Prompton Lake
Wayne County

2022 Fish Population Evaluation: Trap netting and Night Electrofishing Surveys

Prompton Lake, in Wayne County, is a 280-acre impoundment within Prompton State Park. The U.S. Army Corps of Engineers maintains the lake for both flood control, and recreation. Motorboats are permitted but limited to a maximum of 10 horsepower. The only boat launch is located on the west shore off State Route 170. Self-sustaining populations of panfish and black bass reside in the lake, managed by Commonwealth Inland Waters regulations.

To gain further insight into Prompton Lake's fish populations Area 5 biologists used sampling methodologies previously employed in the Spring 2021 evaluation surveys for a follow-up survey in Spring 2022. Those sampling methods included enumerating catch from twelve overnight trap net sets for 24-hour periods between April 11th and April 13th, 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 7.2-ft to 14.4-ft. Additional sampling included enumeration of all immobilized captured fishes from ten single-pass, night-boat electrofishing shoreline transects on June 14th and 15th, 2022. Each transect was sampled for a duration of 10-minutes which covered approximately 1,150-ft of shoreline. Cumulative total distance sampled encompassed 2.2-miles (31%) of shoreline. In both sampling methods, after capture, all fish were enumerated, measured for total length, and released.

2022 Trap Netting

A total of 600 fish were captured with trap nets representing 15 different species (Table 1). Yellow Perch (N = 280) was most abundant. Bluegill (N = 76), Pumpkinseed (N = 75), Brown Bullhead (N = 67), and Black Crappie (N = 66) were also caught in quantity. Yellow Bullhead, White Sucker, Rock Bass, Walleye, Chain Pickerel, Smallmouth Bass, Channel Catfish, Golden Shiner, Green Sunfish, and Muskellunge were observed infrequently (N ≤ 30). Low catch of bass was anticipated as trap nets are not effective in capturing these species.

Total lengths were utilized to gain insight to species-specific size distributions (Table 2). While multiple size classes of Black Crappie, Bluegill, Pumpkinseed, and Yellow Perch were observed, catches of these fishes tended to be composed of a few size classes. Peak abundance of Black Crappie, and Bluegill occurred at 9-in and 8-in size classes, respectfully. Both were indicative of quality-sized (≥ 8-in and ≥ 6-in) fishes, composing 68% and 88% of fish captured, respectively. Pumpkinseed peak abundance occurred at the 5-in size class, but 7-in size class fish were also frequent (i.e., 32%) in catches. Fifty-seven percent of the Pumpkinseed catch were of quality-size (≥ 6-in). Quality-sized **(**≥ 8-in) Yellow Perch represented 19% of their total catch, however, 5-in and 6-in sized fishes were most frequently (i.e., 31% and 28%, respectively) captured.

2022 Night-boat Electrofishing

Night-boat electrofishing captured 1,140 fish representing 17 different species (Table 3). Bluegill (N = 314), Yellow Perch (N = 312), and Pumpkinseed (N = 188) were most prevalent. Redbreast Sunfish (N = 82), Rock Bass (N = 55), Green Sunfish (N = 45), Largemouth Bass (N = 40), and Smallmouth Bass (N = 30) were common. Black Crappie, Yellow Bullhead, Golden Shiner, Brown Bullhead, Chain Pickerel, White Sucker, Eastern Mudminnow, and Lepomis Hybrid were also present (N ≤ 30). Improved catch of black bass was

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

Species	TN 3	TN 4	TN 5	TN 7	TN 8	TN 9	TN 10	TN 11	TN 14	TN 15	TN 16	TN 20	Total
Black Crappie	1	2		2	6	4		45				6	66
Bluegill	6	3		2	32			23		3		7	76
Brown Bullhead	5	1		2	36			17		3	2	1	67
Chain Pickerel	1				1			2					4
Channel Catfish												1	1
Golden Shiner					1							1	2
Green Sunfish					1					1			2
Muskellunge												1	1
Pumpkinseed	13	15		11	11	4	1	7		7		6	75
Rock Bass				3								1	4
Smallmouth Bass												2	2
Walleye												4	4
White Sucker	1				2						1	1	5
Yellow Bullhead		1		1								9	11
Yellow Perch	2	93		19	11	21	32	92		2		8	280
Effort (h)	23.3	23.1	21.6	21.7	22.8	22.9	25.0	22.2	24.5	23.7	23.4	22.8	

Table 2. Size (i.e., total length) frequency distribution of fish captured using trap nets on Prompton Lake during April 2022.

Length (in)	Black Crappie	Bluegill	Brown Bullhead	Chain Pickerel	Channel Catfish	Golden Shiner	Green Sunfish	Muskellunge	Pumpkinseed	Rock Bass	Smallmouth Bass	Walleye	White Sucker	Yellow Bullhead	Yellow Perch
2		1													
3		1													3
4	3	5					1		5						26
5	12	2							27	1				1	86
6	2	13							15						77
7	4	23	1						24	1					35
8	5	29	1				1		4						18
9	28	1	3			1				2				4	14
10	10		9	1		1								2	14
11	1	1	16								1			3	5
12	1		19											1	2
13			5								1				
14			8										2		
15			3										1		
16			2												
17															
18				1											
19				1											
20				1								1	2		
21				1								1			
22												1			
23															
24												1			
25															
26															
27															
28															
29															
30								1							

noted as they are susceptible to night-boat electrofishing as they move into the shallow shorelines to feed after sunset. Low catch of Black Crappie was also expected as they move to structures in deeper water as water temperature increases.

Multiple size classes were evident from length frequencies of fishes collected by night-boat electrofishing gear (Table 4). Five-inch Yellow Perch were the most frequently caught, representing 42% of the total perch catch. Few (3%) quality-sized ($\geq$ 8-in) Yellow Perch were observed. Bluegill occurred most frequently at 4-in with 32% being of quality-size ($\geq$ 6-in). Forty-seven percent of Pumpkinseed were of quality-size ($\geq$ 6-in). Most frequently captured sizes of Largemouth Bass and Smallmouth Bass were 8-in (27%) and 6-in (40%), respectively. Quality-sized Largemouth Bass ($\geq$12-in, 30%) and Smallmouth Bass ($\geq$ 11-in, 20%) were frequently collected.

Table 3. Total catch (N) of fishes from Prompton Lake during the night-boat electrofishing survey in June 2022.

Species	NBE 1	NBE 2	NBE 2B	NBE 5	NBE 6	NBE 8	NBE 9	NBE 10	NBE 11B	NBE 12B	Total
Black Crappie	2	3	1	1	3		4	2	1	1	19
Bluegill	23	36	49	33	44	19	22	10	22	56	314
Brown Bullhead		2			1	2	2	3			10
Chain Pickerel	2	1					1	2	1	2	9
Eastern Mudminnow								1			1
Golden Shiner						2		8		1	11
Green Sunfish	3	4	8	9	7		4			10	45
Largemouth Bass	4	4	4	5	6	4	1	4	3	5	40
Sunfish Hybrid									1		1
Minnows/ Carps					1						1
Pumpkinseed	14	22	19	11	12	36	18	14	31	10	188
Redbreast Sunfish	5	11	13	11	9		15	1		17	82
Rock Bass	2	5	17	4	6	2	5		1	13	55
Smallmouth Bass	5		3	4	1	1	4	1		11	30
White Sucker	1					3	1	4	1		10
Yellow Bullhead		1	1	4	4		1	1			12
Yellow Perch	12	32	19	5	10	54	26	33	71	48	312
Effort (hrs.)	0.175	0.173	0.186	0.171	0.186	0.174	0.159	0.133	0.167	0.167	

## Comparison to Historical Time-series

Limited historical data is available for comparative purposes. Previous trap net and night-boat electrofishing surveys occurred in 1983, 1991, and 2021. The 1983 and 1991 surveys are useful to only provide context to the general state of the present-day fish populations due the considerable time-lapse relative to the present-day surveys. Whereas direct comparisons of the 2022 findings to the 2021 evaluation offers cursory insight to population trends (i.e., relative abundance and size distributions), given only two consecutive years have been surveyed.

Species-specific catch-per-unit-of-effort (CPUE; fish/h) calculated as the annual mean allows comparability among survey years for representing relative abundance of a given species (Figure 1). Trap net catch rates of Black Crappie (2021: 0.58 fish/h; 2022: 0.25 fish/h) and Bluegill (2021: 0.83 fish/h; 2022: 0.28 fish/h) declined from 2021 to 2022; whereas catch rates of Pumpkinseed (2021: 0.16 fish/h; 2022: 0.27 fish/h) and Yellow Perch (2021: 0.11 fish/h; 2022: 1.02 fish/h) increased between the two surveys. These differences in catch rate between the 2021 and 2022 survey years are typical of self-sustaining fish populations that are derived from year classes one year apart. The natural production of a year-class is defined by a host of environmental conditions that converge in the spawning year to influence the survival and abundance of that year class. For example, metrological conditions (e.g., wind, rainfall, etc.), and lake conditions (e.g., lake elevation, spring warming rates, suitability of nursery/forage grounds, etc.) collectively influence the abundance of each year

Table 4. Size (i.e., total length) frequency distribution of fishes from Prompton Lake captured during the night-boat electrofishing survey in June 2022.

Length (in)	Black Crappie	Bluegill	Brown Bullhead	Chain Pickerel	Eastern Mudminnow	Golden Shiner	Green Sunfish	Largemouth Bass	Sunfish Hybrid	Pumpkinseed	Redbreast Sunfish	Rock Bass	Smallmouth Bass	White Sucker	Yellow Bullhead	Yellow Perch
1		5						2					1			9
2		18		1			3		1	1	3					1
3		42					10	3		8	4	1				14
4		82				3	22	1		37	28	4	1			33
5	4	66					7			52	15	5	4			131
6	2	44				1	3	1		33	21	9	12		1	77
7	2	22				2		2		51	7	24	1		1	34
8	2	33		1		1		11		5	2	11	1	1		5
9	5	2		1		4		6				1	2		4	4
10	4			1				1							3	
11								1					1		2	
12				1				1					1		1	
13			2					2					3			
14			2					1					1	1		
15			6					3								
16			2					3								
17				1				1						3		
18				1				1						1		
19				1										1		
20														3		
Unmeasured										1	2					4
Total	19	314	10	9	1	11	45	40	1	188	82	55	30	10	12	312

Figure 1. Annual mean catch-per-unit-of-effort (i.e., fish/h) for panfishes captured in 1983, 1991, 2021, and 2022 trap net surveys.
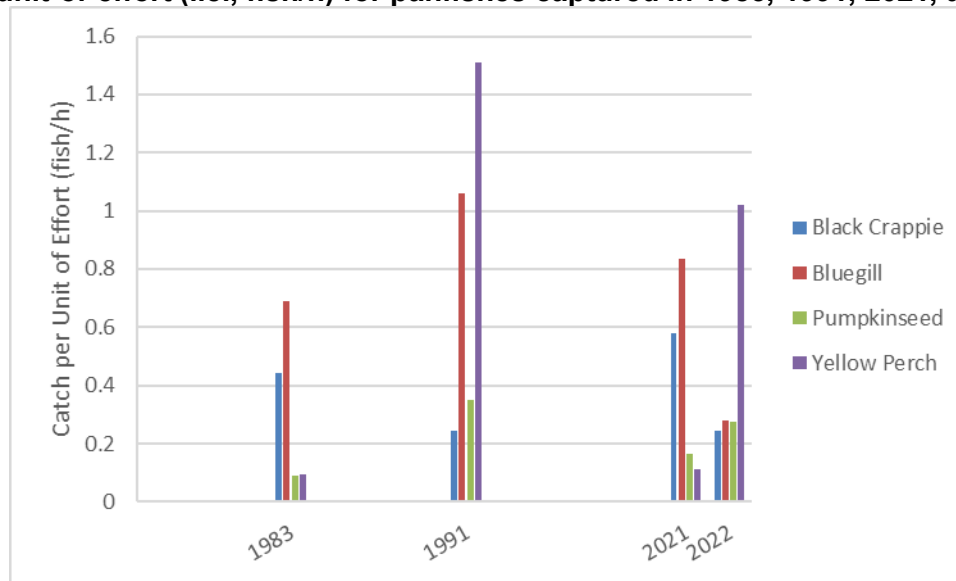
Figure 2. Size (i.e., total length) frequency distribution of panfishes captured in 1983, 1991, and 2021 trap net surveys.
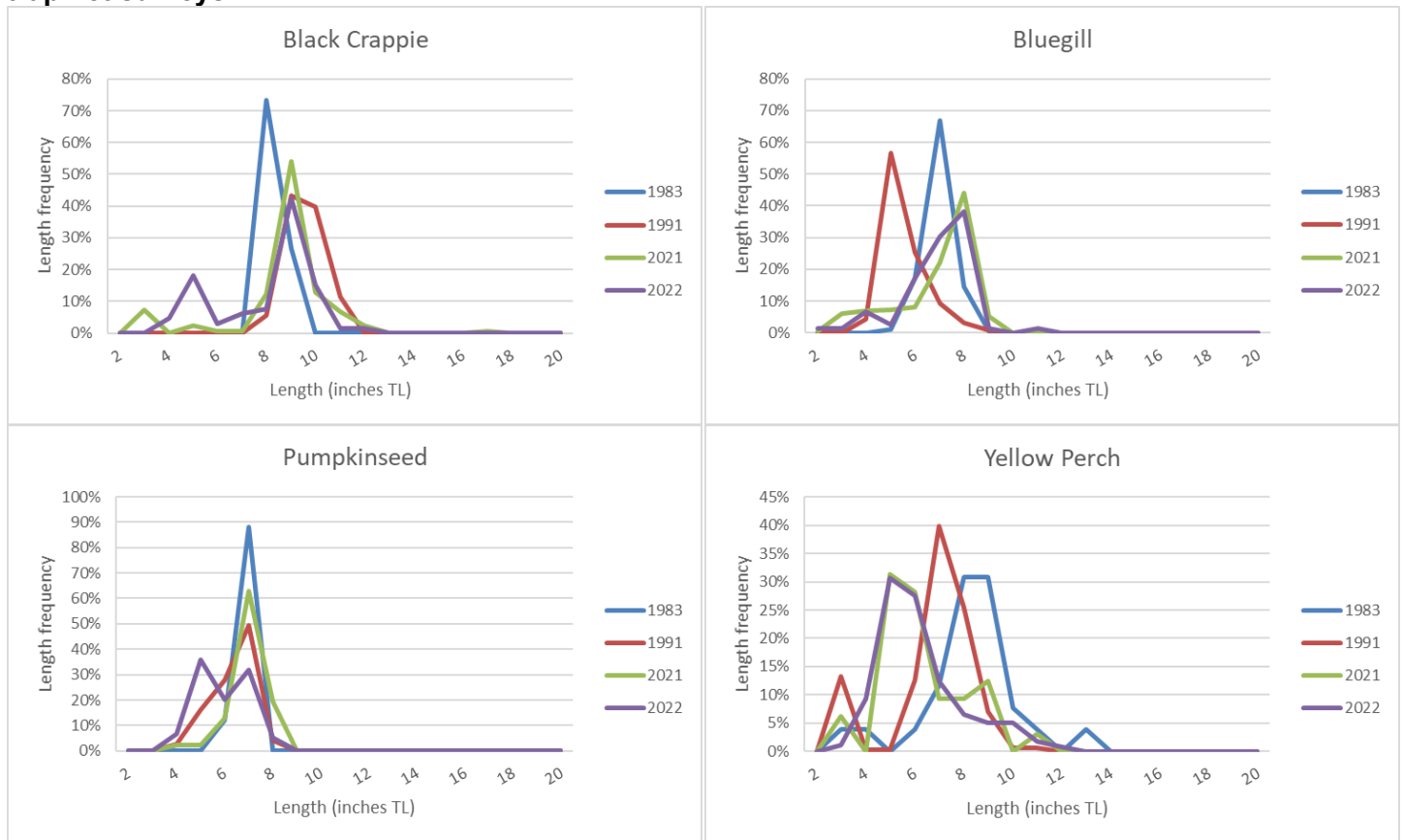

class from hatching to age-one and thus the subsequent collective abundance of year classes comprising our assessment catch. Observed catch rates are within similar magnitude as observed in the 1983 and 1991 surveys, suggesting the present-day catch rates are not unduly disparate. Panfishes within Prompton Lake are managed as self-sustaining populations without any stocking influence.

Comparisons of length frequency distributions to historical trap net surveys are illustrated in Figure 2. Peak modal sizes for Black Crappie (9-in), Bluegill (8-in), Pumpkinseed (7-in), and Yellow Perch (5-in) were approximately similar between the 2021 and 2022 survey years. Additionally, some differences in modal abundance between 2021 and 2022 represents growth as size classes increase in length through time. For example, the 5-in Black Crappie observed in 2022 are composed, in part, of the 3-in fishes caught in 2021. Similarly, 9-in Yellow Perch prevalent in 2021 trap net catches, appear to potentially be the bump of 10-in Yellow Perch caught in 2022. The strong occurrence of 5-in Pumpkinseed in 2022 catches are highly encouraging. Hopefully, these fish will continue to support those desirable sizes as growth continues.

Course evaluation of relative abundance trends from the night-boat electrofishing surveys can be inferred from the observed catch rates (i.e., CPUE). An increasing trend in Largemouth Bass (2021: 12.4 fish/h; 2022: 23.6 fish/h) and Smallmouth Bass (2021: 15.3 fish/h; 2022: 17.8 fish/h) were demonstrated by night-boat electrofishing catches between the 2021 and 2022 survey years (Figure 3). Similarly, Pumpkinseed (2021: 83.3 fish/h; 2022: 111.5 fish/h) and Yellow Perch (2021: 69.4 fish/h; 2022: 188.6 fish/h) also increased in 2022 compared to 2021 catch rates, whereas Black Crappie (2021: 7.1 fish/h; 2022: 11.4 fish/h) and Bluegill (2021: 177.1 fish/h; 2022: 182.3 fish/h) did not demonstrate strong differences of catch rate between the two years (Figure 4). Given only two consecutive years have been surveyed, it is unknown if the observed panfish catch rates for 2021 and 2022 are within the range of average abundances, since historical night-boat electrofishing data from 1983 and 1991 survey years for these species are unavailable. However, Largemouth Bass catch

Figure 3. Annual mean catch-per-unit-of-effort (i.e., fish/h) for black bass captured in 1983, 1991, 2021, and 2022 night-boat electrofishing surveys.
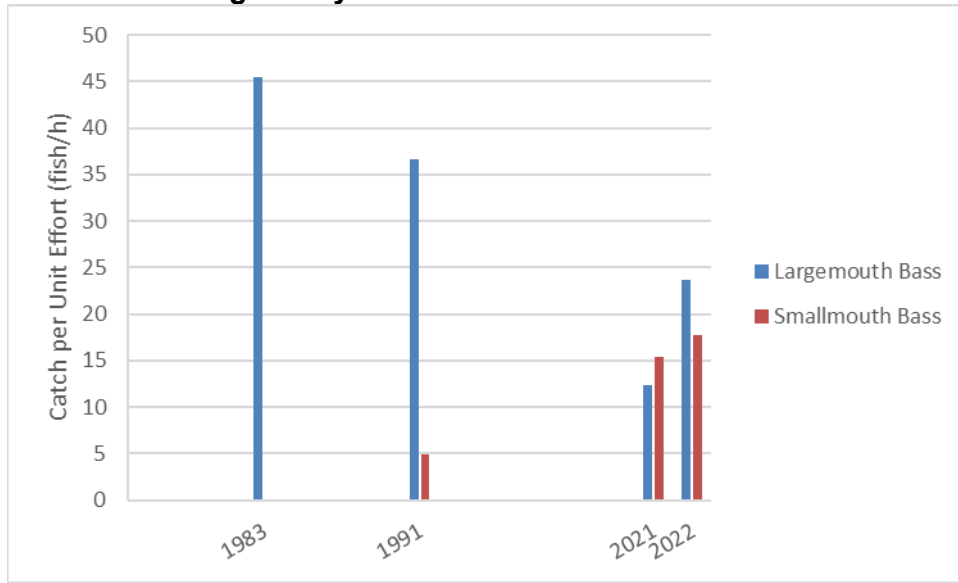

rates appear to be of lower magnitude than observed in 1983 (45.5 fish/h) or 1991 (36.6 fish/h), suggesting the present-day Largemouth Bass population is a bit lower than could be expected. In contrast, Smallmouth Bass population seems to be improving, given none were collected in the 1983 survey and few in the 1991 survey (4.9 fish/h).

Comparisons of species-specific size distributions from the night-boat electrofishing surveys are illustrated for black bass (Figure 5) and panfishes (Figure 6).   Change in abundance in both Largemouth Bass and Smallmouth Bass were evident from 2021 to 2022 and appear to be related to abundance differences in the year-class abundance of those size groups. For example, the 14-in and 15-in Largemouth Bass observed in 2021 catches appear to be represented as the 15-in and 16-in fishes captured in 2022. Similarly, the 4-in Smallmouth Bass captured in 2021 appear to be represented by the 6-in Smallmouth Bass captured in 2022. Interestingly, the abundant 13-in size class of Smallmouth Bass captured in 2022 could not be related to an abundant size class in 2021. Potentially, these fishes may have been underrepresented in the 2021 catches.

Figure 4. Annual mean catch-per-unit-of-effort (i.e., fish/h) for panfishes captured in 2021 and 2022 night-boat electrofishing surveys. Panfish were not recorded for the 1983 and 1991 night-boat electrofishing surveys.
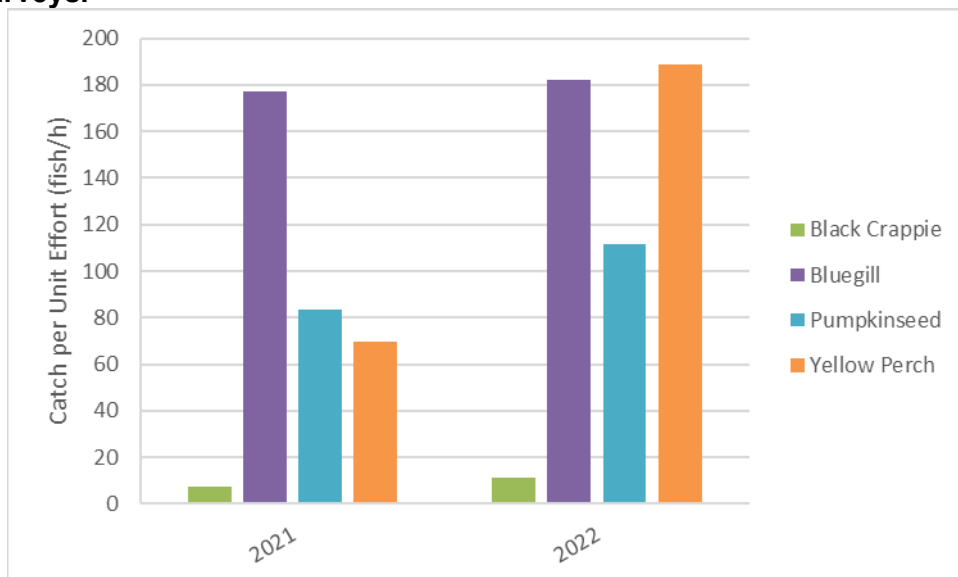
Figure 5. Size (i.e., total length) frequency distribution of black bass captured in 1983, 1991, 2021, and 2022 night-boat electrofishing surveys. Smallmouth Bass data from 1983 (N = 0) and 1991 (N = 5) are not illustrated.
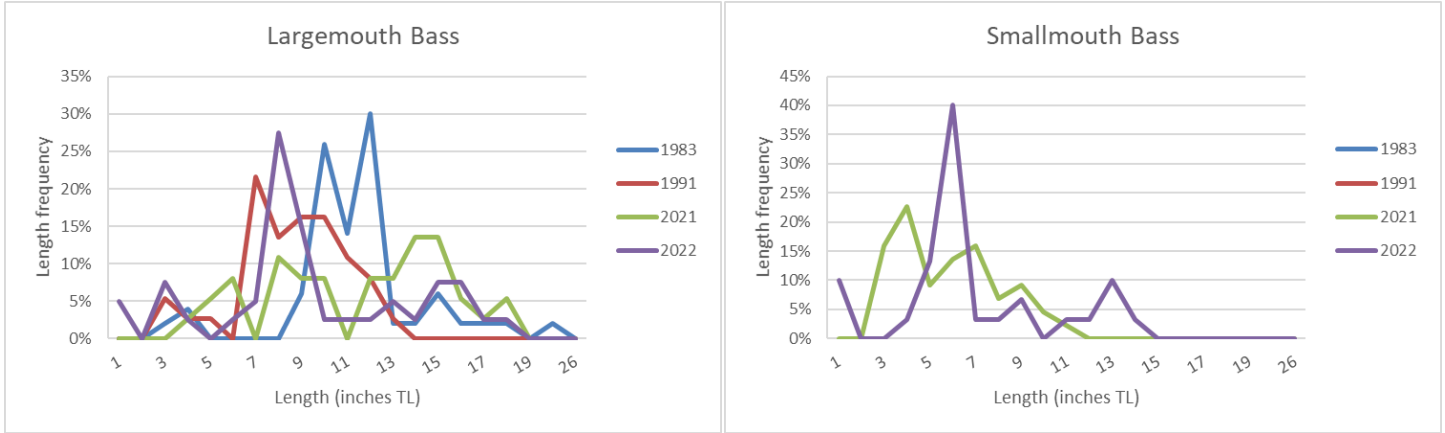
Figure 6. Size (i.e., total length) frequency distribution of panfish captured in 2021 and 2022 night-boat electrofishing surveys.
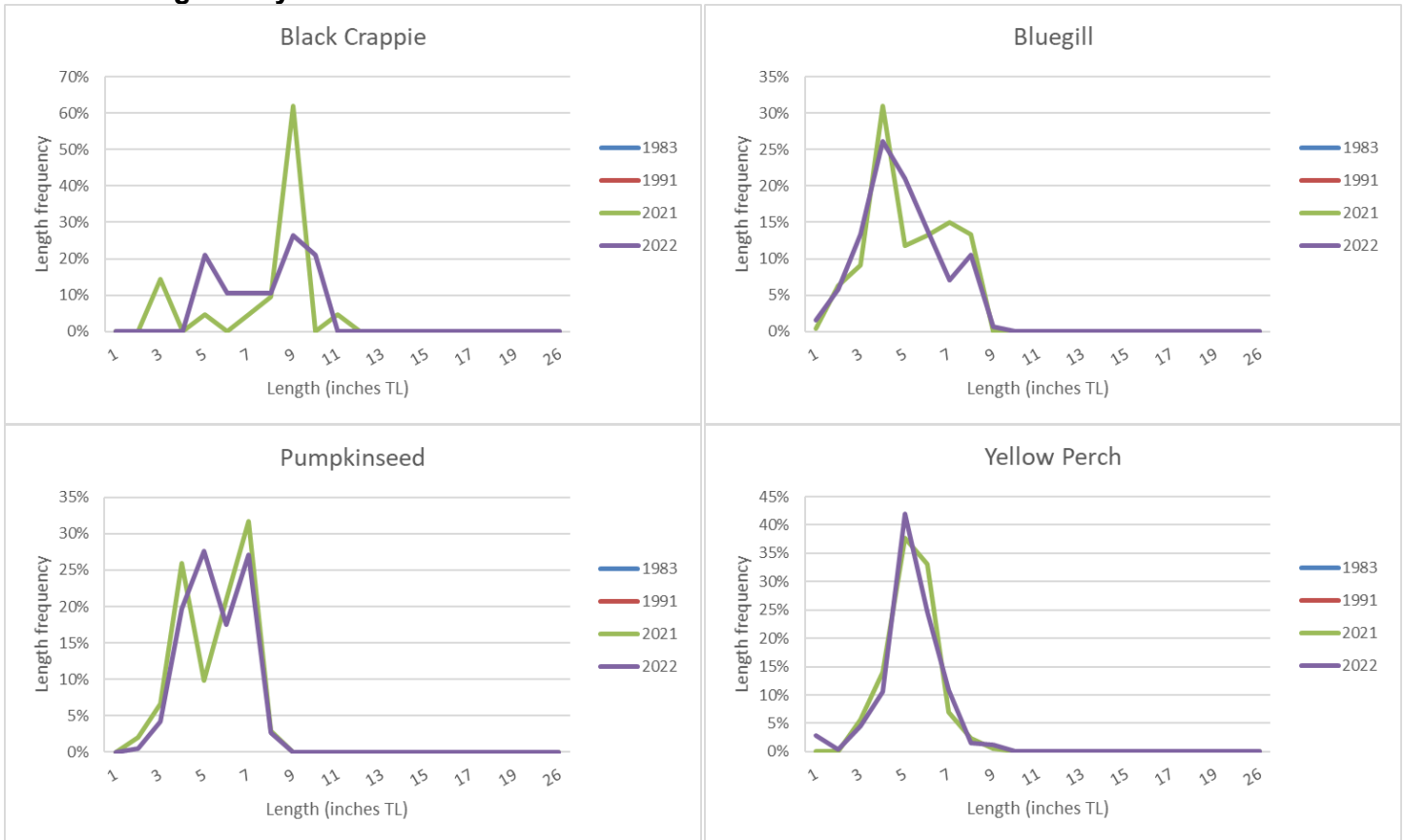
While change in abundance of size classes from one year to the next was also evident for panfishes, a more interesting observation was the general consistency of length frequency distributions between the 2021 and 2022 catches (Figure 6). Thus, while catch rates varied between the two years, availability of sizes, particularly of quality-sized panfishes, remained relatively stable, with only slight reduction from the earlier year.

Muskellunge Stocking Efficacy

Predefined management benchmark criterion, set forth in the [Muskellunge Plan](), has been described for characterizing the success of Muskellunge stockings. Comparison of the 2022 Muskellunge trap net mean catch rate (CPUE = 0.004 fish/h) failed to achieve management criterion (CPUE = 0.01 fish/h). Similarly, catch rate of Muskellunge in the 2021 trap net survey (CPUE = 0.007 fish/h) was also below management criterion. Maintenance stockings of Muskellunge will be discontinued beginning in the 2023 season.

Conclusions

Findings from the 2022 trap net and night-boat electrofishing surveys are suggestive of stable, self-sustaining populations of black bass and panfishes. The consistent occurrence of quality-sized fishes is highly encouraging. Without an angler creel survey, influences of harvest upon black bass and panfish populations remains unknown. Yet, based on the 2021 and 2022 survey findings, anglers should continue to expect frequent catches of quality-sized fishes in future years.

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