

LOUISIANA DEPARTMENT OF WILDLIFE & FISHERIES



**OFFICE OF FISHERIES
INLAND FISHERIES DIVISION**

PART VI -B

WATERBODY MANAGEMENT PLAN SERIES

LAKE BOEUF

**WATERBODY EVALUATION &
RECOMMENDATIONS**

CHRONOLOGY

DOCUMENT SCHEDULED TO BE UPDATED ANNUALLY

June 2010 - Prepared by

Melissa A. Kaintz, Biologist Manager, District 8

TABLE OF CONTENTS

WATERBODY EVALUATION	4
STRATEGY STATEMENT	4
<i>Recreational</i>	4
<i>Commercial</i>	4
<i>Species of Special Concern</i>	4
EXISTING HARVEST REGULATIONS	4
<i>Recreational</i>	<i>Error! Bookmark not defined.</i>
<i>Commercial</i>	<i>Error! Bookmark not defined.</i>
<i>Species of Special Concern</i>	4
SPECIES EVALUATION	5
<i>Recreational</i>	6
<i>Commercial</i>	15
<i>Species of Special Concern</i>	15
HABITAT EVALUATION	15
<i>Aquatic Vegetation</i>	15
<i>Substrate</i>	15
<i>Artificial Structure</i>	15
CONDITION IMBALANCE / PROBLEM	16
CORRECTIVE ACTION NEEDED	16
RECOMMENDATIONS	17

WATERBODY EVALUATION

STRATEGY STATEMENT

Recreational

Sportfish species are managed to provide a sustainable population while providing anglers the opportunity to catch or harvest numbers of fish adequate to maintain angler interest and efforts. Crappie fishing and lake runners are highly sought after in this lake system. Bass anglers are afforded the opportunity to catch quality fish and Florida largemouth (FL LMB) bass have been stocked to provide a potential trophy fish.

Commercial

The physical characteristics of Lake Boeuf do not support the large rough fish species that normally comprise a commercial fishery; therefore, a commercial fishery strategy is not used.

Species of Special Concern

No threatened or endangered fish species are found in this waterbody.

EXISTING HARVEST REGULATIONS

Statewide species and gear specific regulations apply. There are no special regulations for the Lake Boeuf area.

Species of Special Concern

No threatened or endangered fish species are found in this water body.

SPECIES EVALUATION

Table 2. Freshwater and brackish species indicated to be common to the Lake Boeuf area from Louisiana Department of Wildlife and Fisheries sampling data.

FRESHWATER AND BRACKISH SPECIES	
<i>Lepomis miniatus</i>	redspotted sunfish
<i>Lepomis gulosus</i>	warmouth
<i>Lepomis microlophus</i>	redeer sunfish
<i>Lepomis macrochirus</i>	bluegill
<i>Pomoxis nigromaculatus</i>	black crappie
<i>Pomoxis annularis</i>	white crappie
<i>Lepomis cyanellus</i>	green sunfish
<i>Lepomis humilis</i>	orange-spotted sunfish
<i>Lepomis megalotis</i>	longear sunfish
<i>Micropterus salmoides</i>	largemouth bass
<i>Lepisosteus oculatus</i>	spotted gar
<i>Lepisosteus osseus</i>	longnose gar
<i>Morone mississippiensis</i>	yellow bass
<i>Amia calva</i>	bowfin
<i>Esox americanus</i>	grass pickerel
<i>Notemigonus crysoleucas</i>	golden shiner
<i>Mugil cephalus</i>	striped mullet
<i>Lucania parva</i>	rainwater killifish
<i>Dorosoma petenense</i>	threadfin shad
<i>Dorosoma cepedianum</i>	gizzard shad
<i>Ictalurus furcatus</i>	blue catfish
<i>Pylodictis olivaris</i>	flathead catfish
<i>Ictalurus punctatus</i>	channel catfish

Recreational

Largemouth bass (LMB) and crappie are targeted as species indicative of the overall fish population due to their high position in the food chain. Electrofishing is the best method to collect data used to describe largemouth bass abundance and size distribution.

Largemouth Bass

Catch-per-unit-of-effort (CPUE) is defined as the number of fish captured per hour of electrofishing time. Spring electrofishing data is used to derive largemouth bass abundance and size structure information and when displayed graphically over time reflects trends in these population characteristics

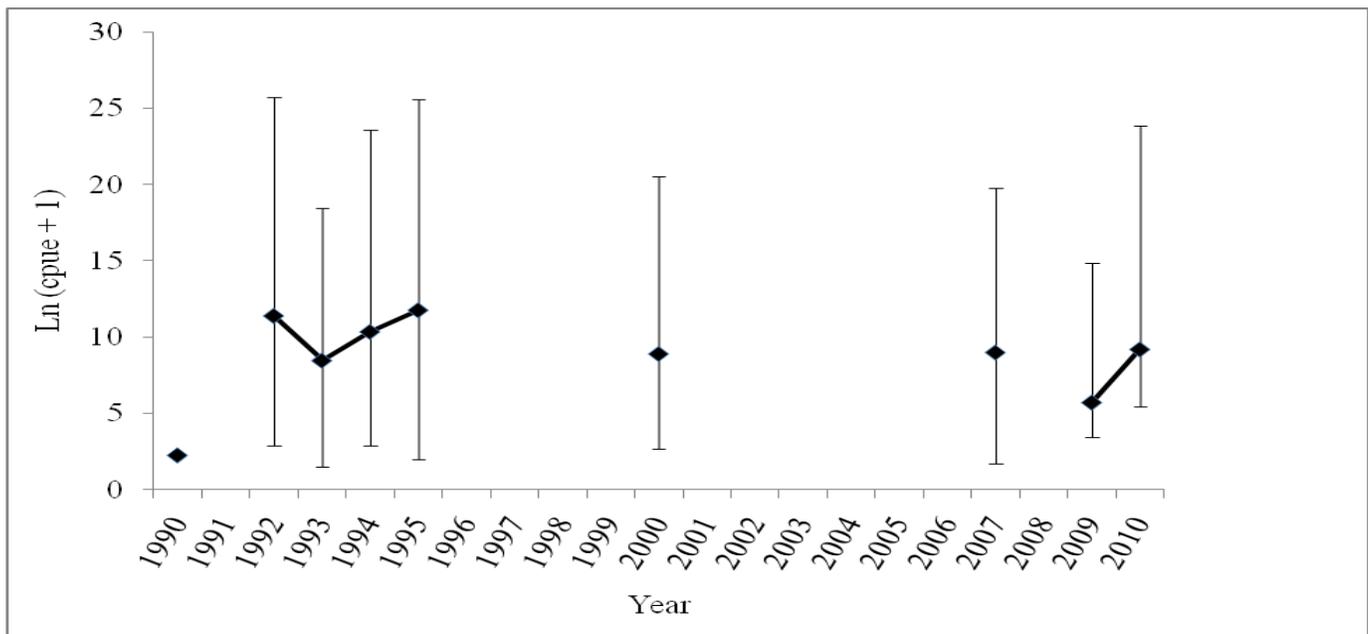


Figure 1. Log_{10} transformed mean CPUE (number per hour + 1) of all largemouth bass collected in spring electrofishing samples from 1990-2010 in the Lake Boeuf area. Error bars represent 95% confidence limits of the log transformed mean CPUE + 1. No samples were collected in 1991, 1996-1999, 2001-2006, and 2008.

Although error bars indicate no significant differences in CPUE among years, the data may suggest a slight decline in abundance from 2007 to 2009, most likely a result of Hurricanes Gustav and Ike in 2008 (Figure 1). However, CPUE in the spring of 2010 may indicate a slight increase which may be a result of a restoration stocking of FL LMB in 2009 and recovery of the system.

Proportional stock density (PSD) and relative stock density (RSD) are indices used to numerically describe length-frequency data. Proportional stock density compares the number of fish of quality-size (greater than 12 inches for largemouth bass) to the number of bass of stock-size (8 inches in length). The PSD is expressed as a percent. A fish population with a high PSD consists mainly of larger individuals, whereas a population with a low PSD consists mainly of smaller fish. For example, the chart below indicates a PSD of 48 for 1993. The number indicates that 48% of the bass stock (fish over 8 inches) in the sample was at least 12 inches or longer.

$$\text{PSD} = \frac{\text{Number of bass} > 12 \text{ inches}}{\text{Number of bass} > 8 \text{ inches}} \times 100$$

Relative stock density (RSD) is the proportion of largemouth bass in a stock (fish over 8 inches) that are 15 inches (preferred-size) or longer.

$$\text{RSD} = \frac{\text{Number of bass} > 15 \text{ inches}}{\text{Number of bass} > 8 \text{ inches}} \times 100$$

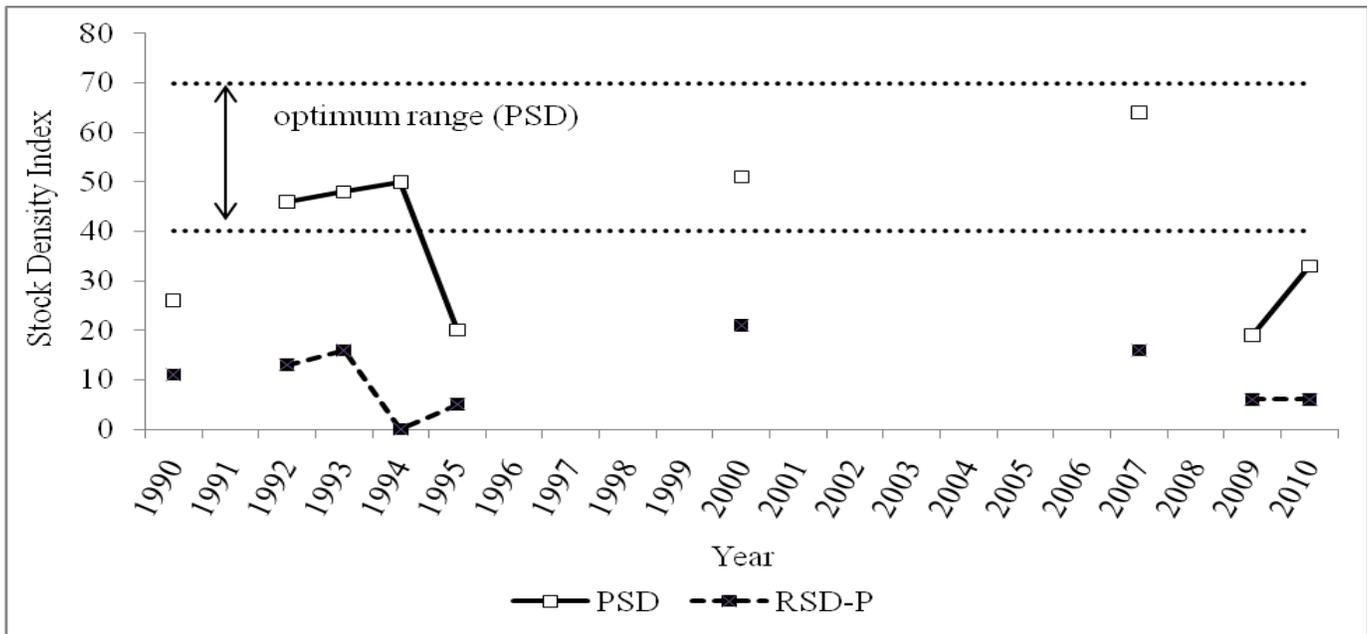


Figure 2. Largemouth bass proportional stock density (PSD) and relative stock density of preferred-length fish (RSD-P) collected in spring electrofishing samples from 1990-2010 in the Lake Boeuf area. No samples were collected in 1991, 1996-1999, 2001-2006, and 2008.

Similar to CPUE, the data suggest a possible decrease in the PSD in 2009 and a slight increase in 2010 (Figures 2 and 3). This increase in PSD may indicate changes in the size structure of LMB as the population recovers and more fish are recruited to the fishery (Figure 4).

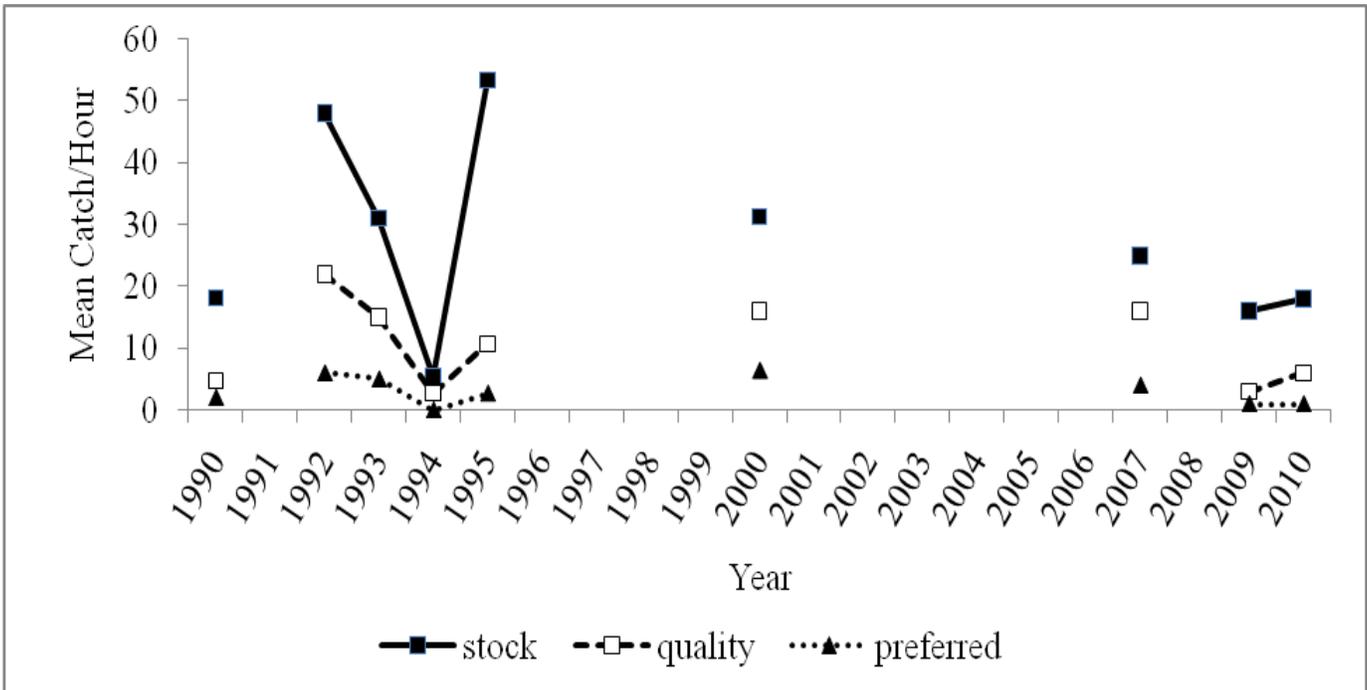


Figure 3. Largemouth bass mean CPUE for stock-length, quality-length, and preferred-length fish collected in spring electrofishing samples from 1990-2010 in the Lake Boeuf area. No samples were collected in 1991, 1996-1999, 2001-2006, and 2008.

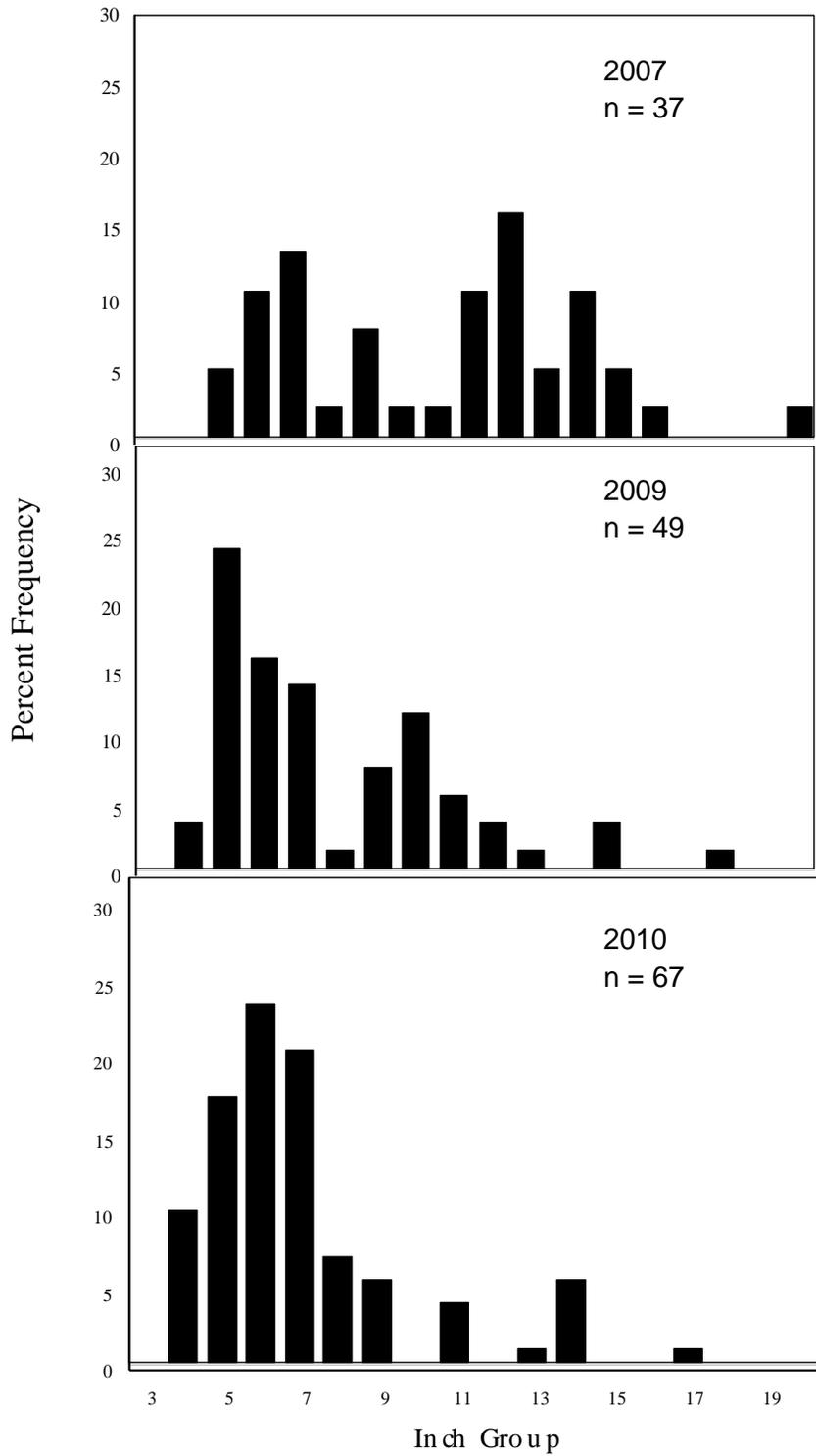


Figure 4. Length frequency distribution for largemouth bass collected in spring electrofishing samples in 2007, 2009, and 2010 in the Lake Boeuf area.

Genetics

Florida bass have been stocked into Lake Boeuf to increase the potential for production of large bass. Florida bass were stocked one time in 1991, by Lafourche Bass Club. This one time stocking did not appear to be effective; however, no genetic information was collected. Hurricane Andrew in 1992 caused a massive fish kill in the lake and surrounding areas just after the Florida bass were stocked. After the Hurricane, an additional stocking occurred in 1996. A total of 53,768 Florida Bass fingerlings were stocked in April 1996. Florida largemouth bass were also stocked after the 2008 Hurricanes Gustav and Ike as a population restoration effort. No genetic information has been collected to date.

Crappie

Spring electrofishing data is used as an indicator of crappie abundance.

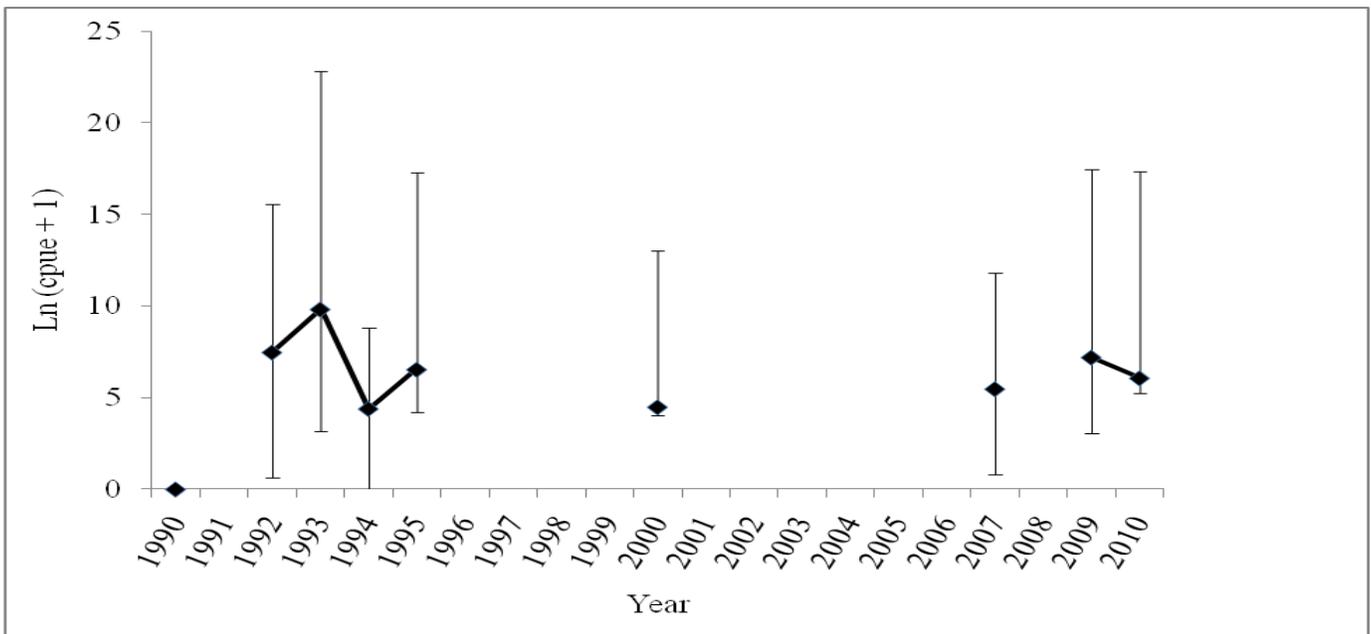


Figure 5. Log₁₀ transformed mean CPUE + 1 of all black crappie collected in spring electrofishing samples from 1990-2010 in the Lake Boeuf area. Error bars represent 95% confidence limits of the log₁₀ transformed mean CPUE + 1. No samples were collected in 1991, 1996-1999, 2001-2006, and 2008.

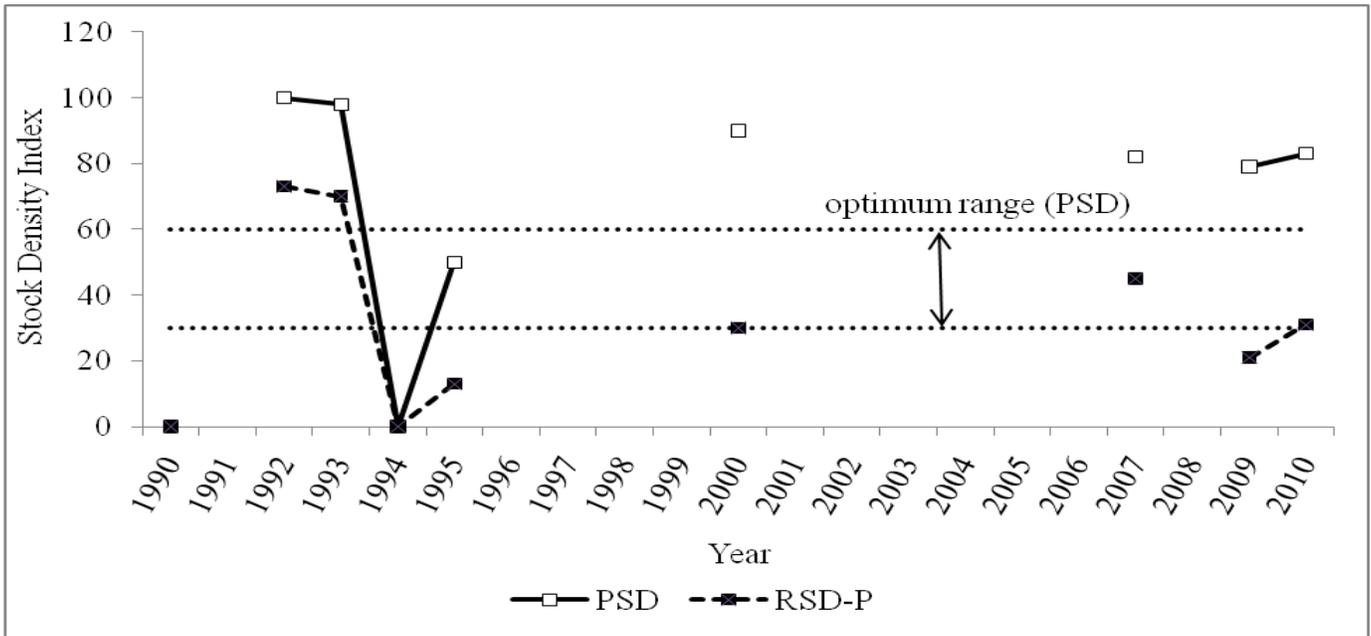


Figure 6. Black crappie proportional stock density (PSD; proportion of stock fish 8-10 inches TL) and relative stock density of preferred-length fish (RSD-P; proportion of stock fish 10-12 inches TL) collected in spring electrofishing samples from 1990-2010 in the Lake Boeuf area. No samples were collected in 1991, 1996-1999, 2001-2006, and 2008.

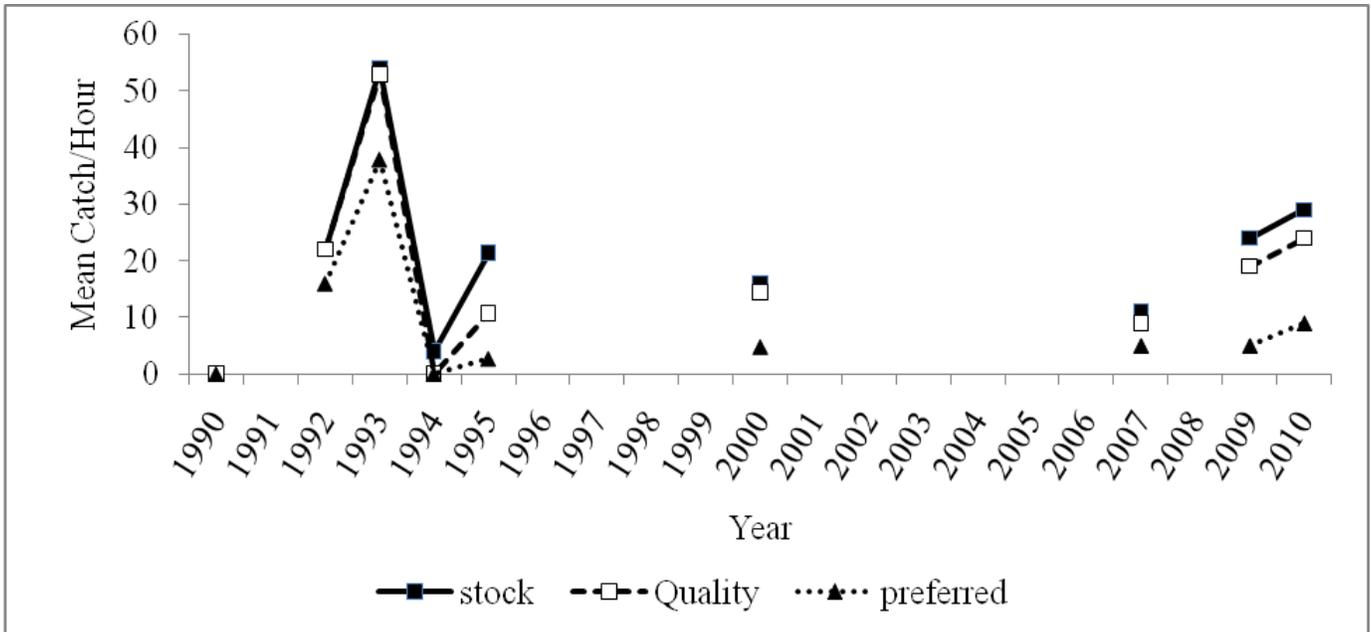


Figure 7. Black crappie mean CPUE for stock-length (5-8 inches TL), quality-length (8-10 inches TL), and preferred-length (10-12 inches TL) fish collected in spring electrofishing samples from 1990-2010 in the Lake Boeuf area. No samples were collected in 1991, 1996-1999, 2001-2006, and 2008.

Although error bars indicate no significant differences in crappie CPUE among years, data may suggest a slight increase from 2007 to 2009 and a slight decrease from 2009 to 2010 (Figure 5). However, CPUE may have increased slightly for stock-length fish indicating that there were a greater number of large fish in the population (Figures 6, 7, and 8). Electrofishing is not the most efficient sampling method for crappie. Lead nets are often used to determine the abundance and size structure of crappie populations. We are currently experimenting with the placement and fishing method for lead nets to monitor the crappie populations in Lake Boeuf and the surrounding area.

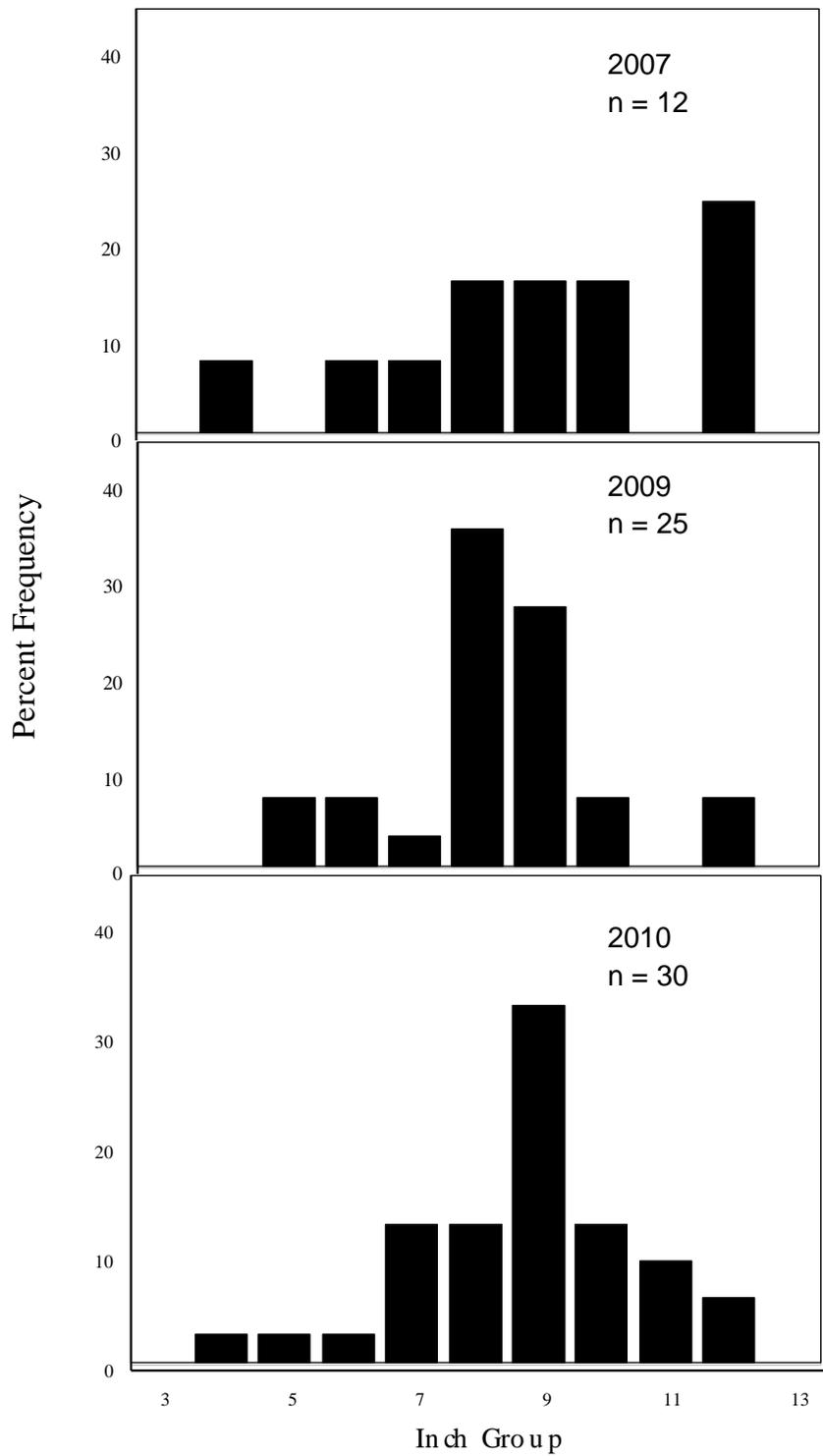


Figure 8. Length frequency distribution of all black crappie collected in spring electrofishing samples in 2007, 2009, and 2010 in the Lake Boeuf area.

Forage -

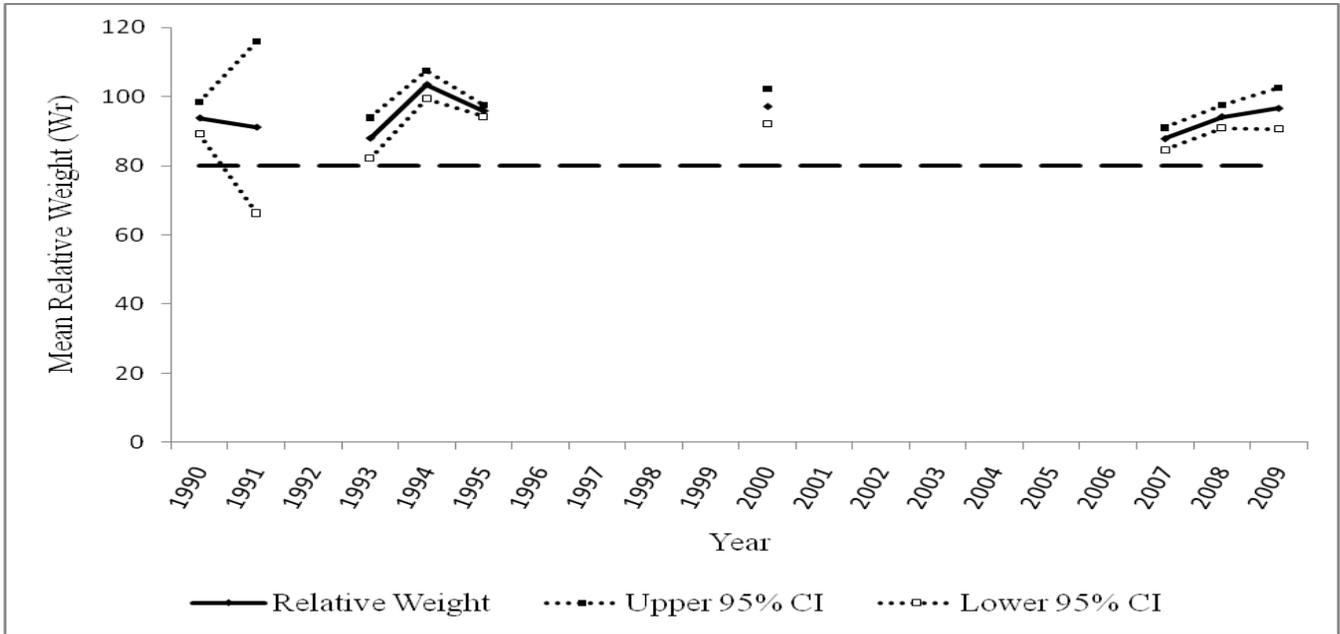


Figure 9. Mean relative weight of stock-length largemouth bass collected in fall electrofishing samples in the Lake Boeuf area 1990-2009. No samples were collected in the fall of 1992, 1996-1999, and 2001-2006.

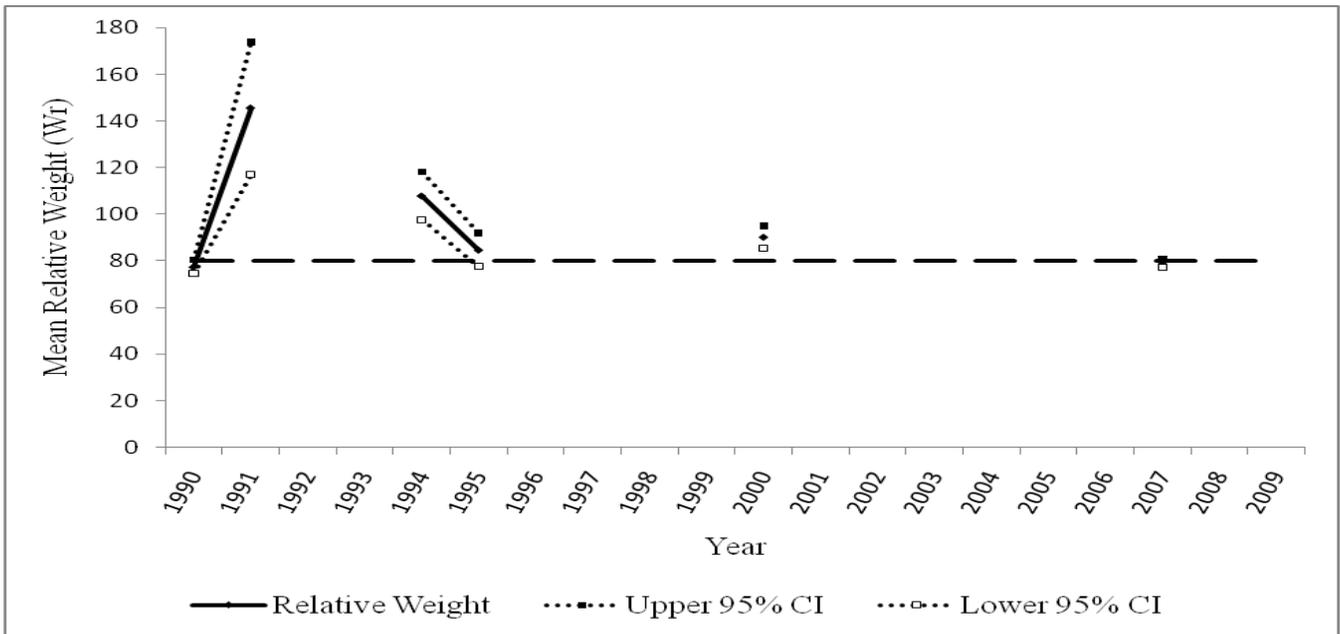


Figure 10. Mean relative weight of stock-length black crappie collected in fall electrofishing samples in the Lake Boeuf area 1990-2009. No samples were collected in the fall of 1992, 1996-1999, and 2001-2006.

Forage availability is typically measured directly through electrofishing and shoreline seine sampling and indirectly through measurement of largemouth bass and black crappie body condition or relative weight. Relative weight (W_r) is the ratio of a fish's weight to the weight of a "standard" fish of the same length. The index is calculated by dividing the weight of a fish by the standard weight for its length, and multiplying the quotient by 100. Largemouth bass relative weights below 80 indicate a potential problem with forage availability. Relative weights of largemouth bass caught in the Lake Boeuf area ranged from 87 to 103 from 1990 to 2009 for all stock length fish, indicating an adequate forage base (Figure 8). Relative weights of crappie ranged from 78 to 140 from 1990 to 2007 also indicating an adequate forage base (Figure 9). Shoreline seine sampling is not a practical sampling method in the Lake Boeuf area because of the abundance of organic material and steep sloping banks along oil field canals throughout the system.

Commercial

The physical characteristics of Lake Boeuf do not support the large rough fish species that normally comprise a commercial fishery; therefore, a commercial fishery strategy is not used.

Species of Special Concern

None

HABITAT EVALUATION

Aquatic Vegetation

In Lake Boeuf, the dominant emerged species was American lotus (*Nelumbo lutea*) and the dominant submerged species was hydrilla (*Hydrilla verticillata*). Other species include common salvinia (*Salvinia minimum*), water hyacinth (*Eichhornia crassipes*), frog's bit (*Limnobium spongia*), yellow water lily (*Nymphaea Mexicana*), coontail (*Ceratophyllum demersum*), cabomba (*Cabomb sp.*), water pennywort (*Hydrocotyle Umbellata*), and water paspalum (*Paspalum fluitans*).

Substrate

Soft organic detritus from surrounding vegetation decay.

Artificial Structure

Lake Boeuf has an abundance of aquatic cover. No artificial structure is necessary.

CONDITION IMBALANCE / PROBLEM

1. There is an abundance of organic material in this area. Organic material is not ideal for optimal largemouth bass spawning success.
2. Excessive organic material and aquatic vegetation severely limit access in Lake Boeuf.

CORRECTIVE ACTION NEEDED

1. Dredge navigation canals in the lake to increase angler access.

RECOMMENDATIONS

1. Continue existing recreational and commercial harvest regulations until LDWF sampling results indicate that change is necessary from a biological perspective or such time as a change in management strategy is indicated by the collective opinion of lake anglers.
2. Continue scheduled standardized sampling of fish populations and aquatic vegetation to determine status over time. Include evaluation of crappie and sunfish populations with the use of standardized lead nets. Increase efforts to:
 - a. Standardize sampling conditions (i.e., sampling is conducted during similar flow rates in the spring and fall each year)
 - b. Investigate random sample site selection in order to increase the precision of catch rate indices.
 - c. Collect growth and mortality data for largemouth bass in the Lake Bouef area to have a better understanding of the population. Additional data such as age class structure and growth rates will enable us to look for trends in the overall condition of the population in relation to environmental parameters.