Tobyhanna Lake

Monroe County

2022 Fish Population Evaluation: Trap netting and Night Electrofishing Surveys

Tobyhanna lake, located in Tobyhanna State Park, is a 170-acre impoundment managed for water-based recreation. The lake's only trailered motorboat launch is on the eastern shore off Pennsylvania Route 423. There is a kayak launch located within the campground on the western shore. Motorized boats are limited to electric motors only. Rowboats, canoes, paddleboats, kayaks, and electric motorboats are available to rent daily from Memorial Day weekend to Labor Day at this access. Populations of Largemouth Bass, Yellow Perch, Pumpkinseed, and Chain Pickerel are self-sustaining via natural reproduction. The lake is also managed as a **Stocked Trout Water** under **Commonwealth Inland Waters** regulations. Brook Trout are stocked during the spring once preseason (approximately end of March), and once in-season (approximately early April). There is also a single fall stocking in early November. Tobyhanna Lake is open to trout harvest during the regular season (opening day of trout season through Labor Day), and the extended season (Labor Day through 3rd week of February). It is then closed to all fishing from approximately the 3rd week in February to opening day of trout season.

Two capture methods were utilized by Area 5 biologists to evaluate the status of the lake's fish populations in terms of their abundance and size distributions. Twelve overnight trap nets were deployed for 24-hour periods between April 4th and April 7th, 2022. Net leads were set directly onshore extending perpendicular to the shoreline into the lake, directing fish towards the lifting enclosure (lifting pot) situated at depths varying from 2.5-ft to 7.4-ft. On June 23rd, 2022, six single-pass night-boat electrofishing sites were sampled. Sampling was inclusive (i.e., all fish being captured), in 10-minute shoreline transects (approx. 1,150-ft each), encompassing a total of 1.3-miles (35%) of shoreline. In both sampling methods, after capture, all fish were enumerated, measured for total length, and released.

2022 Trap Netting

A total of 874 fish were captured with trap nets representing 10 different species (Table 1). Most abundant were Yellow Perch (N = 679). The trap nets were very effective in capturing mature Yellow Perch who spawn in early spring. Other notable catches were Pumpkinseed (N = 59), Chain Pickerel (N = 46), and Golden Shiner (N = 33). Brook Trout - Hatchery, Largemouth Bass, Brown Trout - Hatchery, Brown Bullhead, Yellow Bullhead, and Rainbow Trout were also observed infrequently (N ≤ 30). Low catches of Largemouth Bass were expected as trap nets are not effective in capturing this species.

Species specific size distributions were estimated from total length measurements (Table 2). Ninety-five percent of measured Yellow Perch were of quality size (≥ 8-in.). Similarly, 89.5% of Pumpkinseed and all (100%) Largemouth Bass (N = 20) were of quality size (≥ 6in., ≥ 12in. respectively).

2022 Night-Boat Electrofishing

Night-boat electrofishing collected a total of 731 individual fish (Table 3). Ten different species were captured. Most abundant were Pumpkinseed (N = 256), Golden Shiner (N = 231), and Yellow Perch (N = 132). Chain Pickerel (N = 32), and Largemouth Bass (N = 30), were caught in quantity as well. Other species present were Blue-spotted Sunfish, Bluegill, Yellow Bullhead, Brown Bullhead, and White Sucker (N < 30). Catches of Pumpkinseed and juvenile Yellow Perch were exceptional as night-boat electrofishing was very effective sampling the shoreline habitats frequented by these fishes. High catches of Golden Shiner were also encouraging, suggestive of a robust forage base. The frequent catches of Largemouth Bass were also anticipated given bass will congregate towards shallow shorelines during early nighttime to forage. Catches of Chain Pickerel are likely not representative of the lake population as it was noted many adults were seen darting around the edge of the electric field, escaping netters. Few Bluegills and no trout were captured.

Table 1. Total catch (N) of fish captured using trap nets on Tobyhanna Lake during April 2022.

Species	TN #1	TN #3	TN #4	TN #6	TN #7	TN #8	TN #9	TN #10	TN #11	TN #12	TN #13	TN #14	Total
Brook Trout - Hatchery	1	6	8		2		3		1	2		1	24
Brown Bullhead			4										4
Brown Trout - Hatchery						5							5
Chain Pickerel	7	5	2	3	4	3	3	3	3	8		5	46
Golden Shiner	13	1	15	1	2							1	33
Largemouth Bass	7	1	2	8		1				1			20
Pumpkinseed	12		6	17	3	13	1	1		3		3	59
Rainbow Trout - Hatchery						1							1
Yellow Bullhead			2									1	3
Yellow Perch	310	9	44	13	3	259	5	11	9	12	2	2	679
Total	350	22	83	42	14	282	12	15	13	26	2	13	874
Effort (hrs.)	23.2	22.8	18.9	26.3	22.1	23.3	23.1	24	23.8	23.6	22.0	20.3	

Table 2. Total length (inches) frequency distribution of fish captured using trap nets on Tobyhanna Lake during April 2022.

Size (in.)	Brook Trout - Hatchery	Brown Bullhead	Brown Trout - Hatchery	Chain Pickerel	Golden Shiner	Largemouth Bass	Pumpkinseed	Rainbow Trout - Hatchery	Yellow Bullhead	Yellow Perch	Total
2				1			5			1	7
3					5					1	6
4					6		2			4	12
5					3					1	4
6					3		5			2	10
7				2			32			9	43
8		1			3		13			24	41
9				1	8		1			49	59
10					5					103	108
11				2					2	69	73
12		1		1		1			1	56	60
13		2		7		1				11	21
14				10		5					15
15				11		7					18
16				7		2					9
17				2		3					5
18				1		1					2
20				1							1
Unmeasured	24		5				1	1		349	375
Total	24	4	5	46	33	20	59	1	3	679	869

Length frequency distributions of night-boat electrofishing were tabulated (Table 4). The most abundant size class for Yellow Perch was 3-in. (26%, N = 34), however, 20% (N = 27) were of quality size (≥ 8-in.). Forty percent (40%, N = 12) of Largemouth Bass were 3-in. to 4-in. and 30% (N = 9) were of quality size (≥ 12in.). Chain Pickerel were most abundant as 14-in. to 15-in. size class, 28% (N = 9) were 5-in. Pumpkinseed were most frequently measured at 7-in.

Table 3. Total fish (N) captured using night-boat electrofishing in June 2022.

Species	NBE #1	NBE #2	NBE #3	NBE #4B	NBE #5B	NBE #6	Total
Bluegill	3	6		1	1	7	18
Blue-spotted Sunfish		8	1		2	11	22
Brown Bullhead					1		1
Chain Pickerel	4	7	4	4	4	9	32
Golden Shiner	30	63	54	10	30	44	231
Largemouth Bass	8	10	4		6	2	30
Pumpkinseed	58	111	20	8	31	28	256
Sunfishes - Family	1	1			1	1	4
White Sucker		1					1
Yellow Bullhead	1				1	2	4
Yellow Perch	26	44	14	7	18	23	132
Total	131	251	97	30	95	127	731
Effort (hrs.)	0.163	0.1738	0.17	0.1538	0.1758	0.1711	

Table 4. Total length (inches) frequency distribution of fish captured on Tobyhanna Lake during the night-boat electrofishing survey in June 2022

Size (in.)	Bluegill	Blue-spotted Sunfish	Brown Bullhead	Chain Pickerel	Golden Shiner	Largemouth Bass	Pumpkinseed	sunfishes - Family	White Sucker	Yellow Bullhead	Yellow Perch	Total
1	4	7					3	4				18
2	13	15			10		12				3	53
3					22	7	33				34	96
4					162	5	61				26	254
5				9	20		13				21	63
6	1			1	11		42				17	72
7					1	1	77				4	83
8					1	6	13			2	2	24
9				2	2	1					8	13
10					2		1			2	9	14
11						1					5	6
12			1	2							3	6
13				2		2						4
14				6		1						7
15				7		4						11
16				2		1			1			4
17				1		1						2
Unmeasured							1					1
Total	18	22	1	32	231	30	256	4	1	4	132	731

Comparison to Historical Time-series

Limited historical time-series data is available for comparative purposes. Previous trap net and night-boat electrofishing surveys were completed in 1981 and 1988. Differences in historical methodology for these surveys preclude direct comparability to the present-day assessment, excepting a trap net survey accomplished spring 1981. There is a considerable lapse in time (i.e., > 30 years) between surveys. Without routine assessments, conclusive statements on population trends cannot be inferred. Effects on fish such as juvenile production, natural mortality, and angler harvest also cannot be quantified. However, comparing historical surveys can broadly characterize the general state of present-day fish populations.

Calculating mean catch rates (i.e., catch-per-unit-effort, CPUE, fish/hr.) allows comparability to historic surveys (Figure 1). Relative abundances of Largemouth Bass between 1981 (CPUE = 0.05 fish/hr.) and the 2022 (CPUE = 0.07 fish/hr.) surveys were approximately similar from trap net catches. Moreover, the bass population remains well represented of multiple size classes as observed in the 1981 trap net survey (Figure 2). Yellow Perch, however, more prevalent in 1981 (CPUE =11.85 fish/hr.) but were of generally smaller-sized (< 7-in.) fishes from the 1981 assessment. Chain Pickerel catch in 2022 (CPUE = 0.17 fish/hr.) was reminiscent of catch in 1981 (CPUE = 0.14 fish/hr.). Pumpkinseed occurred at a slightly higher rate in 2022 (CPUE = 0.21 fish/hr.) than observed in 1981 (CPUE = 0.13 fish/hr.).

Figure 1. Annual mean catch-per-unit-of-effort (fish/hrs.) for selected fishes captured in 1981 and 2022 trap net surveys.
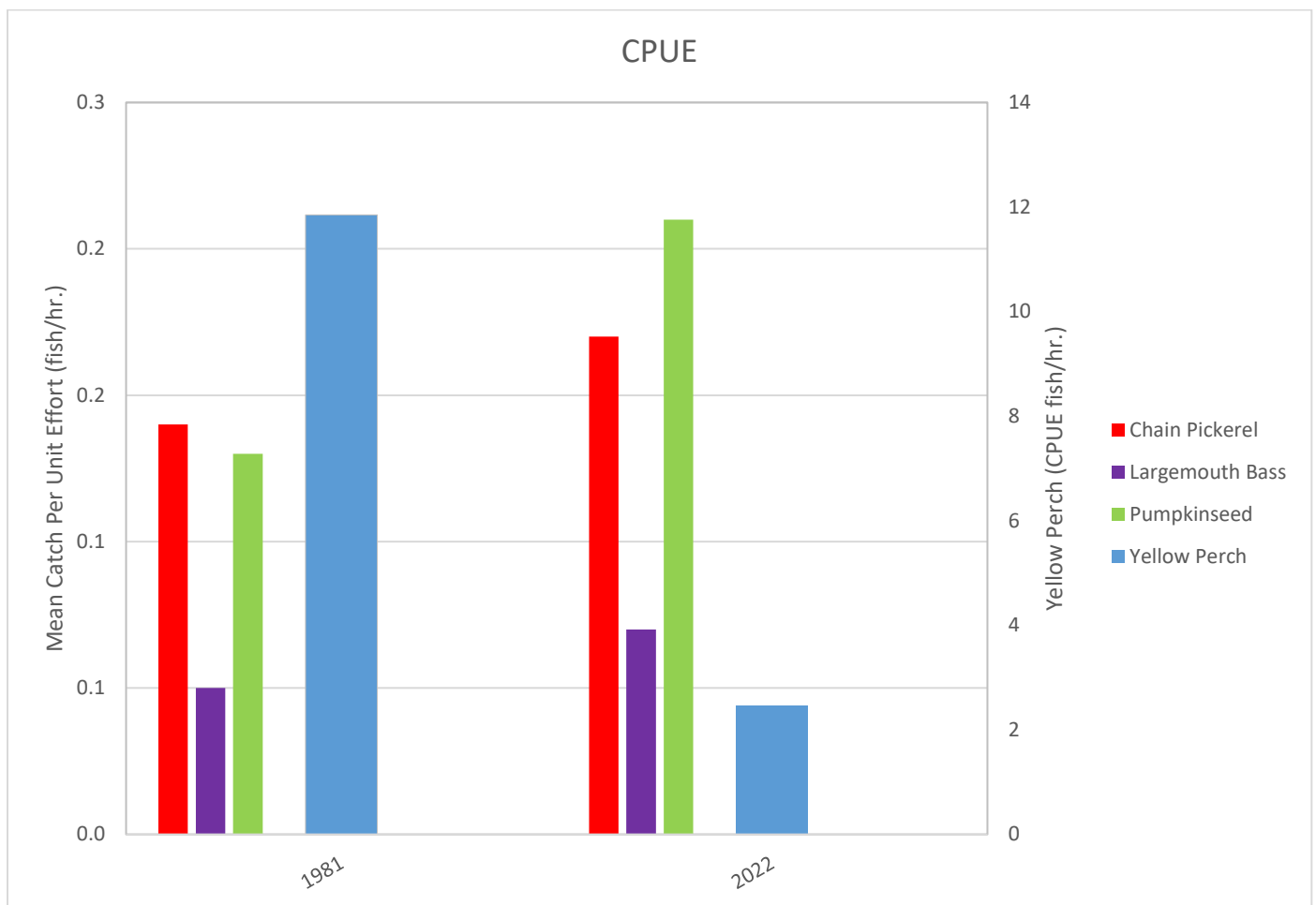
Length frequency distributions of 1981 and 2022 trap net surveys were graphed (Figure 2). While catch of Yellow Perch occurred more frequently in 1981 than 2022 fishes caught in 2022 were generally larger with many exceeding 9-in. Pumpkinseed caught in 2022 also demonstrated a larger-sized population compared to the 1981 trap net catches. Largemouth Bass displayed similar length frequencies for both years. Larger Chain Pickerel were more common in 2022 than 1981, but this might be due more to catchability miss-representing

size distribution. Night-boat electrofishing lengths were not illustrated here as there is no comparable historic survey.

Figure 2. Size distribution (i.e., total length) of selected fishes captured in 1981 and 2022 trap net surveys.
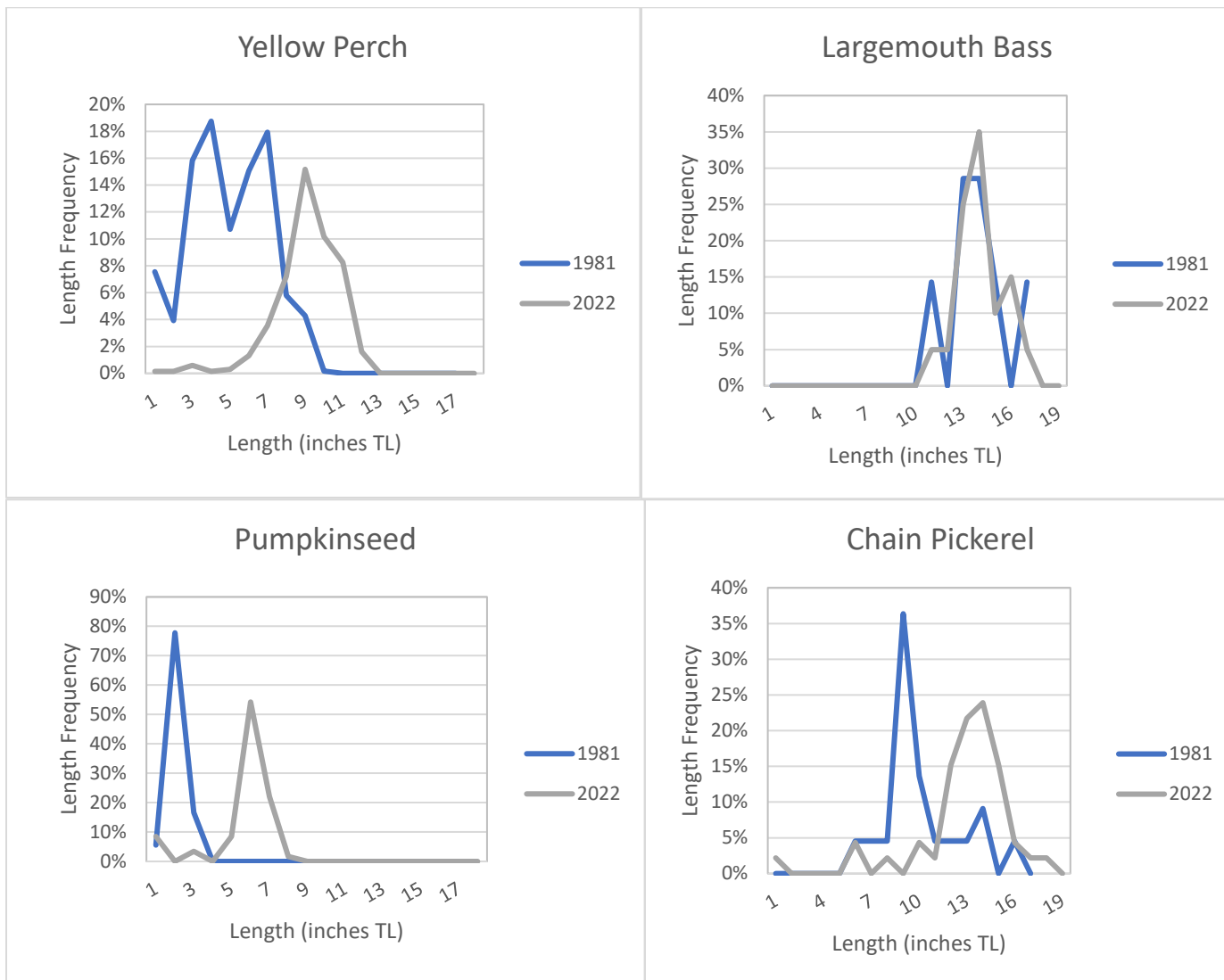
Conclusions

The 2022 trap net and night-boat electrofishing surveys found quality-sized Yellow Perch, Largemouth Bass, and Pumpkinseed. These populations are self sufficient and naturally reproducing, as indicated by strong juvenile production and multiple adult year-classes. Without routine, periodic fish assessments, it is unknown whether these results are indicative of typical lake abundance and size distribution. Factors such as angler harvest can not be quantified. Waters located in northeast Pennsylvania tend to have low productivity resulting from tannic glacial swamp inputs. Low productivity lakes often times are unable to sustain large fishes, however Tobyhanna Lake hosts many quality-sized Yellow Perch, Largemouth Bass, and Pumpkinseed.

Area 5 biologists noted that this shallow lake is home to a plethera of lilies and subaquatic vegetation. This habitat is condusive to macroinvertabrate life. If aquatic macroinvertabrates are flourishing, it would promote healthy panfish populations, along with support juvenile fishes. Coupled with macroinveratabrate habitat provision, lilies could also offer good protection for fishes such as juvenile bass and perch, enabling an easier path towards adulthood. A large forage base is an important facilitator for growing quality-sized game fish. Largemouth Bass and Yellow Perch would be the benefactors of a strong population of Golden Shiner in all size classes.

The recent 2022 survey is not conclusive as to the ability of the lake to consistently produce trophy-sized bass, perch, or panfishes. The current presence of quality-sized fishes is encouraging and suggestive of a healthy ecosystem. Anglers should expect the opportunity to catch quality-sized fish to continue in future years.

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