

# CEDAR LAKE REDEAR SUNFISH STOCKING EVALUATION SEPTEMBER 25 - 28, 2018

By

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## Introduction

This survey was conducted to evaluate the Cedar Lake Association's (CLA) redear sunfish stocking program for Cedar Lake. CLA has been stocking fingerling redear sunfish since 2010. This survey was sanctioned and permitted by the Michigan Department of Natural Resources, Fisheries Division. The idea of introducing this fish into Cedar Lake began in the late 1990's. This was over concern for a declining panfish population and its associated sport fishery and combined with a need to find an ecologically aggressive way to treat the invasion of zebra mussels. The Michigan Department of Natural Resources (MDNR) fishery staff and CLA officials jointly decided to experiment with an introduction of redear sunfish in Cedar Lake. It was hoped that the redear would thrive in Cedar Lake providing a very desirable panfish for anglers to target and at the same time providing a biological check to the expanding zebra mussel population.

## Redear Sunfish Biology

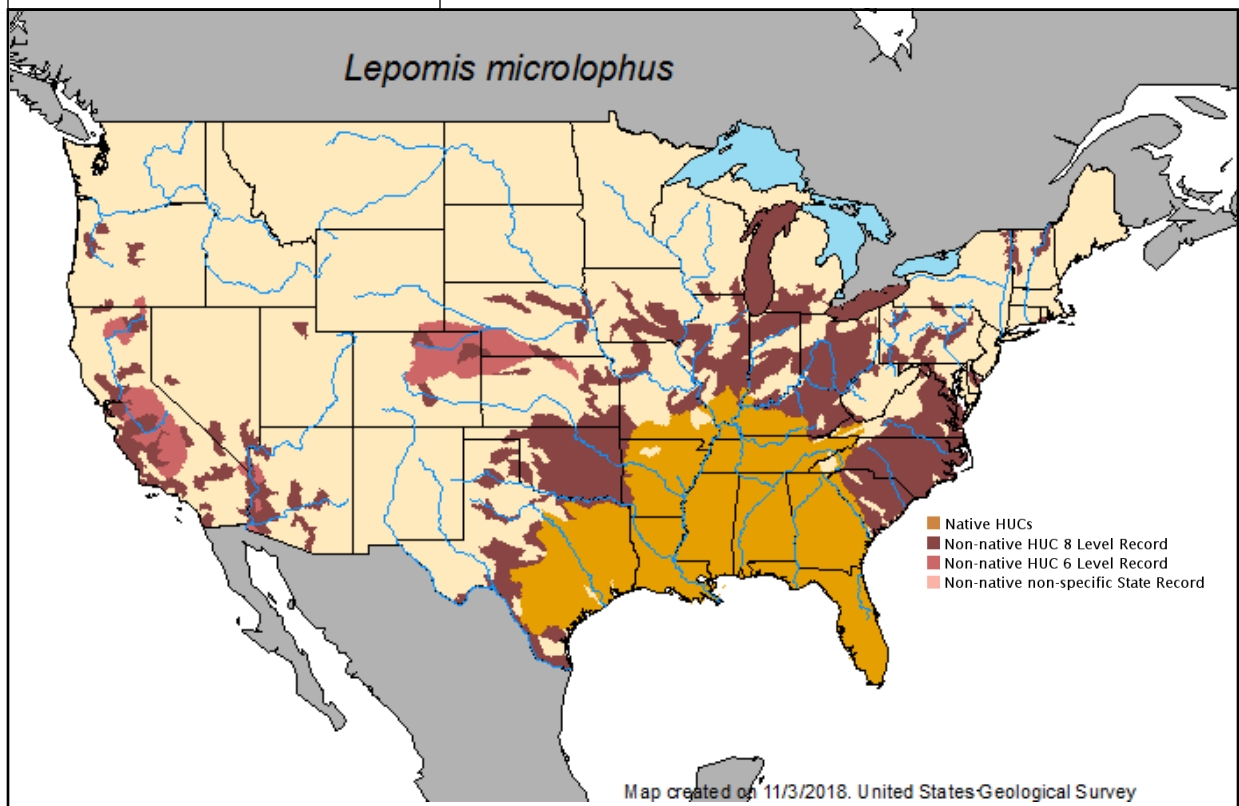
Redear sunfish (*Lepomis microlophus*) are a member of the sunfish family (Centrarchidae) which also includes bluegill, pumpkinseed sunfish, green sunfish, rockbass, largemouth bass and smallmouth bass. Physical characteristics of a redear is a deep-bodied, olive color, with darker spots and flecks of red. Occasionally vertical bars along the sides are visible. The hind end of the gill flap is black with a white border and has a red spot on the tip (hence its name). The chest color is yellowish to cream colored. The mouth is small and when closed barely reaches to the front margin of the eye. The pectoral fins are long and more pointed than those of other sunfish. The first dorsal fin contains 10 sharp spines, followed by 10 to 12 rays. Moyle (1976); Hubbs et al. (1991); Page and Burr (1991) The native range for redear sunfish has been determined as the Atlantic and Gulf Slope drainages of the south eastern region of the United States from Florida west to eastern Texas and then north to southern Illinois and Kentucky (Figure 2) (USEPA 2008). Recent introductions have increased its range in a patch work pattern across the southern U.S. and as far north as the southern Michigan "*Lepomis microlophus*" (On-line) (Figure 1).

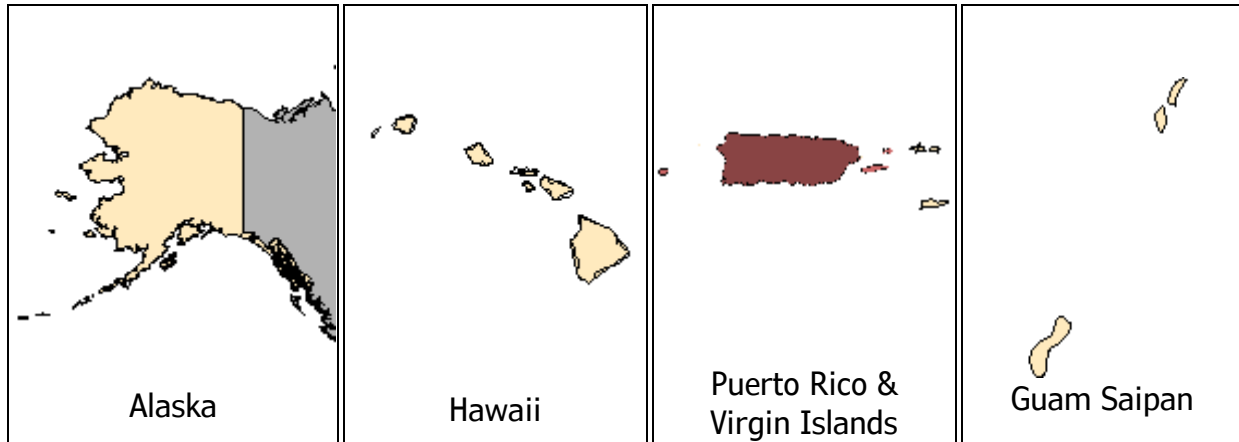
Figure 1 Redear sunfish



The HUCs on the map refer to the way fish distributions are based on spatial or areal characteristics. Watershed is defined in two ways. 1) “a ridge of high land dividing two areas that are drained by different river systems, and 2) the region draining into a river, river system or body of water”. The first defines a linear characteristic whereas the second defines a spatial or areal characteristic. Watersheds defined based on spatial or areal characteristics have been useful for water resource managers and scientists in associating natural and anthropogenic characteristics with water quality, discharge, fish distributions, and other aquatic-related phenomena ([Vannote et al. 1980](#); [Swank et al. 2001](#); [Saly et al. 2011](#); [Marzin et al. 2012](#); [Likens 2013](#); [Macedo et al. 2014](#)). The Hydrologic Unit Code (HUC) dataset provides a convenient nationwide set of geographic polygons based on drainage subdivisions of land surface areas at several hierarchical levels ([USGS and USDA-NRCS 2013](#)). There are **78** major river basins, or watersheds, in the lower 48 states.

Figure 2. Map of the Redear range.





Redear sunfish grow more rapidly and larger than bluegill in the same waters. Redear can reach around 4.3 inches in the second year and around 8 inches by the sixth year. They occasionally reach a length of 10.5 inches but seldom exceed 8.9 inches (Figures 3, 4, and 5)

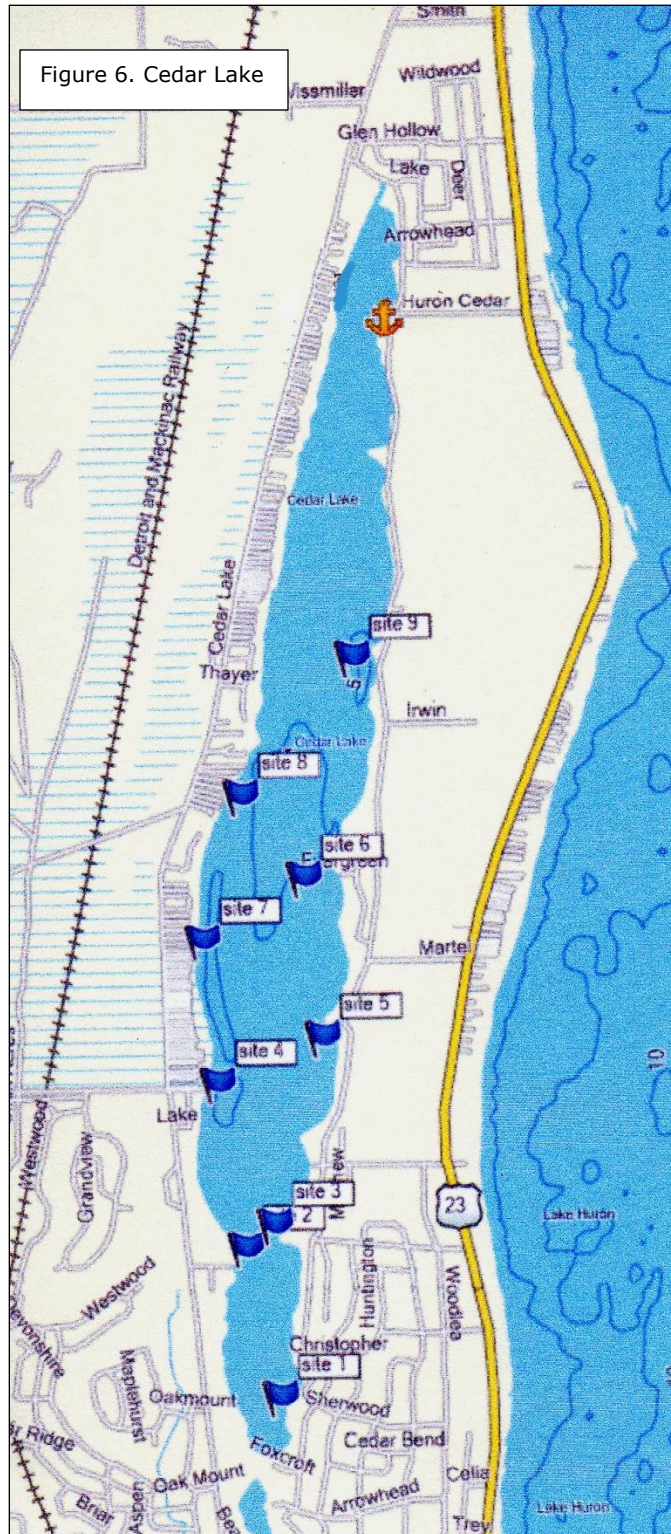


The record redear sunfish in Michigan was 12.6 inches length, weighed 2.36 pounds and was caught from Lyon Lake, Calhoun County in 2010. Redear sunfish make an excellent forage for largemouth bass; however, redear sunfish do not produce as many offspring as bluegill. Recommended stocking rates to establish redear sunfish in ponds is 250 redear fingerlings that are 1 to 3 inches long per surface acre in late summer or early fall. They prefer habitats that are vegetated littoral zones of small to large lakes, marshes, and reservoirs, and streams or rivers with sluggish to slow moving flow (French and Morgan 1995).

A noted additional benefit of the redear is that they have been known for being highly molluscivorous in that they can feed heavily on clams and snails. Direct impacts on invertebrates and indirect impacts on vegetation are associated with *L. microlophus* in Tennessee (Ruiz et al. 1999). In inland lakes of southern Michigan, introduced redear is associated with ecological changes in populations of pumpkinseed *L. gibbosus*, a native molluscivore. Effects of introduced redear on pumpkinseed include reduced consumption of snails and reduced population densities (Huckins 1997), (Fuller, P., G. Jacobs 2007).

## The Lake

Cedar Lake is in the southeast corner of Alcona County and northeast corner of Iosco County. The lake has a surface area of 1,075 acres and a maximum depth of 8 feet (figure 6).



The lake has a recent history of lake level issues, primarily with low lake levels during the summer months mainly due to diversion of watershed flows away from the lake. An aquatic plant management program is being conducted to address an invasive aquatic plant, Eurasian milfoil. Invasive Zebra mussels are also found in the lake. During the summer of 2018, a largemouth bass and smallmouth bass die-off occurred and was attributed to Largemouth Bass Virus (Michigan Department of Natural Resources, Fisheries Division press release 2018).

The fish community is presently composed of a warm water fish community including bluegill, pumpkinseed sunfish, black crappie, rockbass, largemouth bass, smallmouth bass, yellow perch, walleye, northern pike, yellow bullhead, brown bullhead, white sucker and various minnow species. Current MDNR Fisheries Division management actions include periodic stocking of walleye fingerlings. Historic state stocking included tiger muskellunge. (Table 1.)

Table 1. Stocking history.

<b>Stocking History of Cedar Lake from 1980 - 2018</b>						
<b>County</b>	<b>Site name</b>	<b>Species</b>	<b>Date</b>	<b>Number</b>	<b>Operation</b>	<b>Avg. Length</b>
losco and Alcona	CEDAR LAKE	Tiger Muskellunge	9/16/80	5,000	State Plant	8.5
losco and Alcona	CEDAR LAKE	Tiger Muskellunge	8/28/84	19,000	State Plant	6.97
losco and Alcona	CEDAR LAKE	Tiger Muskellunge	9/19/86	5,000	State Plant	6.46
losco and Alcona	CEDAR LAKE	Tiger Muskellunge	9/23/88	5,000	State Plant	9.33

losco and Alcona	CEDAR LAKE	Tiger Muskellunge	9/27/90	5,236	State Plant	9.41
losco and Alcona	CEDAR LAKE	Tiger Muskellunge	9/27/91	9,600	State Plant	9.33
losco and Alcona	CEDAR LAKE	Redear sunfish	10/29/2010	1,000	Private Plant (under permit)	3
losco and Alcona	CEDAR LAKE	Redear sunfish	10/29/10	1,000	Private Plant (under permit)	3
losco and Alcona	CEDAR LAKE	Redear sunfish	10/21/2011	1,000	Private Plant (under permit)	5
losco and Alcona	Cedar Lake	Redear sunfish	10/24/2012	760	Private Plant (under permit)	4
losco and Alcona	CEDAR LAKE	Walleye	6/19/2013	53,235	Marsh & Rearing Pond Release	2.1
losco and Alcona	CEDAR LAKE	Hybrid Sunfish	10/26/2013	920	Private Plant (under permit)	3

losco and Alcona	CEDAR LAKE	Walleye	6/18/2014	70,784	Marsh & Rearing Pond Release	1.81
losco and Alcona	CEDAR LAKE	Redear sunfish	10/16/2014	2,500	Private Plant (under permit)	3.5
losco and Alcona	CEDAR LAKE	Redear sunfish	10/17/2015	2,580	Private Plant (under permit)	3
losco and Alcona	CEDAR lake	Walleye	6/30/2016	53,919	State Plant	1.95
losco and Alcona	CEDAR LAKE	Redear sunfish	2016	4,170	Private Plant (under permit)	2,000/3 2,170/4.5
losco and Alcona	CEDAR LAKE	Walleye	6/7/2018	50,470	State Plant	1.85

### Survey Methods

A netting survey was conducted from September 25 – 28, 2018. Netting gear used in the survey was composed of 6 fyke nets (a style of trap net) of various mesh sizes (1/2", 3/4" and 1" square mesh) (figure 7, 8, and 9). The various mesh sizes allow for all sizes and ages of fish to be captured and to minimize issues with netting gear selectivity (some fish species and sizes do not easily enter dark - small mesh nets). All six nets were set on September 25, tended daily with some moved daily until they were removed on September 28 for a total effort of 18 net nights. Netting sites were selected at various locations around the lake, focusing on near shore structure (primarily weed beds) which are the preferred habitat for redear sunfish. All fish captured were recorded by species and length.



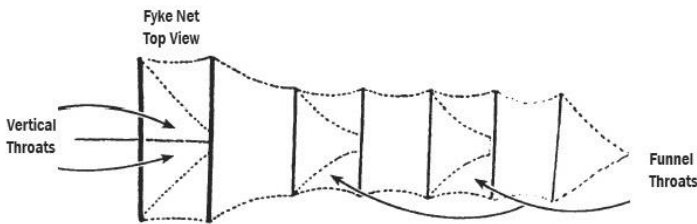
Figure 7. Fyke Net Photograph, taken by Eric Engbretson



Figure 8. Fyke Net Photograph, taken by Eric Engbretson



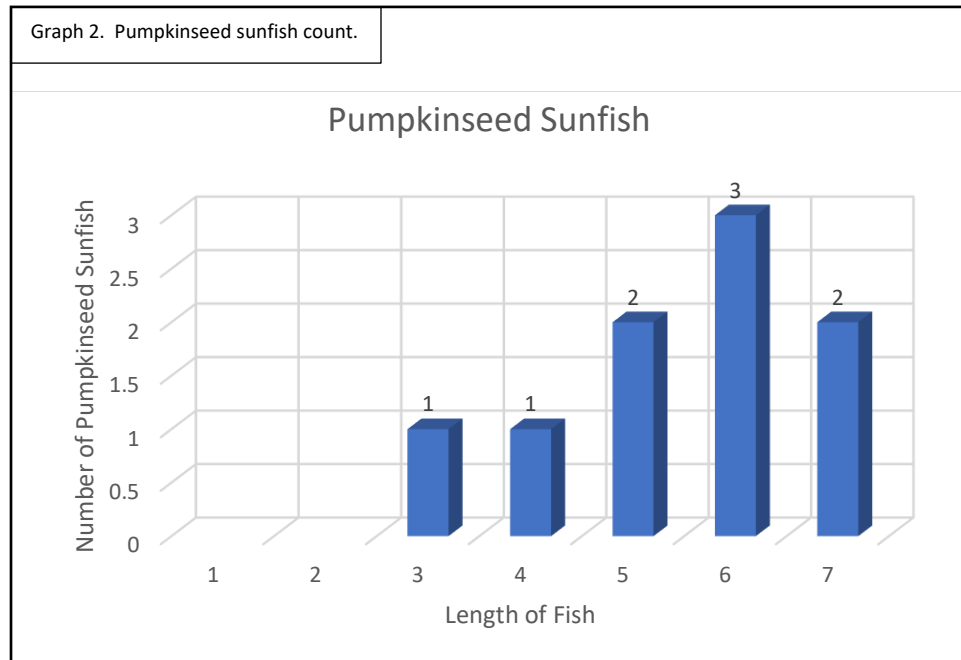
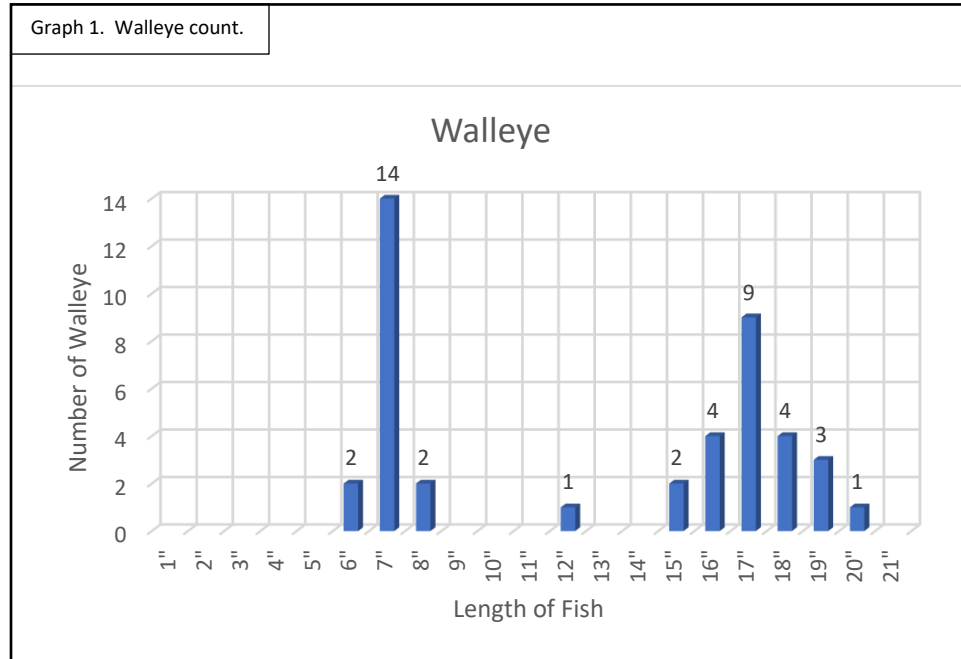
Figure 9. drawing of a Fyke Net by Duluth Fish Nets.



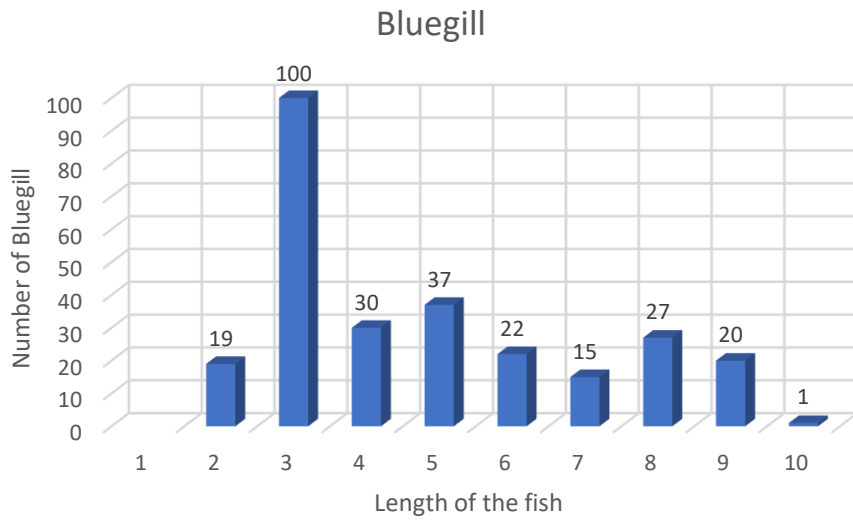
## Survey Results

No redear sunfish were captured during the netting survey. A total 609 fish from 12 different species of fish were captured (Graphs 1 through 13). The most numerous species were bluegill (244), followed by rockbass (175), smallmouth bass (88), walleye (42), yellow perch (17), largemouth bass (11), pumpkinseed sunfish (9), black crappie (7), yellow bullhead (6), white sucker (5), northern pike (3) and brown bullhead (2). Size distribution appears typical of a healthy fish community. The gamefish community is diverse with all sizes being represented in the population. It appears the 2018 walleye fingerling stocking survived and is growing well as represented by the 18 fish captured in the 6 to 8-inch range. Smallmouth bass were up to 19 inches, walleye were up to 20 inches and largemouth bass were up to 15 inches. The only top predator that was not numerous in the sample was northern pike with only 3 captured. The panfish community appears healthy with bluegill very common with all sizes present up to 10 inches. A few

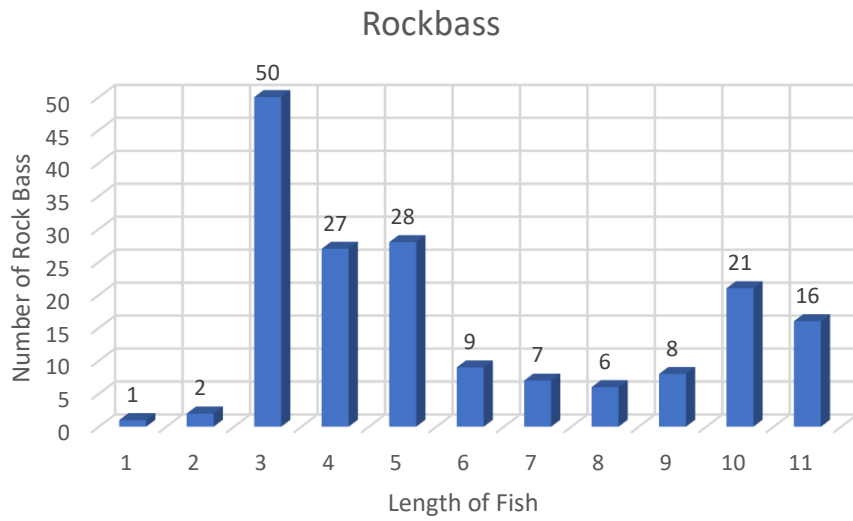
rough fish were captured which included yellow bullhead (6), white sucker (5) and brown bullhead (2). Overall the fish community appears diverse, robust and composed of quality size gamefish.



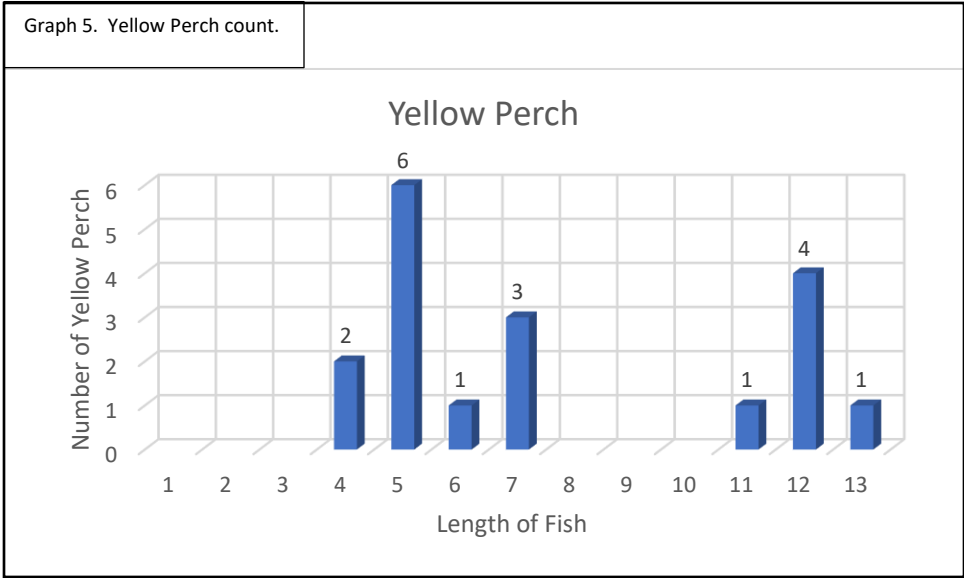
Graph 3. Bluegill count.



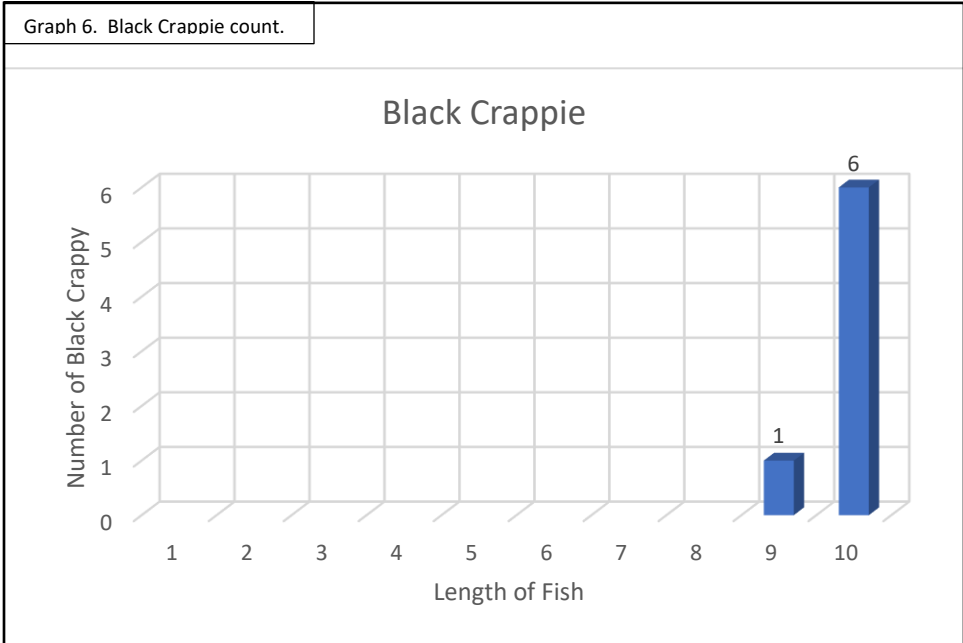
Graph 4. Rockbass



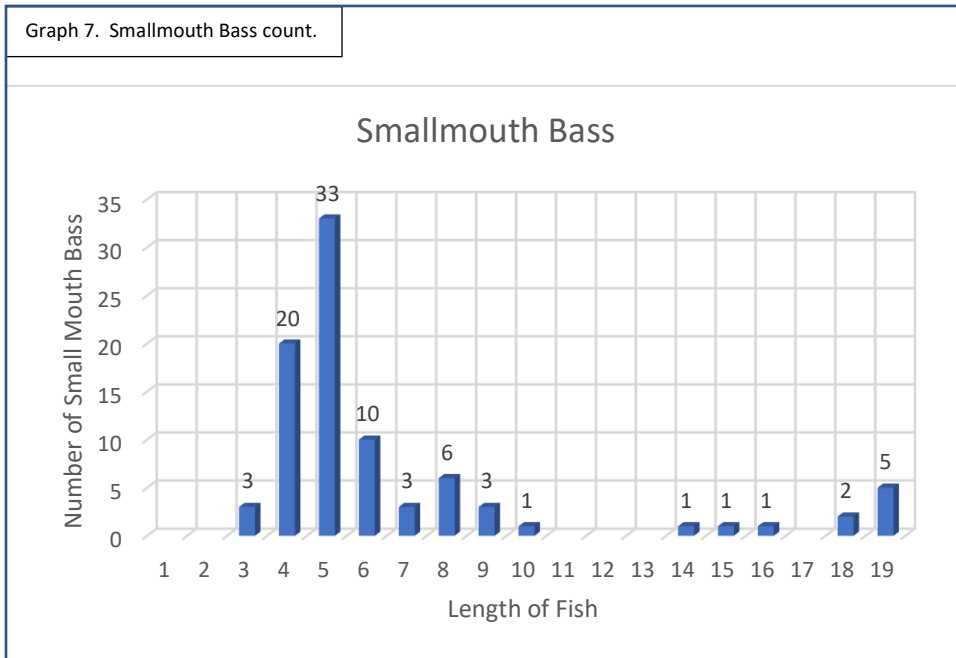
Graph 5. Yellow Perch count.



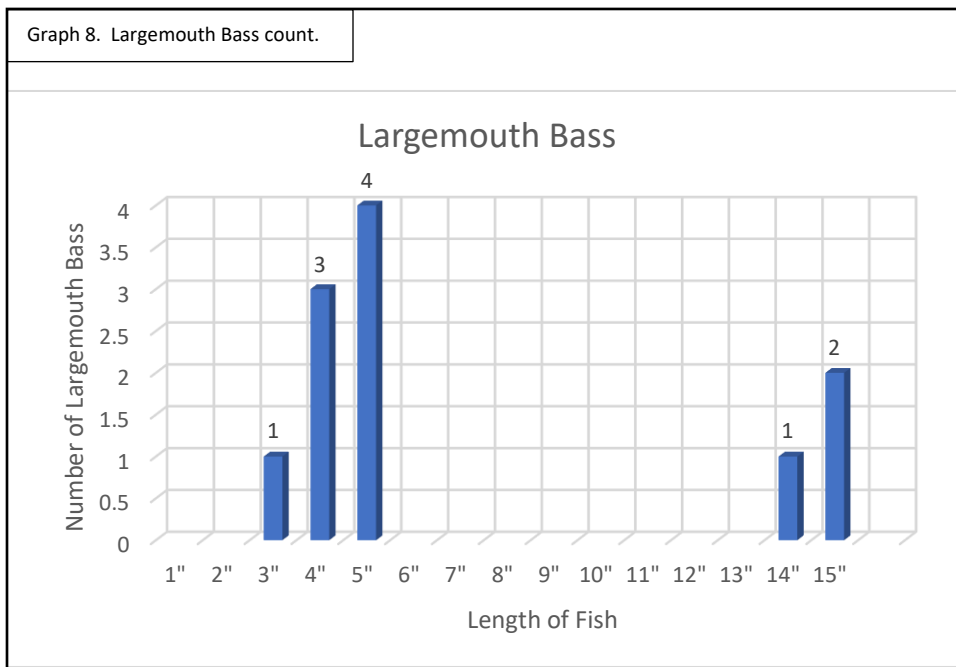
Graph 6. Black Crappie count.



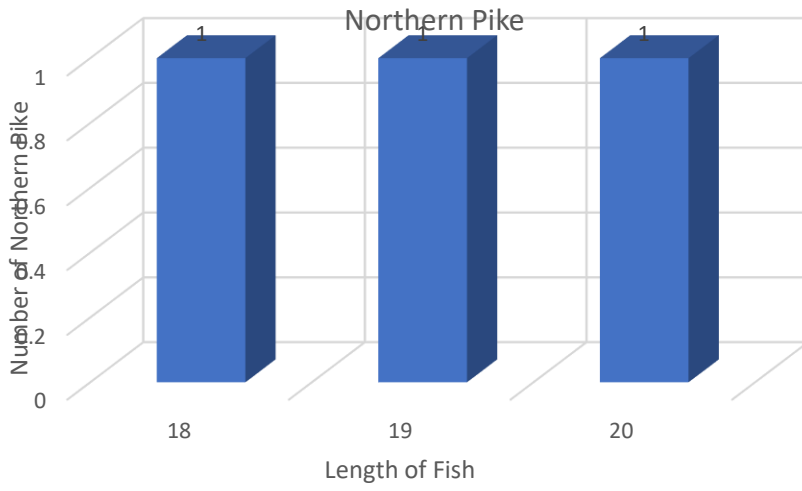
Graph 7. Smallmouth Bass count.



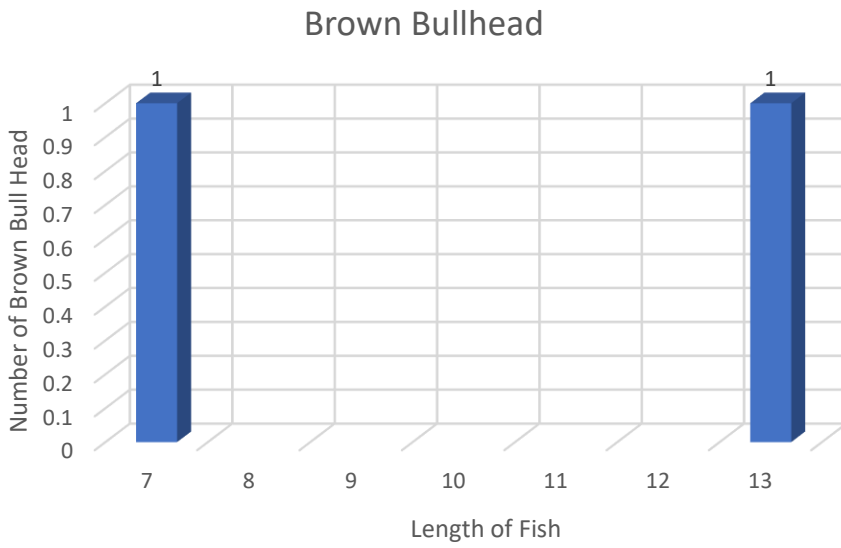
Graph 8. Largemouth Bass count.



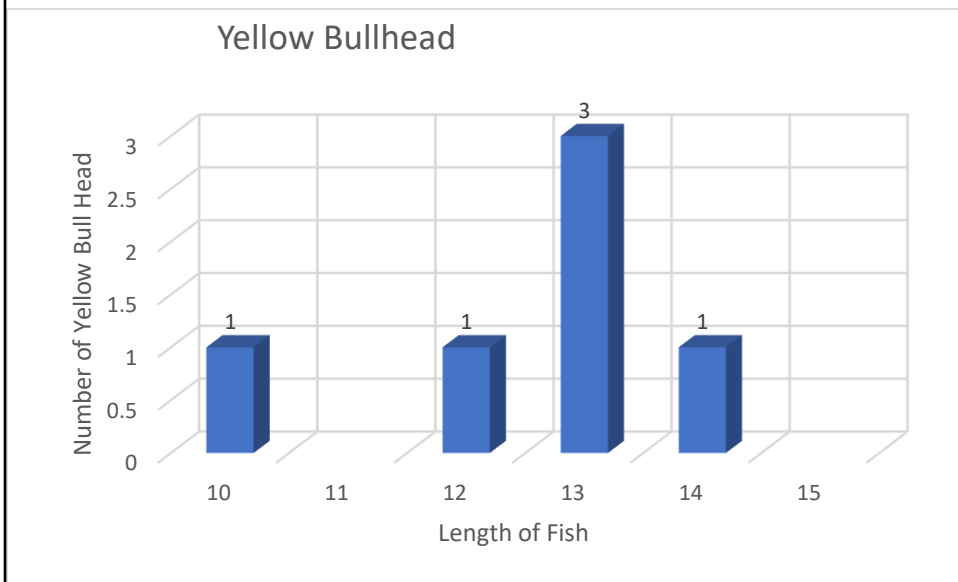
Graph 9. Northern Pike count.



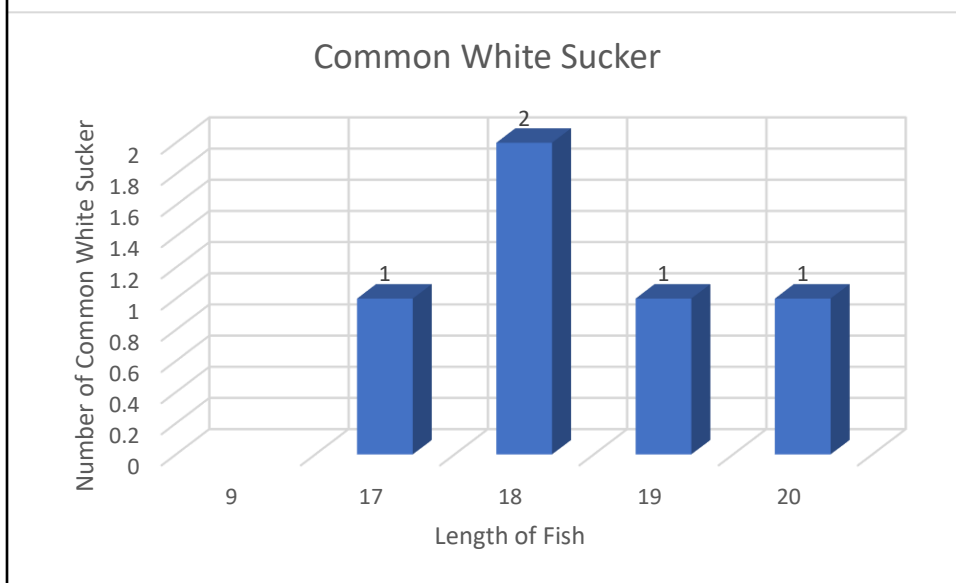
Graph 10. Brown Bullhead count.

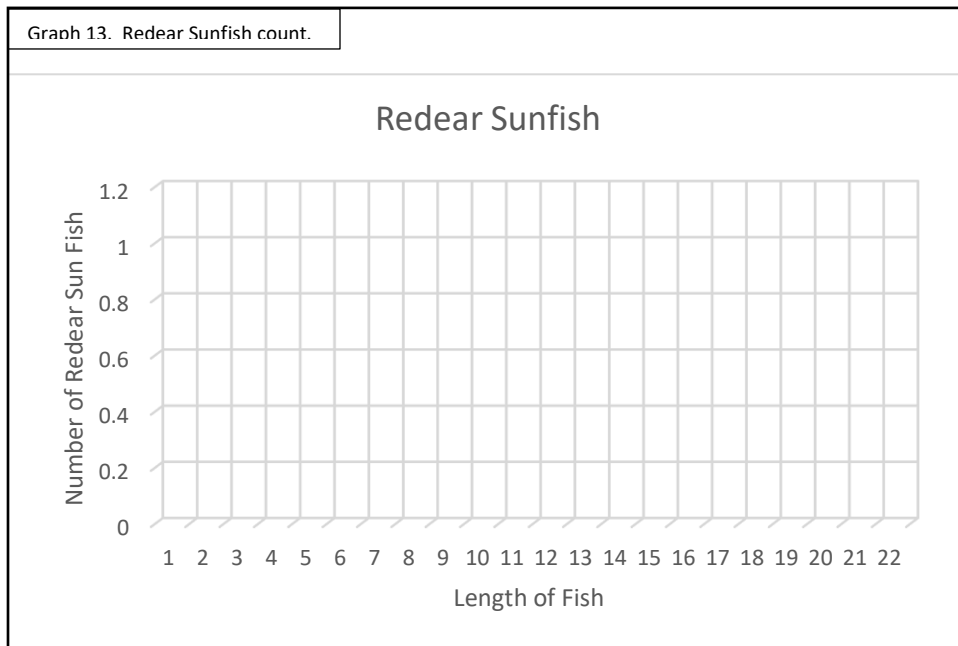


Graph 11. Yellow Bullhead count.



Graph 12. Common White Sucker count.





It appears there is little if any survival of stocked redear sunfish. Possible reasons include:

- Too far north of the native range
- Low stocking rate (1.2 to 3.9 fingerlings per acre)
- Abundant predator base in the lake (walleye, smallmouth bass and largemouth bass)
- Little cover (aquatic plants) for fingerling survival (annual chemical weed treatments)

### Management Options and Recommendations

- Increase fingerling stocking rate significantly (30 fingerlings per acre)
- Decrease aquatic plant control activities (will provide more cover and improve the chance of survival of stocked fingerlings)
- Discontinue redear sunfish stocking program



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# Photo Gallery

19" Smallmouth Bass



10" Bluegill



Juvenile Walleye 6" – 8"



Fish in a Fyke net

