PERFORMANCE REPORT

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STATEWIDE FRESHWATER FISHERIES MONITORING AND MANAGEMENT PROGRAM

2009 Survey Report

# Inks Reservoir

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TABLE OF CONTENTS

SURVEY AND MANAGEMENT SUMMARY

Fish populations in Inks Reservoir were surveyed in 2009 using electrofishing and in 2010 using gill nets. This report summarizes the results of the surveys and contains a fisheries management plan for the reservoir based on those findings.

- **Reservoir Description:** Inks Reservoir is a 768-acre impoundment of the Colorado River. It was constructed in 1938 by the Lower Colorado River Authority (LCRA) for purposes of hydroelectric power, recreation and water supply. The reservoir lies within the Edwards Plateau eco-region, and its shoreline length is 20.5 miles. Inks Lake State Park borders the reservoir and provides access to approximately 30 percent of the shoreline. The remaining shoreline has either been developed by private property owners or is under control by the LCRA.

- **Management History:** Important sport fish include white bass, largemouth bass, and catfish species. Recent management plans have recommended continuing monitoring populations under existing regulations. The Florida subspecies of largemouth bass was stocked in the reservoir in the late 80s and early 90s to increase Florida largemouth bass genetic influence in the population. Channel catfish have been stocked by the Inks Dam National Fish Hatchery through an agreement with the LCRA or when surplus fish become available.

- **Fish Community**
  - **Prey species:** Gizzard shad, threadfin shad, bluegill, and redbreast sunfish were the predominant sources of forage. Threadfin shad abundance declined from high's recorded in the previous survey.

  - **Catfishes:** Channel and blue catfish were present in low-to-moderate density. Flathead catfish were present in low abundance.

  - **Temperate basses:** White bass were present in moderate numbers. Striped bass and sunshine bass were present in very low densities. Emigration from Lake Buchanan during flood releases is responsible for maintaining the striped and sunshine bass population in Inks Reservoir.

  - **Black basses:** Largemouth bass were available in moderate numbers. Total catch rates and catch rates for fish 14 inches and greater doubled and tripled, respectively from the previous survey. Largemouth bass growth rate remained similar since the last survey. Inks Reservoir also contained Guadalupe bass.

  - **Management Strategies**
    The reservoir should continue to be managed with existing fishing regulations. The largemouth bass, catfish and sunfish fisheries provide good opportunity for state park visitors. The TPWD free family fishing at state parks program is a great incentive to introduce new anglers to fishing. Efforts should be made to further promote fishing opportunities in this reservoir. General fish population monitoring with gill nets and electrofishing should be conducted in the 2013 sampling season. An aquatic vegetation survey should be conducted in summer 2010 to monitor the establishment of Eurasian watermilfoil, which was observed in the 2009 fall electrofishing survey.

# INTRODUCTION

This document is a summary of fisheries data collected from Inks Reservoir in 2009 and 2010. The purpose of the document is to provide fisheries information and make fisheries management recommendations to protect and improve the sport fishery. While information on other species of fishes was collected, this report deals primarily with major sport species and important prey species. Fisheries management strategies are included to address existing problems or opportunities. Historical data is presented with the 2009 and 2010 data for comparison.

*Reservoir Description*

Inks Reservoir is a 768-acre impoundment of the Colorado River. It was constructed in 1938 by the Lower Colorado River Authority (LCRA) for purposes of hydroelectric power, recreation, and water supply. The reservoir lies within the Edwards Plateau eco-region, and its shoreline length is 20.5 miles. Inks Lake State Park borders the reservoir and provides access to approximately 30 percent of the shoreline. The remaining shoreline has been developed by private property owners or is under control by the LCRA. Habitat consisted of boulder, bulkhead/boat docks, rock bank, rock bluff, sand, terrestrial grasses, and native emergent vegetation. Native aquatic emergent plants were bulrush, cattail, and water willow, occupying 6.09 acres (< 1% coverage). Inks Reservoir is maintained at full pool, 880.00 feet above sea level (msl). Boat access consisted of one public boat ramp located at the state park. Public bank access was restricted to the shoreline and 2 fishing piers at the state park. Other descriptive characteristics for Inks Reservoir are in Table 1.

*Management History*

**Previous management strategies and actions:** Management strategies and actions from the previous survey report (De Jesus and Magnelia 2006) included:

1. Plant native aquatic vegetation if similar projects at other Central Texas reservoirs were deemed successful.
   **Action:** A native aquatic vegetation introduction project at Lake LBJ, just downstream from Inks Lake, had very limited success. Aquatic plants, other than transplants from other reservoirs, are costly and not readily available. Sediment removed with transplants may carry seeds from undesirable aquatic plant species. Aquatic plants should be available from a TPWD nursery in the future and Inks Reservoir will continue to be a potential site for aquatic plant introductions if additional aquatic vegetation is deemed necessary.
2. Enhance fishing opportunities for sunfish and largemouth bass along state park fishing piers by installing fish attracting devices.
   **Action:** Fish attracting bait blocks were proposed for installation at the Inks Lake State Park fishing piers as part of a research project evaluating fish attracting devices. This part of the special study was removed from the research project.

**Harvest regulation history:** Sport fishes in Inks Reservoir are currently managed with statewide regulations (Table 2).

**Stocking history:** Inks Reservoir has not been stocked since 2006 (channel catfish). The Inks Dam National Fish Hatchery provides surplus channel catfish stockings when available. Largemouth bass were introduced in 1966 and Florida largemouth bass in 1989 and 1991 to increase Florida largemouth bass genetic influence. Blue catfish were introduced in 1968. The complete stocking history is in Table 3.

**Aquatic vegetation/habitat history:** Inks Reservoir had very low aquatic vegetation coverage in 2005 (Table 4). Coverage consisted of native emergent vegetation. Submerged aquatic vegetation has never

been documented. Most of the shoreline habitat was comprised of rock, bulkhead, and terrestrial grasses. Three native species of aquatic emergent vegetation (cattail, water willow, and bulrush) accounted for only 6.09 acres (< 1% coverage), similar to historic surveys. Inks Reservoir's water level is stable; therefore change in aquatic habitat tends to be minimal.

**Water transfer:** There are no inter-basin water diversion structures at Inks Lake.

## METHODS

Fishes were collected by electrofishing (1.0 hour at 12 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 netting as the number of fish caught in one net set overnight (fish/nn). All survey sites were randomly selected and all surveys were conducted according to the Texas Parks and Wildlife Department Inland Fisheries Assessment Procedures (TPWD, Inland Fisheries Division, unpublished manual revised 2008). Trap netting for white crappie was not performed due to historically low catch rates and high cost/benefit ratio associated with collecting these data.

Sampling statistics (CPUE for various length categories) and structural indices [Proportional Size Distribution (PSD); as defined by Guy et al. (2007)], and condition indices [relative weights (Wr)] were calculated for target fishes according to Anderson and Neumann (1996). The Index of Vulnerability (IOV) was used to determine the percentage of gizzard shad vulnerable to predation (DiCenzo et al. 1996). Relative standard error (RSE = 100 x SE of the estimate/estimate) was calculated for all CPUE statistics and SE was calculated for structural indices and IOV. Ages were determined for LMB using otoliths from 13 fish between 330 and 381mm (category 2 age analysis for 14-inch LMB; TPWD Procedures Manual 2008).

## RESULTS AND DISCUSSION

**Habitat:** Littoral zone habitat consisted primarily of rocks, bulkhead, and terrestrial grasses in 2005 (Table 4). Aquatic vegetation was present throughout the reservoir, but coverage was well below optimal levels for fish production (Durocher 1984 and Dibble 1996). Areas covered by Eurasian watermilfoil *Myriophyllum spicatum* were discovered in 2009 during the fall electrofishing survey. A formal vegetation survey will be conducted in summer 2010 to monitor the establishment of Eurasian watermilfoil.

**Prey species:** Electrofishing catch rates of gizzard shad**,** threadfin shad, bluegill, and redbreast sunfish were 173/h, 40/h, 210/h, and 229/h, respectively. Index of Vulnerability (IOV) for gizzard shad was poor, indicating that only 2.9% of gizzard shad were vulnerable to existing predators. This has been a declining trend for the past few surveys (Figure 1). The lack of vulnerable-size gizzard shad as forage may be complimented by the presence of threadfin shad (40/h) and relatively high abundance of sunfish species (Figures 2 and 3). Total CPUE of bluegill in 2009 increased to 210/h from 114/h in 2005, but was still lower than previous surveys (Figure 2). The bluegill population continued to be dominated by small individuals. Total CPUE of redbreast sunfish in 2009 was lower than total CPUE from surveys in 2005

(348/h) and 2001 (423/h); and, quality-size individuals (≥ 7 inches), which are a large enough to support a directed sport fishery were present (Figure 3).

**Catfishes:** The gill net catch rate of channel catfish was 5.4/nn in 2010, increasing from the 3.2/nn in 2006 and 1.4/nn in 2002 (Figure 4). Supplemental stockings from the Inks Dam National Hatchery in recent years may be accountable for this minor increase. The channel catfish population continued to show low relative abundance, with most individuals within the 12- to 14-inch length range; while their

condition remained sub-optimal (Wr < 100) at all lengths (Figure 4). The gill net catch rate of blue catfish was 3.6/nn in 2010, increasing from 1.4/nn and 0.4/nn in 2006 and 2002, respectively (Figure 5). The blue catfish population continued to show low relative abundance, with a population structure dominated by fish larger than 15 inches; while average body condition was sub-optimal (Wr < 100) at all lengths

(Figure 5). The gill net catch rate of flathead catfish was 0.8/nn in 2006. The flathead catfish population continued to show low relative abundance, with a population structure dominated by large individuals.

**Temperate basses:** The gill net catch rate of white bass was 7.4/nn in 2010, increasing from the 6.2/nn surveyed in 2006 (Figure 6). Gill net catch rate indicated that white bass were present at historically high numbers. The historical high catch rate (6.6/nn), was established in the 1999 survey. About half the individuals sampled exceeded legal length (10 inches). Memorable-length (15 inches) individuals were also collected. Sub-legal fish should provide good fishing opportunities in upcoming years. Body condition in 2009 was good (relative weights over 90) for nearly all length classes of fish, and was similar to body condition in previous surveys (Figure 6). The gill net catch rates of striped bass and sunshine bass were 0.8/nn and 0.2/nn, respectively in 2010. These temperate bass species had low relative abundance, and were emigrants from upstream Lake Buchanan, which is stocked with these species.

**Largemouth bass:** The electrofishing catch rate of stock-length largemouth bass was 59/h in 2009, an increase from 27/h in 2005 (Figure 7). Size structure in 2009 remained similar to the 2005 survey as PSD was 56 versus 59 recorded in 2005. Body condition in 2009 was good (relative weights exceeded 90) for nearly all size classes of fish, and was similar to body condition in previous surveys (Figure 7). Growth of largemouth bass in Inks Reservoir was good; average age at 14 inches of length was 2 years (N = 13; range = 1 – 3 years) (Figure 8).

**Fisheries management plan for Inks Reservoir, Texas**

Prepared - July 2010.

**ISSUE 1:** Emergent aquatic vegetation has historically been present in low abundance in Inks Reservoir, while submerged vegetation has never been documented. Eurasian watermilfoil *Myriophyllum spicatum* was first observed in patches at Inks Reservoir during the fall 2009 Electrofishing survey. This aquatic plant is common in downstream reservoirs (LBJ and Austin), and has caused access issues for lakeside homeowners on Lake Austin. In these reservoirs coverage can dramatically fluctuate, often as the result of winter drawdowns, flood events or unexplained natural cycles. Inks Reservoir is a constant level reservoir, although periodic winter drawdowns are conducted so lakeside homeowners can remove debris, and repair docks and waterlines. Eurasian watermilfoil can provide good habitat for centrarchid species, but it also has the potential to restrict shoreline access.

MANAGEMENT STRATEGY

1. Conduct annual aquatic vegetation surveys in summer 2010 and 2011, provided Eurasian water milfoil is present in the summer 2010 survey. Additional surveys should be conducted in summer 2012 and 2013 if Eurasian watermilfoil continues to be present and the trend from the 2010 and 2011 surveys indicate expansion of coverage.

**ISSUE 2:** Excellent bank and good pier access for anglers is available within Inks Lake State Park. Electrofishing and gill net surveys have shown availability of sport fishes and quality-size (≥ 7 inches) bluegill and redbreast sunfish. With the TPWD free fishing program at state parks, we should promote these opportunities whenever possible.

MANAGEMENT STRATEGY

1. Continue to promote Inks Lake State Park as great resource for bank fishing or pier fishing for beginning anglers or families that wish to try fishing for the first time.
2. Coordinate a project with Inks Lake State Park management staff to establish fish attraction structures around the fishing piers at the state park. Several options should be considered for these structures.

**ISSUE 3:** Giant salvinia *Salvinia molesta* and zebra mussels *Dreissena polymorpha* have become established in several Texas reservoirs. These species can negatively affect reservoir sport fisheries, users and businesses. They are difficult or impossible to control once they are established. These species can be easily spread to new locations on boats or boat trailers.

MANAGEMENT STRATEGIES

1. Cooperate with the LCRA to properly promote the importance of checking for aquatic hitchhikers on boats and boat trailers. Contact them to discuss funding for signage to be placed at all boat ramps regarding these species.
2. Contact and educate marina owners about aquatic invasive species awareness.
3. Create a speaking point concerning the impact of invasive aquatic species when presenting to constituent groups.

**SAMPLING SCHEDULE JUSTIFICATION:**

The proposed sampling schedule will constitute standard sampling in 2013/2014 (Table 5). Additional aquatic vegetation surveys may be conducted as stipulated in the management strategy for issue 1. Mandatory sampling every 4 years has been sufficient to monitor fish populations at Inks Reservoir.

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Table 1. Characteristics of Inks Reservoir, Texas

| Characteristic | Description |
|---|---|
| Year constructed | 1938 |
| Controlling authority | LCRA |
| Counties | Burnet and Llano |
| Reservoir type | Mainstream river system: Colorado |
| Shoreline development index (SDI) | 10.1 |
| Conductivity | 366 umhos/cm |

Table 2. Harvest regulations for Inks Reservoir.

| Species | Bag limit | Length limit (inches) |
|---|---|---|
| Black bass: largemouth | 5* | 14 minimum |
| Black bass: Guadalupe | 5* | No minimum limit |
| Striped bass and their hybrids | 5 | 18 minimum |
| White bass | 25 | 10 minimum |
| Flathead catfish | 5 | 18 minimum |
| Catfish: channel and blue catfish | 25 (in any combination) | 12 minimum |

*Five black bass in any combination.

Table 3. Stocking history of Inks, Texas. Life stages are fry (FRY), fingerlings (FGL), advanced fingerlings (AFGL), adults (ADL) and unknown (UNK). Life stages for each species are defined as having a mean length that falls within the given length range. For each year and life stage the species mean total length (Mean TL; in) is given. For years where there were multiple stocking events for a particular species and life stage the mean TL is an average for all stocking events combined.

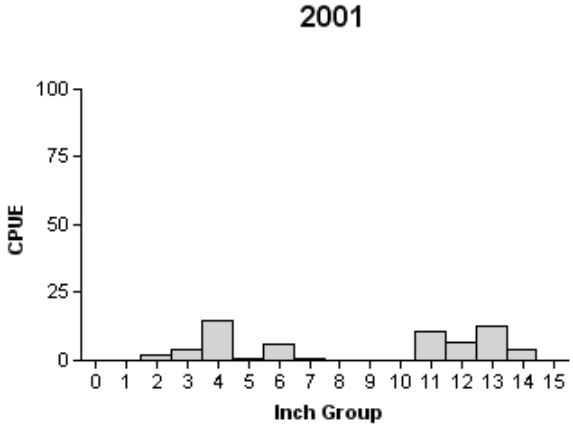
| Species | Year | Number | Life Stage | Mean TL (in) |
|---|---|---|---|---|
| Blue catfish | 1968 | 4,000 | UNK | UNK |
| | Total | 4,000 | | |
| Channel catfish | 1969 | 45,100 | AFGL | 7.9 |
| | 1971 | 28,000 | AFGL | 7.9 |
| | 1984 | 5,487 | AFGL | 11.0 |
| | 1986 | 12,448 | AFGL | 8.0 |
| | 1987 | 1,957 | AFGL | 11.0 |
| | 1994 | 3,080 | ADL | 14.0 |
| | 2000 | 1,250 | ADL | 13.0 |
| | 2006 | 111 | ADL | 24.0 |
| | Total | 97,433 | | |
| Coho salmon | 1974 | 1,245 | | UNK |
| | Total | 1,245 | | |
| Florida Largemouth bass | 1989 | 9,389 | FGL | 2.0 |
| | 1989 | 4,648 | FRY | 1.0 |
| | 1991 | 80,480 | FGL | 1.2 |
| | Total | 94,517 | | |
| Largemouth bass | 1969 | 200,000 | UNK | UNK |
| | 1988 | 25,000 | FRY | 1.0 |
| | Total | 225,000 | | |
| Muskellunge | 1976 | 70 | | UNK |
| | Total | 70 | | |
| Northern pike | 1974 | 4,212 | | UNK |
| | Total | 4,212 | | |
| Palmetto Bass (striped X white bass hybrid) | 1978 | 4,950 | UNK | UNK |
| | 1980 | 12,350 | UNK | UNK |
| | 1984 | 16,148 | FGL | 2.0 |
| | 1986 | 32,105 | FRY | 1.0 |
| | Total | 65,553 | | |
| Rainbow trout | 1974 | 4,293 | UNK | UNK |

| Species | Year | Number | Life Stage | Mean TL (in) |
|---|---|---|---|---|
| | Total | 4,293 | | |
| Striped bass | 1983 | 8,010 | UNK | UNK |
| | 1991 | 34,200 | FGL | 1.2 |
| | 1991 | 86,250 | FRY | 1.0 |
| | Total | 128,460 | | |
| Walleye | 1976 | 10,000 | FRY | 0.2 |
| | 1978 | 4,067,000 | FRY | 0.2 |
| | Total | 4,077,000 | | |

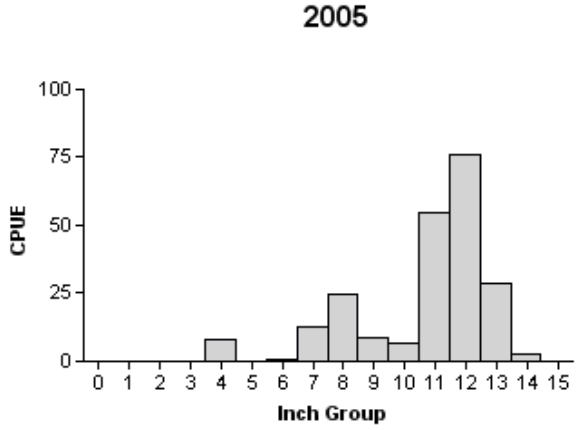
Table 4. Survey of littoral zone and physical habitat types, Inks Reservoir, Texas, 2005. A linear shoreline distance (miles) was recorded for each habitat type found. Surface area (acres) and percent of reservoir coverage were determined for each plant species found.

| | Shoreline distance | | Surface Area | |
|---|---|---|---|---|
| Shoreline habitat type | Miles | Percent of total | Acres | Percent of reservoir surface area |
| Concrete | 0.3 | 1.5 | | |
| Boulder | 4.4 | 21.2 | | |
| Bulkhead/boat dock | 5.6 | 26.9 | | |
| Rock bank | 0.4 | 2.1 | | |
| Rock bluff | 1.2 | 6.1 | | |
| Sand | 0.5 | 2.4 | | |
| Terrestrial grasses | 8.2 | 39.4 | | |
| Bulrush (*Scirpus* sp) | | | 1.95 | <1 |
| Cattail (*Typha* sp) | | | 0.47 | <1 |
| Water willow (*Justicia americana*) | | | 3.88 | <1 |

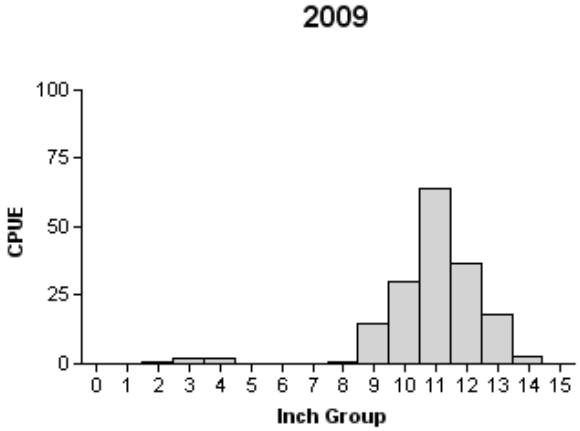
# Gizzard Shad




Effort = 1.0
Total CPUE = 64.0 (23; 64)
IOV = 39.19 (0.12)



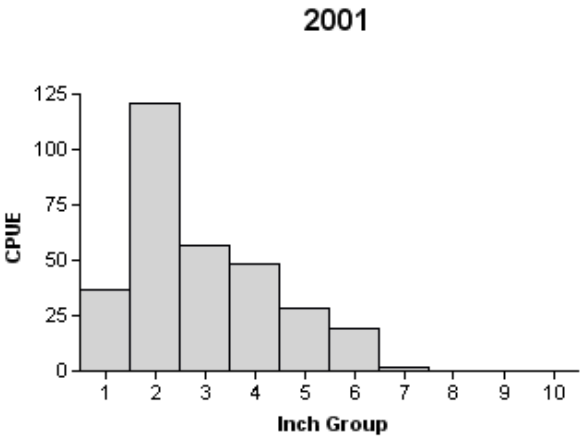

Effort = 1.0
Total CPUE = 226.0 (10; 226)
IOV = 9.73 (0.05)



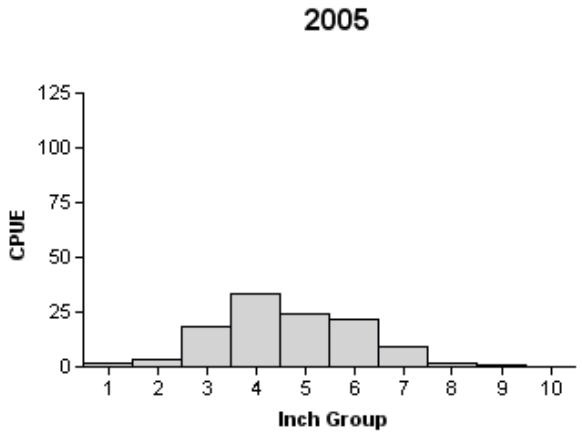

Effort = 1.0
Total CPUE = 173.0 (13; 173)
IOV = 2.89 (1.6)

Figure 1. Number of gizzard shad caught per hour (CPUE) population indices (RSE and N for CPUE and SE for IOV are in parentheses) for fall electrofishing surveys, Inks Reservoir, Texas, 2001, 2005 and 2009.

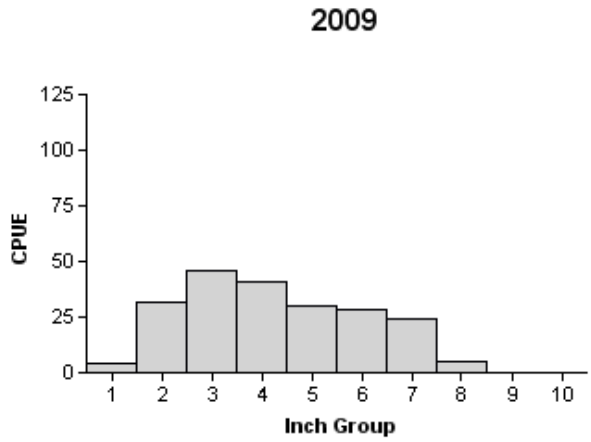
# Bluegill




Effort = 1.0
Total CPUE = 312.0 (14; 312)
PSD = 14 (2.5)



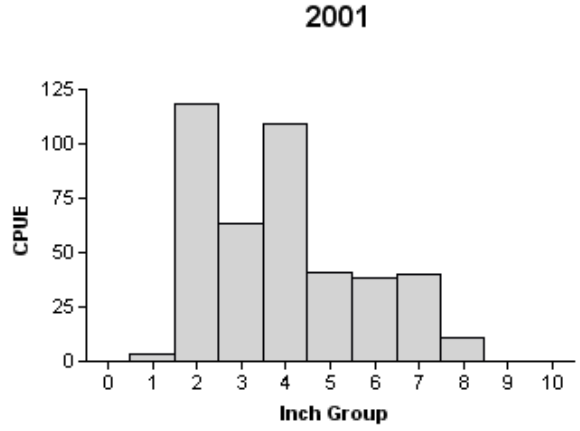

Effort = 1.0
Total CPUE = 114.0 (23; 114)
PSD = 31 (5.6)



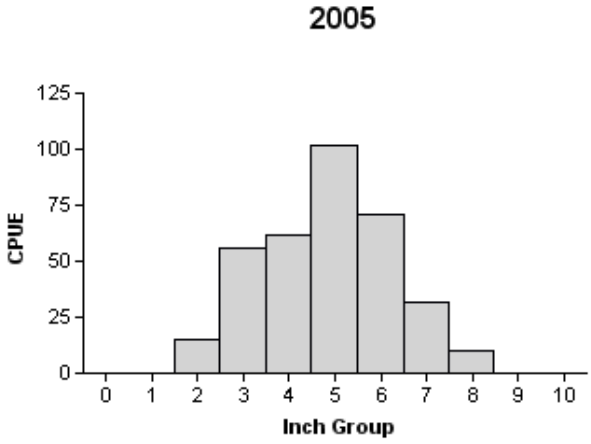

Effort = 1.0
Total CPUE = 210.0 (22; 210)
PSD = 33 (7.4)

Figure 2. Number of bluegill caught per hour (CPUE) population indices (RSE and N for CPUE and SE for size structure are in parentheses) for fall electrofishing surveys, Inks Reservoir, Texas, 2001, 2005 and 2009.

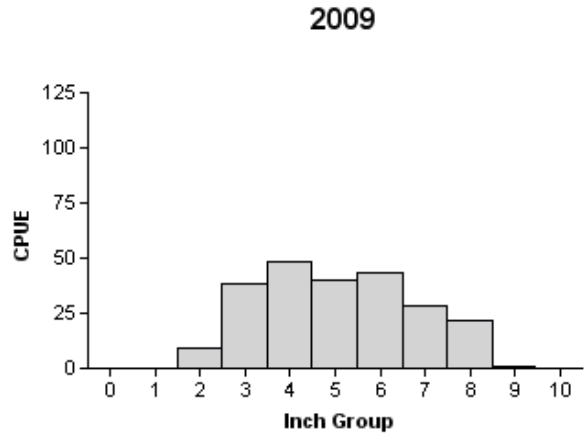
# Redbreast Sunfish




| | |
|---|---|
| Effort = | 1.0 |
| Total CPUE = | 423.0 (19; 423) |
| CPUE-7 = | 51.0 (56; 51) |
| PSD = | 29 (10.8) |



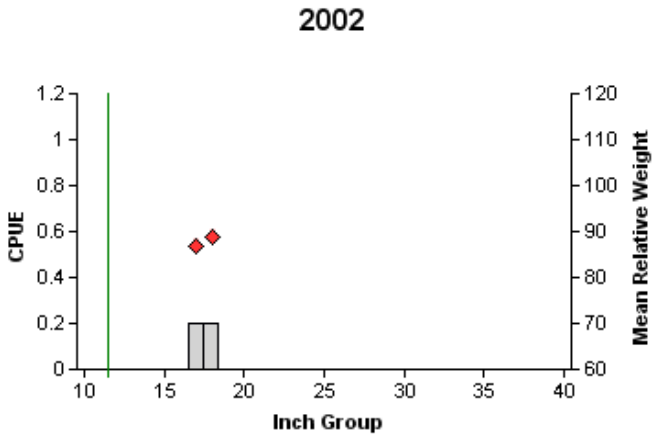

| | |
|---|---|
| Effort = | 1.0 |
| Total CPUE = | 348.0 (20; 348) |
| CPUE-7 = | 42.0 (25; 42) |
| PSD = | 34 (4.7) |



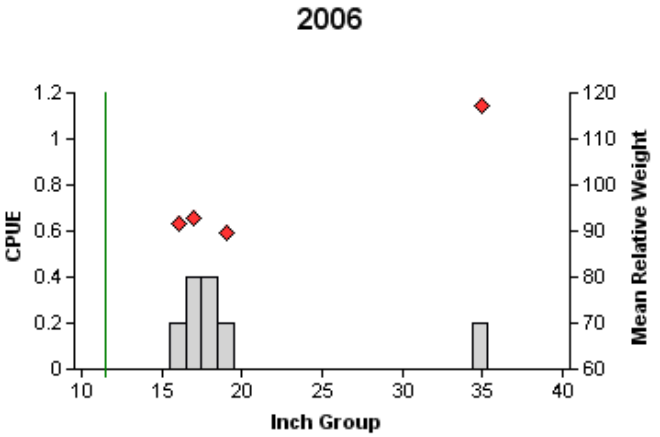

| | |
|---|---|
| Effort = | 1.0 |
| Total CPUE = | 229.0 (20; 229) |
| CPUE-7 = | 51.0 (38; 51) |
| PSD = | 43 (3.8) |

Figure 3. Number of redbreast sunfish caught per hour (CPUE) population indices (RSE and N for CPUE and SE for size structure are in parentheses) for fall electrofishing surveys, Inks Reservoir, Texas, 2001, 2005 and 2009.

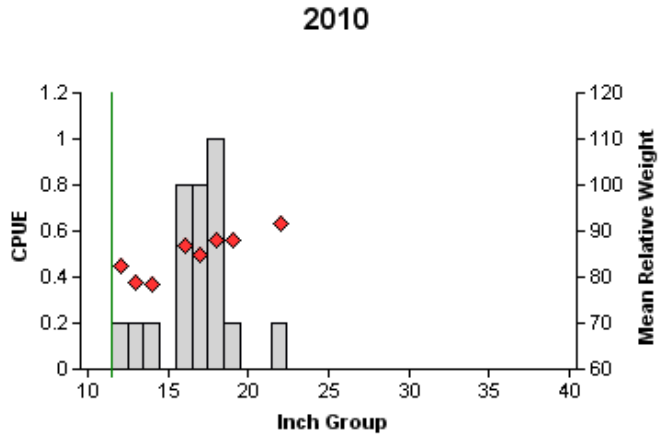
# Blue Catfish




| | |
|---|---|
| Effort = | 5.0 |
| Total CPUE = | 0.4 (61; 2) |
| Stock CPUE = | 0.4 (61; 2) |
| CPUE-12 = | 0.4 (61; 2) |
| PSD = | 0 (79.1) |
| PSD-12 = | 100 (0) |



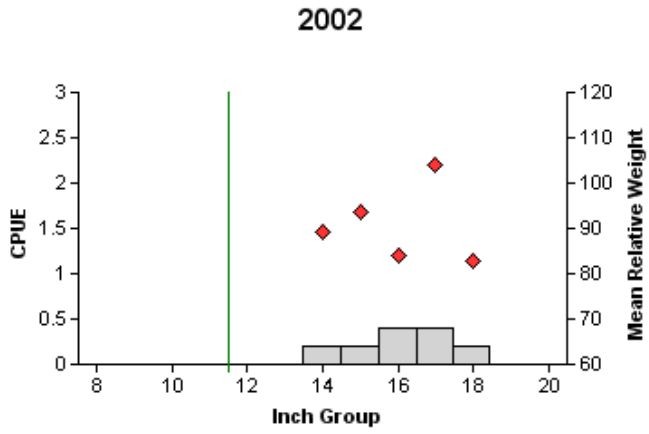

| | |
|---|---|
| Effort = | 5.0 |
| Total CPUE = | 1.4 (48; 7) |
| Stock CPUE = | 1.4 (48; 7) |
| CPUE-12 = | 1.4 (48; 7) |
| PSD = | 14 (11.7) |
| PSD-12 = | 100 (0) |



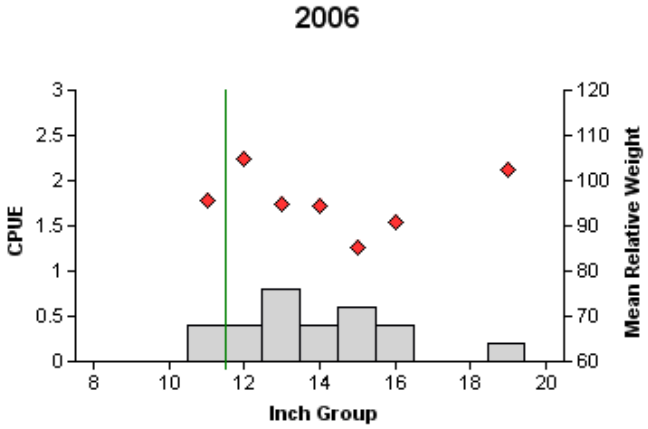

| | |
|---|---|
| Effort = | 5.0 |
| Total CPUE = | 3.6 (47; 18) |
| Stock CPUE = | 3.6 (47; 18) |
| CPUE-12 = | 3.6 (47; 18) |
| PSD = | 6 (6.5) |
| PSD-12 = | 100 (0) |

Figure 5. Number of blue catfish caught per hour (CPUE) population indices (RSE and N for CPUE and SE for size structure are in parentheses) for spring gill net surveys, Inks Reservoir, Texas, 2002, 2006 and 2010. Vertical line represents minimum length limit at the time of sampling.

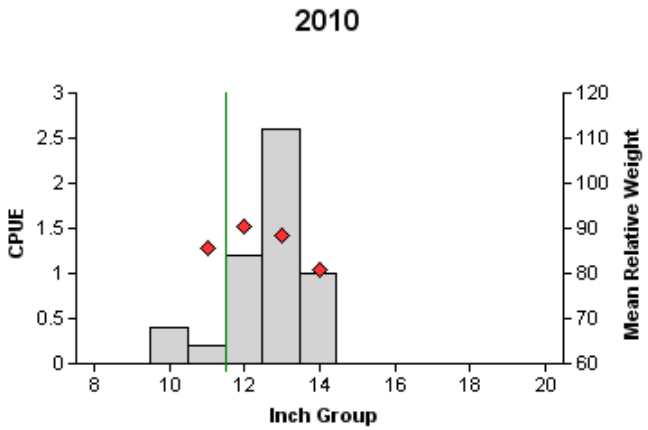
# Channel Catfish




| | |
|---|---|
| Effort = | 5.0 |
| Total CPUE = | 1.4 (36; 7) |
| Stock CPUE = | 1.4 (36; 7) |
| CPUE-12 = | 1.4 (36; 7) |
| PSD = | 71 (19.7) |
| PSD-12 = | 100 (0) |




| | |
|---|---|
| Effort = | 5.0 |
| Total CPUE = | 3.2 (58; 16) |
| Stock CPUE = | 3.2 (58; 16) |
| CPUE-12 = | 2.8 (61; 14) |
| PSD = | 19 (11.0) |
| PSD-12 = | 88 (6.4) |



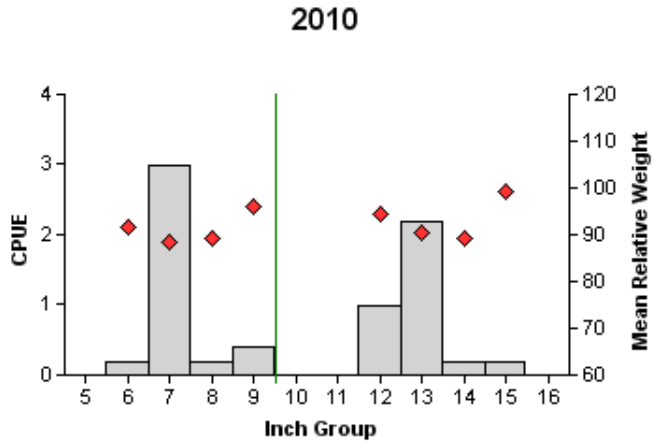

| | |
|---|---|
| Effort = | 5.0 |
| Total CPUE = | 5.4 (32; 27) |
| Stock CPUE = | 5.0 (30; 25) |
| CPUE-12 = | 4.8 (28; 24) |
| PSD = | 0 (64) |
| PSD-12 = | 96 (3.3) |

Figure 4. Number of channel catfish caught per hour (CPUE) population indices (RSE and N for CPUE and SE for size structure are in parentheses) for spring gill net surveys, Inks Reservoir, Texas, 2002, 2006 and 2010. Vertical line represents minimum length limit at the time of sampling.

# White Bass


| | |
|---|---|
| Effort = | 5.0 |
| Total CPUE = | 1.4 (36; 7) |
| Stock CPUE = | 1.4 (36; 7) |
| CPUE-10 = | 1.4 (36; 7) |
| PSD = | 100 (0) |

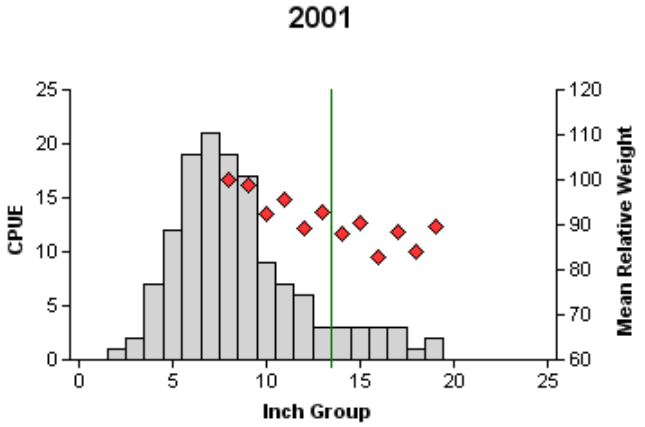

| | |
|---|---|
| Effort = | 5.0 |
| Total CPUE = | 6.2 (50; 31) |
| Stock CPUE = | 6.2 (50; 31) |
| CPUE-10 = | 6.2 (50; 31) |
| PSD = | 100 (0.0) |



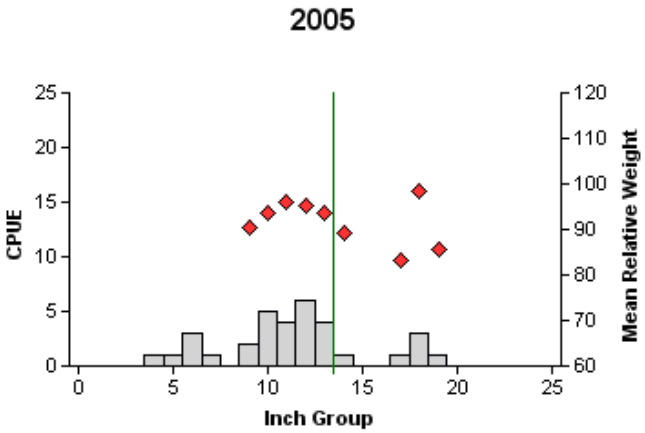

| | |
|---|---|
| Effort = | 5.0 |
| Total CPUE = | 7.4 (40; 37) |
| Stock CPUE = | 7.4 (40; 37) |
| CPUE-10 = | 3.6 (45; 18) |
| PSD = | 54 (10.9) |

Figure 6. Number of white bass caught per hour (CPUE) population indices (RSE and N for CPUE and SE for size structure are in parentheses) for spring gill net surveys, Inks Reservoir, Texas, 2002, 2006 and 2010. Vertical line represents minimum length limit at the time of sampling.

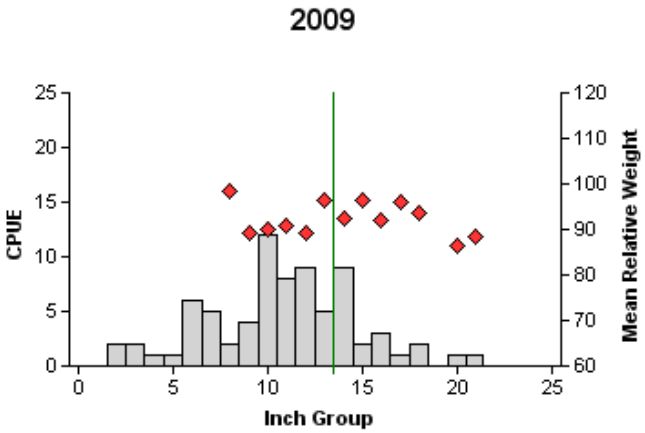
# Largemouth Bass




| | |
|---|---|
| Effort = | 1.0 |
| Total CPUE = | 138.0 (13; 138) |
| Stock CPUE= | 76.0 (20; 76) |
| CPUE-14 = | 15.0 (24; 15) |
| PSD = | 32 (5.9) |
| PSD-14 = | 20 (3.4) |




| | |
|---|---|
| Effort = | 1.0 |
| Total CPUE = | 33.0 (24; 33) |
| Stock CPUE= | 27.0 (29; 27) |
| CPUE-14 = | 6.0 (39; 6) |
| PSD = | 59 (8.1) |
| PSD-14 = | 22 (7.3) |




| | |
|---|---|
| Effort = | 1.0 |
| Total CPUE = | 76.0 (17; 76) |
| Stock CPUE= | 59.0 (16; 59) |
| CPUE-14 = | 19.0 (12; 19) |
| PSD = | 56 (5.1) |
| PSD-14 = | 32 (4.4) |

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, Inks Reservoir, Texas, 2001, 2005 and 2009. Vertical line represents minimum length limit at the time of sampling.

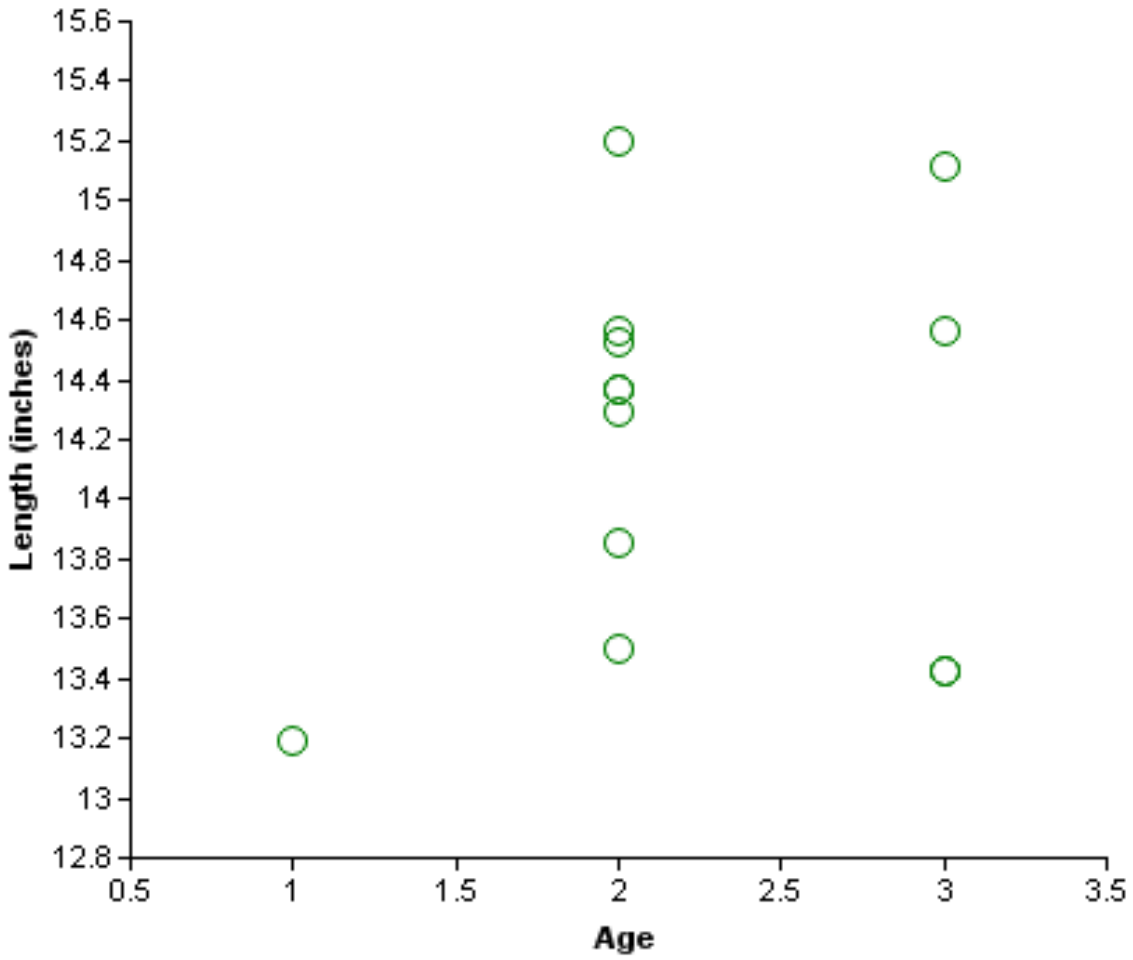



Figure 8. Length at age for largemouth bass collected by electrofishing at Inks Reservoir, Texas, October 2009 (N = 13).

Table 5. Proposed sampling schedule for Inks Reservoir, Texas. Gill netting surveys are conducted in the spring, while electrofishing and trap netting surveys are conducted in the fall. Standard survey denoted by S.

| Survey Year | Electrofisher | Trap Net | Gill Net | Creel Survey | Report |
|---|---|---|---|---|---|
| Fall 2010-Spring 2011 | | | | | |
| Fall 2011-Spring 2012 | | | | | |
| Fall 2012-Spring 2013 | | | | | |
| Fall 2013-Spring 2014 | S | | S | | S |

**Appendix A**

Number (N) and catch rate (CPUE) of all target species collected from all gear types from Inks Reservoir, Texas, 2009 and 2010.

| Species | Gill Netting | | Electrofishing | |
|---|---|---|---|---|
| | N | CPUE | N | CPUE |
| Gizzard shad | | | 173 | 173.0 |
| Threadfin shad | | | 40 | 40.0 |
| Bullhead minnow | | | 3 | 3.0 |
| Inland silverside | | | 17 | 17.0 |
| Blacktail shiner | | | 4 | 4.0 |
| Blue catfish | 18 | 3.6 | | |
| Channel catfish | 27 | 5.4 | | |
| Flathead catfish | 4 | 0.8 | | |
| White bass | 37 | 7.4 | 1 | 1.0 |
| Striped bass | 4 | 0.8 | | |
| Sunshine bass | 1 | 0.2 | | |
| Redbreast sunfish | | | 229 | 229.0 |
| Green sunfish | | | 4 | 4.0 |
| Bluegill | | | 210 | 210.0 |
| Longear sunfish | | | 4 | 4.0 |
| Redear sunfish | | | 2 | 2.0 |
| Largemouth bass | | | 76 | 76.0 |
| Guadalupe bass | | | 4 | 4.0 |
| Logperch | | | 2 | 2.0 |

**Appendix B**

Location of sampling sites, Inks Reservoir, Texas, 2009-2010. Gill net and electrofishing stations are indicated by G and E, respectively.