

Minsi Lake

Northampton County

April 2023 Fisheries Restoration Progress Evaluation

Minsi Lake is a 117-acre impoundment located in Northampton County. The lake is presently receiving restoration stockings of warm-water fishes following the dewatering, rebuilding of the dam structures and its subsequent refill. Restoration fish stockings were initiated in 2020 with the intent to restore Minsi Lake to the high-quality bass-panfish fishery that existed prior to reconstruction. The 2023 season represents the fourth year of the original five-year (i.e., 2020 to 2024) re-stocking schedule (Table 1). Evaluations of restoration are anticipated to continue into the 2025 and 2027 seasons. The lake is currently managed under [Miscellaneous Waters with Special Regulations](#). No harvest rules apply to all species, except trout; it is unlawful to take, kill or possess any fish. Catch and release fishing is permitted for all species, however all species caught other than trout must be immediately returned unharmed. For trout, [Commonwealth Inland Waters regulations](#) apply.

Table 1. The updated restoration stocking plan for Minsi Lake, 2020 – 2025.

Minsi Lake 01F Northampton County Re-Stocking Plan 2020-2024							
<i>Species</i>	<i>Life Stage</i>	<i>Stocking Year</i>					
		<i>2020</i>	<i>2021</i>	<i>2022</i>	<i>2023</i>	<i>2024</i>	<i>2025^a</i>
Gamefishes							
<i>Largemouth Bass</i>	<i>FING</i>	X	X	X	X	X	
<i>Yellow Perch</i>	<i>FING</i>		X	X	X	X^b	X^b
<i>Black Crappie</i>	<i>FING</i>		X	X	X	X^b	X^b
<i>Pumpkinseed</i>	<i>FING</i>				X^c	X^c	
<i>Bluegill</i>	<i>FING</i>				X^c	X^c	
Forage fishes							
<i>Golden Shiner</i>	<i>All</i>	X	X	X	X		

a = Additional year for restoration stocking of identified species.
 b = Stocking rate will be double of the original rate.
 c = Restoration is considered complete; stockings have been terminated.

During April 3 – 6, 2023, biologists completed a total of 12 trap net sites, set at various random-stations throughout the lake. The nets were fished for approximately 24 hours prior to retrieval and processing. All fish were enumerated, measured for total length, and returned alive back to the lake. The 2023 collections are intended to offer insight to the progress of restoration stockings relative to the [2021 baseline assessment](#) and historical perspective.

The 2023 trap netting captured a total of 989 fish representing 10 different species (Table 2). Bluegill (N = 345), Golden Shiner (N = 324), Pumpkinseed (N = 138) and Brown Bullhead (N = 113) were the most abundant fish captured. Other species captured included: American Eel (N = 5), Black Crappie (N = 2), Chain Pickerel (N = 19), Largemouth Bass (N = 28), Rainbow Trout-Hatchery (N = 14), and a single Bluegill x Pumpkinseed hybrid (N =1).

Table 2. Total catch (N) from twelve trap net sites, combined, Minsi Lake, April 2023.

Site	Effort (h)	Am. Eel (N)	Black Crappie (N)	Bluegill (N)	Brown Bullhead (N)	Chain Pickerel (N)	Golden Shiner (N)	Largemouth Bass (N)	Lepomis Hybrids (N)	Pumpkinseed (N)	Rainbow Trout – Hatchery (N)	Total (N)
TN 1	23.5	1		22	44	4	3	5		4	4	87
TN 2	23.4			30	3	3	13	9		20		78
TN 3	22.7			34	5		8			10	5	62
TN 4	20.5			64	48	4	16	9		19	1	161
TN 6	23.3	2		12		2	7			6		29
TN 7	23.4			41	10		6	2	1	10		70
TN 8	23.2			31	3		15			15		64
TN 9	23.8											0
TN 10	24.6		2	68		1	145	1		32	4	253
TN 11	24.8	2		39		1	62	1		10		115
TN 12	23.5			2			32	1		4		39
TN 13	23.7			2		4	17			8		31
Total (N)		5	2	345	113	19	324	28	1	138	14	989
CPUE (Mean)		0.017	0.007	1.246	0.427	0.069	1.125	0.104	0.004	0.495	0.050	

Total lengths of captured fish from the 2023 trap net surveys were tabulated (Table 3). Both Bluegill and Pumpkinseed demonstrated a strong occurrence of trophy-sized fishes. The majority (74%) of Bluegill total catch were \geq 8-inches, whereas 85% of the captured Pumpkinseed were \geq 7-inches. The few Largemouth Bass captured were principally 9-inches in total length (60%), with the remainder of the catch ranging in length from 8-inches to 11-inches. A single, exceptionally large-sized bass, 16-inch, was captured on the shoreline opposite of the western side of the dam breast. Likely this individual fish held over from the remnant pool population during reconstruction.

Comparison of 2023 trap net catch-per-unit-of-effort (CPUE: fish/h) and length frequencies to historical surveys provides context to the present-day fish population status (Figure 1). Specifically, the trap net survey in May 1997 represents established natural reproducing fish populations prior to draining/reconstruction. The remnant pool that existed throughout reconstruction, helped jump-start fish populations after refill, such that the 2021 survey represents the baseline of hold over fishes. Some discrepancy among the surveys is expected. The early April surveys in 2021 and 2023 may mis-represent smaller sized fishes, which remained in the relatively warmer, deeper waters of the lake, prior to inhabiting the shallow littoral shoreline later in the spring (i.e., May). Alternatively, the size structure may reflect the exceptional abundance of the year class from the initial refilling, which kept subsequent years classes at relatively smaller abundances due to predation.

Interestingly, 2023 CPUE for Bluegill and Pumpkinseed both demonstrated increases relative to the 2021 surveys, but CPUEs of both fishes for either year (i.e., 2021 and 2023) has already well exceeded what was observed when Minsi Lake was considered hosting established populations in 1997. The well-known phenomena termed, “new-lake effect”, likely lends to the exceptional abundance of these fishes, as competition for lake resources are minimized following refill and fish populations usually demonstrate exceptional survival and growth. In

contrast, the 1997 CPUEs for Black Crappie and Yellow Perch were suggestive of their occurrence in the lake but appeared secondary to Bluegill and Pumpkinseed. Likely the eventual re-establishment of Yellow Perch may only result in relatively low abundance population.

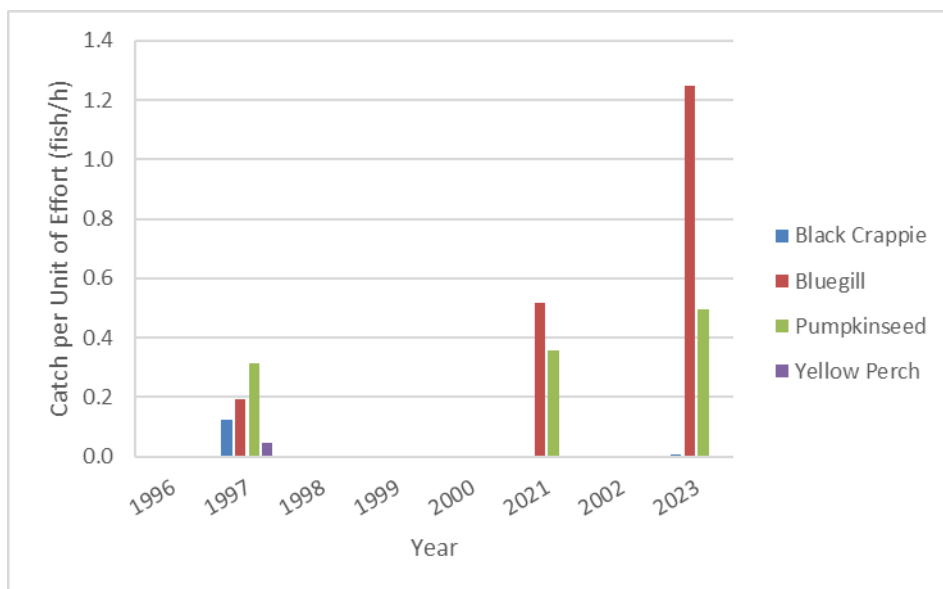
Table 3. Size (i.e., total length) frequency distribution of fish captured using trap nets on Minsi Lake during April 2023.

Total Length (in.)	Am. Eel	Black Crappie	Bluegill	Brown Bullhead	Chain Pickerel	Golden Shiner	Largemouth Bass	Lepomis Hybrids	Pumpkinseed	Rainbow Trout - Hatchery
2										
3										
4			2							
5			7							
6			26	1		2			21	
7			49	3					92	
8		1	196	2		60	2	1	25	
9		1	46	2		121	17			
10				11		19	7			
11				50	5	1	1			
12				29	8					
13				10	4					
14				2						
15										
16							1			
17										
18										
19										
21					1					
22										
24					1					
Un-measured	5		19	3		121				14
Total	5	2	345	113	19	324	28	1	138	14

Historical perspective of fishes' length frequencies is insightful (Figure 2). Captured Bluegill and Pumpkinseed during the 1997 survey clearly demonstrated both a strong size class of 5-inch fishes, but also of 2-inch to 3-inch sized fishes, characteristic of established populations. Comparatively, the 2021 and 2023 surveys principally caught ≥ 7 -inch individuals, whereas occurrences of the smaller-sized fishes in either survey were not noticeable. This is likely related to the 2021 and 2023 surveys occurring in early April versus during May when the small-sized fishes are more susceptible to trap net gear-type and the absence of removal of larger fishes by anglers. Upon establishment of Black Crappie and Yellow Perch, observed length distributions from the 1997 survey would be suggestive for crappies achieving 9-inches, varying from 7-inches to 11-inches and perch commonly being 6-inch to 10-inch with a few approximating 12-inches.

Trap net catches from the 2023 season offer mixed indications of successful restoration of Minsi Lake's fish populations. Highly encouraging were the consistent catches of Bluegill and Pumpkinseed. Coupled with their trophy-sized length distributions are suggestive these species have been restored to Minsi Lake. A strong occurrence of fishes of the 2-inch to 5-inch size classes will need to be confirmed during the anticipated 2023 fall trap net survey to ensure natural reproduction is fully engaged. Yet, given the plethora of the trophy-sized adult population, further stockings of both Bluegill and Pumpkinseed have been terminated for the 2023 season and beyond (Table 1). Additionally, the consistent, adult-sized Golden Shiner in trap net catches demonstrates their successful establishment as a forage base and their stockings will be discontinued following the 2023 season.

Figure 1. Historical trap net CPUE (fish/h) of Bluegill, Pumpkinseed, Black Crappie and Yellow Perch from Minsi Lake.

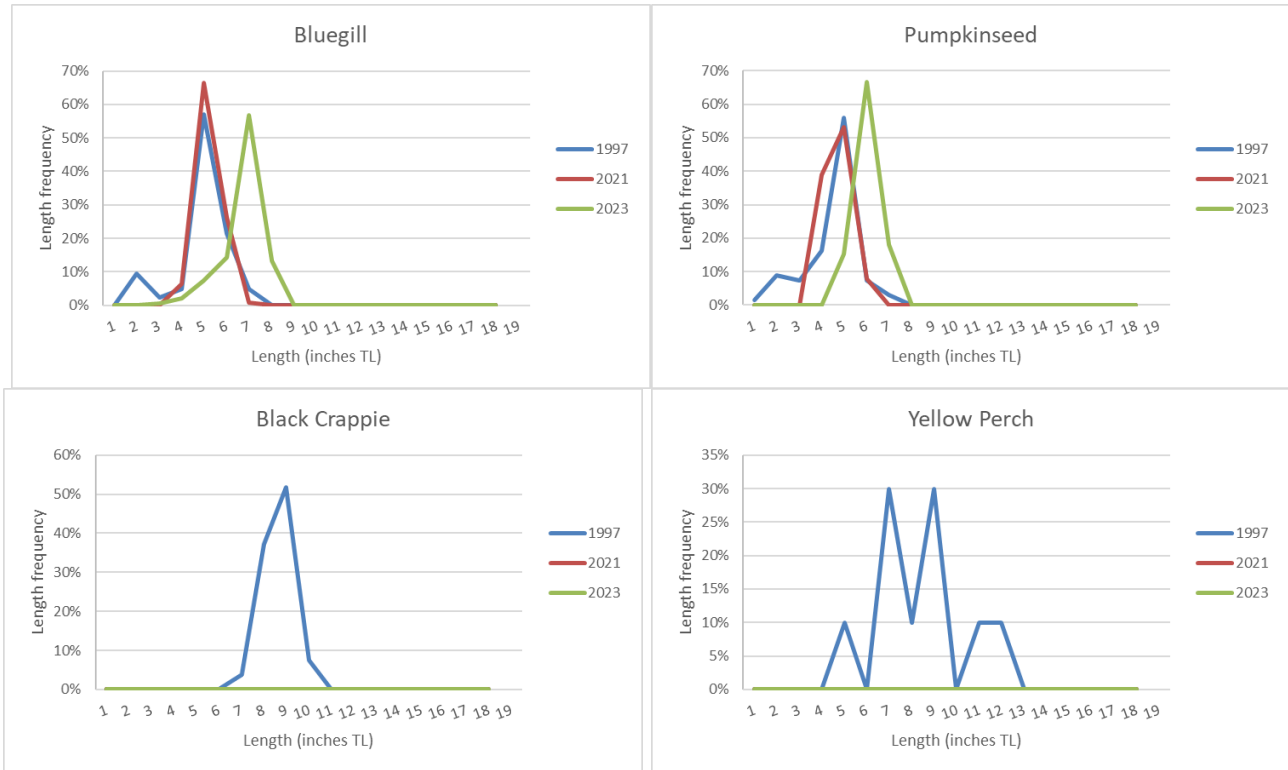


The successful restoration of Largemouth Bass to Minsi Lake is undetermined at this time. The few bass that were caught are suggestive of principally a unimodal size class, that could have originated from the initial restoration stockings. Yet, bass are not readily susceptible to the trap net gear-type, particularly small-sized individuals, such that the low catch simply does not represent the status of their population. Future targeted night-boat electrofishing will best characterize the bass populations for both relative abundance and length distributions. The lake remains strongly influenced by terrestrial, emergent and submergent vegetation, which precluded effective shoreline boat electrofishing for the 2023 season. Thus, electrofishing assessments will remain delayed until the next assessment in 2025. Restoration stockings for bass will continue as originally scheduled (Table 1).

The poor catch of Black Crappie and the complete lack of Yellow Perch in the April 2023 trap net catches are perplexing. Certainly, the extensive standing terrestrial, emergent, and submergent vegetation and integrated lake habitat structures should offer excellent habitat for these fishes. Potentially the early season trap netting may have missed the Black Crappie, as they remained in habitats beyond effective shoreline trap netting depths during April. Yet, early season trap netting is a very effective methodology to capture Yellow Perch. Their absence in

the trap net catches is a clear indication of unsuccessful restoration stockings. Thus, the initial two years of stockings appear to have not materialized. Restoration stockings for both Black Crappie and Yellow Perch fishes will be doubled for the 2024 season and extended an additional year into 2025 (Table 1).

Figure 2. Historical total length distribution of Bluegill, Pumpkinseed, Black Crappie and Yellow Perch captured using trap net gear-type May 1997, April 2021, and April 2023.



Daryl Pierce
Area 5 Fisheries Manager