

Survey Report

Oklahoma Department of Wildlife Conservation



Fish Management Survey and Recommendations
for
Southern Hills North & Southern Hills South
El Reno
2022

Survey Report

State: Oklahoma

Project Title: Southern Hills North & Southern Hills South Ponds

Operating Authority: City of El Reno

Period Covered: 2013-2023

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Date Prepared: February 2023

Southern Hills North & Southern Hills South

Abstract

Southern Hills North & Southern Hills South are two ponds in El Reno, Oklahoma. The ponds were sampled by electrofishing in 2017 and 2022. Both were hoop netted in 2022, with only Southern Hills North sampled in 2022 with trap nets. This was due to low water levels in the south pond. Largemouth Bass, sunfish, Channel Catfish, Black Bullheads, and White Crappie were sampled. Catfish and Bullheads were the most numerous species collected. White Crappie numbers were low. Sunfish numbers were moderate.

Introduction

Southern Hills North & Southern Hills South ponds are two ponds located in El Reno, OK (2710 Faith Ave). The ponds are separated by dam (appendix 1). Water can overflow from Southern Hills South to Southern Hills North. The north pond is 2 acres and has .25 miles of shoreline. The south pond is .75 acres with .2 miles of shoreline.

This pond is a Close to Home Fishing Pond. Close to Home Fishing Ponds are managed as put and take fisheries. Sampling has 3 goals. First, to determine if fish introductions are adequate. The second is to collect as much baseline data for each pond. Lastly, to determine the most effective gear to evaluate sunfish and crappie metrics. Current management practices for the pond include stocking Channel Catfish and hybrid sunfish (appendix 2). Close to Home fishing ponds have an aggregate limit of 3 Channel Catfish and/or sunfish. Only rod and reel fishing is allowed, with a limit of three fishing poles per angler. Everything else falls under statewide regulations. In 2022, the Largemouth Bass statewide regulation changed from a 6 fish limit with a minimum of 14in to a 6 fish limit and only 1 fish can be over 16in.

The pond has spider block fish attractors located throughout the ponds. At times, both ponds are surrounded by willow tree saplings and water primrose is along the shoreline. There is a feeder on the pond, but it is filled infrequently during the heat of the summer. In the summer, Southern Hills North commonly has large algae blooms, so an aerator was installed in 2023, but it was not fully operational when a fish kill occurred. We counted 32 Largemouth Bass, 33 Channel Catfish, some sunfish and White Crappie.

Electrofishing was conducted with a Smith-Root 5.0 generator-powered pulsator (setting: High Range, DC, 102 pluses per second, 20-60% or power) in April of 2017 and April of 2022. In 2017, one ten minute was conducted (no weights collected), with four being conducted in 2022 on two different dates

In June 2022, the ponds were set with three 1in tandem hoop nets. The nets were baited with Sportsman's Choice Trophy Fish Food. Three stations were set and checked daily. The nets are checked daily in Close to Home ponds to remove turtles. All fish are measured and weighed daily. All fish, except crappie, are returned to the pond afterward. In Southern Hills North, on night 2, a fisherman caught net 2, pulled it up on shore, and released all the fish back into the pond. All Black Bullheads were removed each day for aging purposes. The findings were published in the Oklahoma

Academy of Sciences Vol. 102 (2022), Population Characteristics of Black Bullhead *Ameiurus melas* in Two Small Oklahoma Close to Home Fishing Ponds.

Southern Hills North was trap netted in 2022 for 6 net nights. Three nets were set overnight, pulled the next day, and then reset in the same locations they were pulled from. Southern Hills South water level was too low for trap netting.

Results

Southern Hills North

Largemouth Bass

In April of 2017, only one (429mm) Largemouth Bass was collected. In 2022, 39 were collected (figure 1). The catch per unit of effort (CPUE) for 2022 was 58.50. Twenty-nine of the fish were below 232mm (9in). There was a gap in size from 232mm to 423mm (16.7in). The proportional size distribution (PSD) was 77 and the PSD-P was 77 (table 1). The relative weights (Wr) for 2022 were all above the accepted ≥ 90 . The overall was 102.04 (table 2). The heaviest fish sampled was 2302g (5.08lbs).

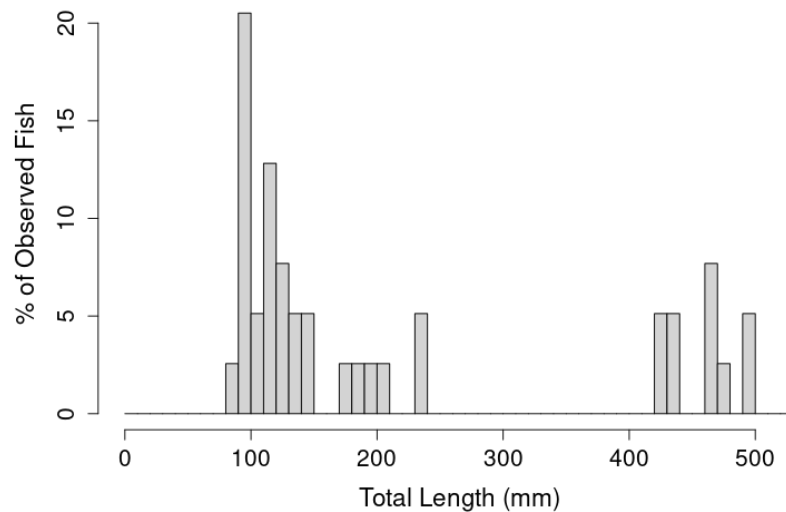


Figure 1 – Length-Frequency Histogram for Largemouth Bass collected in 2022.

Table 1 – PSD table for Largemouth Bass in 2002.

2022			
	PSD Value	L 95% CI	U 95% CI
PSD	77	54	100
PSD-P	77	54	100
PSD S-Q	23	0	46
PSD P-M	77	54	100

Table 2 – The relative weight for Largemouth Bass in 2022

Relative Weight Largemouth Bass							
2022	Size Category	Mean	Count	CV	SE	L 95% CI	U 95% CI
	Substock 0mm	99.89	3	6.75	3.89	92.26	107.51
	Stock 200mm	97.8	3	7.98	4.5	88.97	106.63
	Preferred 300mm	103.96	10	10.01	3.29	97.51	110.41
	Overall	102.04	16	9.10	2.32	97.49	106.59

Sunfish

In 2017, 98 Bluegill Sunfish and 62 other sunfish were collected. All of the fish were between stock (80mm) and quality (150) size (figure 2). Weights were not collected. In 2022 electrofishing, 147 Bluegill, 17 Green Sunfish, 28 hybrid sunfish, and 1 Orangespotted Sunfish (figure 2) were collected. Hoop netting caught 22 Bluegill and 7 hybrid sunfish. Lastly, trap netting caught 43 Bluegill, 1 hybrid sunfish, 1 Orangespotted Sunfish, 2 Redear Sunfish, and 7 other sunfish.

The largest amount of length classes and number of sunfish were collected during 2022 electrofishing. Electrofishing 2022 and trap netting both caught the most amount of species, but Green Sunfish were not collected during trap netting, and Redear were not collected during electrofishing. The largest sunfish collected was a hybrid sunfish caught during hoop netting (180mm/7in) (figure 2).

Electrofishing produced the highest CPUEs. The CPUE was the overall highest for Bluegill at 588.00 (2017 electrofishing). It was low for Bluegill hoop netting (2.44) and trap netting (7.64) (table 3).

The majority of the proportional size distribution (PSD) for sunfish fell into stock (80mm) and quality (150mm) size fish. Hoop netting did collect slightly larger fish with a PSD Q-P of 18 (table 4).

The relative weights (W_r) for Bluegill were below the acceptable ≥ 90 during electrofishing 2022. They increased during hoop netting, but decreased for trap netting. Substock Green Sunfish were well above the acceptable ≥ 90 for electrofishing but fell below the acceptable amount for stock and quality size fish (table 5).

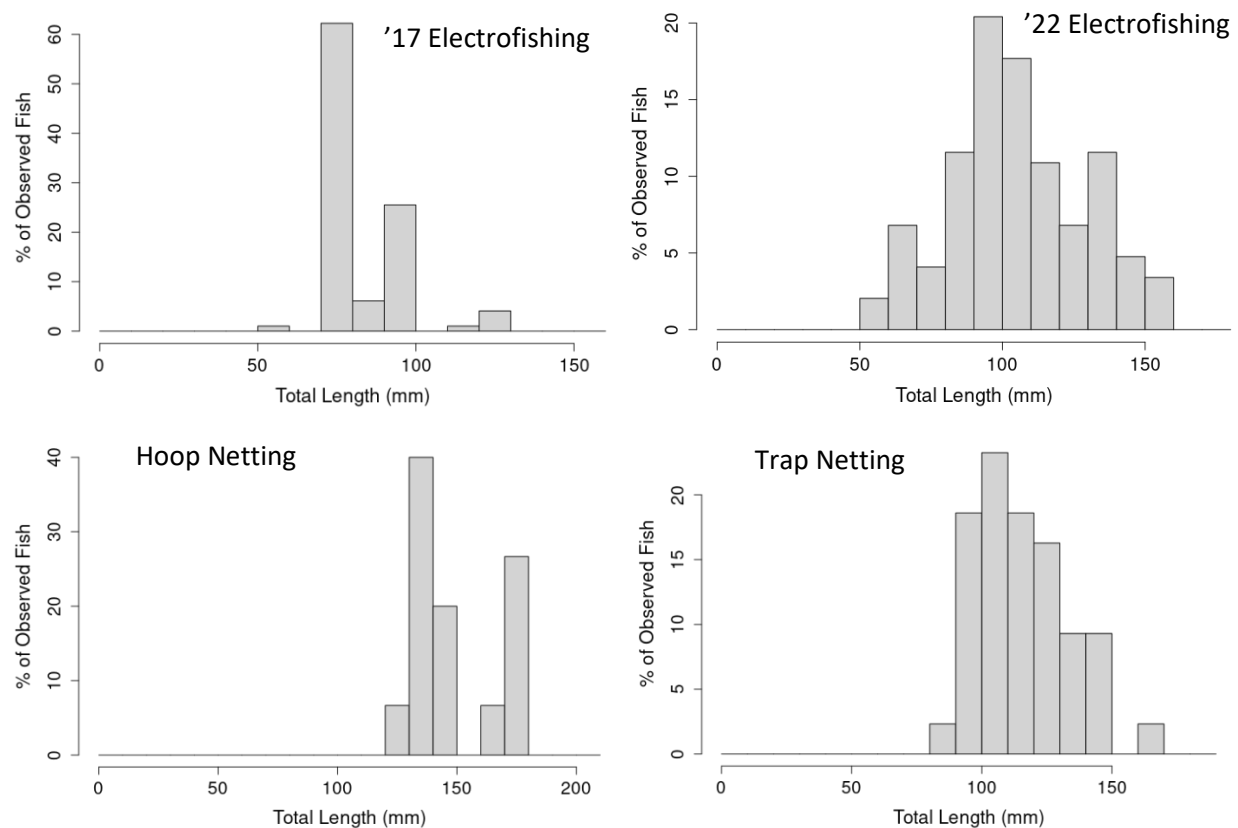


Figure 2 – Length-frequency histograms for Bluegill for electrofishing 2017 (n=98) and 2022 (n=147), hoop netting (n=22), and trap netting (n=43).

Table 3- CPUE for Sunfish

Total CPUE for Sunfish													
	17 Electrofishing		22 Electrofishing				Hoop Netting		Trap Netting				
Species	Bluegill	Sunfish Spp.	Bluegill	Hybrid	Green	Orange spotted	Bluegill	Hybrid	Bluegill	Hybrid	Orange spotted	Redear	Sunfish Spp.
Mean	588	372	220.5	25.5	42	1.5	2.44	0.78	7.64	0.18	0.18	0.36	1.24
Count	1	1	4	4	4	4	3	3	6	6	6	6	6

Table 4 – PSD values for Bluegill

	2022 EF	Hoop Netting	Trap Netting
PSD	5	18	2
PSD S-Q	95	82	98
PSD Q-P	5	18	2

Table 5 – Relative weights for Bluegill and Green Sunfish

Relative Weight Sunfish										
	Bluegill Electrofishing 2022		Green Electrofishing 2022		Bluegill Hoop Netting		Green Hoop Netting		Bluegill Trap Netting	
Size Category	Mean	Count	Mean	Count	Mean	Count	Mean	Count	Mean	Count
Substock			129.84	1						
Stock	81.62	116	76.41	10	92.29	16	78.62	3	80.37	42
Quality	79.86	6			101.35	1			90.99	1
Overall	81.53	122	81.27	11	92.82	17	78.62	3	80.61	43

Channel Catfish

During hoop netting, a total of 441 Channel Catfish were collected (CPUE = 49.00). Since hoop nets are pulled daily, we decided to mark Channel Catfish. Of the 441, 101 Channel Catfish were recaptured once, and 3 were recaptured twice. Seven Channels were collected during trap netting (CPUE = 1.24).

The majority of the fish collected during hoop netting were between stock (280mm) and quality (410mm) size. The PSD S-Q was 77, with the PSD Q-P = 23 (table 6). Larger-sized fish were caught in the trap nets; the smallest one was 395mm (figure 3). The largest Channel Catfish was 690mm (27.17in) and its weight was 3490g (7.69lbs). The Wr was above the acceptable ≥ 90 . The overall Wr equaled 94.59. The trap netting Wr was slightly less at 93.34.

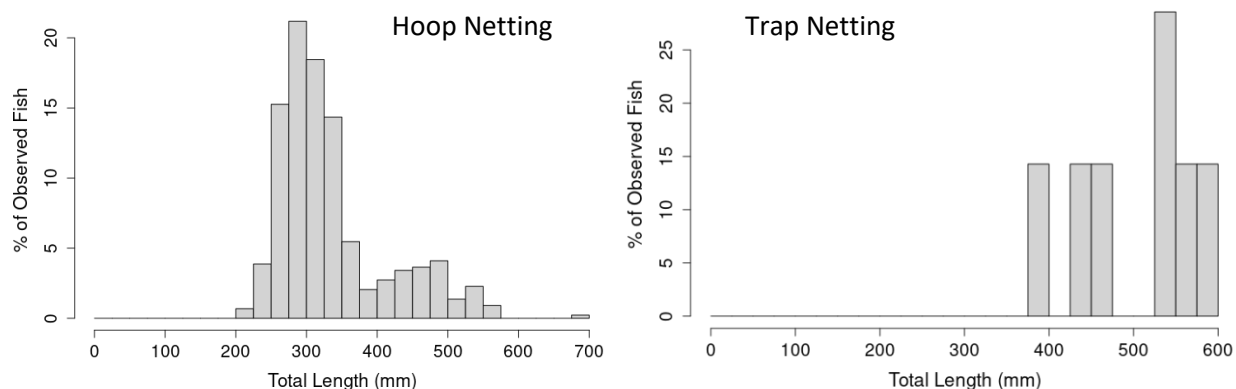


Figure 3 - Length-frequency histograms for Channel Catfish during hoop netting (n=441) and trap netting (n=7).

Table 6 – PSD values for Channel Catfish

PSD Values		
	Hoop Netting	Trap Netting
PSD	23	86
PSD S-Q (280-410mm)	77	14
PSD Q-P (410-610mm)	23	86

Table 7 – Relative Weight for Channel Catfish

Relative Weight for Channel Catfish				
	Hoop Netting		Trap Netting	
Size Category	Mean	Count	Mean	Count
substock	98.22	95		
stock	93.03	264	87.83	1
quality	95.38	78	94.34	6
preferred	98.1	1		
Overall	94.59	438	93.34	7

Black Bullheads

Seventy-eight Black Bullheads came from hoop nets (CPUE=8.67) and 32 were collected in trap nets (CPUE=5.69). All bullheads were removed from the pond for aging. An age study was conducted and published on the Black Bullheads from Southern Hills North and South.

A majority of the fish caught during hoop netting were between quality (230mm) and preferred (300mm) (PSD=63), but the ones collected during trap netting were stock to quality (PSD=81) (figure 4) (table 8).

The relative weights were higher from the hoop net fish, than the trap netted ones. The substock were of the best body quality (Wr=131.04), but a majority of the fish collected were below acceptable.

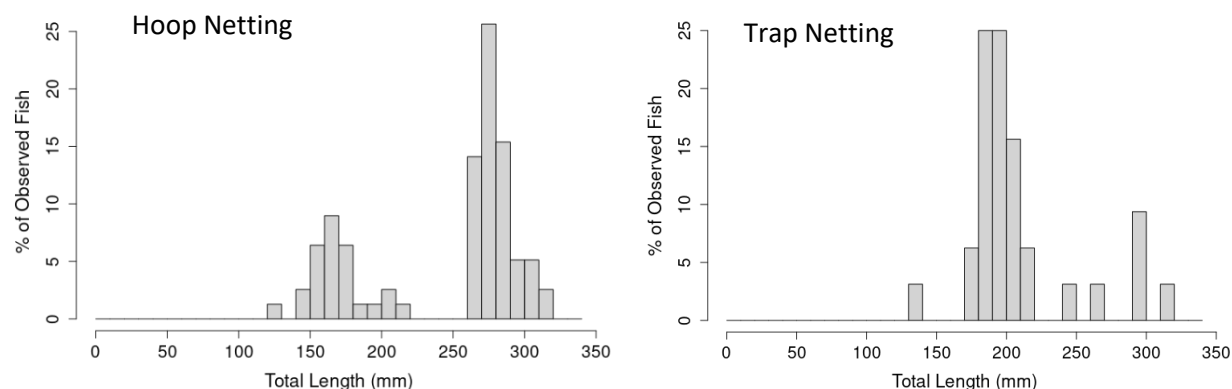


Figure 4 – Length-frequency histograms for Black Bullheads in hoop nets(n = 78) and trap nets (n = 32).

Table 8 – Proportional size distribution values for Black Bullheads

PSD Values		
	Hoop Netting	Trap Netting
PSD	71	19
PSP-P	8	3
PSD S-Q (150-230mm)	29	81
PSD Q-P (230-300mm)	63	16
PSD P-M (300-390mm)	8	3

Table 9 – Relative weights from Black Bullheads

Relative Weights				
	Hoop Netting		Trap Netting	
Size Category	Mean	Count	Mean	Count
substock	131.04	3	54.08	1
stock	93.74	22	65.54	25
quality	80.87	47	68.61	5
preferred	79.5	6	70.43	1
Overall	86.32	78	65.82	32

White Crappie

Eighteen White Crappie were collected during hoop netting (CPUE = 2.00), and fifty-one were collected during trap netting (CPUE 9.07) (figure 5). White Crappie were removed from the ponds for aging. The overall PSD was 50 for hoop netting and 67 for trap netting (table 10).

Trap netting produced better body conditions for the crappie, with the overall being 99.28. The quality size fish had the worst body conditions of the size classes collected (table 11).

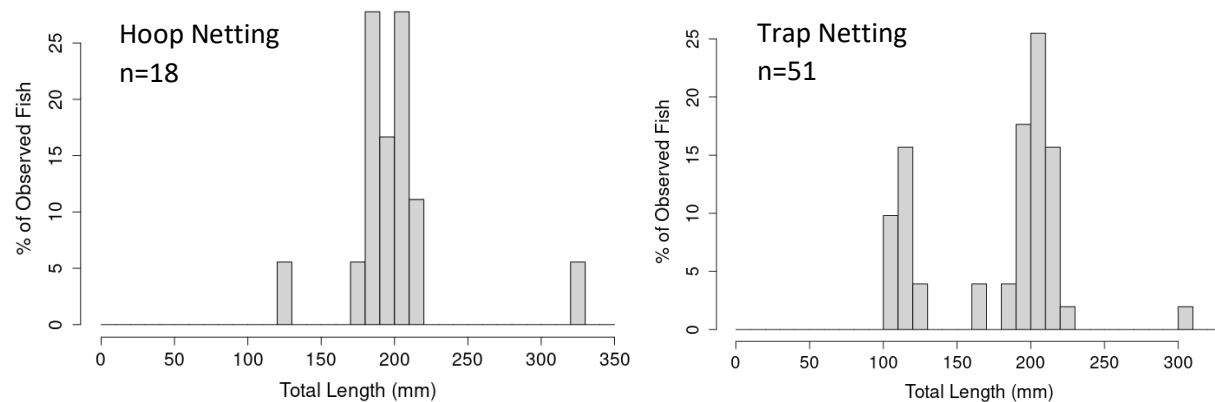


Figure 5 – Length-frequency histograms for White Crappie

Table 10- Proportional size distribution for White Crappie

PSD Values		
	Hoop Netting	Trap Netting
PSD	50	67
PSP-P	6	3
PSD-M	6	3
PSD S-Q (130-200mm)	50	33
PSD Q-P (200-250mm)	44	64
PSD M-T (300-380mm)	6	3

Table 11- Relative Weight for White Crappie

Relative Weight				
	Hoop Netting		Trap Netting	
Size Category	Mean	Count	Mean	Count
substock			101.04	15
stock	94.64	9	104.70	12
quality	77.93	8	95.20	23
preferred	105.37	1	101.80	1
Overall	87.81	16	99.28	51

Results

Southern Hills South

Largemouth Bass

During the 2017 electrofishing, no Largemouth Bass were collected. Only three were collected in 2022. The CPUE was 18.00. The fish collected had good body conditions (overall = 106.06) (table 12).

Table 12 – Proportional size distribution and relative weight for Largemouth Bass

PSD		Relative Weight	
22 Electrofishing		22 Electrofishing	
Value	Size Category	Mean	Count
PSD 50	stock	108.88	1
PSD S-Q 50	quality	103.24	1
PSD Q-P 50	Overall	106.06	2

Sunfish

In 2017, 47 Bluegill, 22 Green Sunfish, and 40 other sunfish were collected. All of the fish were stock (80mm) to quality (150mm) size fish. In 2022 electrofishing, 9 Bluegill, 35 Green Sunfish, and 16 hybrid sunfish were collected (figure 6 & 7). Eighteen Bluegill, 3 Green Sunfish, and 13 hybrid sunfish were collected during hoop netting (figure 6 & 7).

The overall PSD for 2022 electrofishing was 0 for Bluegill and 6 for Green Sunfish. The overall PSD for hoop netting was 6 for Bluegill and 0 for Green Sunfish (table 13).

The relative weight increased from 83.36 for Bluegill electrofishing to 88.25 for hoop netting. It was below the acceptable ≥ 90 . The relative weight decreased from 92.82 for Green Sunfish electrofishing to 78.62 for hoop netting, but it was only a sample size of 3 fish for hoop netting (table 14).

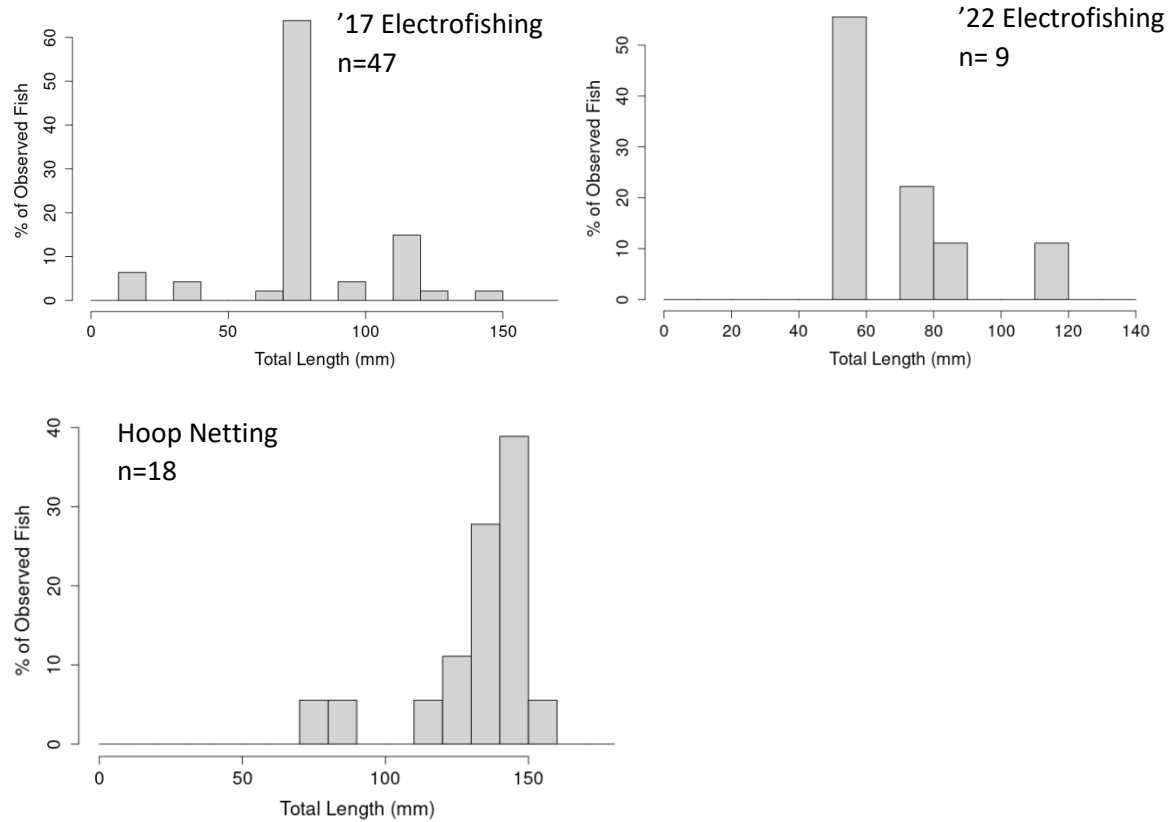


Figure 6 – Bluegill Sunfish length-frequency histograms

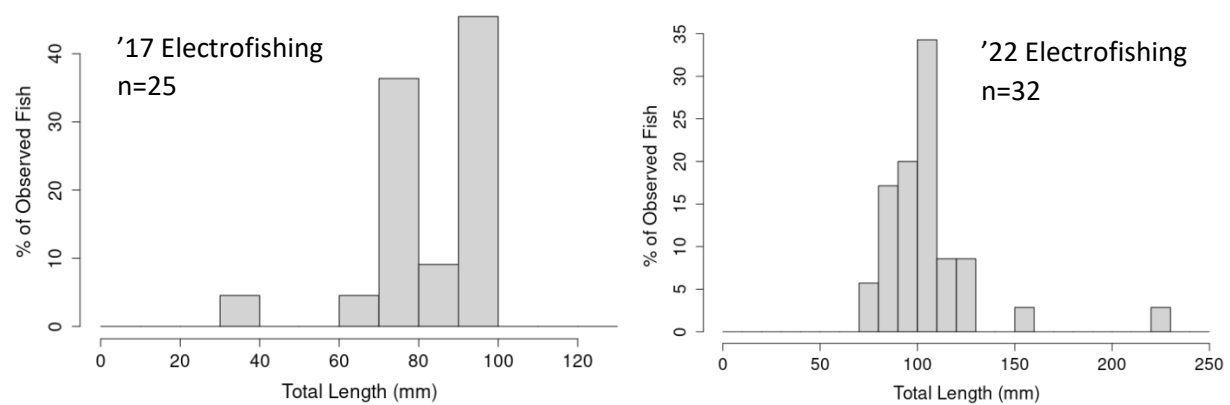


Figure 7 – Green Sunfish length-frequency histograms

Table 13 – PSD Values for Bluegill and Green Sunfish

PSD Values - Bluegill Sunfish		
	22 electrofishing	Hoop Netting
PSD		6
PSD S-Q (130-200mm)	100	94
PSD Q-P (200-250mm)		6
PSD Values - Green Sunfish		
	22 electrofishing	Hoop Netting
PSD	6	
PSD-P	3	
PSD S-Q (130-200mm)	94	100
PSD Q-P (200-250mm)	3	
PSD P-M (200-250mm)	3	

Table 14 – Relative weight for Bluegill and Green Sunfish

Relative Weight - Bluegill				
	22 Electrofishing		Hoop Netting	
Size Category	Mean	Count	Mean	Count
stock	83.36	1	92.29	16
quality			101.35	1
Overall	83.36	1	92.82	17
Relative Weight - Green Sunfish				
	22 Electrofishing		Hoop Netting	
Size Category	Mean	Count	Mean	Count
Substock	105.1	1		
Stock	86.54	32	78.62	3
Preferred	126.15	1		
Overall	88.25	34	78.62	3

Channel Catfish

Channel Catfish were only collected during hoop nettings. Twenty-three were collected (CPUE 344.00). The max length was 579mm (22.8in) and 1766g (3.89 lbs) (figure 8). Since fish are returned to the pond daily, we marked the catfish being returned. Sixteen fish were recaptured once, and 4 fish were recaptured twice.

Only stock size catfish relative weights were above the acceptable ≥ 90 (95.47) (table 15). The overall was 89.79. The PSD for 38.

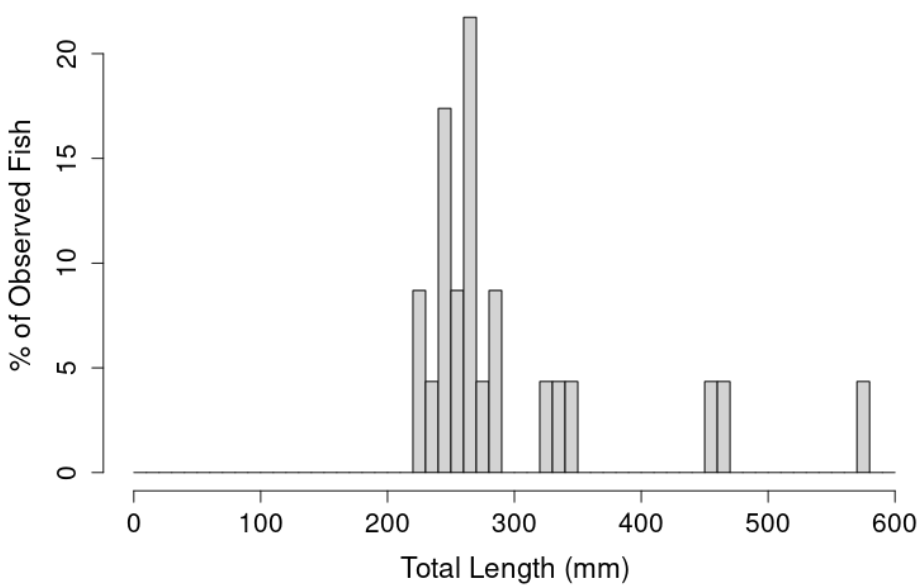


Figure 8 – Length-frequency histograms for Channel Catfish

Table 15 – Relative Weights for Channel Catfish

Relative Weight		
	Hoop Netting	
Size Category	Mean	Count
substock (0mm)	87.77	14
stock (280mm)	95.47	5
quality (410mm)	85.07	3
Overall	89.79	22

Table 16 – PSD values for Channel Catfish

PSD Values	
	22 electrofishing
PSD	38
PSD S-Q (130-200mm)	62
PSD Q-P (200-250mm)	38

Black Bullhead

We first noticed a large amount of small Black Bullheads during 2022 electrofishing. When we came back for hoop netting, all of them were removed each day to get age data. Two-hundred and thirty-six were collected. (CPUE=26.22) (figure 9).

Most fell into stock (150mm) and quality (230mm) sizes (table 17). All relative weights (Wr) were below the acceptable ≥ 90 . The overall PSD was 3 and the PSD S-Q was 97 (table 18). This population is stunted. That is most likely the cause for the low Wr.

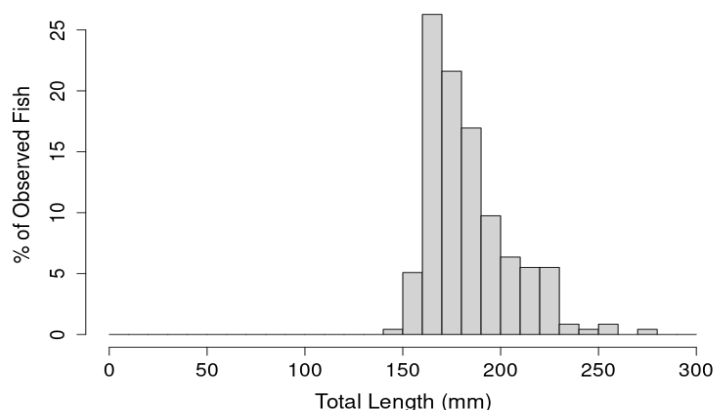


Figure 9 – Length- frequency histogram for Black Bullheads

Table 17 – Relative Weight for Black Bullheads

Relative Weight		
	Hoop Netting	
Size Category	Mean	Count
substock (0mm)	78.16	1
stock (280mm)	84.59	227
quality (410mm)	79.88	8
Overall	84.4	236

Table 18 – PSDs for Black Bullheads

PSD Values	
	Hoop Netting

PSD	3
PSD S-Q (130-200mm)	97
PSD Q-P (200-250mm)	3

Appendix 1 – Southern Hills North and Southern Hills South



Appendix 2 –

Stocking Reports for the past 10 years – Southern Hills North

Year/Month	Species	Count	Weight (lbs.)	Size (in.)
21-Oct	Hybrid Sunfish	300	50	6
21-Apr	Hybrid Sunfish	120	20	6.5
20-Sep	Hybrid Sunfish	200	36.4	5.5
19-Jul	Hybrid Sunfish	300	54.5	5
18-Jun	Hybrid Sunfish	150	37.5	6
17-May	Hybrid Sunfish	300	50	5
17-Apr	Channel Catfish	201	48	9
16-May	Channel Catfish	150	150	14
16-Apr	Channel Catfish	206	137.33	13
14-Jul	Channel Catfish	201	67	11
14-Apr	Bluegill	19	15	7
14-Apr	Bluegill	400	2.2	2.5
14-Feb	Bluegill	400	2.2	2

Stocking Reports for the past 10 years – Southern Hills South

Year/Month	Species	Count	Weight (lbs.)	Size (in.)
21-Oct	Hybrid Sunfish	100	16.7	6
20-Sep	Hybrid Sunfish	100	18.1	5.5
19-Jul	Hybrid Sunfish	100	18.16	5
18-Jun	Hybrid Sunfish	150	37.5	6
17-May	Hybrid Sunfish	200	33.3	5
17-Apr	Channel Catfish	100	24	9
16-May	Channel Catfish	150	150	14
16-Apr	Channel Catfish	101	67.34	13
14-Jul	Channel Catfish	102	34	11
14-Apr	Bluegill	22	17	7
14-Apr	Bluegill	600	3.3	2.5
14-Feb	Bluegill	600	3.3	2