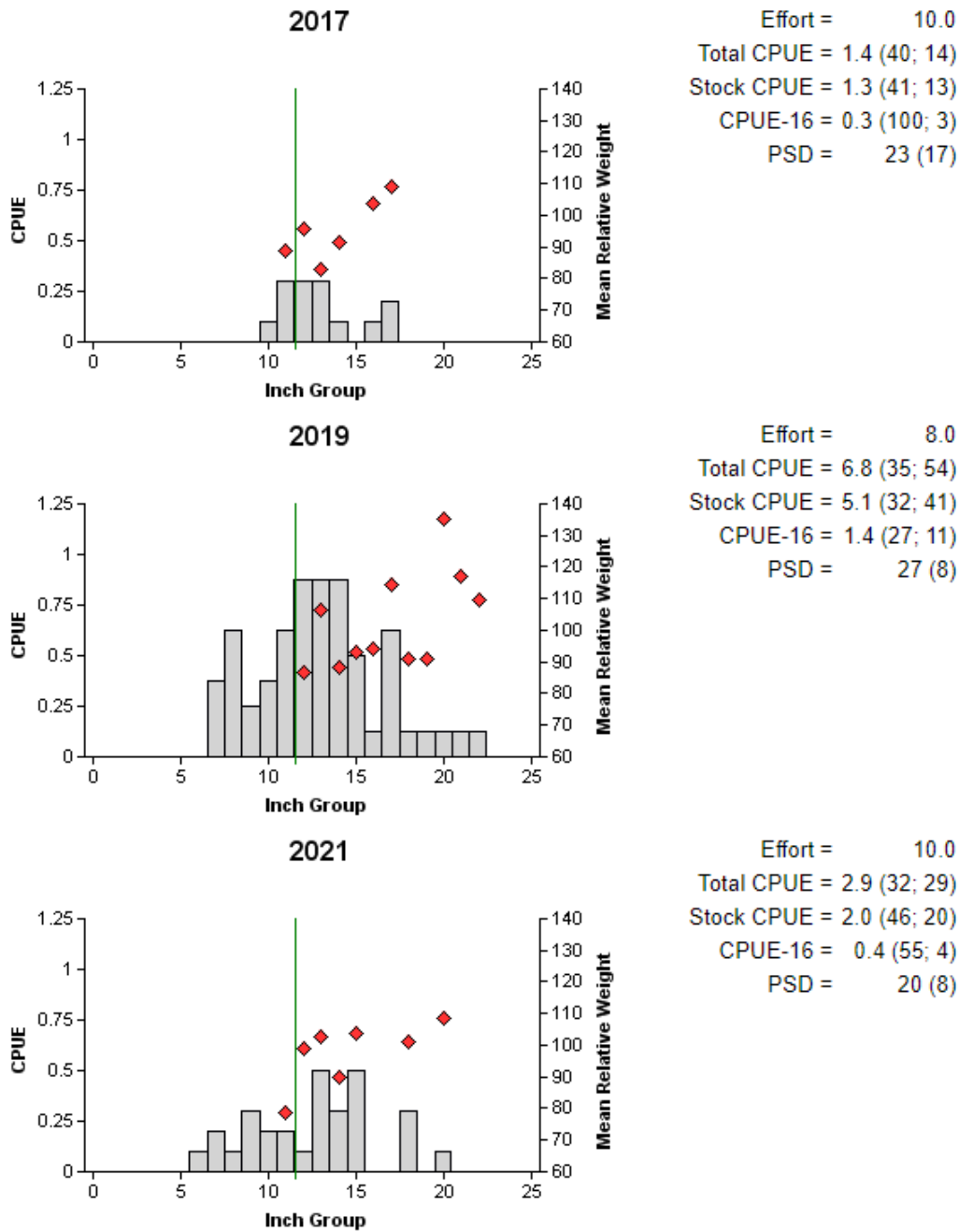


Figure 5. Number of Channel Catfish caught per net night (CPUE), mean relative weight (diamonds), and population indices (RSE and N for CPUE and SE for size structure are in parentheses) for spring gill net surveys, Placid Reservoir, Texas, 2017, 2019, and 2021. Vertical line indicates minimum length limit at time of survey.

Channel Catfish

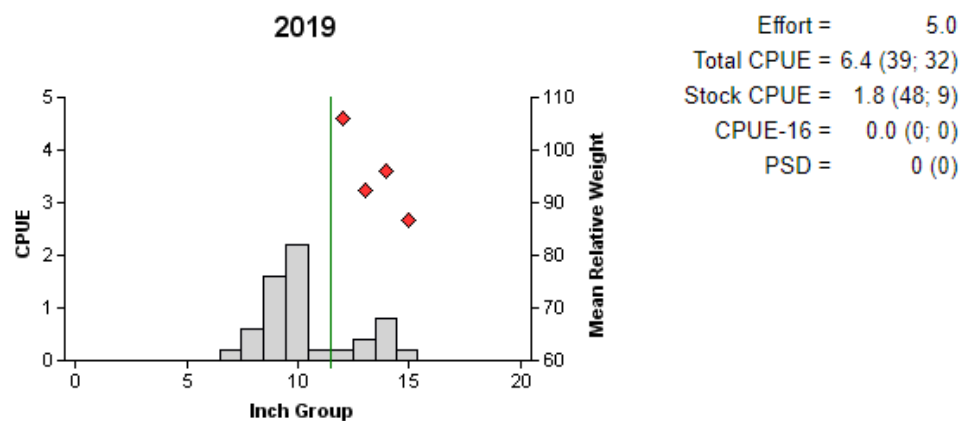


Figure 6. Number of Channel Catfish caught per net night (CPUE), mean relative weight (diamonds), and population indices (RSE and N for CPUE and SE for size structure are in parentheses) for hoop net surveys, Placid Reservoir, Texas, 2017, and 2019. No fish were collected in the 2017 survey. Vertical line indicates minimum length limit at time of survey.

Flathead Catfish

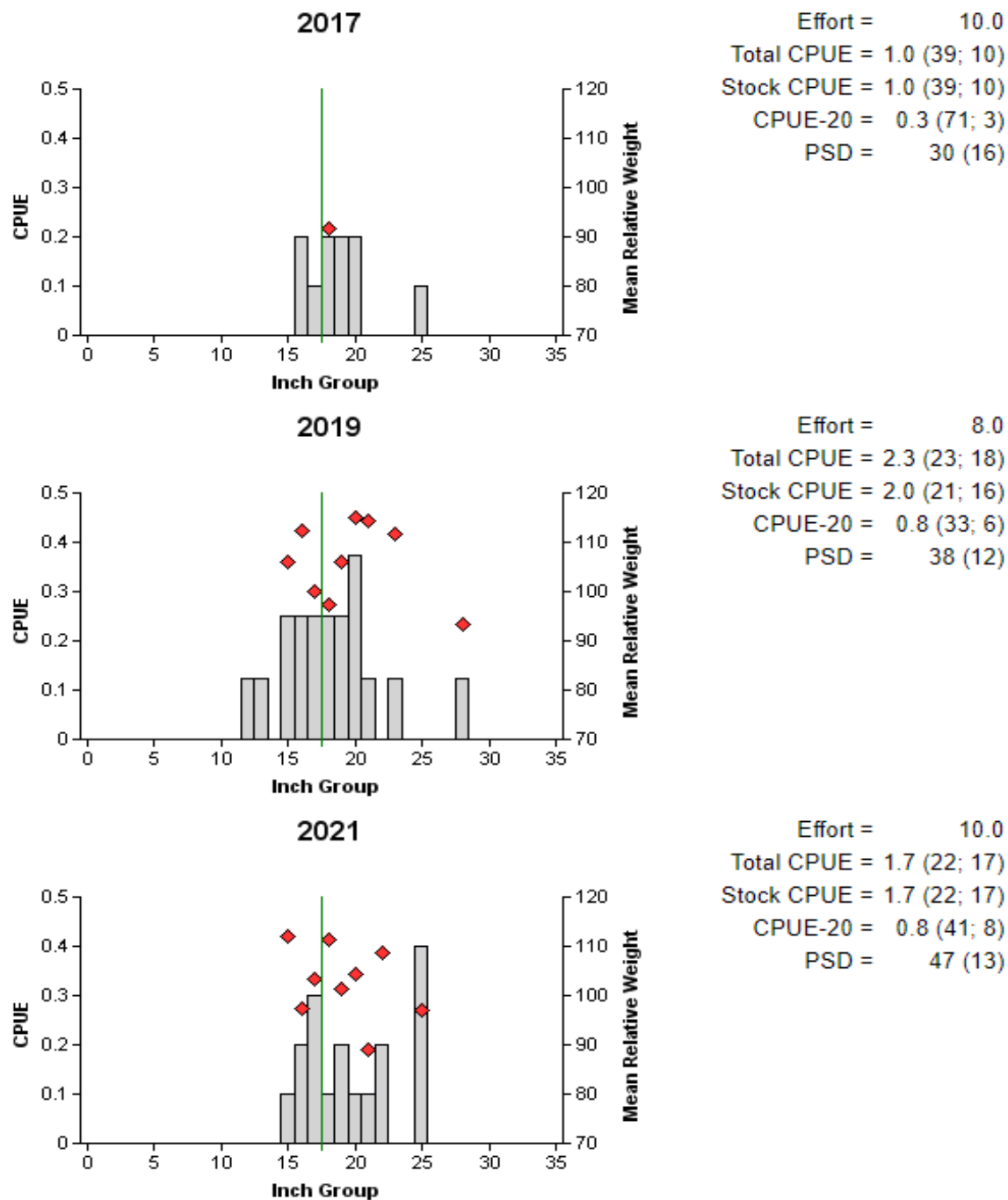


Figure 7. Number of Flathead Catfish caught per net night (CPUE), mean relative weight (diamonds), and population indices (RSE and N for CPUE and SE for size structure are in parentheses) for spring gill net surveys, Placid Reservoir, Texas, 2017, 2019, and 2021. Vertical line indicates minimum length limit at time of survey.

Flathead Catfish

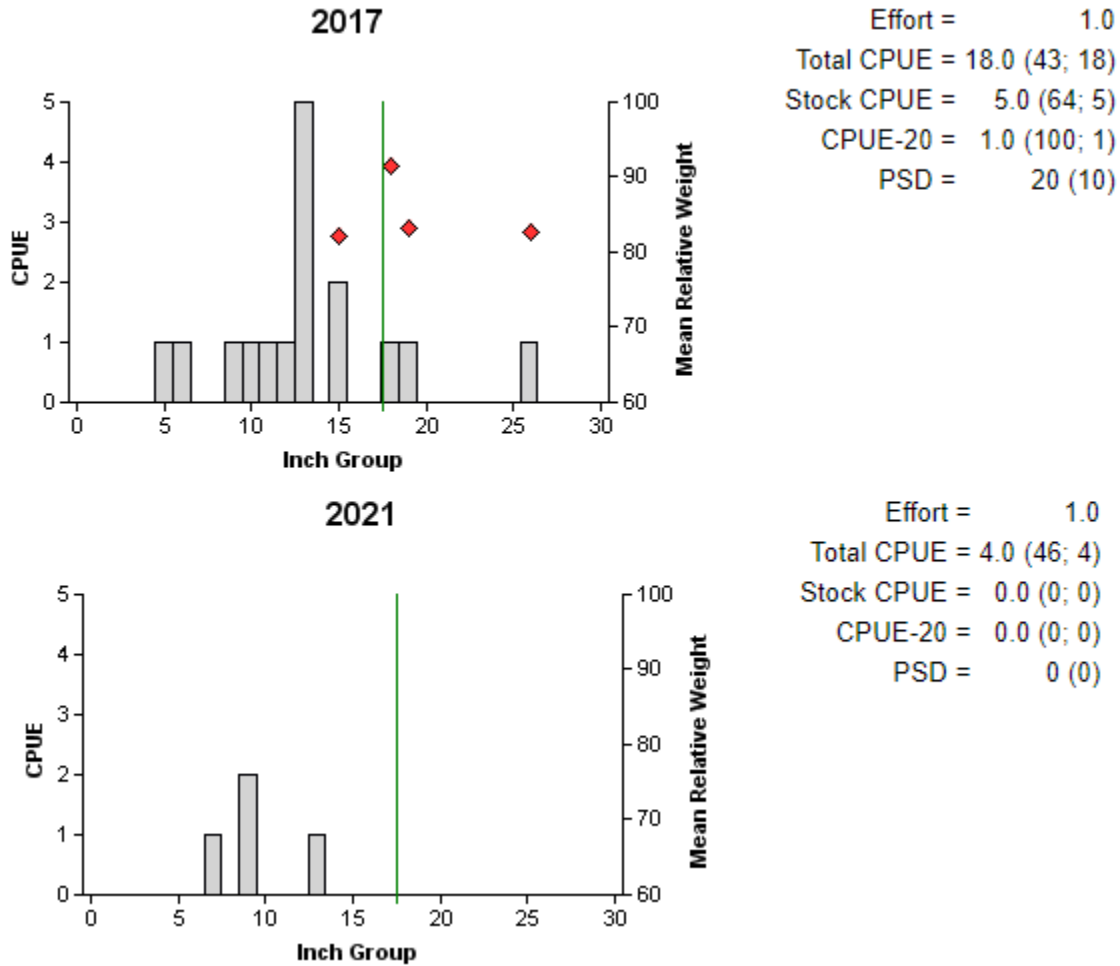


Figure 8. Number of Flathead Catfish caught per hour (CPUE, bars), mean relative weight (diamonds), and population indices (RSE and N for CPUE and SE for size structure are in parentheses) for summer low frequency electrofishing surveys, Placid Reservoir, Texas, 2017 and 2021. Vertical line indicates minimum length limit at time of survey.

Largemouth Bass

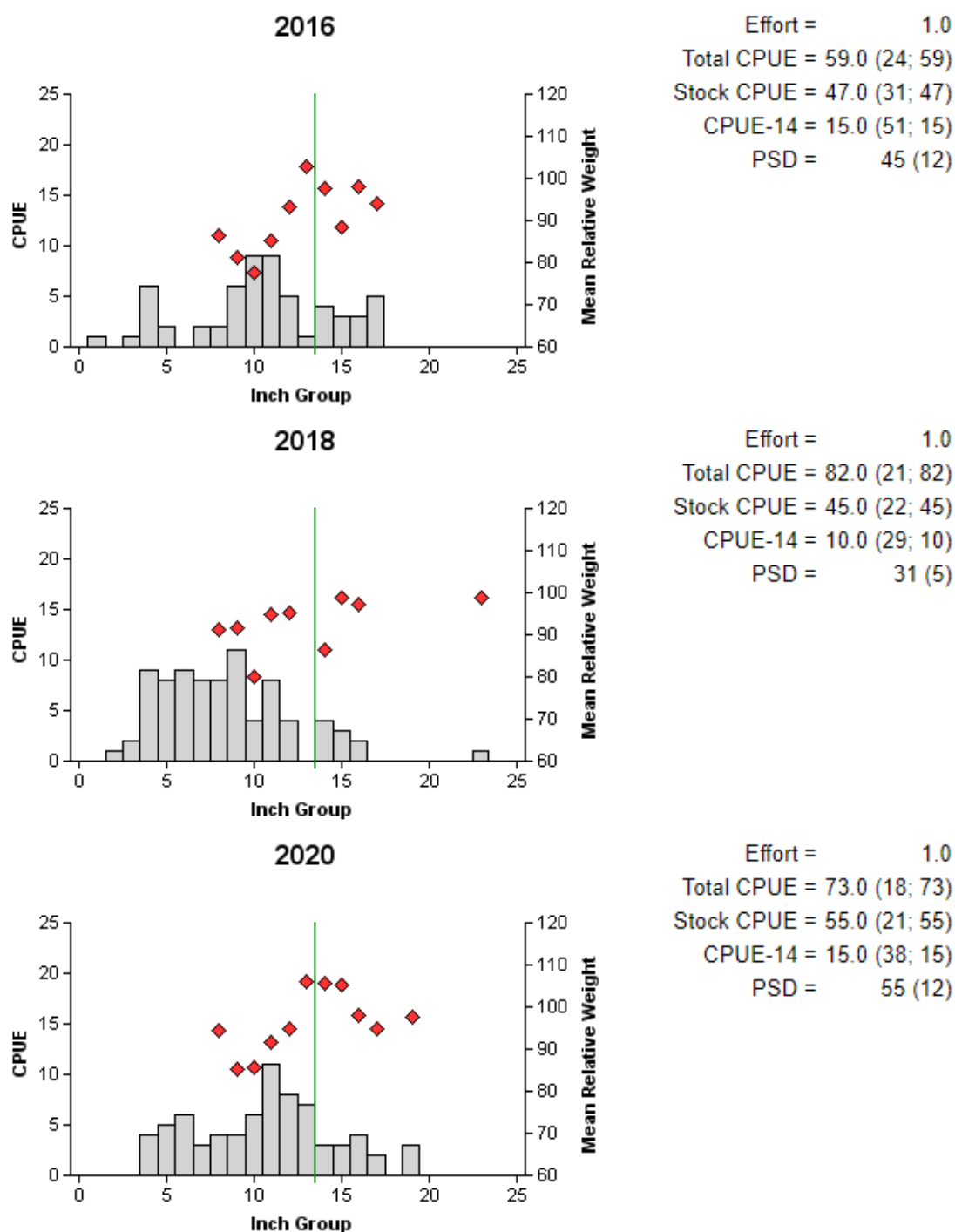


Figure 9. Number of Largemouth Bass caught per hour (CPUE, bars), mean relative weight (diamonds), and population indices (RSE and N for CPUE and SE for size structure are in parentheses) for fall electrofishing surveys, Placid Reservoir, Texas, 2016, 2018, and 2020. Vertical line indicates minimum length limit at time of survey.

Table 8. Mean age at legal length (14 in) for Largemouth Bass collected by fall electrofishing, Placid Reservoir, Texas. Standard deviations are in parentheses.

Year	N	Age Range	Age at Length
2008	12	2 – 3	2.3 (0.45)
2010	4	2 – 4	3.0 (0.81)
2012	13	1 – 4	2.7 (0.83)
2014	15	2 – 3	2.5 (0.52)
2016	12	2 – 5	3.1 (0.99)
2020	13	2 – 3	2.5 (0.52)

Table 9. Results of genetic analysis of Largemouth Bass collected by fall electrofishing, Placid Reservoir, Texas, 2008, 2010, and 2012. FLMB = Florida Largemouth Bass, NLMB = Northern Largemouth Bass, Intergrade = hybrid between a FLMB and a NLMB.

Year	Sample size	Number of fish			% FLMB alleles	% FLMB
		FLMB	Intergrade	NLMB		
2008	14	0	14	0	64.6	0.0
2010	30	1	28	1	57.4	3.3
2012	30	0	30	0	56.7	0.0

Proposed Sampling Schedule

Table 10. Proposed sampling schedule for Placid Reservoir, Texas. Survey period is June through May. Gill netting surveys are conducted in the spring, low frequency electrofishing is conducted in the summer, and electrofishing surveys are conducted in the fall.

	Survey year			
	2021-2022	2022-2023	2023-2024	2024-2025
Angler Access				X
Vegetation				X
Electrofishing – Fall		X		X
Electrofishing – Low frequency				X
Gill netting				X
Creel – Spring Quarter		X		
Report				X

APPENDIX A – 2021 Current waterbody access restrictions



Map produced by the Guadalupe-Blanco River Authority outlining prohibited and restricted unsafe zones to keep the public safe within Placid Reservoir. The prohibited unsafe zone is defined as an area unsafe for ALL activities in the water (boating, canoeing, jet skiing, swimming, wading, tubing, etc.) whereas, the restricted unsafe zone is an area unsafe for activities for public physically in the water (swimming, wading, tubing, etc.).

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

Number (N) and catch rate (CPUE) (RSE in parentheses) of all target species collected from all gear types from Placid Reservoir, Texas, 2020-2021. Sampling effort was 1 hour for electrofishing, 10 net nights for gill netting, and 1 hour for low frequency electrofishing.

Species	Electrofishing		Gill Netting		Low Frequency Electrofishing	
	N	CPUE	N	CPUE	N	CPUE
Gizzard Shad	241	241.0 (32)	146	14.6 (32)		
Threadfin Shad	1	1.0 (100)				
Spotted Gar			2	0.2 (100)		
Longnose Gar			1	0.1 (100)		
Common Carp			1	0.1 (100)		
Golden Shiner	3	3.0 (52)	3	0.3 (71)		
Red Shiner	1	1.0 (100)				
Bullhead Minnow	10	10.0 (55)				
Inland Silverside	5	5.0 (100)				
Smallmouth Buffalo			2	0.2 (100)		
Gray Redhorse			26	2.6 (42)		
Blue Catfish			34	3.4 (20)	11	11.0 (54)
Channel Catfish			29	2.9 (32)	4	4.0 (58)
Flathead Catfish			17	1.7 (22)	4	4.0 (46)
Mexican Tetra	1	1.0 (100)				
Redbreast Sunfish	21	21.0 (28)				
Green Sunfish	4	4.0 (67)				
Warmouth	5	5.0 (46)				
Bluegill	105	105.0 (21)	1	0.1 (100)		
Longear Sunfish	24	24.0 (37)	2	0.2 (100)		
Redear Sunfish	11	11.0 (43)	1	0.1 (100)		
Spotted Bass	20	20.0 (24)	12	1.2 (37)		
Largemouth Bass	73	73.0 (18)	4	0.4 (55)		
White Crappie	1	1.0 (100)	4	0.4 (55)		
Black Crappie	1	1.0 (100)	7	0.7 (37)		

APPENDIX B – Continued

Number (N) and catch rate (CPUE) (RSE in parentheses) of all target species collected from all gear types from Placid Reservoir, Texas, 2020-2021. Sampling effort was 1 hour for electrofishing, 10 net nights for gill netting, and 1 hour for low frequency electrofishing.

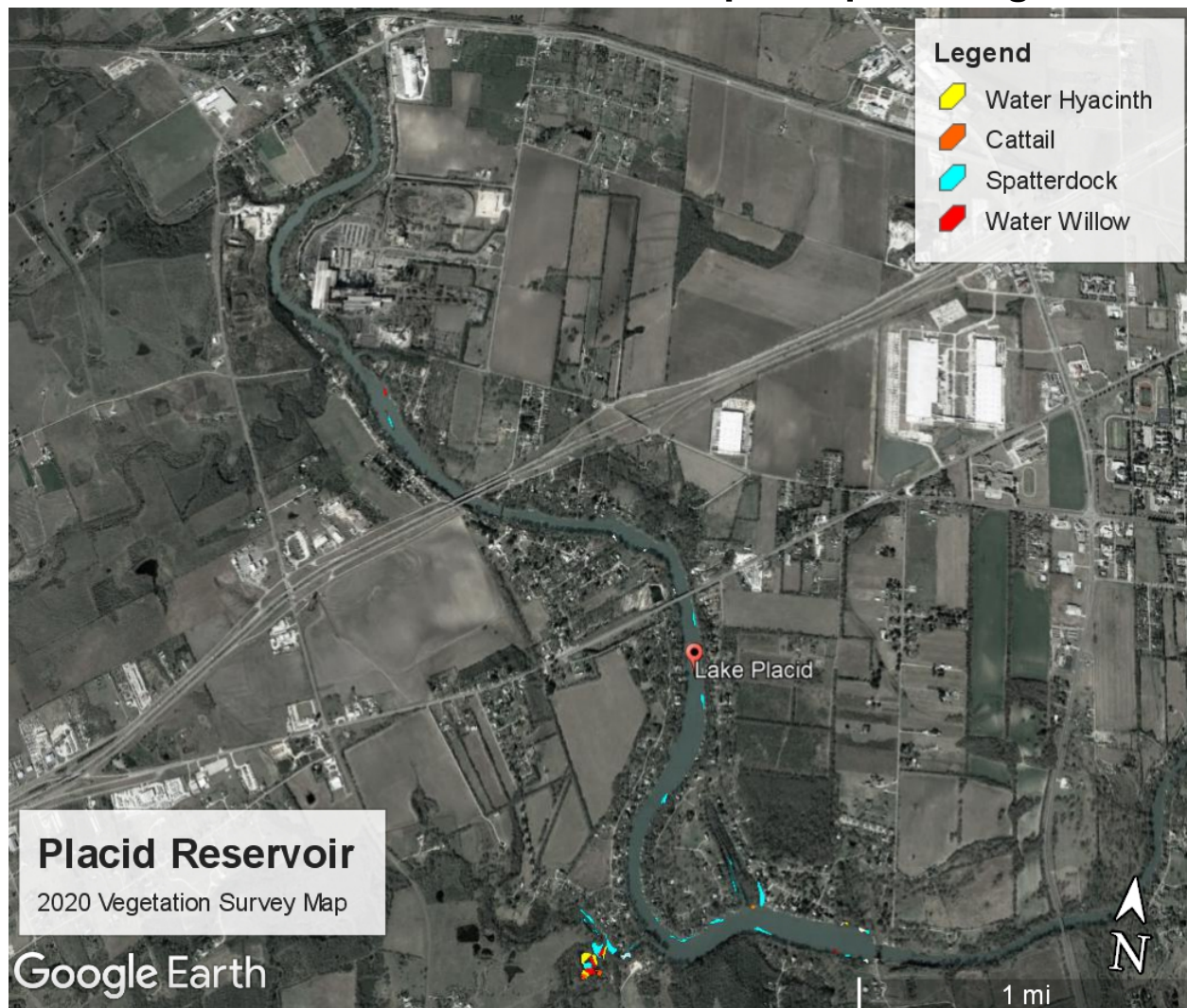
Species	Electrofishing		Gill Netting		Low Frequency Electrofishing	
	N	CPUE	N	CPUE	N	CPUE
Rio Grande Cichlid	5	5.0 (62)				
Blue Tilapia	1	1.0 (100)				
Grass Carp			1	0.1 (100)		

APPENDIX C – Map of sampling locations



Location of sampling sites, Placid Reservoir, Texas, 2020-2021. Low frequency electrofishing, gill net, and electrofishing stations are indicated by square (blue), triangle (green), and circle (red), respectively. Water level was near full pool at time of sampling.

APPENDIX D – 2020 Distribution map of aquatic vegetation



Map of native and non-native vegetation, Placid Reservoir, TX, 2020.

APPENDIX E – 2019 Angler survey results

Question	Answer
<i>Over the past 12 months, which of the following water bodies have you fished?</i>	Dunlap 100.0%
	McQueeney 15.6%
	Placid 33.3%
	Meadow 8.3%
	H-4 9.4%
	H-5 3.1%
<i>Over the past 12 months, which of these waterbodies do you fish most frequently fish?</i>	Dunlap 89.6%
	McQueeney 2.1%
	Placid 4.2%
	Meadow 1.0%
	H-4 2.1%
	H-5 1.0%
<i>During your fishing trips to these waterbodies, what fish species do you fish for?</i>	Top Ranked
	Largemouth Bass 46%
	All Black Bass 38%
	All Catfish 16%
	All Crappie 6%
	All Sunfish 6%
	Temperate Bass 4%
	Carp 3%
	All Gar 2%
<i>During your fishing trips to these waterbodies, what fish species do you most frequently fish for?</i>	Top Ranked
	Largemouth Bass 49%
	All Black Bass 31%
	All Catfish 13%
	All Crappie 2%
	Striped Bass 1%
	Blue Catfish 1%
	Flathead Catfish 1%
	All Sunfish 1%
	Carp 1%
<i>What types of fishing gear do you use when you fish these water bodies?</i>	Top Ranked
	Rod and Reel 100%
	Bow Fishing 2.1%
	Trotline and Jugline 1.0%
<i>Are you satisfied with the current fishing regulations on the above listed waterbodies?</i>	Preference
	Yes 93.7%
	No 6.3%



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