

Gouldsboro Lake

Monroe County

2024 Panfish and Largemouth Bass Population Evaluations: Trap netting and Night Electrofishing Surveys

Gouldsboro Lake, located in Monroe County, is a 250-acre impounded water owned and operated by the Pennsylvania Department of Conservation and Natural Resources. The public boat launch is located in Gouldsboro State Park, on the southwest shoreline (GPS: 41.225191, -75.457395) off of State Park Road. Self-sustaining populations of various panfish and Largemouth Bass are present in the lake, managed under the Panfish Enhancement and Big Bass regulations, respectively.

Pennsylvania Fish and Boat Commission (Commission) Area 5 biologists utilized trap nets and night boat electrofishing to evaluate abundance and length distributions of Gouldsboro Lake's fish populations. Eleven overnight trap nets were set April 8-10, 2024. Net leads were set directly onshore extending perpendicular to the shoreline into the lake, directing fish towards the lifting enclosure (pot) situated at depths varying from 3.5 ft to 7.0 ft. On June 16th, five single-pass, night boat electrofishing sites were sampled specifically targeting black basses. Each survey covered approximately 1,150-ft of shoreline, encompassing a total of 1.1-miles (24%) of shoreline. After capture, all fish were enumerated by species, total length measured, and released.

2024 Trap Netting

A total of 770 fish representing 10 different species were captured using trap nets (Table 1). Bluegill (N = 277), Yellow Perch (N = 142), Creek Chub (N = 95), Black Crappie (N = 91), Yellow Bullhead (N = 44), and Pumpkinseed (N = 41) were most abundant species in the catch. Chain Pickerel, Brown Bullhead, Largemouth Bass, and Golden Shiner were also present in lower quantities. The low catch of Largemouth Bass is expected as trap nets are not effective at capturing this species. Bluegill sizes ranged from less than one inch up to 8 inches with a modal length of 7 inches (53%; Table 1). Yellow Perch fell mostly (68%) into the 7-inch to 9-inch length groups and 65% of captured individuals were of quality-length or greater (\geq 8-inch). The Black Crappie length distribution ranged between 6-14 inches. Most (87%) crappies were in the 8-inch to 11-inch length groups; quality-length fish (\geq 8-inch) made up 92% of their total catch. Pumpkinseed were primarily (88%) 5 and 6-inch fish.

Table 1. Length-frequency distribution of fish species captured from trap net sets at Gouldsboro Lake, April 2024.

Length (in)	Species									
	Golden Shiner	Creek Chub	Yellow Bullhead	Brown Bullhead	Chain Pickerel	Pumpkinseed	Bluegill	Largemouth Bass	Black Crappie	Yellow Perch
0	0	0	0	0	0	1	1	0	0	0
1	0	0	0	0	0	0	0	0	0	0
2	0	0	0	0	0	0	0	0	0	0
3	0	0	0	0	0	0	0	0	0	0
4	0	0	0	0	0	1	2	0	0	0
5	0	0	0	0	0	12	24	0	0	10
6	1	0	0	0	0	24	103	0	1	8
7	3	0	1	2	0	3	145	0	6	31
8	0	1	3	0	0	0	2	0	19	40
9	1	1	5	1	0	0	0	0	24	26
10	0	2	20	4	0	0	0	1	20	18
11	0	11	12	17	3	0	0	1	17	6
12	0	25	1	5	3	0	0	1	3	3
13	0	20	1	0	9	0	0	2	1	0
14	0	29	1	1	4	0	0	2	0	0
15	0	5	0	0	9	0	0	1	0	0
16	0	1	0	0	1	0	0	0	0	0
17	0	0	0	0	0	0	0	1	0	0
18	0	0	0	0	1	0	0	0	0	0
19	0	0	0	0	1	0	0	0	0	0
20	0	0	0	0	0	0	0	0	0	0
21	0	0	0	0	4	0	0	1	0	0
22	0	0	0	0	0	0	0	0	0	0
Total	5	95	44	30	35	41	277	10	91	142

2024 Night-boat Electrofishing

Night boat electrofishing surveys collected a total of 108 Largemouth Bass with 1.25 hours of electrofishing effort with lengths ranging from 2- 21 inches (Table 2). Six and seven-inch fish accounted for 27% of the total catch. Nine Largemouth Bass 15 inches and longer were captured during the surveys accounting for 8% of the total catch. No Smallmouth Bass were found.

Table 2. Collective size (total length) frequency distribution of Largemouth Bass captured from night-boat electrofishing transects on Gouldsboro Lake, June 2024.

Length (inches)	Largemouth Bass
<1	0
1	0
2	1
3	7
4	7
5	1
6	14
7	15
8	10
9	7
10	6
11	4
12	9
13	9
14	9
15	3
16	1
17	0
18	1
19	2
20	0
21	0
22	2
Total	108

Evaluation of Panfish Enhancement Regulation Objectives

We can track changes of relative abundance of different species over time by comparing annual mean species-specific catch rate (fish/h; Figure 1). Catch rates for Bluegill, Pumpkinseed, Black Crappie, and Yellow Perch have varied somewhat over the 2012 to 2024 period within trap nets. Bluegill catch rates appeared to increase from 2012 to 2018 then declined slightly in 2024, though 2024's catch rate (1.1 fish/h) is still above the mean of 0.9 fish/h. The trend for Pumpkinseed catch rates followed a similar pattern to Bluegill, varying between 0.1 fish/h to 0.3 fish/h. Catch rates for both Yellow Perch (2012: 2.3 fish/h, 2024: 0.6 fish/h) and Black Crappie (2012: 1.2 fish/h, 2024: 0.4 fish/h) appear to demonstrate a decline through the time-series. Overall, for any of the four species, the broad overlapping 95% confidence intervals are not suggestive of significant changes in relative abundance temporally. However, low abundances for Bluegill (2012: 0.3 fish/h), Pumpkinseed (2012: <0.1 fish/h) and Yellow Perch (2015: 0.2 fish/h) are significantly depressed compared to the respective species peak abundances.

Modal lengths for panfishes observed from trap net catches were fairly consistent from 2012 to 2024 (Figure 2). Modal lengths of Bluegill varied between 6 inches (2015: 60%; 2018: 72%) and 7 inches (2012: 44%; 2024: 53%). Pumpkinseeds were most frequently 5 inches long from 2012 (45%) to 2015 (40%) but increased to 6 inches in 2018 (64%) and 2024 (58%) surveys. Black Crappie length distributions varied among years, but the modal length generally remained between 8 (2015: 60%) and 9 inches (2018: 56%) except for 2012 when modal length was 7 inches (40%). Yellow Perch length distributions have remained relatively stable in the range of 7 -9 inches with most of the total catch (>65%) being of quality-length or larger (\geq 8-inch)

in all years except for 2012 (47%). Observed variation of sizes likely reflects the influence of annual recruitment of juvenile fish into the adult length classes.

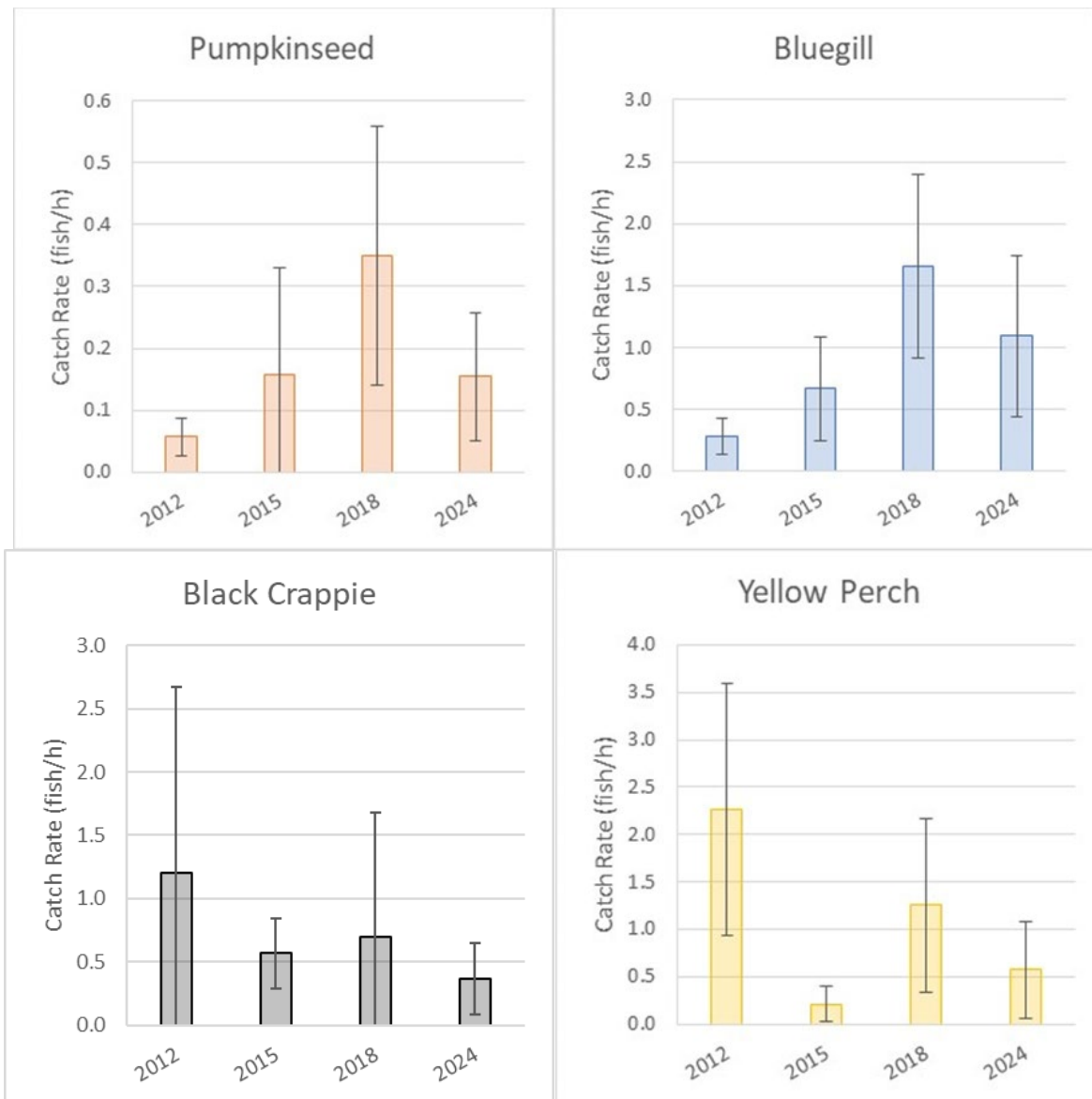


Figure 1. Mean catch rate (fish/h) and associated 95% confidence intervals for panfish captured using trap nets, 2012 to 2024.

Gouldsboro Lake is managed specifically as a Panfish Enhancement water for Bluegill, Pumpkinseed, Black Crappie, and Yellow Perch (Figure 2). Minimum length limits were established as ≥ 7 inches for Bluegill and Pumpkinseed or ≥ 9 -inches for Black Crappie and Yellow Perch. Bluegill length exceeded the minimum length limit in all years surveyed (2012: 50%; 2015: 15%; 2018: 19%; 2024: 53%); however, the model length only equaled or exceeded the minimum length limit in 2012 and 2024. Relatively few Pumpkinseeds (< 20%) were observed above the minimum length limit in any given year. Black Crappies were consistently larger than the minimum length throughout the time-series (2012: 22%; 2015: 19%; 2018: 61%; 2024: 71%) with the highest frequency of fish being of legal length or longer during the 2018 and 2014 surveys. Similarly, Yellow Perch also consistently exceeded the minimum length limit (2012: 23%; 2015: 45%; 2018: 58%; 2024: 37%) in all years surveyed.

The applicability of Panfish Enhancement regulations will eventually need reevaluation. The low occurrence of Pumpkinseeds and Bluegills at or below the minimum length limit would suggest those populations remain unresponsive to the Panfish Enhancement regulation (Figure 2). In contrast, large portions of both Black

Crappie and Yellow Perch populations exceed the minimum length limit and appear to benefit from the Panfish Enhancement regulation (Figure 2). Fish populations are principally reliant on recruitment of juveniles into adulthood to support adequate fisheries (i.e., exceed minimum length limit), presuming limited angler harvest. Certainly, the length distributions are not indicative of angler cropping effects. Without quantifiable knowledge of present-day angler behaviors and opinions relative to trip satisfaction, it remains unknown if these populations fulfill angler expectations.

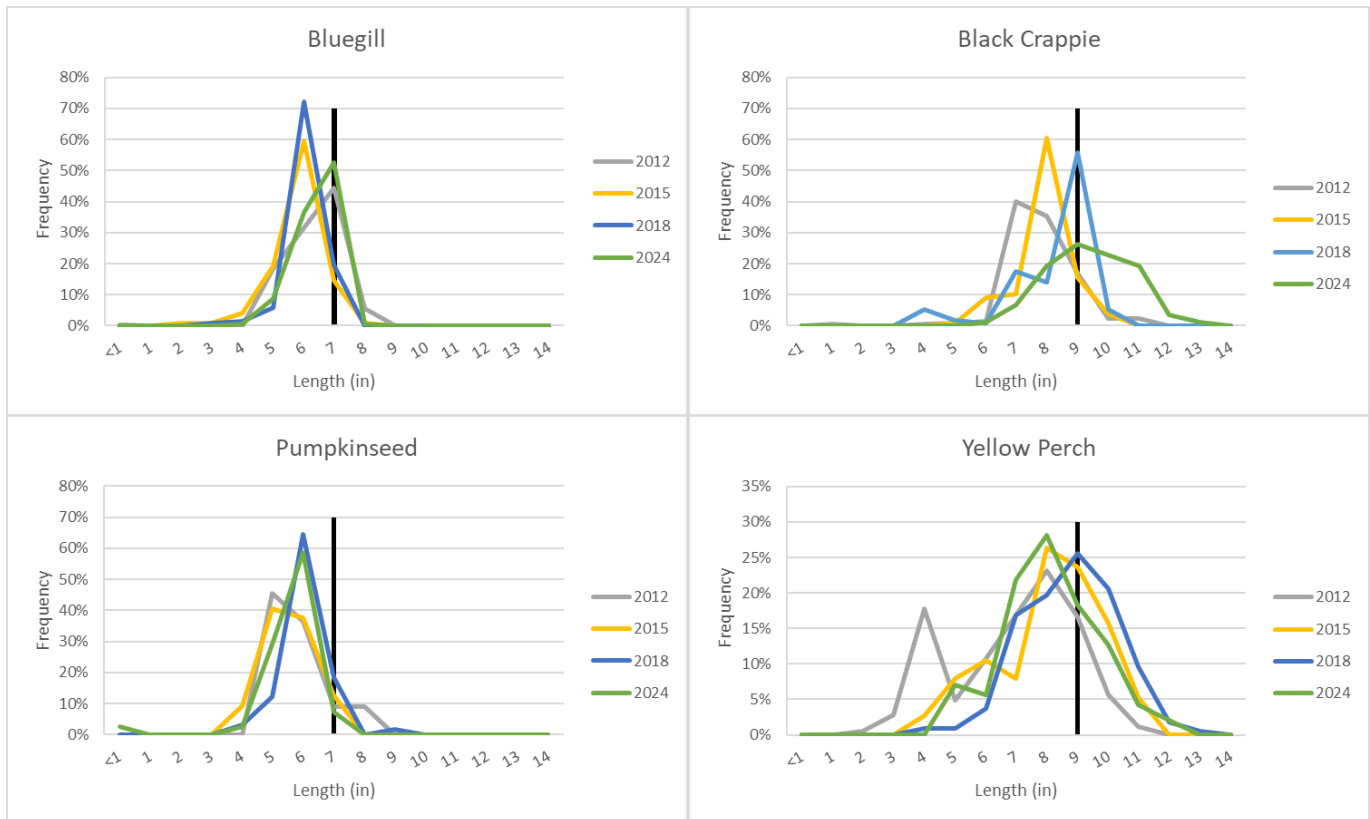


Figure 2. Length-frequency distribution of panfish captured using trap nets, 2012 to 2024. The Panfish Enhancement minimum size limit is represented as a vertical black bar.

Evaluation of Big Bass Regulation Objectives

Relative abundance of Largemouth Bass, as inferred by night boat electrofishing catch rate (fish/h), appears to be stable through the time-series (Figure 3). Observed catch rates from 2012 to 2018 were highly consistent (2012: 36.7 fish/h; 2015: 37.1 fish/h; 2018: 25.0 fish/h), with the time-series peak (81.1 fish/h) occurring in 2024. While the 2024 catch rate appears suggestive of an increased relative abundance of Largemouth Bass, the broad, overlapping 95% confidence limits suggest the 2024 peak is not a significant trend.

Largemouth Bass length distributions were well represented by multiple length classes throughout the time-series (Figure 4). Bass were primarily (> 57%) between 10 and 13 inches from 2012 to 2018. Whereas, in 2024, modal peaks were observed at the 3-inch to 4-inch and 6-inch to 7-inch length classes, which were not evident in previous annual surveys. Additionally, the 12-inch to 15-inch length classes were also well represented in the 2024 survey.

Gouldsboro Lake is managed under the Big Bass Program. Collectively, this applies to Largemouth Bass, Smallmouth Bass and Spotted Bass, but only Largemouth Bass occur in Gouldsboro Lake. A ≥ 15 -inch minimum length limit, with a catch and immediate release season only during spawning has been established. Focusing solely on ≥ 12 and ≥ 15 -inch Largemouth Bass, catch rates appear to be achieving program objectives (i.e., 7 fish/h ≥ 12 -inch and 2 fish/h ≥ 15 -inch). The capture of two bass exceeding 20-inches in the 2024 survey

is highly encouraging. The consistent exceedance of the Big Bass Program catch rate benchmarks suggests Gouldsboro Lake remains supportive of the program.

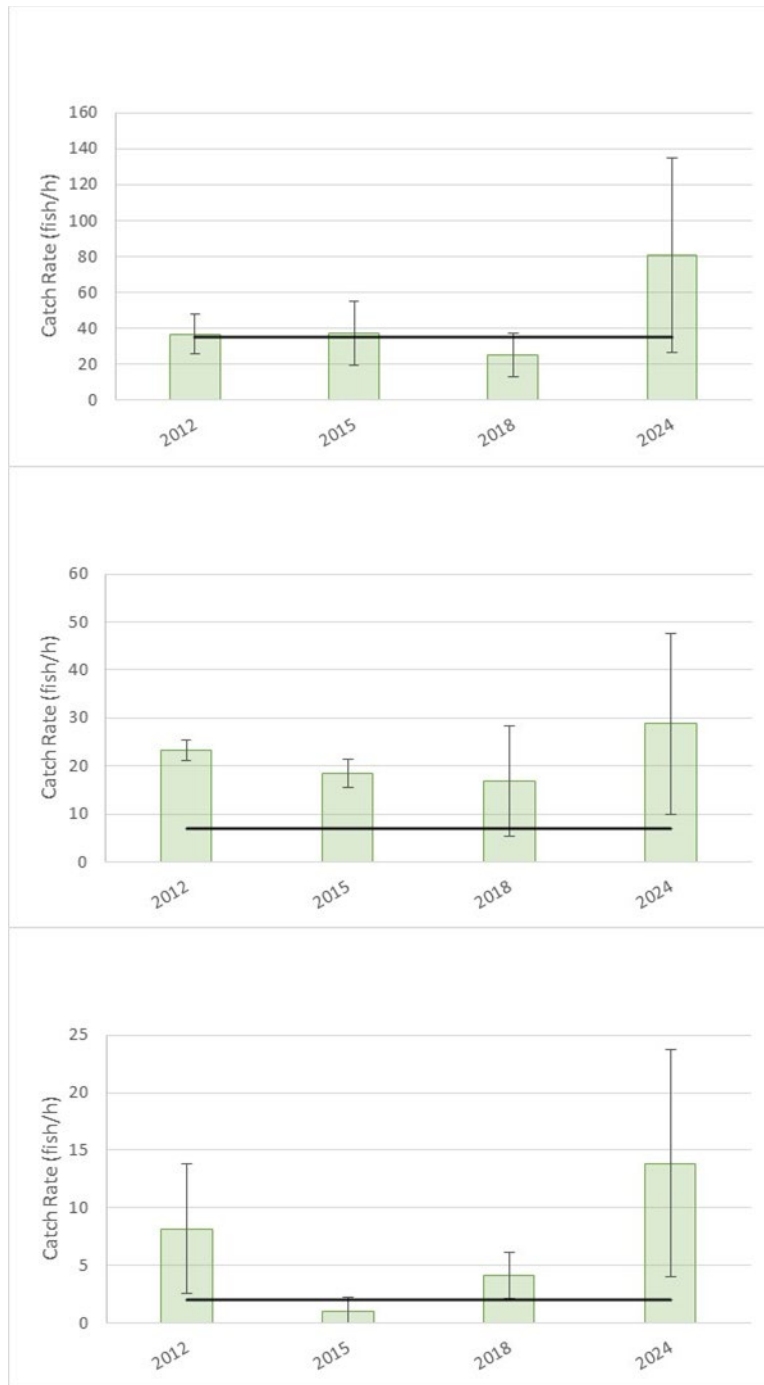


Figure 3. Mean catch rate (fish/h) and associated 95% confidence intervals for Largemouth Bass captured during night-boat electrofishing, 2012 to 2024. Catch rates are separately illustrated include total black bass catch (top), black bass \geq 12-inch (middle), and black bass \geq 15-inch (i.e., Big Bass Program minimum length limit; bottom).

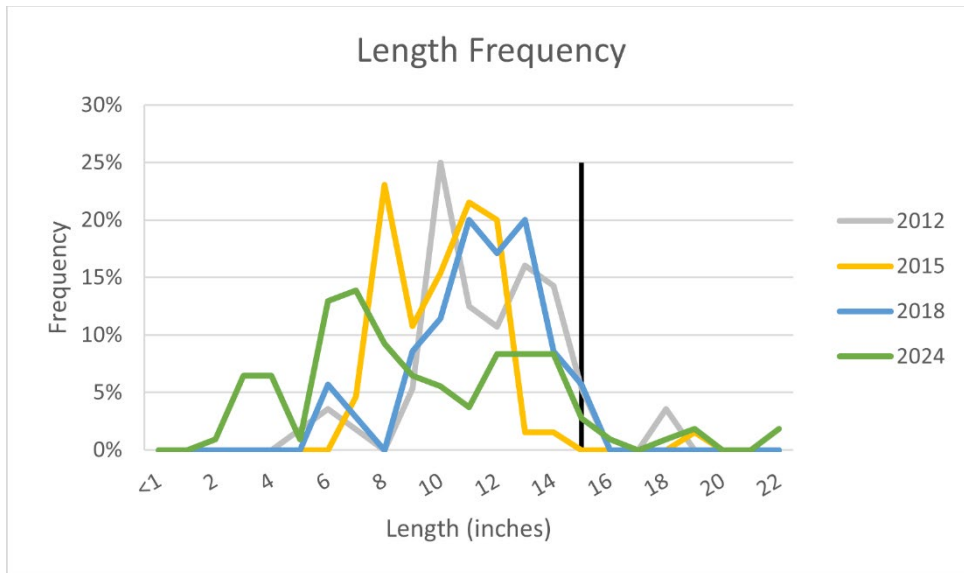


Figure 4. Length-frequency distribution for Largemouth Bass captured during night-boat electrofishing, 2012 to 2024. The Big Bass program minimum length limit is represented by the vertical black bar.

Conclusion

Results of the 2024 surveys indicate favorable Largemouth Bass population characteristics meeting or exceeding Big Bass regulation objectives. Panfish Enhancement regulations, while they appear effective for Black Crappie and Yellow Perch at Gouldsboro, are not performing as well for Bluegill and Pumpkinseed populations. Additional monitoring will aid in redressing Bluegill and Pumpkinseed management under the Panfish Regulations. Management of the panfish populations of the lake could benefit from present-day angler behavior and opinion surveys. Anglers on Gouldsboro Lake can look forward to catches of quality-sized Black Crappie, Yellow Perch, and Largemouth Bass. The large cohort of smaller bass present in the lake in the 2024 survey is encouraging as these fish will eventually recruit into the larger length-classes desired by the fishery. The Commission anticipates population monitoring will continue into the foreseeable future.

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