

State of California
The Resources Agency
Department of Fish and Game

Pardee Lake General Fish Survey
Spring, 2012

By

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North Central Region



Introduction

In an effort to evaluate the fishery of Pardee Reservoir (Pardee), a general fish survey was conducted on May 30, 2012. For the survey, eight random areas were selected for sampling with an electrofishing boat. This data along with future efforts will be used to monitor the status of this fishery.

Location

Pardee Reservoir was formed by damming the Mokelumne River. The reservoir is operated by East Bay Municipal Utility District and is located approximately 10 miles southwest of the city of Jackson (Figure 1). Pardee sits at an elevation of approximately 568 feet above mean sea level in the western foothills of the Sierra Nevada Mountain Range. At maximum pool the lake occupies 2,134 surface acres and has 197,950 acre-feet of water storage (DWR 2012). Pardee was first filled in 1930 and now supports a significant warmwater (black bass, sunfish, and catfish) fishery in addition to a hatchery and wild trout fishery.

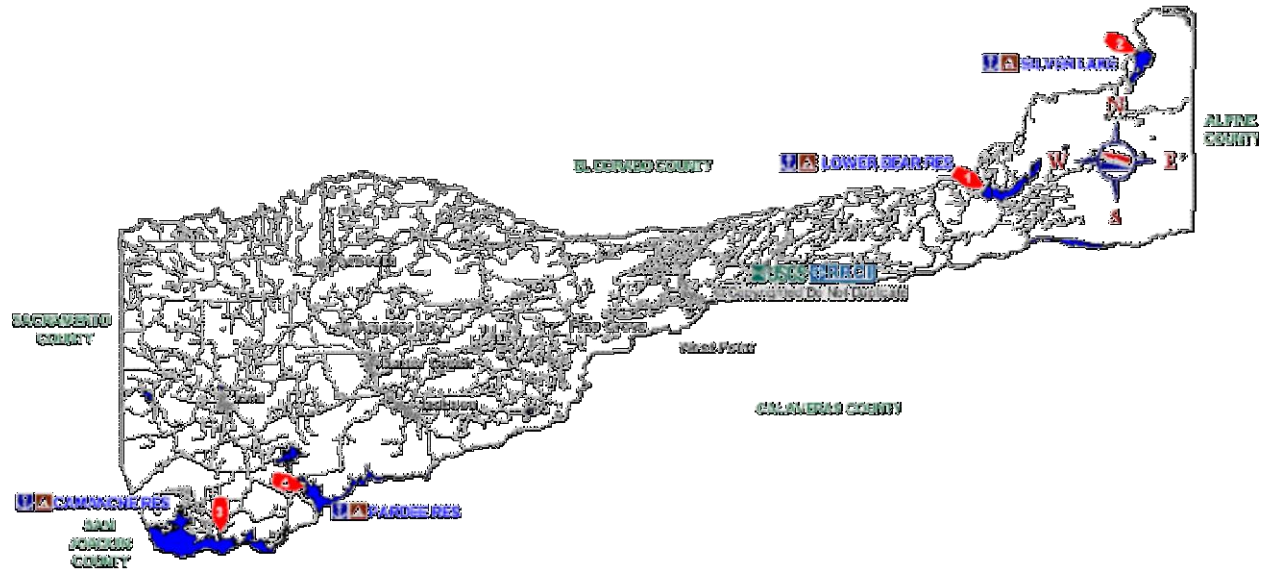


Figure 1. Map of Pardee Lake in relation to Jackson.

Methods and Materials

Eight selected sites (Figure 2) were sampled for approximately 600 electrofishing seconds (10 minutes) each at night using an 18 ft. Smith-Root electrofishing boat. Pulsed DC current (8-12 amps) was used to “stun” the fish. This survey was completed and data analyzed using methods described in the Lake Perris General Fish Survey, October, 2008 (Ewing 2008).

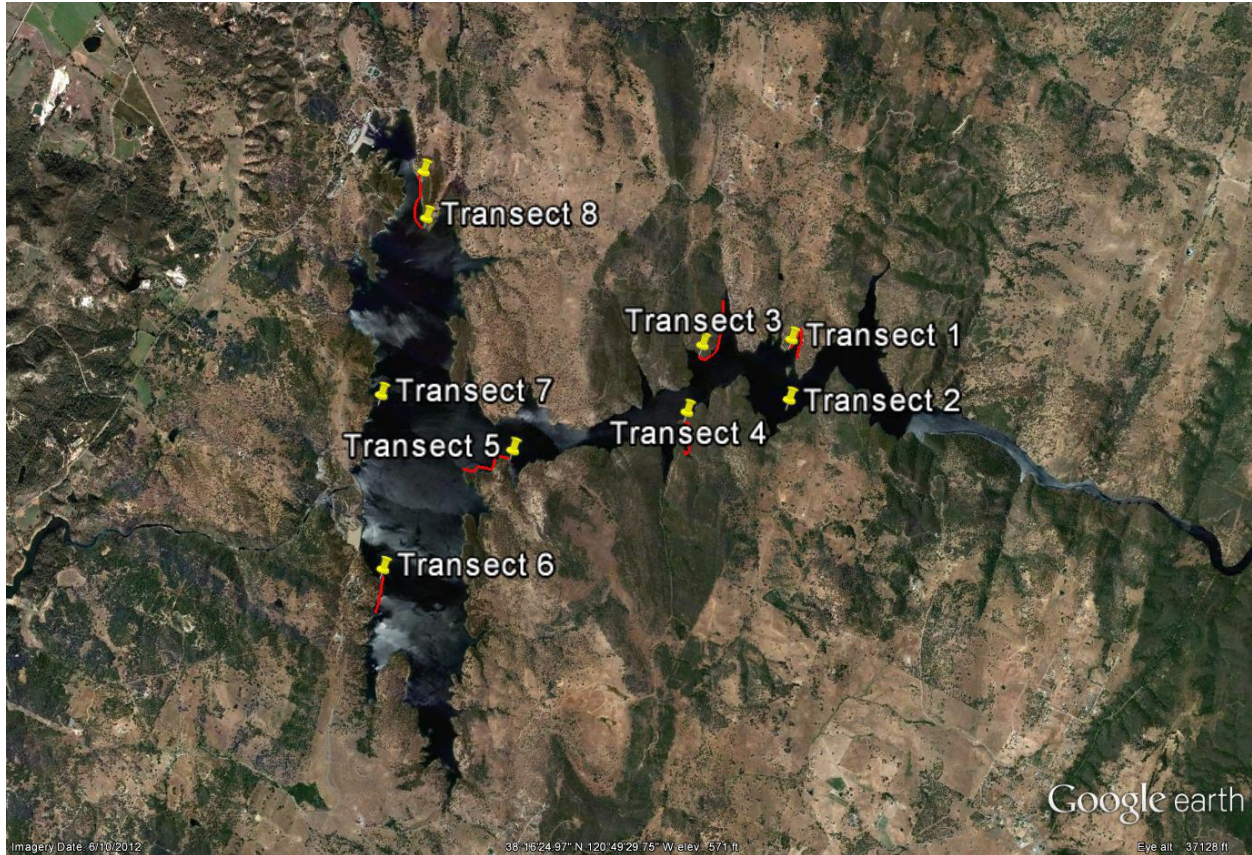


Figure 2. Electrofishing transect location for the Pardee Lake general fish survey May 30, 2012.
* Transects 2 and 7 show no transect line due to errors in final ending points for those transects.

Data Analysis

This survey was completed and the data analyzed using methods described in the Lake Perris General Fish Survey, June, 2008 and 2009 (Ewing 2008, 2009). The mean length and weight for each species was determined and an analysis of population indices were evaluated for selected species. Of primary concern will be indices for the largemouth bass (LMB) (*Micropterus salmoides*), and bluegill (BG) (*Lepomis macrochirus*) populations. These indices include catch per unit of effort (CPUE) weight-length relationships, Relative Weight (Wr), and proportional stock density (PSD) (Anderson, R.O. and R.M. Neumann 1996).

Results and Discussion

Table 1 summarizes the species composition, mean total length and weight, and length ranges. A total of 633 fish representing six species were collected during the survey (Table 1). Bluegill comprised over 54 percent of the total fish sampled. Green sunfish (GSF) (*Lepomis cyanellus*) followed with 27 percent of the total fish sampled. Smallmouth bass (SMB)

(*Micropterus dolomieu*) and LMB each had eight percent respectively. Redear sunfish (RE) (*Lepomis microlophus*) and channel catfish (*Ictalurus punctatus*) finished with approximately one percent of the total catch each. The total CPUE for this survey effort was 7.87 fish/min.

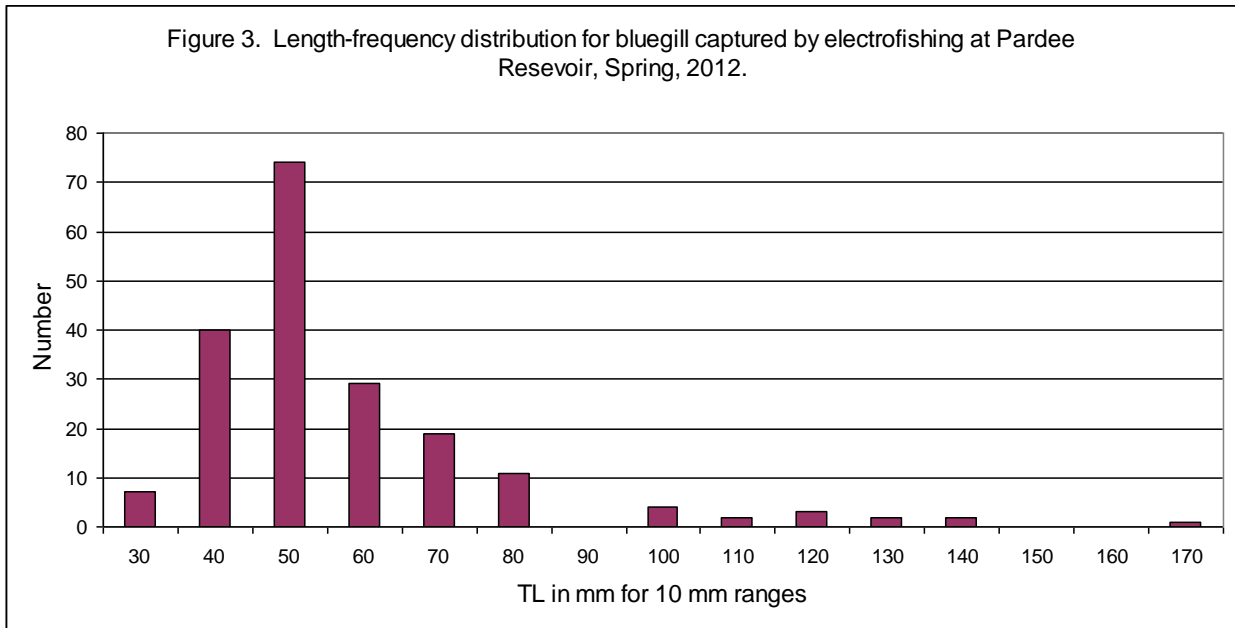
Table 1. Species composition from Pardee Reservoir, May 30, 2012.

Mean Total Length (TL) was measured in millimeters (mm). Average Weight was in grams (g)

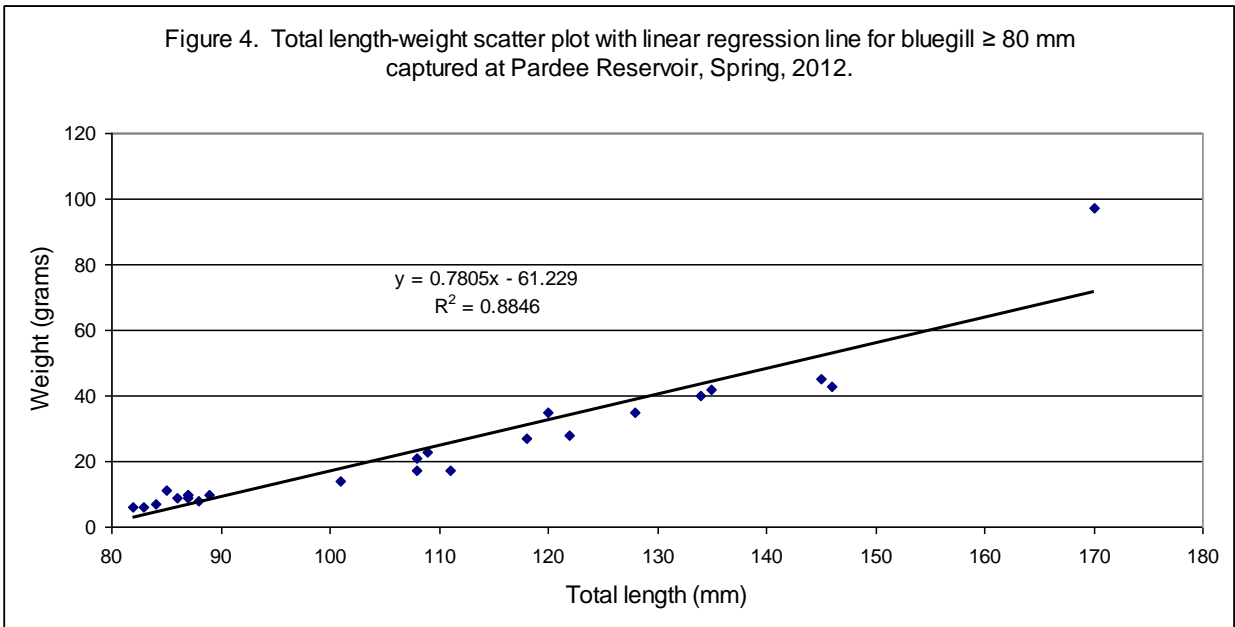
	Species	Number	Percent	CPUE	(TL)	Weight	Length Ranges
1	Bluegill	342	54%	4.3	61.5	23.0	30 - 170
2	Green sunfish	170	27%	2.1	61.7	20	35 - 164
3	Largemouth bass	53	8%	0.7	137.8	333.0	20 - 512
4	Smallmouth bass	52	8%	0.6	118.1	234	26 - 355
5	Redear sunfish	9	1%	0.1	92.2	21	63 - 130
6	Channel catfish	7	1%	0.1	282.6	550	145 - 625
	Total	633					
	Generator minutes:	80.4					
	CPUE (Fish/ gen. min)	7.9					
	Water temperature	72°F					

Bluegill

Bluegill captured and measured ranged from 30 - 170 mm (1.2 and 6.7 inches) (Table 1). This indicates the bluegill range from approximately young of the year to four years of age at the time of sampling (Moyle 2002). The length range with greatest frequency for BG was the 50mm class (2.0 in.) (Figure 3). The average length for BG was 61.5 mm (2.4 inches).

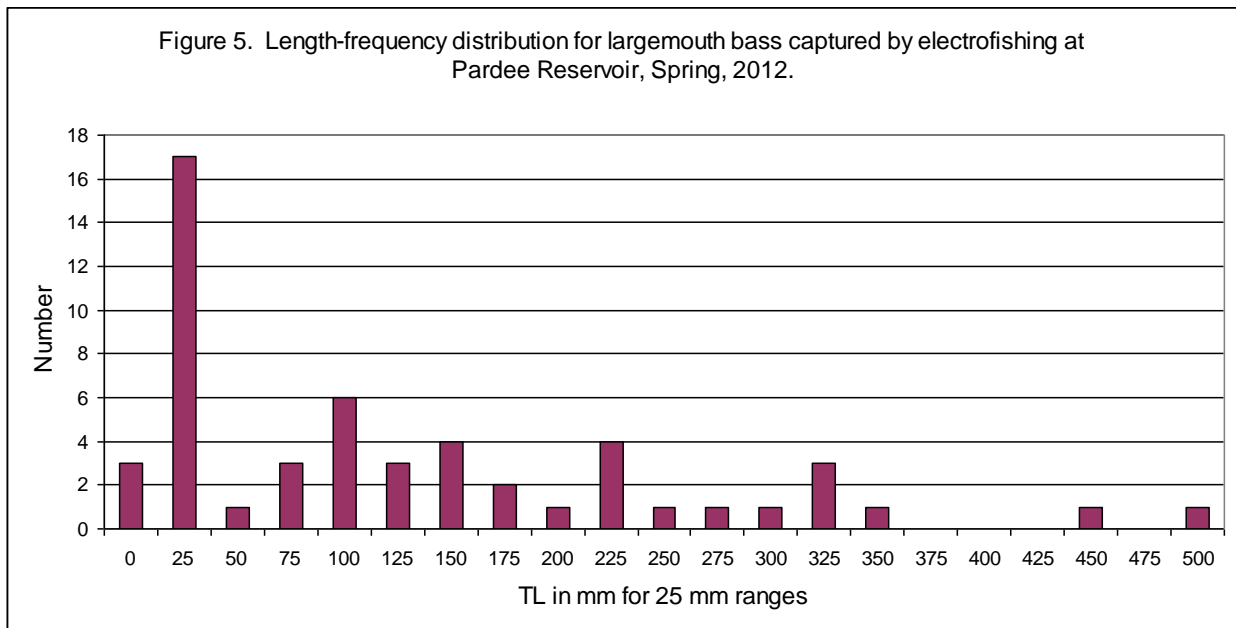


Using the linear regression equation presented in Figure 4, a reliable estimated weight can be determined from the length of a bluegill. These estimates are considered reliable due to the high R^2 (coefficient of determination) for this equation. No PSD or mean relative weight was calculated for bluegill due to the lack of larger sizes collected (Table 1).

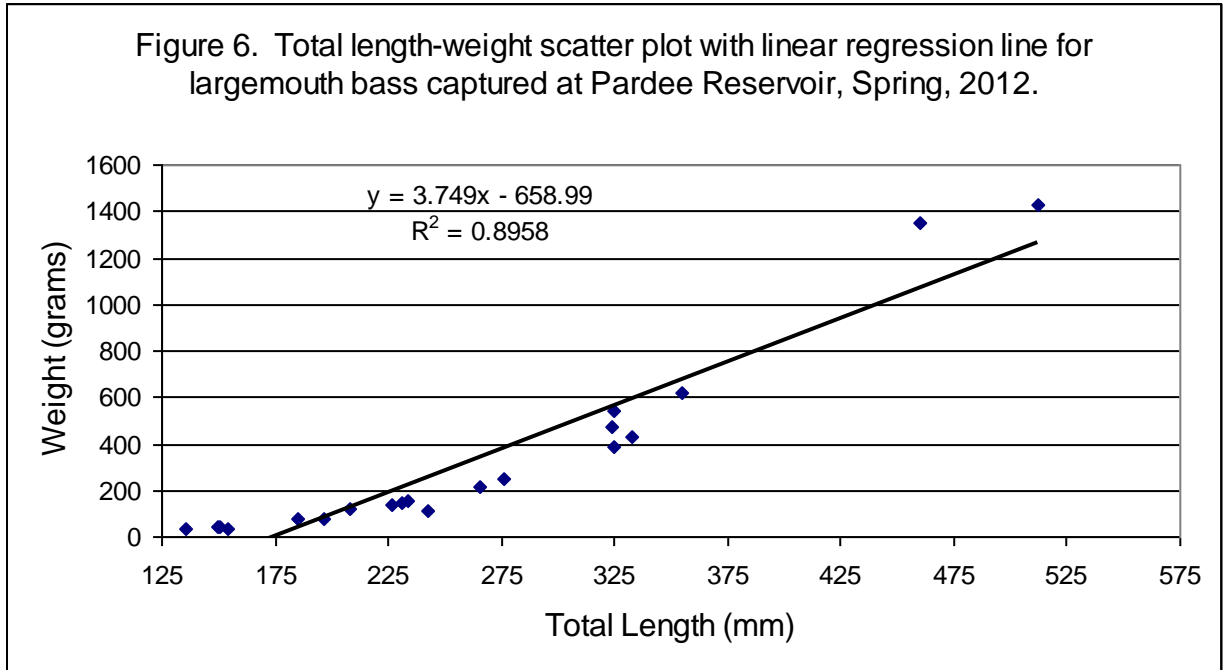


Largemouth bass

As seen in Table 1, LMB total length ranged from 20 – 512 mm (0.8 - 20.2 in.). The length frequency distribution for LMB is presented in Figures 5. The length class with the highest frequency was the 25mm (1.0 in.) class. This indicates there are numerous young of the year bass (Moyle 2002). The length frequency distribution shows a LMB population which had a successful spawn in 2012 with few stock size and greater fish (Figure 5). It is possible with the high surface water temperature of 72° F at the time of the survey that some of the larger – size bass were occupying greater depths.



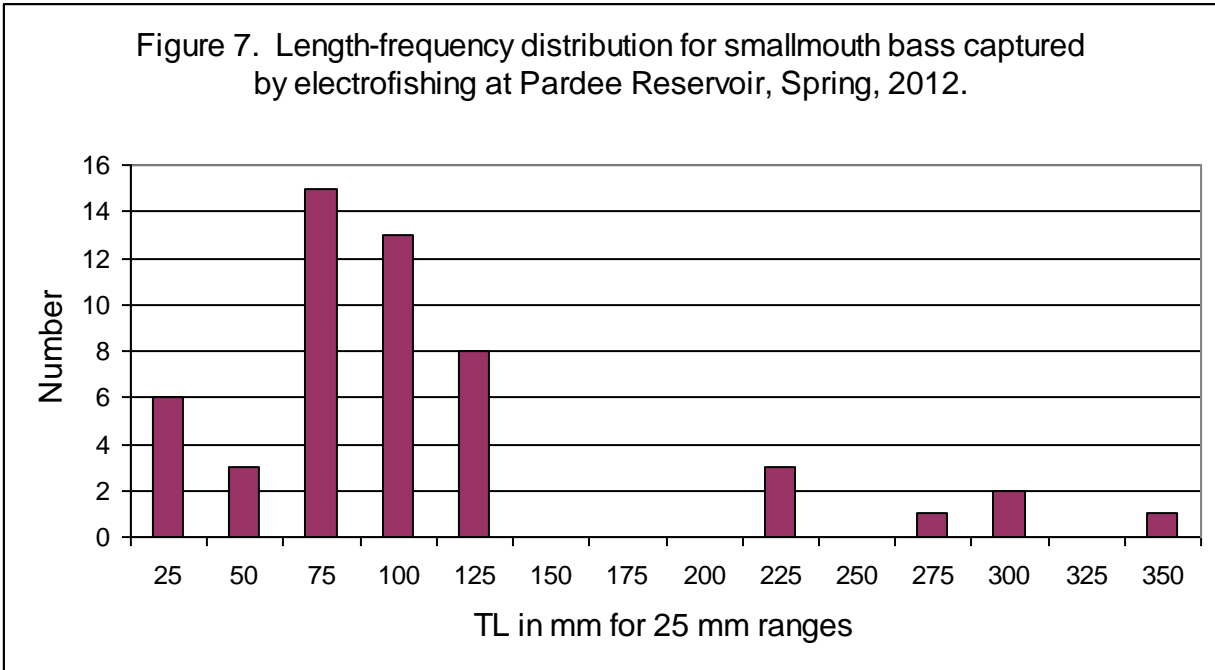
Using the linear regression equation presented in Figure 6, a reliable estimated weight can be determined from the length of a LMB. No PSD or mean relative weight was calculated for LMB due to the lack of larger sizes collected.



Smallmouth bass

Fifty two SMB were collected ranging from 26 - 355 mm (1.0 - 14.0 in.) (Table 1). Length range data shows the SMB sampled are in the young of the year to four year age classes (Moyle 2002). The majority of SMB collected were in the young of the year to one year of age (Figure 7) (Moyle 2002). Like, LMB, the surface water temperature could be a big reason for the small number of SMB collected that were of greater sizes. Future surveys to compare to this spring's survey could help the Department of Fish and Game (Department) get a better understanding of how the different age classes are doing in Pardee.

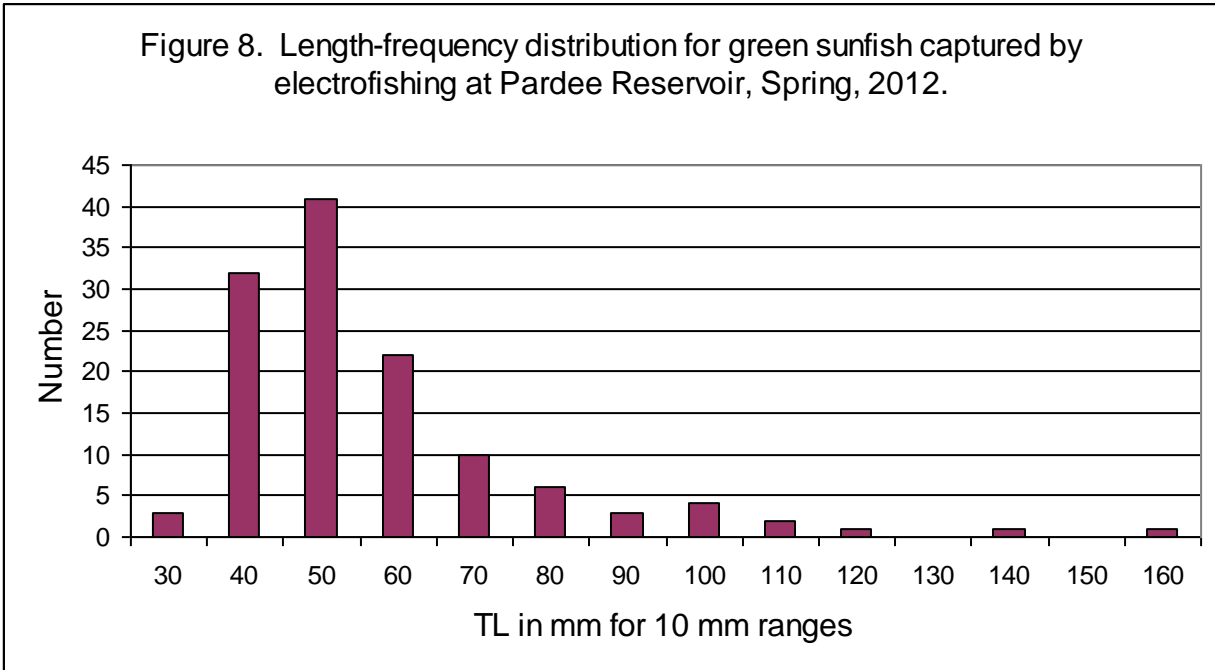
No PSD, W_r , and length-weight correlation figure for SMB was calculated due to the small sample size of fish greater than 150 mm collected.



Green sunfish

One hundred seventy GSF were collected ranging from 35 - 164 mm (1.4 – 6.5 in.) (Table 1). Analysis of the length range data shows the GSF sampled are one to three years of age (Moyle 2002). The majority of GSF collected were in the young of the year to one year of age (Figure 8) (Moyle 2002).

No PSD, W_r , and length-weight correlation figure for GSF was calculated due to the small sample size of fish greater than 80 mm collected.



Conclusions

Due to the lack of suitable sample sizes for the other species collected during the survey, no summaries were made since the results would be unreliable. Bluegill numbers seem to be doing well but the larger size classes seem to be lacking which could be due to high surface water temperatures. A fall survey as well as a spring 2013 survey can help determine the survivorship of these fish in this vulnerable age when they are prone to being predated on. There were respectable numbers of black bass collected in Pardee. It is possible with the surface temperature of 72° F at the time of the survey that SMB and LMB equal to or greater than 200 mm (7.9 in.) were occupying cooler, greater depths. Pardee also is home to a healthy channel catfish population, though it was not shown in the general fish survey. During a population estimate for black bass in Pardee in May 2012, many catfish greater than five pounds were seen. Pardee has a fair diversity of species inhabiting the reservoir. Future spring surveys at Pardee will be conducted during a timeframe that is suitable for capturing all life stages present in the reservoir.

References

Anderson, R. O. and R. M. Newmann. 1996. Length, weight and associated structural indices. Pages 447-482 in B. R. Murphy and D. W. Willis, editors. Fisheries techniques, 2nd edition. American Fisheries Society, Bethesda, Maryland.

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