

## **Shenango River Lake** Mercer County

### **2017 Lake Survey**



*A nice Hybrid Striped Bass*

Fisheries Management Area 1 conducted a trap netting, night electrofishing and angler opinion survey on Shenango River Lake in spring of 2017. Our primary target for the trap net survey were the Black Crappie and White Crappie populations. The trap net survey ran from April 24 – May 5, 2017. We counted all fish captured, and for selected sportfish, we measured and collected scale samples to calculate age and growth statistics. Night electrofishing, targeting black bass, occurred on the nights of May 18, 22 & 23, 2017. Angler opinions were collected by interviewing crappie anglers actively fishing at Shenango River Lake in May and June.

#### **Trap netting**

The results for all fish captured in our trap nets are presented in Table 1. It was surprising how our index of abundance of fish populations documented change in abundance of some populations since our last survey and detected fish species not previously captured. For example, this is the first time we've captured Alewife in Shenango River Lake. They've been present in Pymatuning Reservoir for years and appear to have made the journey down the Shenango River (21 miles) and are now established in Shenango River Lake. Will they experience a population boom like other introduced species sometimes do? Only time will tell.

We captured our first Flathead Catfish in Shenango River Lake in 2014. The population appears to be expanding. The individual Flatheads we captured were large, so they probably have been in the lake for quite some time. Again, their future in the lake can't be predicted.

**Table 1. Number captured and size ranges for all fish captured in trap nets in Shenango River Lake, 2017.**

<b>Species</b>	<b>Number caught</b>	<b>Size range (inches)</b>
Black Crappie	1,541	3 – 16
White Crappie	81	3 - 15
Bluegills	346	3 - 8
Pumpkinseeds	10	4 - 7
Yellow Perch	27	5 - 9
White Bass	60	7 - 16
Northern Pike	37	19 – 36
Walleyes	18	15 - 27
Channel Catfish	541	8 – 28
Hybrid Striped Bass	21	8 - 27
Brown Bullheads	125	2 - 13
Yellow Bullheads	35	7 - 12
Muskellunge	2	32 - 34
Flathead Catfish	11	27 - 42
Green Sunfish	1	6
Quillback	1,262	Not Measured
Common Carp	547	Not Measured
Redhorse species	615	Not Measured
Spotted Suckers	2	Not Measured
Grass Carp	1	Not Measured
Gizzard Shad	1,486	Not Measured
Alewives	67	Not Measured
Golden Shiners	20	Not Measured



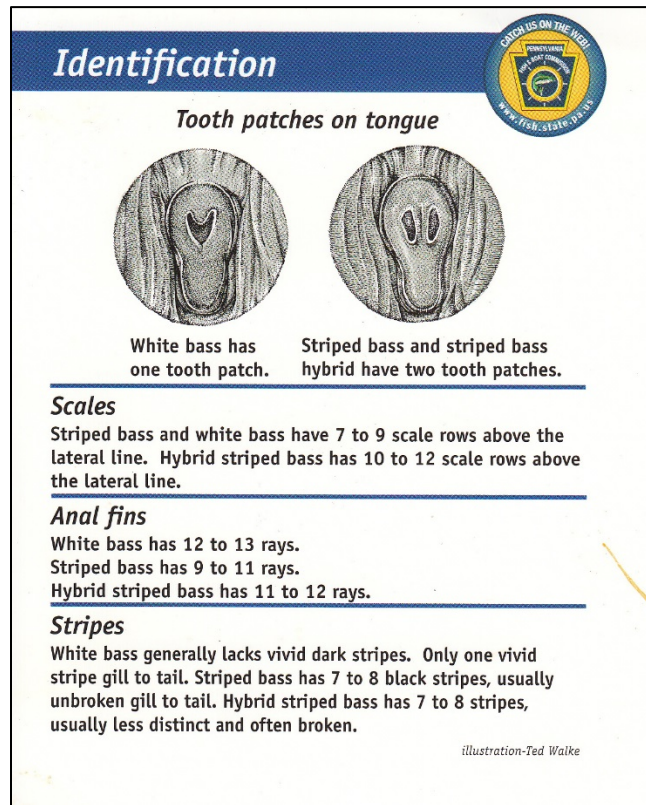
*One of the Flathead Catfish now established in Shenango River Lake.*



*One of many nice Channel Catfish*

We continue to stock Hybrid Striped Bass fingerlings on an annual basis and Shenango River Lake has received its allotment every year since 2007. The presence of a good, naturally reproducing White Bass population, alongside the stocked Hybrid Striped Bass population, is

still causing some confusion with anglers because of the difficulty in distinguishing one from the other. Hybrid Striped Bass are managed with a 20-inch minimum size limit and managed with a 2 per day creel limit, whereas, White Bass are managed as a Panfish with no minimum size limit and a 50 panfish per day creel limit (combined panfish species). We have found the most reliable characteristic to differentiate the two is via tooth patches on the tongue (see illustration). However, White Bass abundance has declined substantially since their peaked in 2014.



*White Bass/Hybrid Striped Identification Card*

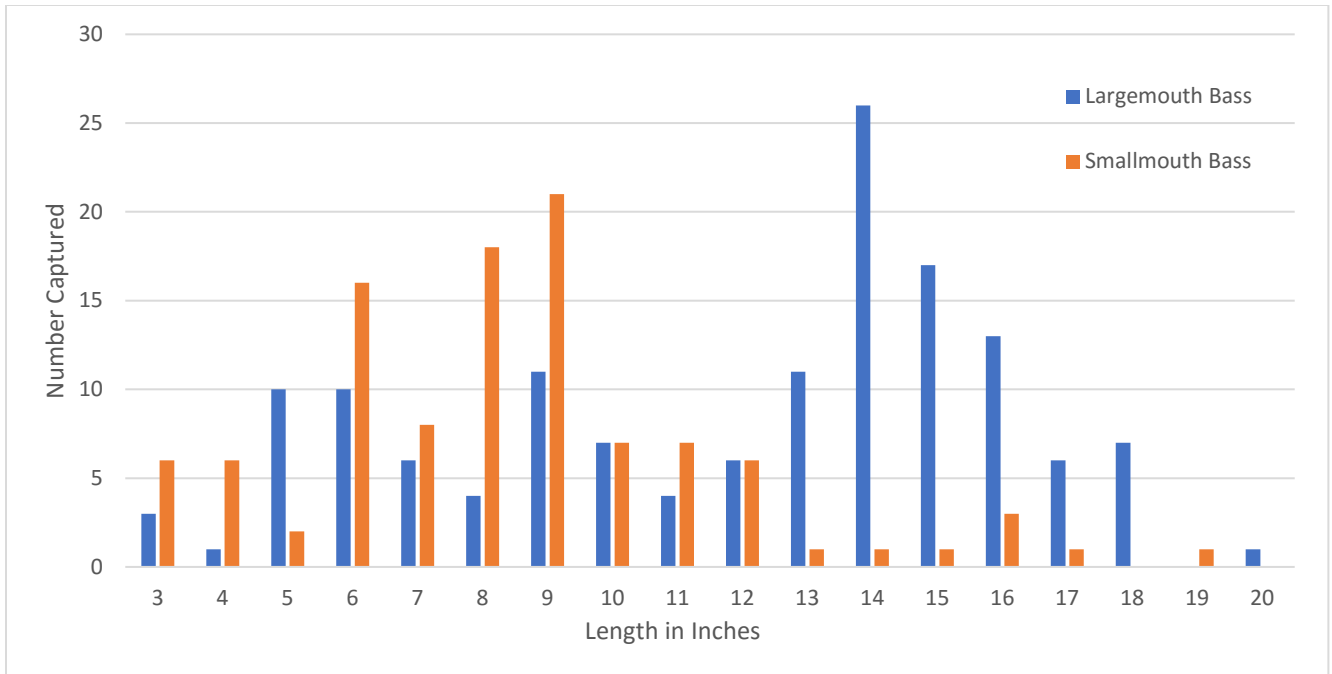
We continue to stock Walleye fingerlings on an annual basis. However, due to shortfalls in hatchery production, Shenango River Lake hasn't received its requested allotment every year. Thus our sample catch has shown a decline in Walleye abundance as these missing year classes have affected abundance and likely the associated fishery. Channel Catfish continue to provide a high-density, high-quality fishery. Channel Catfish are sustained solely through natural reproduction. Bluegills have decreased in abundance but have increased in quality over previous surveys. Previously, Bluegills over 7 inches were rare; however, this year 78% of our Bluegill catch was equal to or greater than 7 inches.



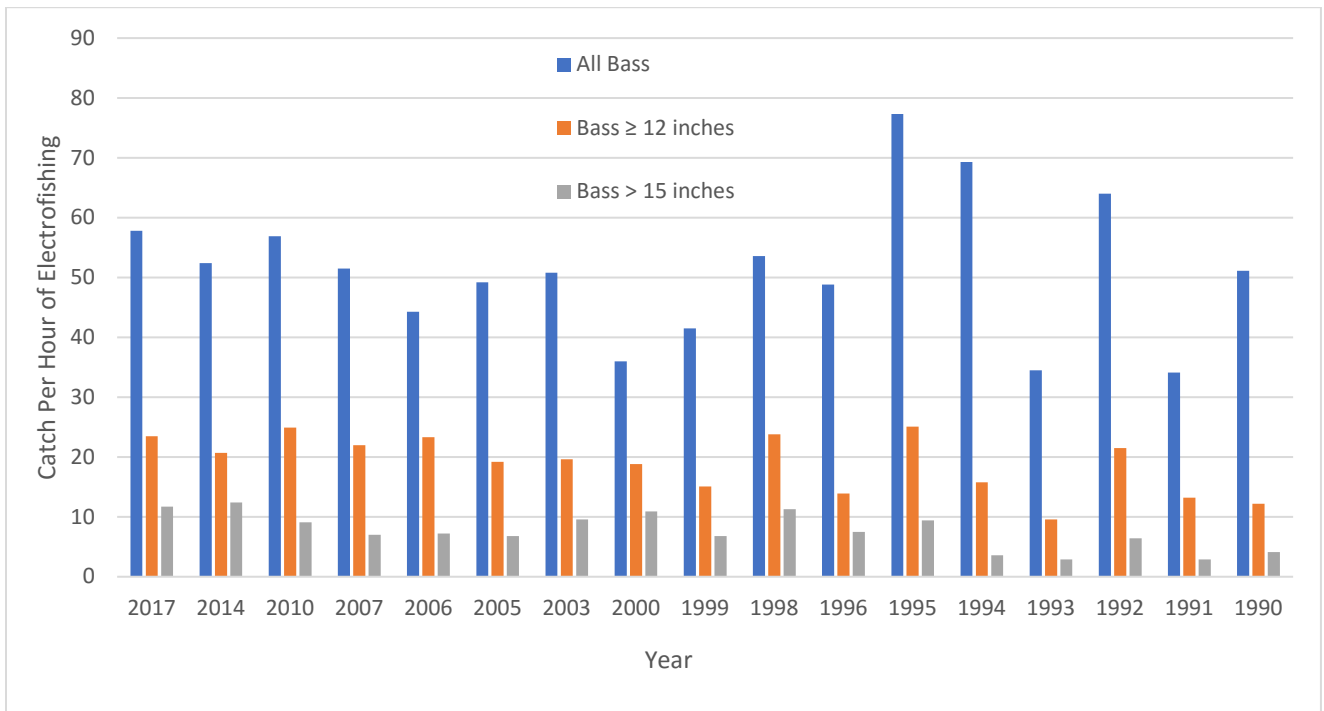
*Nice Largemouth Bass captured during Night Electrofishing*

### **Night Electrofishing**

The black bass population (Largemouth and Smallmouth Bass) has remained remarkably steady over the years after the implementation of Big Bass Regulations in 1991. Figure 1 shows the size distribution of our 2017 sample. Largemouth Bass contributed most of the quality and trophy size Bass. Figure 2 compares the electrofishing catch rates for all Bass since 1990. Our catch rate in 2017 of 57.8 Bass per hour is slightly above the long-term average (51.3 Bass per hour) and the catch rates for Bass over 12 inches and Bass over 15 inches were very good.



**Figure 1. Size distribution of Black Bass captured by night electrofishing in Shenango River Lake, 2017.**



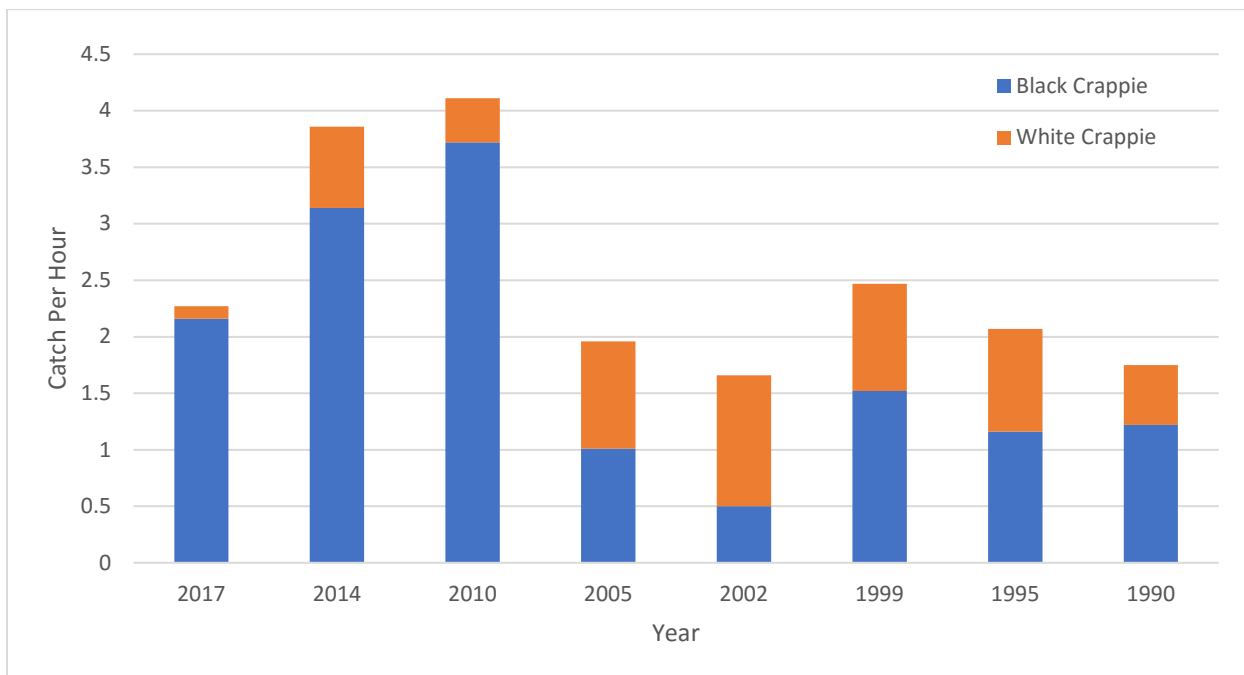
**Figure 2. Comparison of night electrofishing catch rates for all Black Bass captured in Shenango River Lake, 1990 – 2017.**

## Crappie

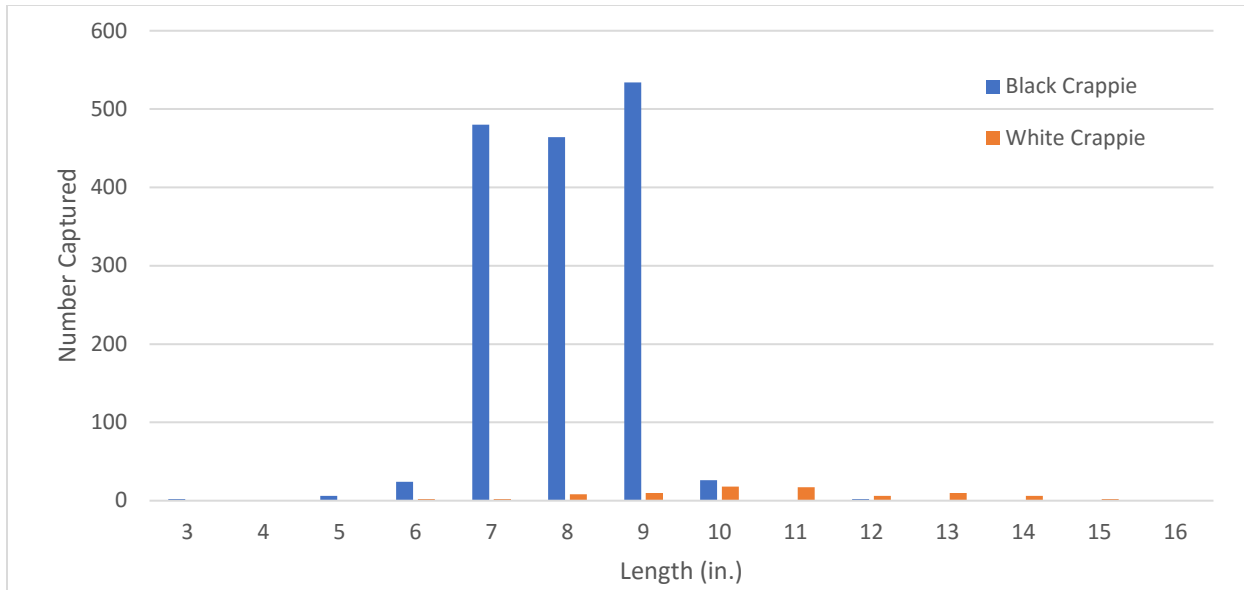
We have received complaints regarding the small average size of the abundant crappie population. These complaints are often followed by requests that we apply Panfish Enhancement Regulations to the crappie populations in Shenango River Lake. We measured relative abundance statistics, growth rates and angler opinions regarding Panfish Enhancement Regulations to determine if the regulations are appropriate and acceptable for Shenango River Lake.

### Relative Abundance

Historically, the ratio of Black Crappie to White Crappie was close to 50/50 (Figure 3). However, since 2010, Black Crappie have increased dramatically in abundance and now dominate the fishery. In 2017, Black Crappie comprised 95% of the catch with White Crappie contributing only 5%. Figure 3 shows the change in survey catch rates over time. The abundance of crappie in Shenango River Lake peaked in 2010 and has gradually declined and is now near the long-term average for this lake.



**Figure 3. Comparison of Trap Net Catch Rates for Black and White Crappie in Shenango River Lake, 1990 – 2017.**

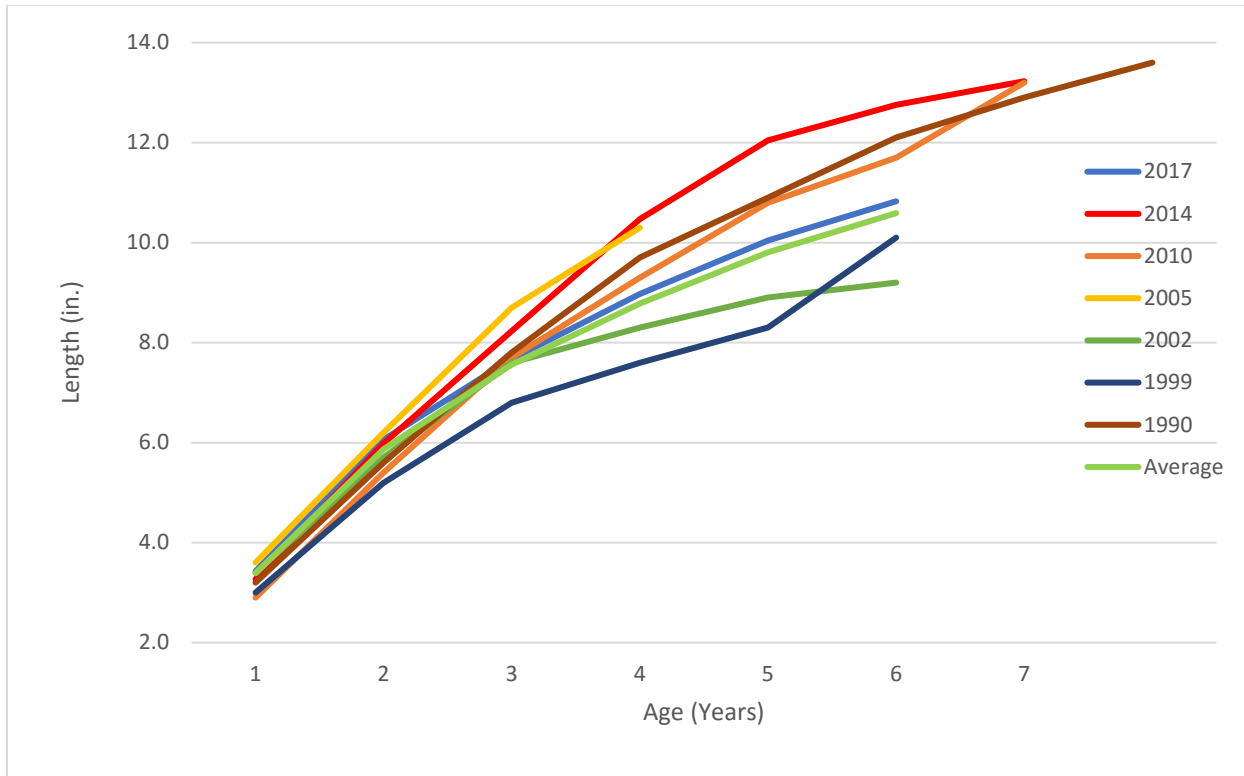


**Figure 4. Length frequency distribution of Black Crappie and White Crappie captured in Trap Nets in Shenango River Lake, April 24 - May 5, 2017. Ninety-six percent (96%) of the Black Crappie were between 7 and 9.9 inches, while 88% of the White Crappie were greater than 9 inches.**

### **Growth Rates**

Results of our analysis of the scales collected from Black Crappie and White Crappie this spring yielded contradictory results. White Crappie grow very fast and on average exceed 9 inches early in their third year. This growth rate is very fast for crappie in Pennsylvania. Conversely, Black Crappie grow much slower and on average don't reach 9 inches until late in their fourth year. Annual Black Crappie growth rates have varied substantially over the years; but generally, have been equivalent to or slightly above the state average growth rate for Black Crappie in Pennsylvania (Figure 5). Currently, the fish population is comprised of three consecutive large year classes spawned in 2012, 2013 and 2014, which accounted for ninety-four percent (94%) of all the Black Crappie we captured.





**Figure 5. Growth rates for Black Crappie captured in Shenango River Lake, 1990 – 2017, and compared to the statewide average growth rate for the species.**

### Angler Opinions

Area 1 staff interviewed 138 anglers at Shenango River Lake during 5 days in May and June to gather angler opinions and preferences regarding application of Panfish Enhancement Regulations to Shenango River Lake and to measure harvested crappie in angler creels. The interview consisted of three parts: (1) general demographic data about the angler, (2) specific data pertaining to their fishing trip (crappie harvested by species) and (3) their opinion regarding: (a) the current state of the crappie fishery and (b) preferences pertaining to application of Panfish Enhancement Regulations.

Angler characteristics are presented in Table 2. The species of fish being targeted by the anglers we interviewed are presented in Table 3. Anglers could pick up to 3 species that they were targeting during their fishing trip; therefore, the number of species will add up to greater than the 138 anglers interviewed. All survey data was collected anonymously from the angler.

Table 2. Selected angler characteristics for 138 anglers interviewed at Shenango River Lake in 2017.

	Male/Female	Adult/Youth	Shore Angler/Boat Angler
Ratio	125/13	136/2	60/78

Table 3. Species targeted by 138 anglers interviewed at Shenango River Lake in 2017.

Species Targeted	Number of Anglers Targeting
Crappie	79
Black Bass	25
Any Fish That Bites	21
Channel Catfish	11
Bluegill	8
Walleye	5
Hybrid Striped Bass	2
Yellow Perch	2
White Bass	2
Common Carp	1

Anglers were asked if they had fished for crappie in Shenango River Lake within the last year. Those that self-identified as crappie anglers were asked a series of questions regarding current and potential future management of crappie in Shenango River Lake. The responses of these ninety (90) crappie anglers are shown below. Percentages are rounded to the nearest whole number, so the total may not add up to exactly 100 percent. The number of responses is in parentheses.

1. How do you feel about the **number** of crappie you've **caught** in Shenango River Lake the past year?

<b>Satisfied</b>	<b>48%</b>	<b>(43)</b>
<b>Dissatisfied</b>	<b>47%</b>	<b>(42)</b>
<b>Neutral/No Opinion</b>	<b>2%</b>	<b>(2)</b>
<b>Catch any crappie</b>	<b>3%</b>	<b>(3)</b>

2. How do you feel about the **number** of crappie you've **harvested** from Shenango River Lake the past year?

<b>Satisfied</b>	<b>36%</b>	<b>(32)</b>
<b>Dissatisfied</b>	<b>46%</b>	<b>(41)</b>
<b>Neutral/No Opinion</b>	<b>7%</b>	<b>(6)</b>
<b>Didn't Harvest any crappie</b>	<b>12%</b>	<b>(11)</b>

3. How do you feel about the **size** of the crappie you've **caught** in Shenango River Lake the past year?

<b>Satisfied</b>	<b>38%</b>	<b>(34)</b>
<b>Dissatisfied</b>	<b>54%</b>	<b>(49)</b>
<b>Neutral/No Opinion</b>	<b>4%</b>	<b>(4)</b>
<b>Didn't Catch any crappie</b>	<b>3%</b>	<b>(3)</b>

4. How do you feel about the **size** of the crappie you've **harvested** from Shenango River Lake the past year?

<b>Satisfied</b>	<b>42%</b>	<b>(38)</b>
<b>Dissatisfied</b>	<b>34%</b>	<b>(31)</b>
<b>Neutral/No Opinion</b>	<b>9%</b>	<b>(8)</b>
<b>Didn't Harvest any crappie</b>	<b>14%</b>	<b>(13)</b>

5. How do you feel about the current regulations at Shenango River Lake? (50 per day, No size limit)

<b>Satisfied</b>	<b>34%</b>	<b>(31)</b>
<b>Dissatisfied</b>	<b>56%</b>	<b>(50)</b>
<b>Neutral/No Opinion</b>	<b>10%</b>	<b>(9)</b>

6. Would you approve or disapprove of changing the creel limit for crappie at Shenango River Lake to 20 per angler per day?

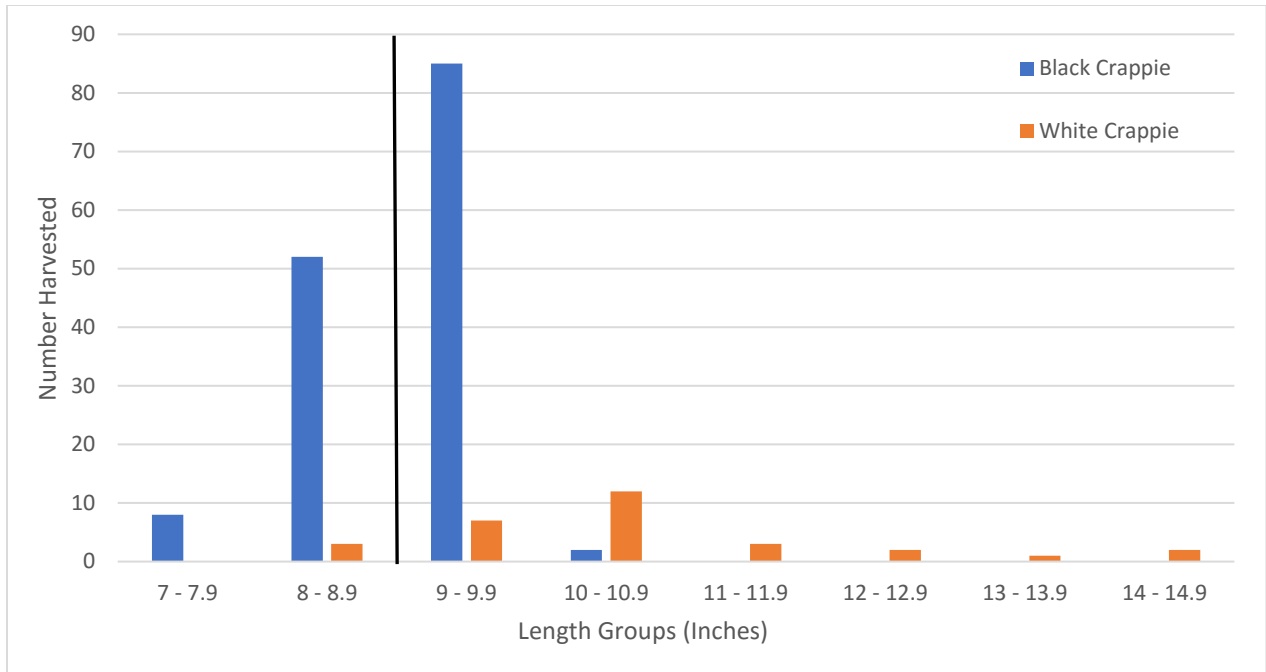
<b>Approve</b>	<b>71%</b>	<b>(64)</b>
<b>Disapprove</b>	<b>27%</b>	<b>(24)</b>
<b>Neutral/No Opinion</b>	<b>2%</b>	<b>(2)</b>

7. Would you approve or disapprove with applying a 9-inch minimum size limit to all crappie harvested from Shenango River Lake?

<b>Approve</b>	<b>89%</b>	<b>(80)</b>
<b>Disapprove</b>	<b>8%</b>	<b>(7)</b>
<b>Neutral</b>	<b>3%</b>	<b>(3)</b>

Less than half of the crappie anglers were satisfied with number and/or size of the crappie that they were catching and harvesting. Most (55%) disagreed with the current regulations applicable to crappie (No minimum size limit and 50 per day creel limit). A large majority of anglers were in favor of the two components of Panfish Enhancement Regulations. Eighty-nine percent (89%) approved of the application of a 9-inch minimum size limit to crappie, and 72% approved of the 20 per day creel limit.

We also measured all crappie that had been harvested by the anglers we interviewed. We measured 147 Black Crappie and 30 White Crappie. Their size distribution is shown in Figure 6. Forty-one percent (41%) of Black Crappie and 10% of White Crappie harvested were less than 9 inches, suggesting that a 9-inch minimum size limit would protect a substantial number of small crappie from harvest. The 9-inch minimum size limit rule, if applied, would result in many throw-backs.



**Figure 6. Sizes of Crappie harvested at Shenango River Lake.**

No angler harvested the current creel limit of 50 crappie. Only 2 of the 138 anglers interviewed had harvested more than 20 crappie (the creel limit under Panfish Enhancement Regulations). It is likely that the 20 crappie per day creel limit under Panfish Enhancement Regulations would have much less (minimal) effect on harvest of crappie at Shenango River Lake.

**Panfish Enhancement Regulations**

Part of the reason for the recent decline in quality of the crappie fishery in Shenango River Lake is the shift composition of the crappie community to slower growing Black Crappie (Figure 4). It appears that anglers are harvesting large numbers of crappie overall and a substantial portion of that harvest (41%) was less than 9 inches in length. Presumptively, much of the harvest of large individuals in the past were comprised of White Crappie. We plan to recommend application of Panfish Enhancement Regulations to crappie harvest at Shenango River Lake. Our biggest concern is any potential decrease in growth rate or decrease in survival associated with increased crappie abundance resulting from reduced harvest, including loss from hooked and released crappie. We will monitor crappie relative abundance, growth, and survival closely as these regulations have recently received approval by the Pennsylvania Fish and Boat Commission.

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