

# Francis E. Walter Reservoir

## Luzerne/Carbon Counties

### 2022 Fish Population Evaluation: Night Electrofishing Surveys

Francis E. Walter Reservoir (FE Walter) is an impoundment in Luzerne and Carbon Counties located at the confluence of the Lehigh River and Bear Creek. The FE Walter Reservoir is owned and operated by the [U. S. Army Corps of Engineers](#) (USACE) as a flood control facility and secondarily for supporting water-based recreation. Lake levels vary seasonally, from the wintertime base pool of 1,300 ft (80 acres) to the late spring target pool elevation of 1,370 ft (480 ac.) as per the annual [Recreation Operations Plan](#). A popular location for fishing, kayaking, and boating, there are two separate launch points into the lake. A kayak ramp on the western shore, and a motorboat ramp on the east bank, both located near the dam breast. Motors are limited to 10 horsepower. Populations of Smallmouth Bass, Yellow Perch, Black Crappie, and Bluegill inhabit the basin. The reservoir is managed as a [Stocked Trout Water](#) under [Commonwealth Inland Waters](#) regulations within the [Open to Year-round Fishing](#) program. Trout may be harvested during the regular season (opening day of trout season through Labor Day), and the extended season (Labor Day through 3<sup>rd</sup> week of February), being catch-and-immediate-release for trout all other dates in the calendar year. A mix of Brook Trout/Rainbow Trout are stocked preseason with only Rainbow Trout being stocked twice during in-season.

Area 5 Biologists completed twelve single-pass night-boat electrofishing sites in 2022 to evaluate fish populations. At each 10-minute site (approximately 1,148-ft.), all species were collected from shoreline habitats. In total, sampling encompassed 2.6-miles (38%) of shoreline. After capture, all fish were enumerated, measured for total length, and released.

### 2022 Night Boat Electrofishing

A total of 501 fish were captured, during two nights, June 21 to 22, 2022, representing 13 different species (Table 1). Most abundant were Smallmouth Bass (N = 173). Other notable catches were Yellow Perch (N = 89), Bluegill (N = 84), and Black Crappie (N = 78). Rock Bass, Brown Bullhead, Yellow Bullhead, Largemouth Bass, Common Carp, White Sucker, Hatchery Rainbow Trout, Redbreast Sunfish, and Chain Pickerel were also observed infrequently (N < 30). High quantities of Smallmouth Bass were anticipated as most of the shoreline was conducive to quality bass habitats composed of large cobble and boulders. Bass also tend to congregate towards shallower waters shortly after sunset to feed, becoming susceptible to the electrofishing gear.

Total lengths (inches) were recorded to characterize species size distributions (Table 2). Seventy-eight percent of Smallmouth Bass were 4-in to 8-in total length; however, relatively few three percent (3%) were of quality size ( $\geq 12$ -in). All (100%) Bluegill (N = 84) were less than 5-in. total length. Seventy percent (70%) of Black Crappie were 4-in. to 5-in total length. Three percent (3%) of the Black Crappie were of quality size ( $\geq 8$ -in.). Approximately half of the Yellow Perch catch (56%) were representative of small-sized (3-in to 4-in total length) fishes, most likely yearlings. Eighteen percent (18%) were quality size ( $\geq 8$ -in.). Two 13-in Rainbow Trout were caught. The high occurrences of small-sized juvenile fishes were not surprising, given these size classes tend to nestle up in the boulders near the shoreline.

### Comparison to Historical Time-series

Limited historical time-series data are available for comparative purposes. Previous trap net and night-boat electrofishing surveys were completed in 1981 and 2007; however, due to differences in methodology the only directly comparable survey was the springtime night-boat electrofishing survey accomplished in 2007. With only one other survey to reference, and a lack of routine assessments, conclusive statements on population trends cannot be quantified. However, comparison to the 2007 springtime collections may offer insight to the present-day survey findings.

**Table 1. Total Catch (N) of fishes captured using night-boat electrofishing on Francis E. Walter Reservoir, June 2022**

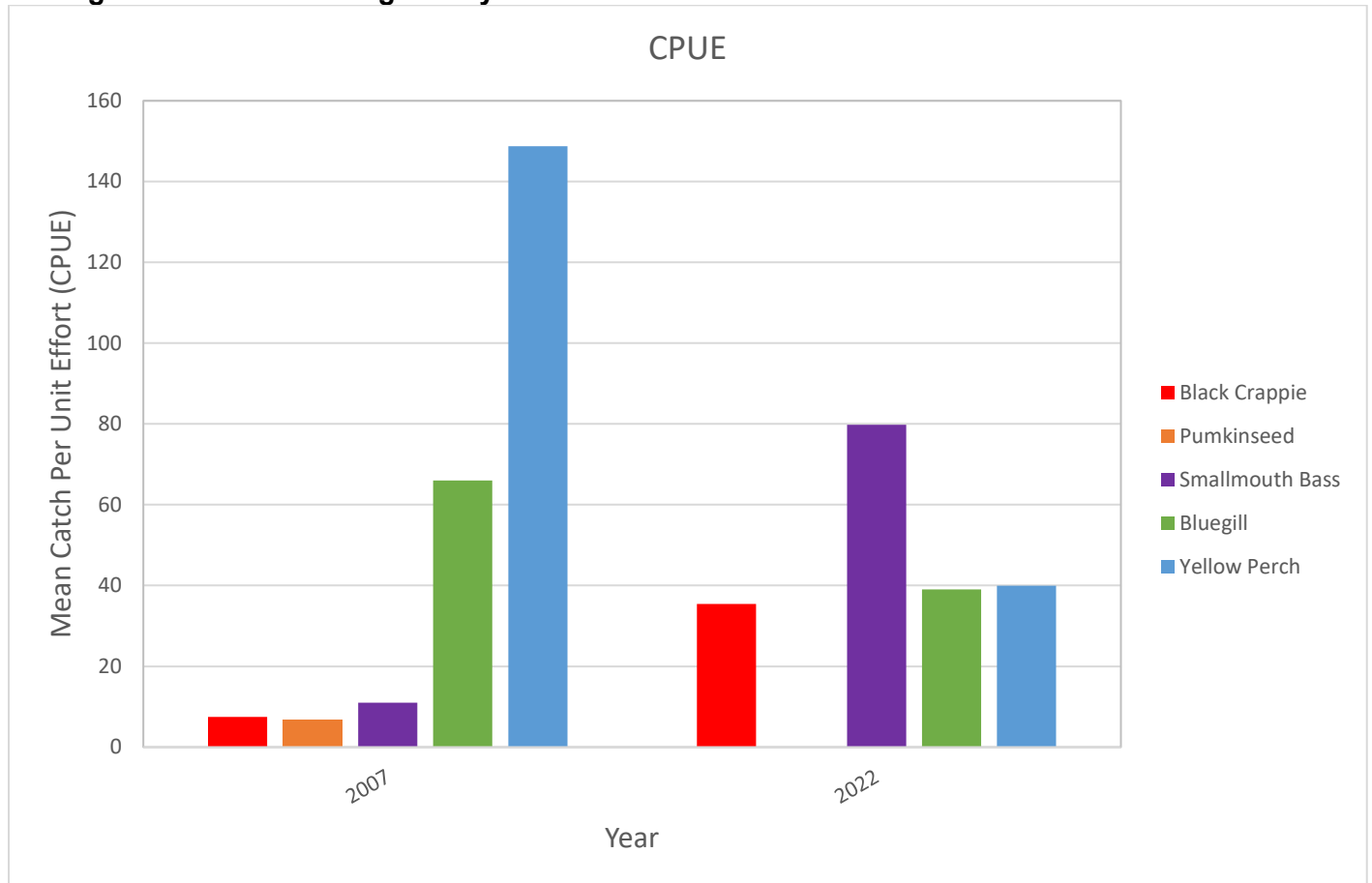
Species	NBE #1	NBE #2	NBE #3	NBE #5	NBE #7	NBE #9	NBE #11B	NBE #14	NBE #16	NBE #17	NBE #18	NBE #21	Total
Black Crappie			8	12	6	22	16		4	6	4		78
Bluegill		11	18	10	9	3	5	1	7	6	4	10	84
Brown Bullhead		2		3	1	3	1	4	3	3			20
Chain Pickerel			1										1
Common Carp		2			1				1	1			5
Largemouth Bass					1		1		2	2			6
Pumpkinseed													0
Rainbow Trout- hatchery							1			1			2
Redbreast Sunfish					1								1
Rock Bass	5	1		4		2	2		2	7	4		27
Smallmouth Bass	3	15	42	23	16	16	12	4	12	7	13	10	173
White Sucker					2				1	1	1		5
Yellow Bullhead		1	2			6			1				10
Yellow Perch		5	11	16	18	22	4		9	3		1	89
Total	8	37	82	68	55	74	42	9	42	37	26	21	501
Effort (hrs.)	0.17	0.18	0.18	0.21	.18	.19	.17	.17	0.18	0.17	0.17	0.17	

**Table 2. Total length (inches) frequency distribution of fishes captured using night-boat electrofishing on Francis E. Walter Reservoir, June 2022.**

Length (in.)	Black Crappie	Bluegill	Brown Bullhead	Chain Pickerel	Common Carp	Largemouth Bass	Rainbow Trout-Hatchery	Redbreast Sunfish	Rock Bass	Smallmouth Bass	White Sucker	Yellow Bullhead	Yellow Perch	Total
1		1								1			6	8
2		21												21
3	4	19							1	6			16	46
4	28	28						1	10	41			34	144
5	25	15							7	25			7	80
6	4								2	33		1	9	51
7	12								2	37		2	1	54
8	2		2						3	12		3	11	33
9			7						2	2		4	3	18
10			7							4	1		2	14
11			3							7	1			11
12			1							4				5
13							2			1	1			4
14											1			1
15				1										1
16											1			1
17						1								1
18					1									1
20					2									2
21					2									2
Total	75	84	20	1	5	6	2	1	27	173	5	10	89	498

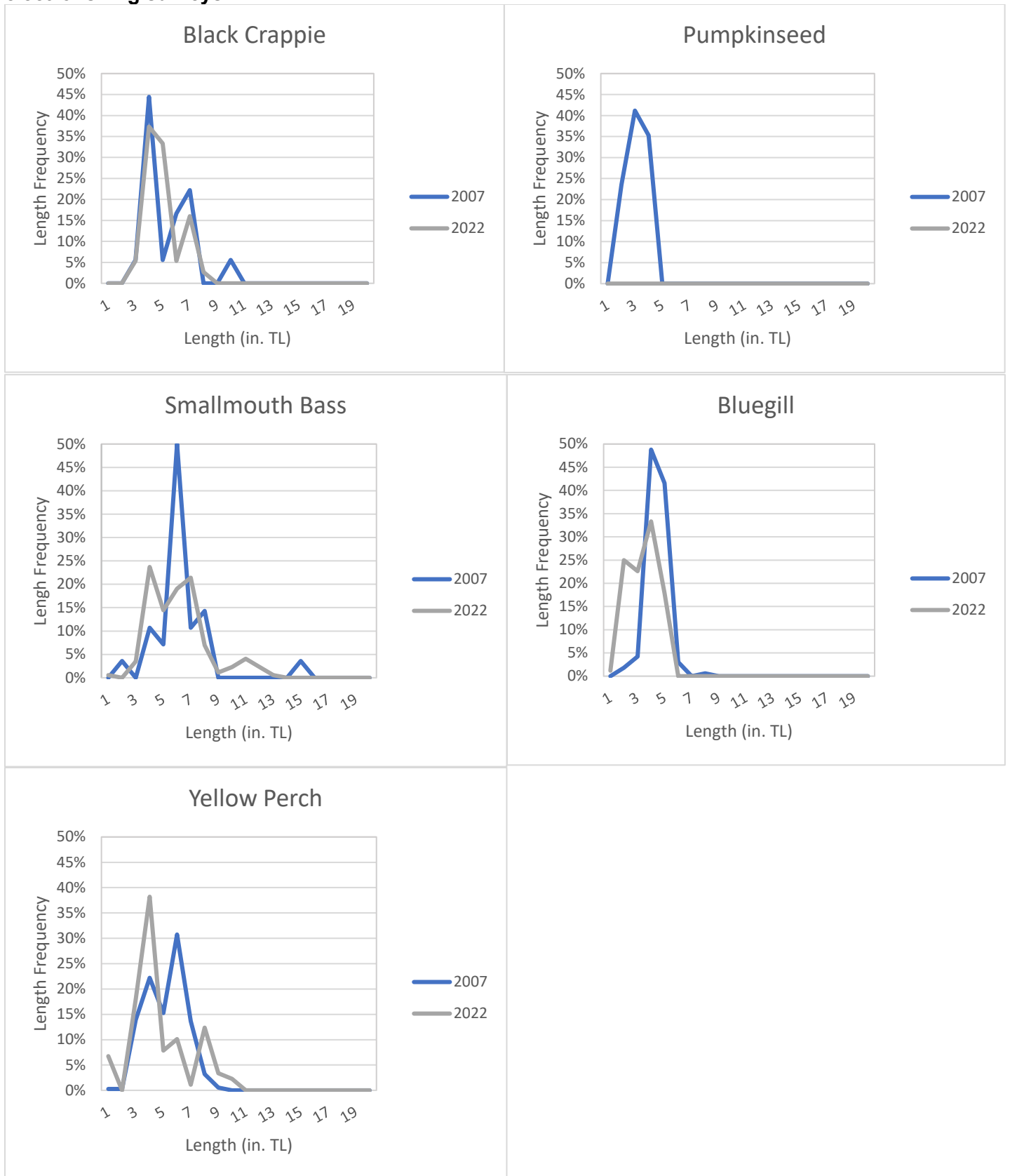
Calculating the mean of catch-per-unit-effort (CPUE; fish/hrs.) allows comparability to historic night-boat electrofishing surveys (Figure 1). Smallmouth Bass occurred at a higher mean catch rate in 2022 (CPUE = 79.7 fish/hr.) than observed in 2007 (CPUE = 11.04 fish/hr.). Similarly, the 2007 catches of Black Crappie in 2022 (CPUE = 35.4 fish/hr.) was higher than observed in 2007 (CPUE = 7.51 fish/hr.). Whereas catches of Pumpkinseed (2007: 6.8 fish/hr.; 2022: 0.0 fish/hr.), Bluegill (2007: 66.0 fish/hr.; 2022: 39.0 fish/hr.) and Yellow Perch (2007: 148.7 fish/hr.; 2022: 39.9 fish/hr.) were all less frequent in 2022 than observed in 2007.

**Figure 1. Annual mean catch-per-unit-of-effort (N fish/hrs.) for selected fishes captured in 2007 and 2022 night-boat electrofishing surveys.**



Comparison of size distributions between the 2007 and 2022 collections, demonstrated occurrence of multiple year classes, composed of both juvenile and adult sizes (Figure 2). Size distribution of Smallmouth Bass in either year were generally composed of 4-in. to 9-in. fishes, but 6-in. Smallmouth Bass were dominant in the 2007 collections. Peak sizes of Black Crappie were nearly similar in either year, whereas adult Bluegill in either year were of similar peak sizes (5-in.) but juvenile-sized (2-in.) Bluegill were also prevalent in 2022 collections. Yellow Perch occurred most frequently at 6-in. and 4-in. in 2007 and 2022 respectively.

**Figure 2. Size distribution (i.e., total length) of selected fishes captured in 2007 and 2022 night-boat electrofishing surveys.**



## **Conclusions**

The 2022 night-boat electrofishing survey demonstrated a scarcity of quality-sized fishes. Observed variation between the two survey years are most likely related to natural reproduction and survival of each years' offspring, as there appears to be variable survival of juveniles into larger size classes. Given the apparent presence of multiple size classes, natural reproduction is sufficient to sustain populations. It is encouraging to see strong and stable juvenile production. Abundance of larger fishes can be influenced by natural mortality, and preferential angler harvest of larger-sized adults. Additionally, the steep shorelines allow the possibility for larger individuals to be present at greater water depths, but beyond the effective range of the electric field.

Without routine fish population assessments and angler surveys it remains unknown if the impoundment is capable of growing trophy-sized fishes. Moreover, it is not known if the current fish populations and size distributions represent typical qualities of the populations. Waters in northeastern Pennsylvania tend to be tannic. Lower levels of productivity make it difficult for lakes to host large-sized fishes. The observed size-distributions might reflect the inherent inability for FE Walter Reservoir to produce trophy fishes. Conversely, the steeply slope shorelines might also introduce poor catchability of larger-sizes fishes, potentially, skewing our observations. For example, anecdotal statements by anglers have indicated satisfaction catching Walleye from FE Walter Reservoir. Yet, we were unable to quantify their abundance in this survey, with gear types employed, simply due to their occurrence in deeper waters. Regardless, FE Walter Reservoir offers plenty of bass and panfishes for an enjoyable day on the water.

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