PERFORMANCE REPORT

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INLAND FISHERIES DIVISION MONITORING AND MANAGEMENT PROGRAM

2013 Fisheries Management Survey Report

Victor Braunig Reservoir

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SURVEY AND MANAGEMENT SUMMARY

Fish populations in Victor Braunig Reservoir were surveyed in 2013 using electrofishing and in 2014 using gill netting. Historical data are presented with the 2013-2014 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: Victor Braunig is a 1,298-acre reservoir located on the southeast side of San Antonio in Bexar County. It was built in 1964 by City Public Service Energy for power plant cooling and later opened for recreation. Recreation access is controlled by Thousand Trails Management Services, Inc., and paid entry is required. Water level is maintained at or near conservation pool by pumping from the San Antonio River. Aquatic plants, primarily bulrush, cattails, and brittle naiad, typically occupy up to 10% of the reservoir. Boat angling effort was 35,600 hours and angler expenditures were $194,893 in 2009-2010.

Management History: Important sport fishes include Red Drum, Palmetto Bass, and Channel Catfish. Stockings of Red Drum and Palmetto Bass were required to maintain their populations. Stockings have occurred most years since the mid-70s. All sport fish are managed with statewide regulations, except Red Drum and Largemouth Bass. Red Drum have a minimum size limit of 20 inches but do not have a maximum length limit. Largemouth Bass harvest regulations were changed from the statewide 10-inch minimum length limit (MLL), 10 fish daily bag limit (DBL) to a 21-inch MLL, 2-fish DBL in 1985. The harvest regulations were again changed in 1995 to an 18-inch MLL, 3-fish DBL. The DBL was raised to 5 in 1995. Florida Largemouth Bass (FLMB) were first stocked in 1976 and were last stocked in 1987. Sub-adult Northern Largemouth Bass were purchased and stocked by CPSE in 2004, 2006, 2007, and 2008.

- **Fish Community**
  - **Prey species:** Despite a decrease in abundance and increase in size of Gizzard Shad, adequate forage was available to most predators because of the abundance of Threadfin Shad, Bluegill, other sunfishes, Blue Tilapia, and Rio Grande Cichlids.
  - **Catfishes:** Channel Catfish abundance declined, but still provided a popular fishery.
  - **Palmetto Bass:** Palmetto Bass abundance increased and fish reached harvestable size about two years after stocking.
  - **Largemouth Bass:** Largemouth Bass abundance was low and only supports a marginal fishery.
  - **Red Drum:** Red Drum supported a popular fishery, but gill net catch rates were variable.
- **Management Strategies:** Continue stocking Palmetto Bass fingerlings at 30 fish/acre and Red Drum fingerlings at 200 fish/acre. Develop a Hybrid striped bass identification poster and work with Thousand Trails Management Services, Inc. to post it at the entrance of the reservoir. Explore alternative sampling protocols for Red Drum. Inform the public about the negative impacts of aquatic invasive species. Conduct general monitoring surveys with a 6-month creel survey in 2015, gill nets in 2016 and 2018, and electrofishing, access, and vegetation surveys in 2017.

INTRODUCTION

This document is a summary of fisheries data collected from Victor Braunig Reservoir in 2013-2014. 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 2013-2014 data for comparison.

Reservoir Description

Victor Braunig is a 1,298-acre reservoir constructed in 1964 for power plant cooling and recreation. It is located in Bexar County on the southeast side of San Antonio and owned by City Public Service Energy (CPSE). Recreation access is controlled by Thousand Trails Management Services, Inc. (TTMS), and paid entry is required. Water level is maintained at or near conservation pool by pumping from the San Antonio River. Recently, CPSE transitioned from traditional generators to "peaking units" which only run when the demand for electricity cannot be met by other sources. This change has led to a slight cooling of the reservoir, which will continue for the next few years until demand for electricity requires more constant use of those units (Gregg Tieken, CPSE, Power Generation, Environmental Manager, personal communication). About half of the shoreline was categorized as rocky and the remainder natural. Aquatic plants, primarily bulrush, cattails, and brittle naiad, typically occupy 10% or less of the reservoir. Improvements were made to the boat launches in 2008. Other descriptive characteristics for Victor Braunig Reservoir are in Table 1.

Angler Access

Victor Braunig Reservoir has two public concrete boat ramps with two lanes each located in the cove near the park entrance and an unimproved designated kayak launching area (Table 2). The two public ramps are located on the southwest side of the reservoir and the kayak launching area is located at the farthest east end of the park. Considerable shoreline access including a fishing pier exists for bank angling

Management History

Previous management strategies and actions: Management strategies and actions from the previous survey report (Dennis and Myers 2010) included:

1. Stock Palmetto Bass fingerlings annually at a rate of 30 fish/acre, twice the rate previously used to increase population abundance.

   Action: Palmetto Bass fingerlings were stocked at 30/acre in 2013. As a result of inadequate hatchery production, no Palmetto Bass were stocked in 2012 and only 7.5/acre were stocked in 2011. In 2010 the stocking rate was 17 fingerlings/acre and an additional 310,858 fry were also stocked.
2. Stock Red Drum fingerlings annually at a rate of 200 fish/acre or sub-adult Red Drum annually at a rate of 4 fish/acre.

   Action: Red Drum fingerlings were stocked annually from 2010-2013 at stocking rates that ranged from 219-255/acre. No sub-adult Red Drum were available for stocking.

Harvest regulation history: All sport fishes, except Largemouth Bass and Red Drum, are currently managed with statewide regulations (Table 3). From 1985 to 1994, Largemouth Bass were managed with a 21-inch MLL and 2-fish daily bag limit (DBL). The regulations were changed to an 18-inch MLL, 5-fish DBL in 1995. Red Drum are managed with a 20-inch MLL and 3-fish DBL.

Stocking history: Palmetto Bass and Red Drum were stocked in most years since 1976. Largemouth Bass were stocked in most years from 1967 to 1984 to supplement low natural reproduction. In addition, experimental stockings of Kemp's Largemouth Bass, Nile Perch, Orangemouth Corvina, Tarpon, and Black X White Hybrid Crappie were conducted to evaluate alternative angling opportunities. In 2004, 2006, 2007, and 2008 sub-adult Northern Largemouth Bass (6-10 inches total length, TL) were

purchased and stocked by CPSE as part of a special research project to improve the Largemouth Bass fishery. The complete stocking history is in Table 4.

Vegetation/habitat management history: No habitat or vegetation management activities have been conducted on this reservoir.

Water transfer: While water from the San Antonio River is pumped into the reservoir, no inter-basin transfers are known to exist.

METHODS

Fishes were collected by electrofishing (1 hour at 12, 5-min stations) and gill netting (5 net nights at 5 stations). Catch per unit effort (CPUE) for electrofishing was recorded as the number of fish caught per hour (fish/h) of actual electrofishing and for gill nets as the number of fish per net night (fish/nn). All survey sites were randomly selected and all surveys were conducted according to the Fishery Assessment Procedures (TPWD, Inland Fisheries Division, unpublished manual revised 2011). Aerial photography for Appendix A came from the Texas Natural Resources Information System website (http://www.tnris.org/).

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). Palmetto Bass PSD was calculated according to Dumont and Neely (2011) and Red Drum PSD was calculated according to Dennis (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 statistics.

Genetic analysis of Largemouth Bass was conducted according to the Fishery Assessment Procedures (TPWD, Inland Fisheries Division, unpublished manual revised 2011). Micro-satellite DNA analysis was used to determine genetic composition of individual fish from 2000 through 2013 and by electrophoresis for previous years.

Otoliths were collected from Largemouth Bass, Palmetto Bass, and Red Drum for age analysis in accordance with the Fishery Assessment Procedures (TPWD, Inland Fisheries Division, unpublished manual revised 2011). Red Drum otoliths were taken to the Perry R. Bass Marine Research Station for processing and analysis. One year was added to the observed age of each Red Drum as the fingerlings stocked in Victor Braunig Reservoir are spawned in September and do not lay down the first annulus until 15 months later (Brent Bumguardner, Perry R. Bass R. Bass Marine Fisheries Research Center, personal communication).

A shoreline structural habitat survey was conducted in 2009 and a vegetation survey was conducted in 2013. These surveys were conducted according to the TPWD Fishery Assessment Procedures in effect at time of the surveys.

An annual access-point creel survey was conducted from 2009 through 2010. The creel period was December through November. 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 2011). Only boat anglers were surveyed.

RESULTS AND DISCUSSION

Habitat: Shoreline structural habitat has remained rocky or natural since reservoir impoundment. Aquatic vegetation species (bulrush, brittle naiad, and cattail) occupied 10% of the reservoir (Table 5). Herbicide treatments have never been conducted. A shoreline structural habitat survey was last conducted in 2009 (Dennis and Myers 2010).

Creel: Total boat fishing effort was 35,600 hours in 2009-2010, down from 44,573 hours in 2004-2005. Angler expenditures were similar in both creel periods ($190,688 in 2004-2005 and $194,893 in 2009-2010; Table 6). Anglers prefer to fish for anything, red drum, or channel catfish (Table 7).

Prey species: Gizzard Shad CPUE in 2011 and 2013 was less than half of CPUE in 2010 (61.0/h in 2011, 72.0/h in 2013, and 161.0/h in 2010) and IOV has dropped from 90 in 2010 to 68 in 2013. This indicated a substantial decrease in the availability of Gizzard Shad as a forage resource (Figure 1). Bluegill CPUE was 180.0/h in 2013 (the highest from the past thee surveys) and PSD has decreased to 24, indicating good availability of adequately sized forage (Figure 2). Threadfin Shad, Redear Sunfishes, Rio Grande Cichlids, and Blue Tilapia also contribute to the forage base (Appendix A).

Channel Catfish: The gill net CPUE of Channel Catfish has declined for the last three surveys and the sample is dominated by larger fish, as PSDs were 83 or higher all three years. Mean relative weights were at or near 100 for all three sample years (Figure 3). While boat angling effort for catfishes declined from 23% in 2004-2005 to 18% in 2009-2010, they were still the second most popularly sought-after species in the reservoir (Table 7). Estimated harvest dropped from 9,035 fish in 2004-2005 to 4,604 in 2009-2010. No legal-sized fish were released in either survey year (Table 8). Harvested Channel Catfish ranged in size from 13 to 26 inches (Figure 4).

Palmetto Bass: The gill net CPUE of Palmetto Bass increased over the last three samples, from 3.2/nn in 2010 to 8.4/nn in 2012 to 14.4/nn in 2014 and PSD values have been variable (Figure 5). Palmetto Bass reach legal size (18 inches) in two years (Table 9). Percent of directed effort for Palmetto Bass was similar in 2009-2010 and 2004-2005 suggesting that angling interest in the species relative to others was consistent (Table 7). Directed fishing effort, however, was about 50% less in 2009-2010 than in 2004-2005 (Table 10). This decline may in part be a product of the creel interview protocol. Anglers at this reservoir often effectively fish for Palmetto Bass and Red Drum at the same time using the same technique. They frequently indicate they were targeting the species they catch most that particular trip, thus skewing directed effort estimates. In years when the Palmetto Bass population was low from poor stocking success, anglers will tend to indicate they were targeting Red Drum, even though they were fishing for both. Additionally, anglers that indicated they were fishing for both Red Drum and Palmetto Bass were recorded as targeting “anything,” further skewing directed effort estimates. The decreases in directed effort for Palmetto Bass and anything and the corresponding increase in directed effort for Red Drum may be explained, in part, by an increase in the catch of Red Drum over Palmetto Bass. Only a small percentage of legal fish were released in both creel survey years (Table 10). Harvested fish ranged in size from 12 to 26 inches (Figure 6). The harvest of sub-legal Palmetto Bass is likely a result of misidentification.

Largemouth Bass: Electrofishing catch rates of Largemouth Bass were low, ranging from 15.0/h in 2013 to 55.0/h in 2011. Mean relative weights were above 100 for all fish (Figure 7). The percentage of Florida Largemouth Bass alleles declined following the stocking of the Northern Largemouth Bass, but has begun to increase since the stocking of NLMB has ceased. Percent of intergrades continues to remain around 50% (Table 11). Largemouth bass grow to 18 inches (MLL) in 3-5 years (Table 12). Percent directed fishing effort was low in both 2004-2005 and 2009-2010 (Table 7). Percent of legal fish released was high and total harvest was low in both years (Table 13). Only one Largemouth Bass (18 inches) was observed in the creel surveys (Figure 8).

Red Drum: Gill net catch rates of Red Drum were variable (Figure 9). Random winter and spring gill nets did not appear to be effective at sampling this species. Red Drum reached legal size (20 inches) after 3 years (Table 14). Red Drum were a popular game fish at Victor Braunig Reservoir; percent directed effort was highest for Red Drum in 2009-2010 (39%) and was 23% in 2004-2005 (Table 7). As mentioned in the Palmetto Bass section, anglers at this reservoir often effectively fish for both Palmetto

Bass and Red Drum simultaneously and they frequently indicate they are targeting the species they catch most that particular trip which skews the directed effort estimates. In those years when the Palmetto Bass population is low, anglers will tend to indicate they are targeting Red Drum, even though they are fishing for both. Additionally, anglers that indicate they are fishing for both Red Drum and Palmetto Bass are recorded as targeting "anything," further skewing directed effort estimates. The increase in directed effort for Red Drum and the corresponding decreases in directed effort for anything and Palmetto Bass may be a result of anglers targeting Red Drum and Palmetto Bass being more successful at catching Red Drum. Harvest in 2009-2010 was over twice as high as the 2004-2005 estimates (Table 15). Harvested fish ranged in size from 20 to 37 inches (Figure 10).

Fisheries management plan for Victor Braunig Reservoir, Texas

Prepared – July 2014.

ISSUE 1: Palmetto Bass and Red Drum are popular game fish at Victor Braunig Reservoir and their populations must be maintained by stocking.

MANAGEMENT STRATEGIES

1. Stock Palmetto Bass annually at the rate of 30 fingerlings/acre.
2. Stock Red Drum annually at the rate of 200 fingerlings/acre.
3. Conduct creel survey in 2015 to quantify red drum and palmetto bass directed effort, catch, and harvest.
4. Work with the data analysis group to develop procedures and protocols to properly code the effort from anglers targeting multiple species to be attributed to those species and not grouped into the 'anything' category.

ISSUE 2: Some anglers misidentify Palmetto Bass as White Bass and, as a result, harvest sub-legal Palmetto Bass.

MANAGEMENT STRATEGIES

1. Develop an informative poster describing proper identification of hybrid striped bass and the lack of White Bass in Victor Braunig Reservoir, and work with TTMS to place the notices at the entrances to the reservoirs.

ISSUE 3: Winter and spring gillnet sets are not consistently effective at collecting Red Drum in Victor Braunig Reservoir.

MANAGEMENT STRATEGIES

1. Explore alternative sampling protocols to effectively collect Red Drum.

ISSUE 4: Despite an 18 inch minimum length limit since 1995 and stockings of northern largemouth bass fingerlings, largemouth bass comprise a very small component of the reservoir's fishery and very few fish in the population exceed the minimum length limit.

MANAGEMENT STRATEGIES

1. Propose changing the largemouth bass minimum length limit to 14 inches (statewide standard).

ISSUE 5: Many invasive species threaten aquatic habitats and organisms in Texas and can adversely affect the state ecologically, environmentally, and economically. For example, zebra mussels (*Dreissena polymorpha*) 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 (*Salvinia molesta*) 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.

SAMPLING SCHEDULE JUSTIFICATION:

The proposed sampling schedule includes a six month creel survey in 2015, additional gill netting in 2016, and mandatory monitoring in 2017/2018 (Table 16). The creel survey in 2015 and additional gill net survey in 2016 are necessary to maintain consistent data for trend information on the heavily used Palmetto Bass and Red Drum fisheries. Electrofishing surveys are only necessary every four years at this point as Largemouth Bass provide a minimal fishery. Trap netting is not required as crappies do not exist in this reservoir.

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Table 1. Characteristics of Victor Braunig Reservoir, Texas.

Characteristic	Description
Year Constructed	1964
Controlling authority	City Public Service Energy
County	Bexar
Reservoir type	Tributary
Shoreline Development Index	2.24
Conductivity	1,649 µmhos/cm

Table 2. Boat ramp characteristics for Victor Braunig Reservoir, Texas, August, 2013.

Boat ramp	Latitude Longitude (dd)	Public	Parking capacity (N)	Elevation at end of boat ramp (ft)	Condition
Improved Ramps	29.248122 −98.39382	Y	53	NA[1]	Excellent
Kayak Launch	29.246121 −98.38489	Y	10	NA[1]	Adequate

1 Not Available

Table 3. Harvest regulations for Victor Braunig Reservoir, Texas.

Species	Bag limit	Length limit
Catfish: Channel and Blue, their hybrids and subspecies	25 (in any combination)	12-inch minimum
Catfish, Flathead	5	18-inch minimum
Bass, Palmetto	5	18-inch minimum
Bass, Largemouth	5	18-inch minimum
Drum, Red	3	20-inch minimum

Table 4. Stocking history in Victor Braunig Reservoir, Texas from 1967 – 2013.

Species	Year	Number Stocked	Size
Bass, Florida Largemouth	1984	268,580	Fry
Bass, Florida Largemouth	1983	67,900	Fingerling
Bass, Florida Largemouth	1982	68,500	Fingerling
Bass, Florida Largemouth	1981	68,000	Fingerling
Bass, Florida Largemouth	1978	49,968	Fingerling
Bass, Florida Largemouth	1977	67,300	Fingerling
Bass, Florida Largemouth	1976	27,000	Fingerling
Bass, Kemp's Largemouth	1987	112,584	Fingerling
Bass, Kemp's Largemouth	1986	92,100	Fry
Bass, Kemp's Largemouth	1986	5,555	Fingerling
Bass, Kemp's Largemouth	1985	273,368	Fingerling
Bass, Largemouth	2008	11,000	Adult
Bass, Largemouth	2007	12,000	Adult
Bass, Largemouth	2006	11,997	Adult
Bass, Largemouth	2004	6,999	Adult
Bass, Largemouth	1974	69,630	
Bass, Largemouth	1972	56,200	
Bass, Largemouth	1970	67,000	
Bass, Largemouth	1969	40,000	
Bass, Largemouth	1968	60,000	
Bass, Largemouth	1967	28,000	
Bass, Palmetto	2013	41,309	Fingerling
Bass, Palmetto	2011	9,902	Fingerling
Bass, Palmetto	2010	310,858	Fry
Bass, Palmetto	2010	22,175	Fingerling
Bass, Palmetto	2009	20,692	Fingerling
Bass, Palmetto	2008	19,638	Fingerling
Bass, Palmetto	2007	19,538	Fingerling
Bass, Palmetto	2006	21,572	Fingerling
Bass, Palmetto	2005	19,517	Fingerling
Bass, Palmetto	2004	19,650	Fingerling
Bass, Palmetto	2003	19,370	Fingerling
Bass, Palmetto	2002	10,108	Fingerling
Bass, Palmetto	2000	20,100	Fingerling
Bass, Palmetto	1999	20,650	Fingerling
Bass, Palmetto	1998	20,461	Fingerling
Bass, Palmetto	1997	20,648	Fingerling
Bass, Palmetto	1996	22,500	Fingerling
Bass, Palmetto	1995	25,150	Fingerling
Bass, Palmetto	1994	135,000	Fingerling
Bass, Palmetto	1992	277,085	Fingerling
Bass, Palmetto	1991	139,894	Fingerling
Bass, Palmetto	1989	179,200	Fry
Bass, Palmetto	1988	180,000	Fry
Bass, Palmetto	1987	135,310	Fingerling
Bass, Palmetto	1986	67,000	Fingerling
Bass, Palmetto	1985	101,885	Fingerling
Bass, Palmetto	1984	61,140	Fingerling
Bass, Palmetto	1983	13,500	
Bass, Palmetto	1981	16,425	
Bass, Palmetto	1977	9,900	

Table 4. (Continued).

Species	Year	Number Stocked	Size
Black crappie x White crappie	1995	128,933	Fry
Black crappie x White crappie	1994	135,000	Fry
Black crappie x White crappie	1987	545,095	Fingerling
Catfish, Blue	1987	136,720	Fingerling
Catfish, Blue	1986	134,975	Fingerling
Catfish, Channel	2005	61,923	Fingerling
Catfish, Channel	1974	103,280	
Catfish, Channel	1969	35,000	
Corvina, Orangemouth	1985	3,150	
Crappie, Black	1972	5,600	
Crappie, White	1974	10,000	
Drum, Black x Red	1984	3,316	Adult
Drum, Black x Red	1984	47,035	
Drum, Black x Red	1983	5,995	
Drum, Red	2013	314,257	Fingerling
Drum, Red	2012	299,551	Fingerling
Drum, Red	2011	330,622	Fingerling
Drum, Red	2010	284,555	Fingerling
Drum, Red	2008	270,330	Fingerling
Drum, Red	2007	251,543	Fingerling
Drum, Red	2006	260,136	Fingerling
Drum, Red	2006	51,835	Fry
Drum, Red	2004	153,276	Fingerling
Drum, Red	2003	246,505	Fingerling
Drum, Red	2002	159,321	Fingerling
Drum, Red	2001	190,806	Fingerling
Drum, Red	2000	183,619	Fingerling
Drum, Red	1999	198,621	Fingerling
Drum, Red	1997	136,046	Fingerling
Drum, Red	1996	159,026	Fingerling
Drum, Red	1995	146,108	Fry
Drum, Red	1994	160,229	Fingerling
Drum, Red	1993	182,540	Fry
Drum, Red	1992	4	Adult
Drum, Red	1992	270,305	Fingerling
Drum, Red	1991	294,715	Fry
Drum, Red	1990	213,100	Fry
Drum, Red	1990	1,910	Fingerling
Drum, Red	1989	2,800	Fry
Drum, Red	1988	19,700	Fingerling
Drum, Red	1987	180,000	Fingerling
Drum, Red	1986	293,223	Fingerling
Drum, Red	1985	447,000	Fingerling
Drum, Red	1984	162,000	Fingerling
Drum, Red	1983	126,000	
Drum, Red	1982	135,000	
Drum, Red	1981	135,000	
Drum, Red	1980	3,051	
Drum, Red	1976	2,065	
Perch, Nile	1984	26	
Perch, Nile	1979	14	
Perch, Nile	1978	88	
Seatrout, Spotted	1984	72,000	Fingerling
Tarpon	1985	17	
Tarpon	1984	17	

Table 5. Percent occurrence with of aquatic vegetation habitat at 100 random sites in Victor Braunig Reservoir, Texas, August, 2013. Acreage was determined by multiplying the percent occurrence by the reservoir size (1,298 acres). Lower and upper 95% confidence limits are in parentheses. The reservoir was full at the time of sampling.

Habitat	Percent occurrence	Acreage
Open water	90 (83, 95)	1,168 (1,077, 1,233)
Bulrush	6 (1, 11)	78 (13, 143)
Brittle naiad	2 (0, 5)	26 (0, 65)
Cattail	2 (0, 5)	26 (0, 65)

Table 6. Total fishing effort (h) for all species and total directed expenditures by boat anglers at Victor Braunig Reservoir, Texas, 2004-2005 and 2009-2010. Survey periods were from 1 December through 30 November. Relative standard error is in parentheses.

Creel statistic	2004/2005	2009/2010
Total fishing effort	44,573 (12)	35,600 (15)
Total directed expenditures	$190,688 (25)	$194,893 (29)

Table 7. Percent directed angler effort by species for Victor Braunig Reservoir, Texas, 2004–2005 and 2009-2010. Survey periods were from 1 December through 30 November.

Species	2004/2005	2009/2010
Channel Catfish	23	18
Palmetto Bass	7	5
Largemouth Bass	7	5
Red Drum	23	39
Anything	39	33

Gizzard Shad

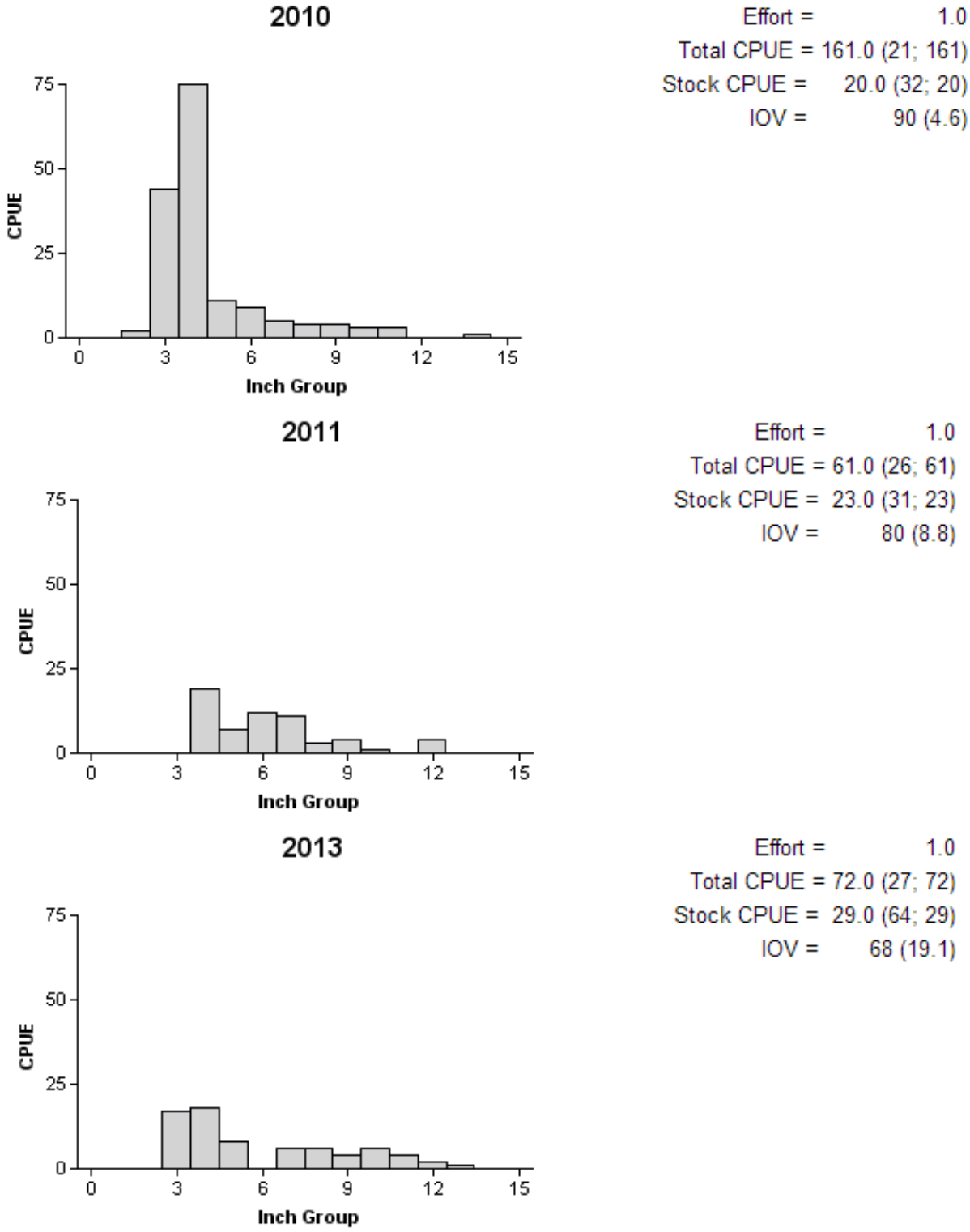


Figure 1. Number of Gizzard Shad caught per hour (CPUE, bars) and population indices (RSE and N for CPUE and SE for IOV are in parentheses) for fall electrofishing surveys, Victor Braunig Reservoir, Texas, 2010, 2011, and 2013.

Bluegill

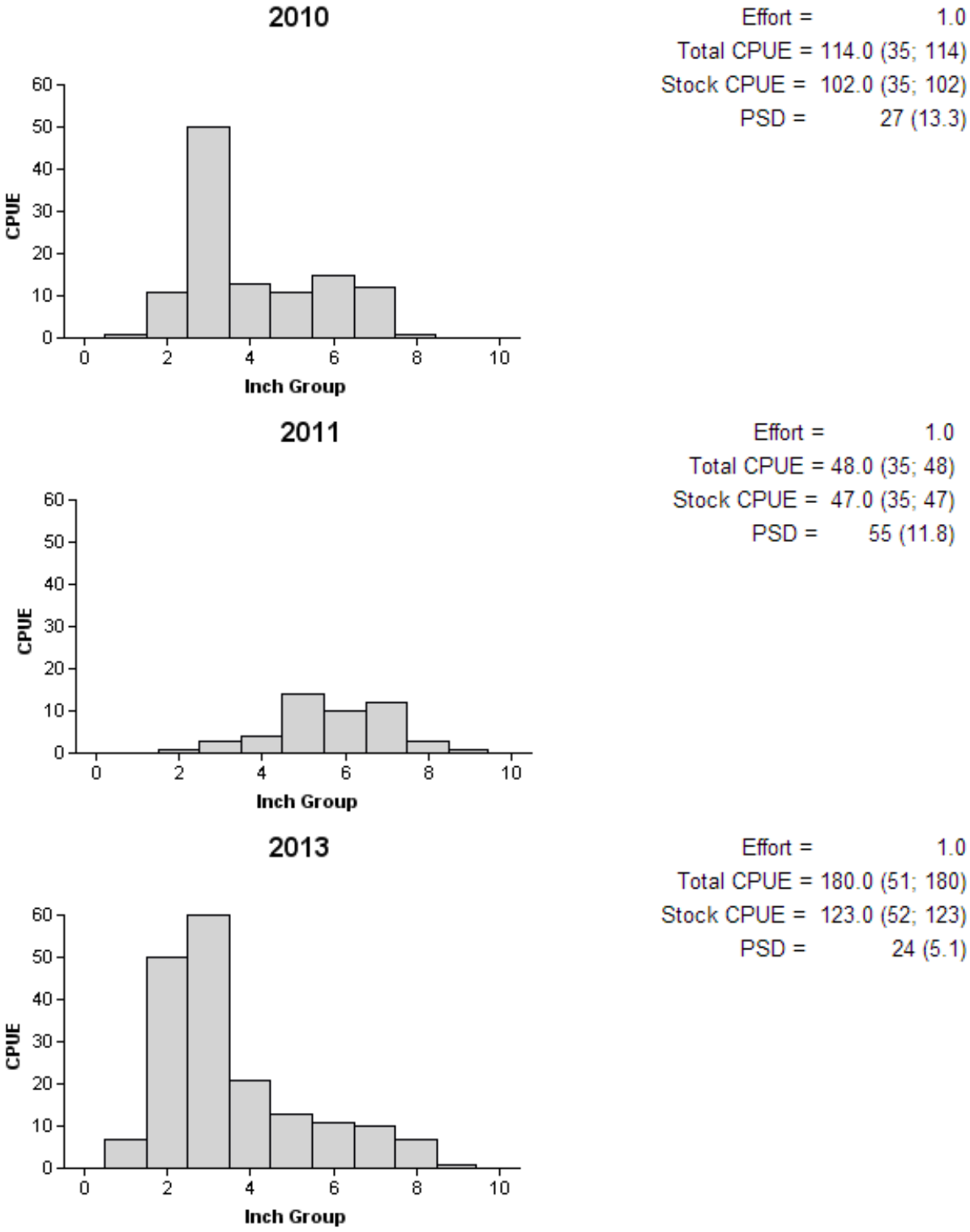


Figure 2. Number of Bluegill caught per hour (CPUE, bars) and population indices (RSE and N for CPUE and SE for size structure are in parentheses) for fall electrofishing surveys, Victor Braunig Reservoir, Texas, 2010, 2011, and 2013.

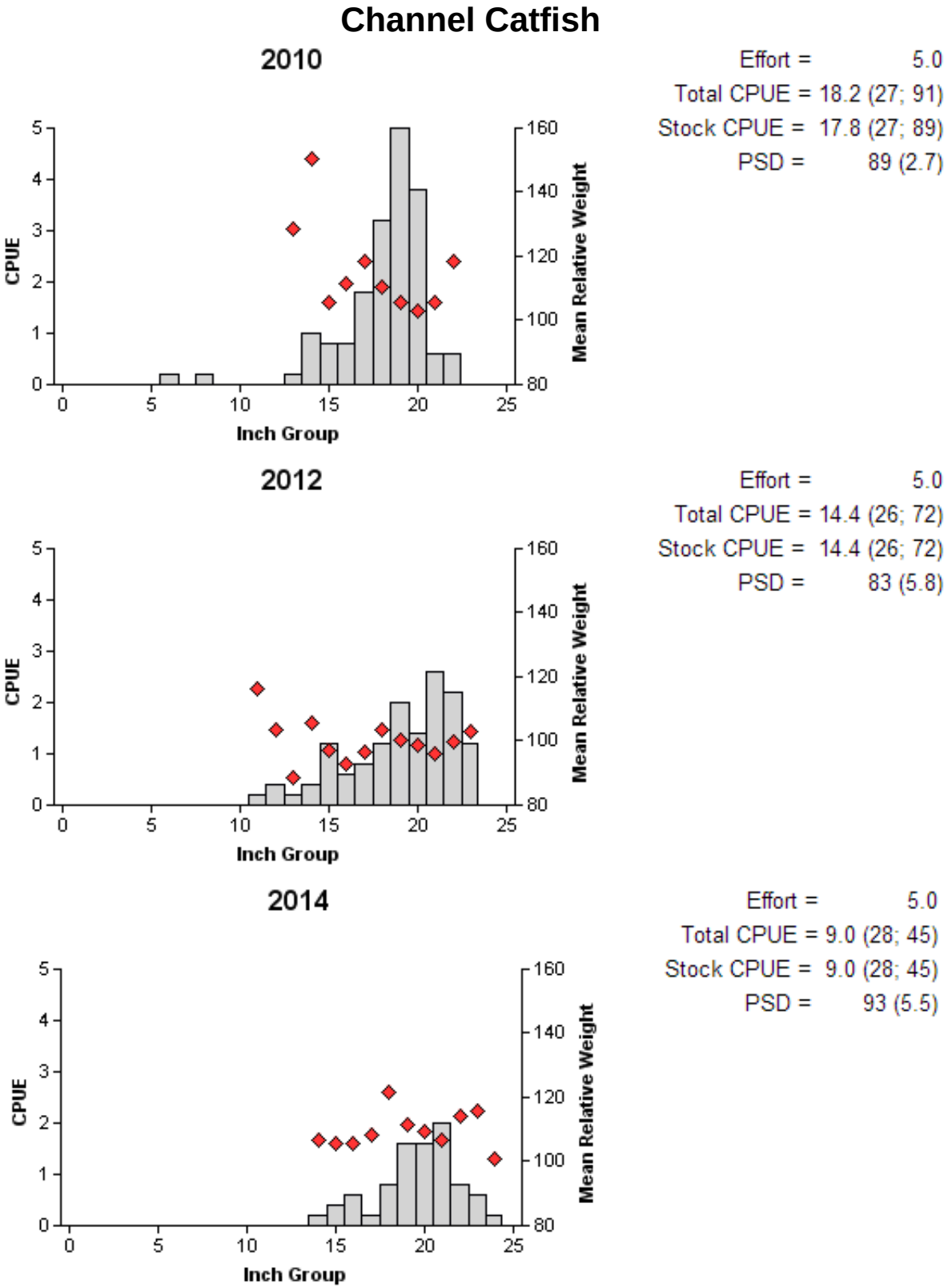


Figure 3. Number of Channel Catfish caught per net night (CPUE, bars), mean relative weights (diamonds), and population indices (RSE and N for CPUE and SE for size structure are in parentheses) for spring gill net surveys, Victor Braunig Reservoir, Texas, 2010, 2012, and 2014.

Channel Catfish

Table 8. Creel survey statistics for Channel Catfish by boat anglers at Victor Braunig Reservoir from December 2004 through November 2005, and December 2009 through November 2010. Total catch per hour is for anglers targeting Channel Catfish and total harvest is the estimated number of Channel Catfish harvested by all anglers. Relative standard errors (RSE) are in parentheses.

Creel survey statistic	Year	
	2004/2005	2009/2010
Directed effort (h)	10,187 (18)	6,413 (20)
Directed effort/acre	7.9 (18)	4.9 (20)
Total catch per hour	0.40 (62)	0.39 (46)
Total harvest	9,035 (47)	4,604 (37)
Harvest/acre	6.96 (47)	3.55 (37)
Percent legal released	0	0

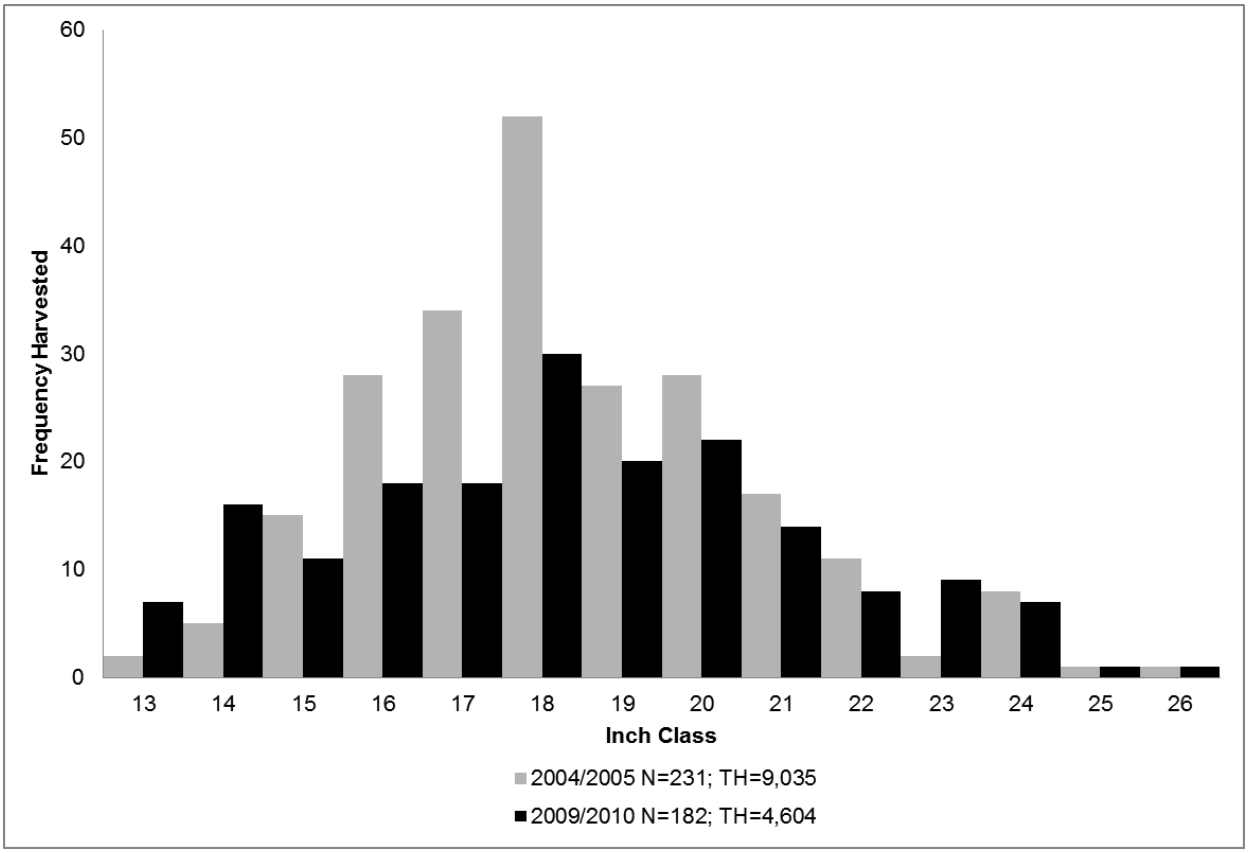


Figure 4. Length frequency of harvested Channel Catfish observed during creel surveys of boat anglers at Victor Braunig Reservoir, Texas, from December 2004 through November 2005, and December 2009 through November 2010, all anglers combined. N is the number of harvested Channel Catfish observed during creel surveys, and TH is the total estimated harvest for the creel period.

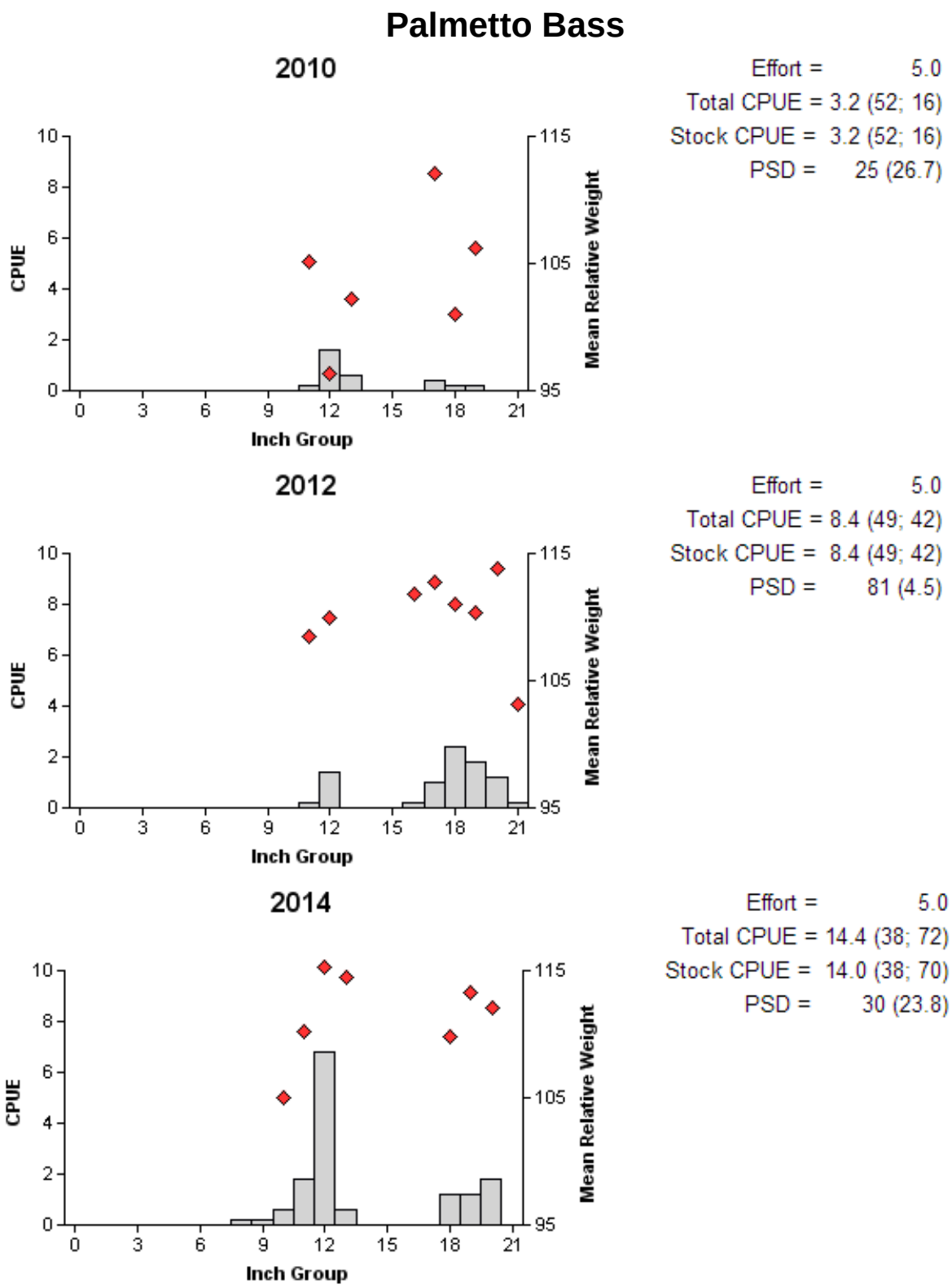


Figure 5. Number of Palmetto Bass caught per net night (CPUE, bars), mean relative weights (diamonds), and population indices (RSE and N for CPUE and SE for size structure are in parentheses) for spring gill net surveys, Victor Braunig Reservoir, Texas, 2010, 2012, and 2014

Table 9. Average length at age for Palmetto Bass (sexes combined) collected in gill net surveys, Victor Braunig Reservoir, Texas, 2006, 2012, and 2014. Sample size is in parenthesis (N).

	Length (inches) at age				
Year	1	2	3	4	5
2006		18.2 (32)	18.7 (2)		
2012	17.8 (5)	18.5 (9)	18.7 (1)	18.1 (1)	18.0 (1)
2014	12.1 (51)		19.3 (15)	20.3 (4)	20.7 (1)

Palmetto Bass

Table 10. Creel survey statistics for Palmetto Bass at Victor Braunig Reservoir by boat anglers from December 2004 through November 2005, and December 2009 through November 2010. Total catch per hour is for anglers targeting Palmetto Bass and total harvest is the estimated number of Palmetto Bass harvested by all anglers. Relative standard errors (RSE) are in parentheses.

Creel survey statistic	Year	
	2004/2005	2009/2010
Directed effort (h)	3,315 (29)	1,710 (32)
Directed effort/acre	2.6 (29)	1.3 (32)
Total catch per hour	0.38 (53)	0.32 (57)
Total harvest	1,829 (40)	948 (37)
Harvest/acre	1.41 (40)	0.73 (37)
Percent legal released	9	3

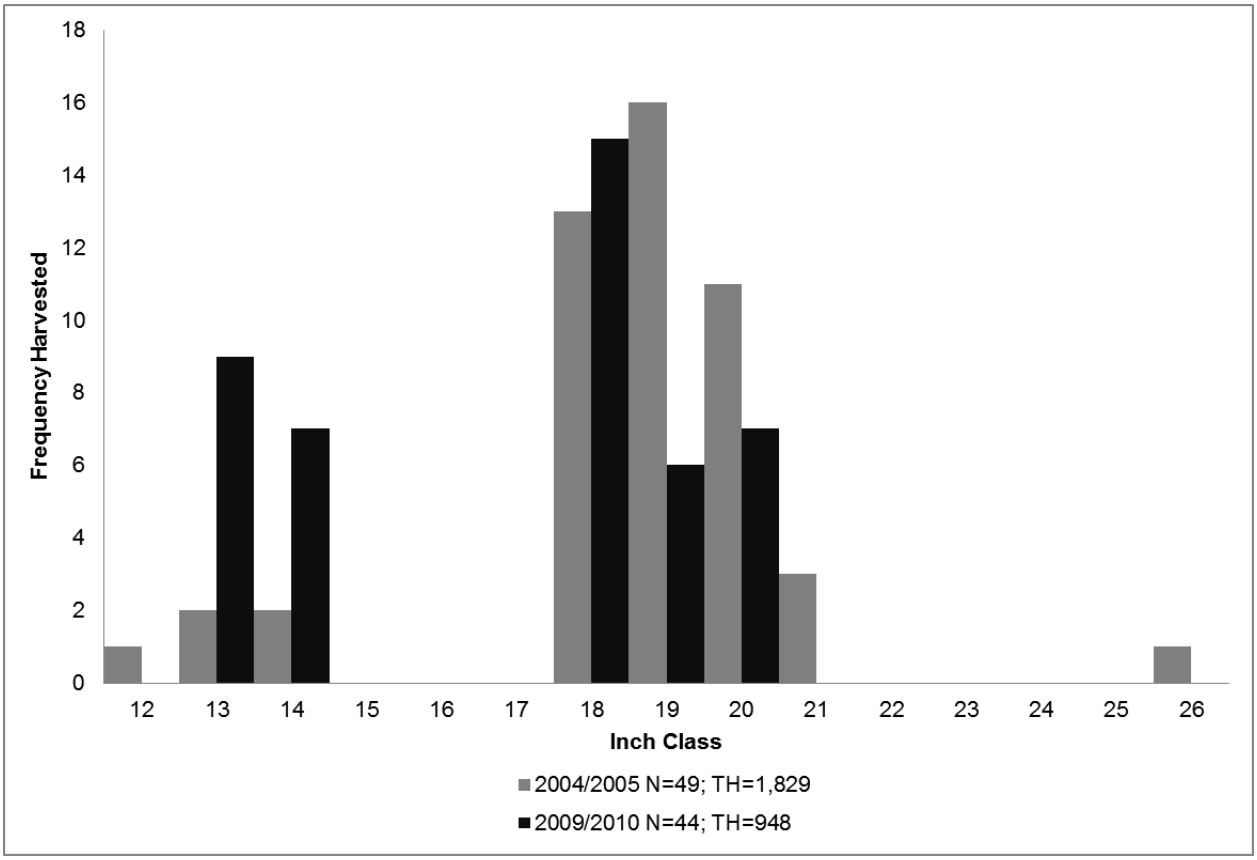


Figure 6. Length frequency of harvested Palmetto Bass observed during creel surveys of boat anglers at Victor Braunig Reservoir, Texas, from December 2004 through November 2005, and December 2009 through November 2010, all anglers combined. N is the number of harvested Palmetto Bass observed during creel surveys, and TH is the total estimated harvest for the creel period.

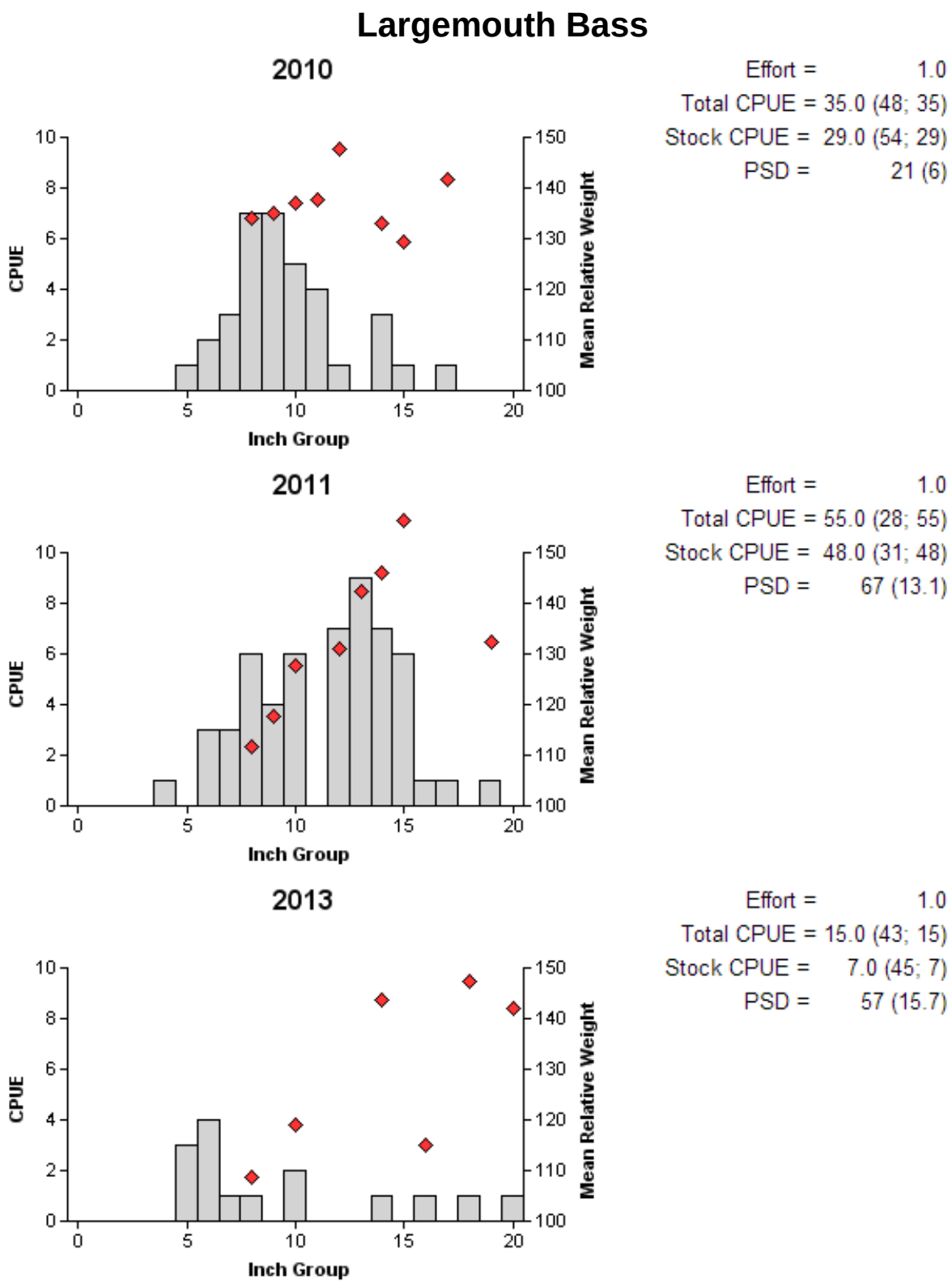


Figure 7. Number of Largemouth Bass caught per hour (CPUE, bars), mean relative weight (diamonds), and population indices (RSE and N for CPUE and SE for size structure are in parentheses) for fall electrofishing surveys, Victor Braunig Reservoir, Texas, 2010, 2012, and 2013.

Largemouth Bass

Table 11. History of genetic analysis of Largemouth Bass collected by fall electrofishing, Victor Braunig Reservoir, Texas, 2000-2013. 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. Shaded rows indicate years when Northern Largemouth Bass were stocked.

Year	Sample size	Number of fish			% FLMB alleles	% FLMB	% Intergrade
		FLMB	Intergrade	NLMB			
2000	31	28	3	0	94	90	10
2003	50	43	7	0	97	86	14
2004	30	25	5	0	97	83	17
2005	195	173	22	0	98	89	11
2006	200	115	58	27	79	57	29
2007	218	127	77	14	83	58	35
2008	202	50	106	46	55	25	54
2009	200	70	103	27	72	35	52
2010	259	143	108	8	80	55	42
2011	196	99	95	2	84	51	48
2013	30	13	16	1	84	43	53

Table 12. Mean length at age for Largemouth Bass (sexes combined) in inches at Victor Braunig Reservoir, Texas, Fall 2000, 2002, 2003, 2005-2009, and 2013. Sample sizes are shown in parenthesis.

Year	Length (inches) at age											
	0	1	2	3	4	5	6	7	8	9	10	11
2000	8.7 (17)	12.8 (5)		15.9 (2)		18.7 (2)		19.1 (3)				
2002	11.8 (3)	12.9 (9)	15.2 (5)	16.1 (7)	18.2 (10)	19.8 (4)	18.0 (1)	19.0 (4)	20.9 (1)	19.3 (1)		
2003	8.8 (86)	13.3 (6)	14.8 (6)	11.5 (1)		18.7 (1)	18.0 (2)					
2005	8.1 (219)	13.6 (21)	16.1 (1)	18.1 (2)	19.2 (2)	19.8 (1)						
2006	8.4 (53)	13.3 (65)	15.0 (57)	16.6 (6)	19.8 (2)	18.1 (7)	17.5 (3)	17.8 (3)	18.1 (2)	18.7 (1)		
2007	7.8 (186)	11.5 (10)	14.2 (9)	14.5 (7)	16.6 (3)							19.3 (1)
2008	9.7 (60)	14.0 (90)	16.3 (28)	16.6 (13)	16.8 (4)	19.4 (2)	17.7 (1)	18.0 (2)				
2009	9.8 (84)	14.0 (30)	15.7 (56)	17.3 (10)	17.4 (15)	18.3 (3)	18.2 (1)	18.9 (1)				
2013	7.6 (12)	14.4 (6)	15.5 (3)	15.7 (6)			18.5 (1)	20.2 (1)				

Largemouth Bass

Table 13. Creel survey statistics for Largemouth Bass at by boat anglers Victor Braunig Reservoir from December 2004 through November 2005, and December 2009 through November 2010. Total catch per hour is for anglers targeting Largemouth Bass and total harvest is the estimated number of Largemouth Bass harvested by all anglers. Relative standard errors (RSE) are in parentheses.

Creel survey statistic	Year	
	2004/2005	2009/2010
Directed effort (h)	2,953 (29)	1,944 (29)
Directed effort/acre	2.3 (29)	1.5 (29)
Total catch per hour	0.12 (74)	0.08 (98)
Total harvest	71 (360)	0 (00)
Harvest/acre	0.05 (360)	0.00 (00)
Percent legal released	77	100

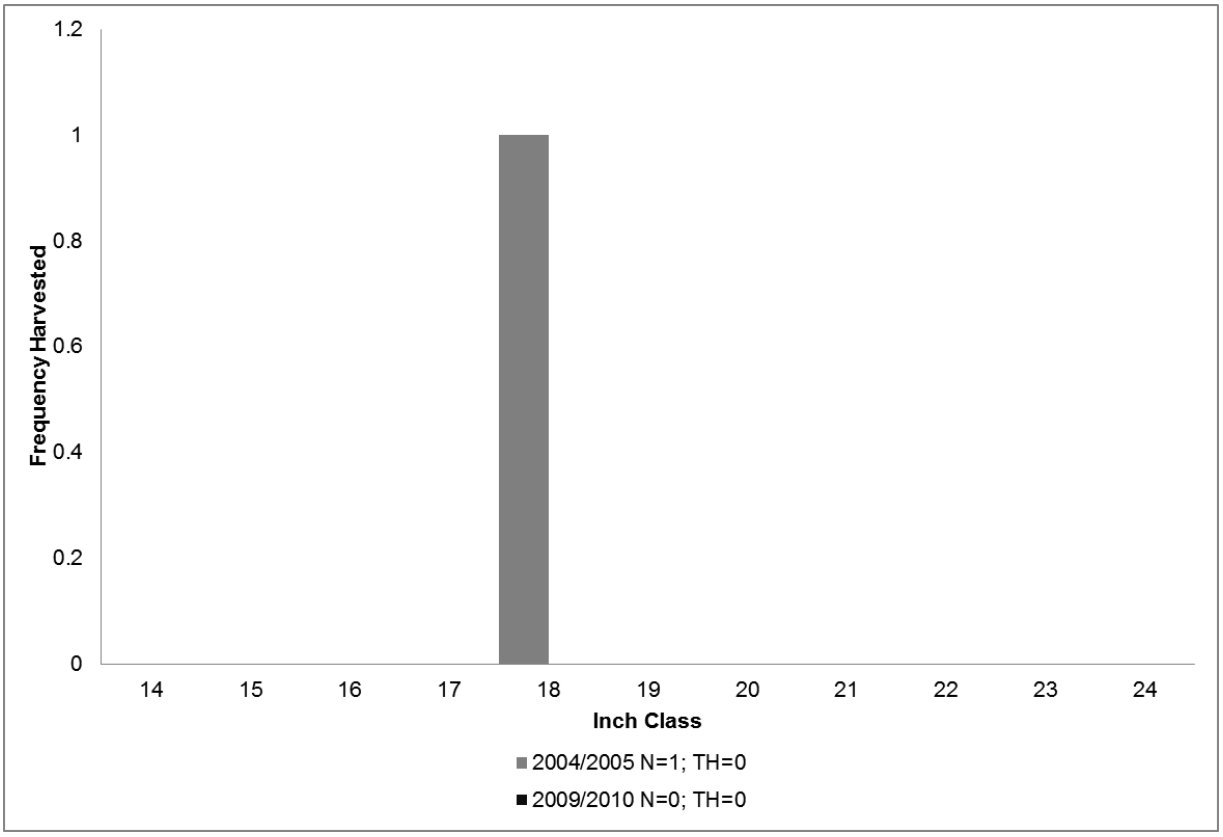


Figure 8. Length frequency of harvested Largemouth Bass observed during creel surveys of boat anglers at Victor Braunig Reservoir, Texas, from December 2004 through November 2005, and December 2009 through November 2010, all anglers combined. N is the number of harvested Largemouth Bass observed during creel surveys, and TH is the total estimated harvest for the creel period.

Red Drum

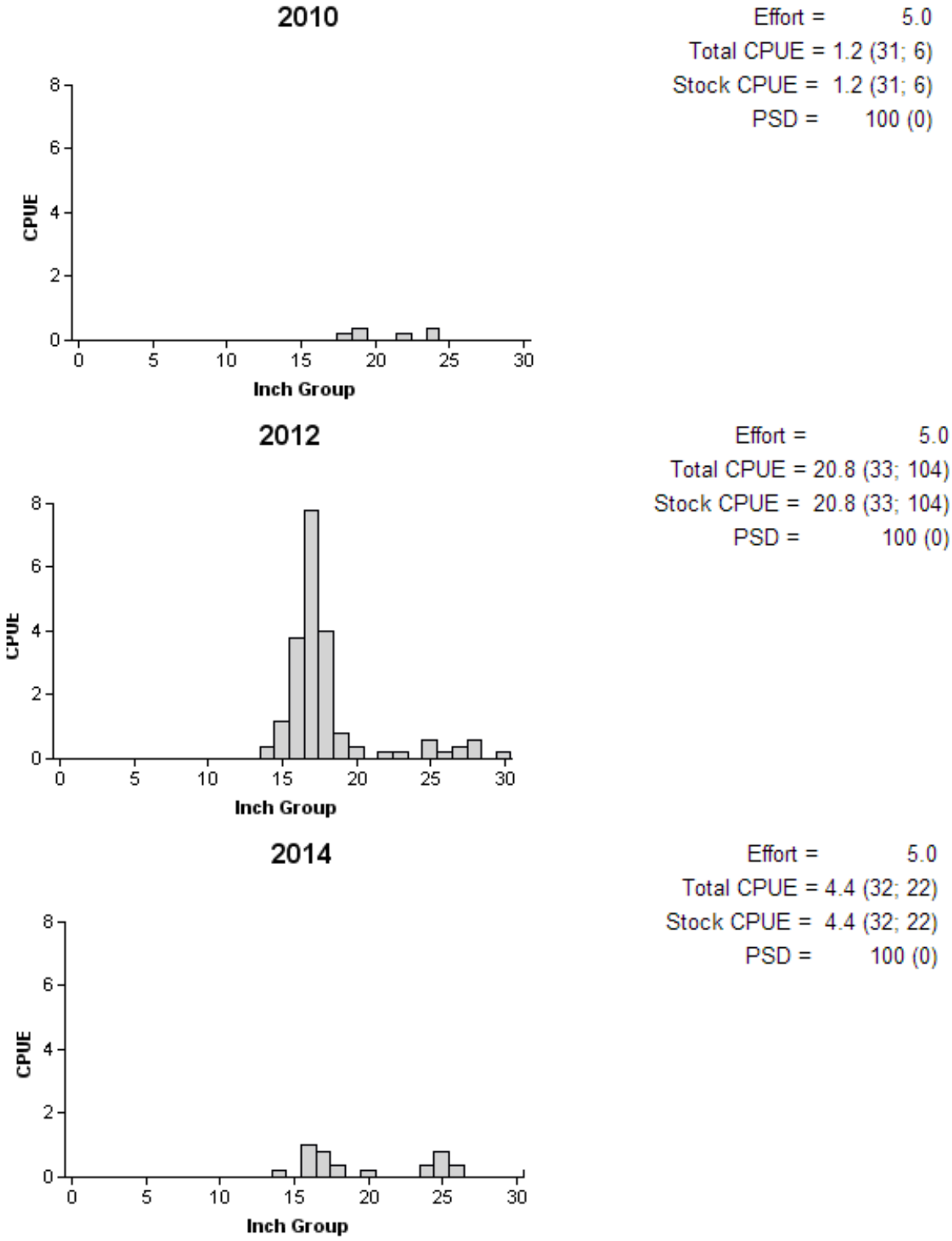


Figure 9. Number of Red Drum caught per net night (CPUE, bars) and population indices (RSE and N for CPUE and SE for size structure are in parentheses) for spring gill net surveys, Victor Braunig Reservoir, Texas, 2010, 2012 and 2014.

Table 14. Average length at age for Red Drum (sexes combined) collected in gill net surveys, Victor Braunig Reservoir, Texas, 2014. Sample size is in parenthesis (N).

	Length (inches) at age						
Sampling date	1	2	3	4	5	6	7
02/03/2014		17.6 (4)	16.9 (8)	24.6 (9)			33.0 (7)

Red Drum

Table 15. Creel survey statistics for Red Drum at by boat anglers Victor Braunig Reservoir from December 2004 through November 2005, and December 2009 through November 2010. Total catch per hour is for anglers targeting Red Drum and total harvest is the estimated number of Red Drum harvested by all anglers. Relative standard errors (RSE) are in parentheses.

Creel survey statistic	Year	
	2004/2005	2009/2010
Directed effort (h)	10,248 (18)	13,865 (17)
Directed effort/acre	7.9 (18)	10.7 (17)
Total catch per hour	0.09 (55)	0.19 (38)
Total harvest	1,428 (11)	2,969 (27)
Harvest/acre	1.10 (11)	2.29 (27)
Percent legal released	77	36

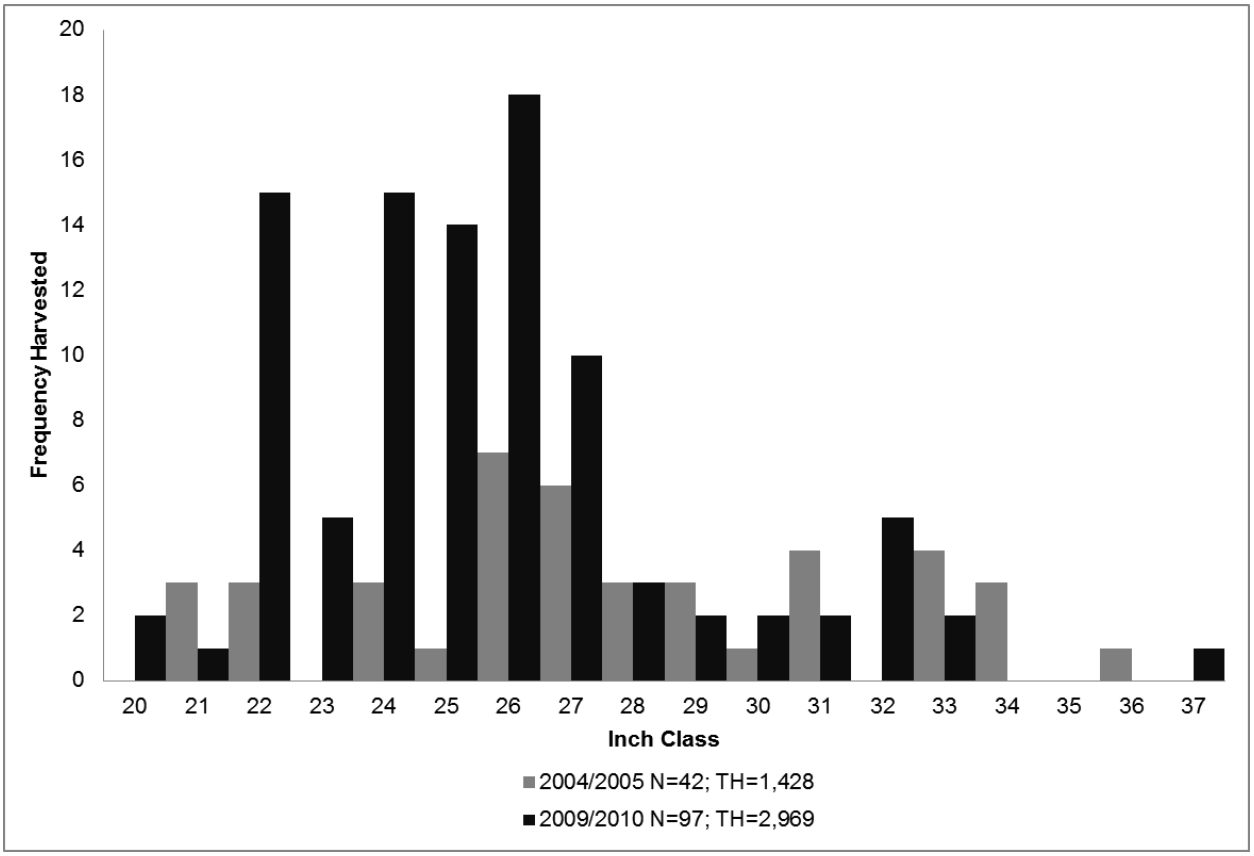


Figure 10. Length frequency of harvested Red Drum observed during creel surveys of boat anglers at Victor Braunig Reservoir, Texas, from December 2004 through November 2005, and December 2009 through November 2010, all anglers combined. N is the number of harvested Red Drum observed during creel surveys, and TH is the total estimated harvest for the creel period.

Table 16. Proposed sampling schedule for Victor Braunig Reservoir, Texas. Survey period is June through May. Gill netting surveys are conducted in the spring, while electrofishing and trap netting surveys are conducted in the fall. Standard survey denoted by S and additional survey denoted by A.

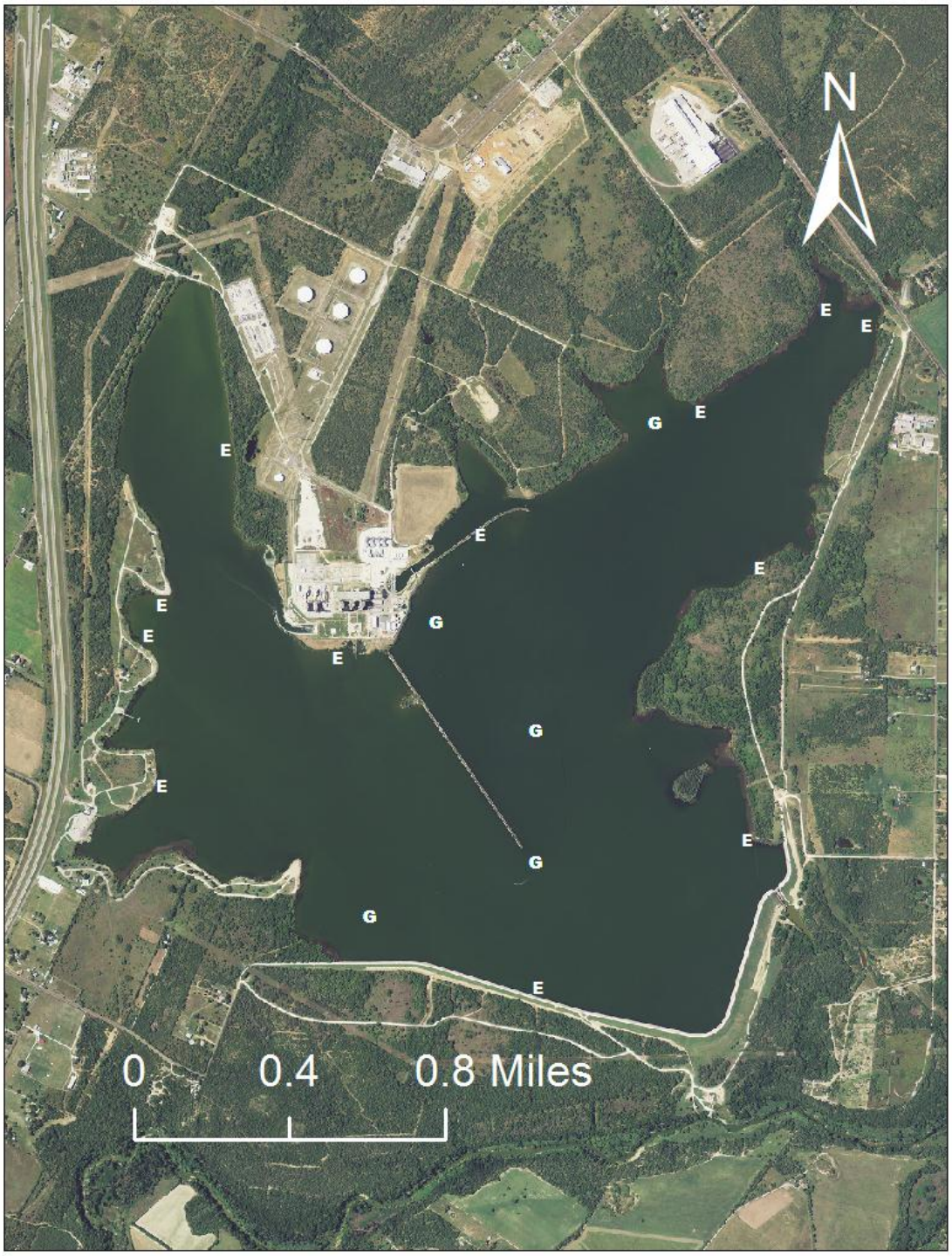
				Habitat				
Survey year	Electrofish Fall	Trap net	Gill net	Structural	Vegetation	Access	Creel survey	Report
2014-2015							S	
2015-2016			A					
2016-2017								
2017-2018	S		S		S	S		S

APPENDIX A

Number (N) and catch rate (CPUE) of all target species collected from all gear types from Victor Braunig Reservoir, Texas, 2013-2014. Sampling effort was 1 hour for electrofishing and 5 net nights for gill netting.

Species	Gill Netting		Electrofishing	
	N	CPUE	N	CPUE
Gizzard Shad			72	72.0
Threadfin Shad			130	130.0
Channel Catfish	45	9.0		
Palmetto Bass	72	14.4		
Bluegill			180	180.0
Redear Sunfish			2	2.0
Largemouth Bass			15	15.0
Rio Grande Cichlid			63	63.0
Blue Tilapia			40	40.0
Red Drum	22	4.40		

APPENDIX B



Location of sampling sites, Victor Braunig Reservoir, Texas, 2013-2014. Gill net and electrofishing stations are indicated by G and E, respectively.